ENVIRONMENTAL AND COMMUNITY ASSESSMENT SUMMARY FOR ELK CREEK

Prepared for:

NioCorp Developments Ltd.

January 2022 Olsson Project No. 021-06507

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1. INTRODUCTION

1.1 **Project Owner**

NioCorp Developments Ltd. (NioCorp) is a U.S.-based mineral development company focused on developing several critical minerals from the proposed Elk Creek Mine Project (Project), a 640acre section of land in Johnson County (Property). This Project is one of the few pure-play critical minerals projects in the U.S. with a definitive feasibility study completed, key U.S. federal permits already obtained, and strong support from local residents in Nebraska. Additionally, all three of NioCorp's planned products have been designated as "Critical Minerals" by the U.S. Government, with a fourth critical mineral product stream, rare earths, under evaluation at the time of writing. When operational, the Elk Creek Mine will inaugurate the first production in the U.S. in decades of niobium, and the first-ever production in the U.S. of scandium from a greenfield mine. The Company's three products (niobium, scandium, and titanium) are valuable superalloy additives used in large, diverse end markets, including transportation, aerospace and defense, oil and gas, advanced manufacturing, and steel mega-structures. Niobium has a global market value of over \$2 billion (U.S. Dollars).

1.2 Project Description

NioCorp is developing North America's only niobium, scandium, and titanium advanced materials manufacturing facility co-located with an underground mine. Located near Elk Creek, in Johnson County, Nebraska, this will be the highest-grade niobium project in North America, as well as one of the largest prospective producers of scandium in the world. It is located approximately 105 kilometers (km) (65 miles) southeast of Lincoln, Nebraska (the state capital), and 129 km (80 miles) south of Omaha, Nebraska. The deposit is located within the U.S. Geological Survey (USGS) Tecumseh Quadrangle Nebraska SE (7.5-minute series) map sheet in Sections 1-6, 9-11; Township 3 North; Range 11 East and Sections 19-23, 25-36; Township 4 North, Range 11 East (see Figure 1). The mineralization (ore deposit) is centered approximately at 40°16'0.3.5" N latitude and 96°11'08.5" E longitude (see Figure 2). The deposit is located adjacent to a state highway and well-established roadway system. The City of Tecumseh is located within 10 miles from the deposit and provides local services and workforce. Rail, supply, and distribution companies, and a local workforce including heavy equipment operators are available within the area. According to NioCorp's April 2019 Feasibility Study, the Project is expected to produce the following over its 36-year operating life:

• Ferroniobium (FeNb): An average of 7,220 tonnes per annum (tpa) of ferroniobium, a crucial component in high strength, low-alloy steel that is increasingly used in bridges and other large infrastructure projects, as well as in high pressure oil and gas pipelines, steel-chassis vehicles, commercial aviation, aerospace, defense systems, and in many other

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applications. Niobium also is a component of superalloys used in nearly all jet engines and power generation turbines.

- Scandium Trioxide (Sc2O3): An average of 95 tpa of scandium trioxide. Scandium has important uses in environmentally preferred Solid Oxide Fuel Cells, as well as in ultrahigh-performance aluminum alloys. Scandium greatly strengthens aluminum alloys and allows them to be reliably welded, which presents revolutionary potential for the commercial airline industry. For example, between \$1.0-\$1.5 million of scandium oxide in a single airliner offers \$10-15 million in net present value fuel savings.
- Titanium Dioxide (TiO2): An average of 11,642 tpa of titanium dioxide. Titanium has the highest strength-to-density ratio of any metallic element, and it is used in wide variety of sectors, including aerospace, national defense, chemical processing, desalination, automotive, health care, communications, sporting goods, and many others. Titanium in its oxide form also is used in the manufacture of pigments in paints, plastics, and paper, and is a photocatalyst.

The company is also in the process of evaluating the production of three rare earth products from the same resource, namely neodymium/praseodymium oxide, dysprosium oxide and terbium oxide. These products are the enabling ingredients in rare earth magnets, which are the strongest natural magnets known and which are essential to the electrification and decarbonization of the world's economies.

NioCorp has completed metallurgical testing, core drilling, mineral resource updates in 2014, and 2015, two Preliminary Economic Assessments in 2015, and Feasibility Studies in 2017 and 2019. Prior to NioCorp ownership, the Project area was explored by the USGS, Cominco American and Molycorp.

All potential permits required over the life of the Project are described further in Tables 3 and 4.

Project Infrastructure

Presently, the Project area has limited existing infrastructure suitable for an industrial facility, except for access via Nebraska State Highway 50 and County Road 721. Surface and underground infrastructure will be incorporated, as well as surface tailings and salt storage facilities. Offsite infrastructure constructed by other and not formally part of the scope of the Elk Creek Mine includes a new high voltage transmission line and a natural gas pipeline. The transmission line will be constructed by the Omaha Public Power District (OPPD) which will provide power to an on-site primary sub-station. On-site power will include a 44 kilovolt (kV) transmission line between the primary substation and the mine substation, along with a 13.8 kV on-site power distribution network. NioCorp has a natural gas transportation contract with Tallgrass Energy, which will construct a 45 km (28 mile) natural gas pipeline to the Project area. Telecommunications service will be provided by the local telecom supplier with on-site telecommunications distribution consisting of a combination of hardwire and fiber optics systems.

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The main on site-infrastructure will include mine facilities, the mineral processing plant, the hydromet plant, the pyromet plant and acid recovery and recycling operations.

Supporting surface infrastructure will include:

- an electrical substation and distribution system;
- on-site telecommunications;
- fuel storage and dispensing system for above ground vehicles;
- fuel storage and dispensing system for diesel storage and pipeline transmission to • underground mine fuel storage;
- truck scale: •
- Water treatment and distribution •
- natural gas distribution to site loads; and
- access roads around the site with parking, fencing and security. •

Infrastructure building facilities would include the following: leased modular trailers for the administration building and security gate house, assay laboratory, combination warehouse and maintenance shop, modular warehouse/maintenance shop offices, water treatment plant building, and the mine change building. The mining related facilities will include a temporary lined mine waste rock and ore storage area, surface water control facilities, and the tailings and salt impoundments. The mine surface facilities include two headframes and their associated hoisthouses, mine substations, temporary power generation system, paste backfill and cement plant, a multi-use facility comprised of a warehouse, maintenance shops, mine dry, and the administration building. The proposed locations of these facilities are shown in Appendix A, Figure 2. The underground mine will be serviced by the production and ventilation shafts. The underground facilities will include a shop, warehouse, fuel storage and filling area, offices, explosives storage areas, electrical distribution system, water pumping and discharge system, process water distribution, compressed air distribution, underground material handling system and the backfill distribution system. The underground material handling system includes a grizzly, feeder, crusher, storage bins, conveyors, and a skip loading system that loads skips in order to hoist the mined material to the surface facility.

A temporary contractor constructed and operated freeze plant will be utilized during construction and sinking of the shafts. This freeze plant will be located adjacent to the headframes in order to service both shafts simultaneously. The freeze plant will be operated during the early phases of shaft sinking and will draw power from the temporary power generation system until permanent site power is available. The temporary plant will be removed from the site during the final stages of shaft sinking and will not be a permanent feature of the site.

There are several local communities near the Project area including Elk Creek, Tecumseh, Pawnee City, Syracuse, Steinauer and Lewiston that are projected to provide local housing for the Project construction and operating staff. There are several other communities within driving

distance, and the large cities of Lincoln and Omaha are also within reasonable driving distance of the Project area. Both cities have substantial regional airports.

Further details about regarding the specifications of the Project infrastructure can be found in the 2019 Feasibility Study on the NioCorp website.

Underground Mine

The underground mine will be accessed from the surface at a collar elevation of approximately 354 meters (m) (1,161 feet (ft)) ASL, via twin 6 m (20ft) diameter concrete lined shafts, named the "production shaft" and the "ventilation shaft". The shafts are excavated by means of conventional shaft sinking and will be combined with freezing down to the potential water-bearing contact between the Pennsylvanian sediments and carbonatite unit. This method of excavation allows control of potential water inflows.

The production shaft will facilitate the movement of larger mining equipment, workforce, services, material hoisting, and act as the supply route for the mine ventilation system. The production shaft is excavated to a 755 m. This elevation allows for earlier access to higher grade ore in the central portion of the mine and to higher grade ore in the lower mining block with a more efficient material handling system.

The ventilation shaft will used for moving the workforce and smaller materials, hoisting for initial lateral development, as well as act as an exhaust route for the mine ventilation system. A second temporary hoist, hoist room, and headframe will be installed for the ventilation shaft sinking process and will be utilized to hoist waste from initial lateral mine development prior to the completion and installation of the permanent hoisting arrangement in the production shaft.

Shaft Layout

Access to the underground mine is via either the 6 m (20 ft) diameter concrete lined production shaft or the 6 m (20 ft) diameter concrete lined ventilation shaft. Atop the production shaft lies a 71 m (233 ft) tall headframe, with three sheave decks for five rope sheaves. The production shaft will host the two production skips, the main service cage and counterweight, and auxiliary cage as well as house all services to the underground .:

The 6m (20 ft) (inside diameter) production shaft is excavated to a depth of 755 m (2,477 ft). The production shaft is excavated using conventional shaft sinking methods in conjunction with a freezing process through the first 200 m (656 ft) from the surface to ensure ground and water control. Upon completion of the first 200 m (656 ft) section, the shaft sinking continues, but freezing is no longer required to reach the bottom elevation.

The ventilation shaft is excavated with the same diameter and method as the production shaft, but only to a depth of 530 m (1,739 ft). Conventional shaft sinking is combined with freezing down to the potential water-bearing contact between the Pennsylvanian sediments and the carbonatite unit. This method allows control of potential water inflows. A second temporary hoist, hoist room, and headframe is installed for the sinking process and will be utilized to hoist waste from lateral mine development prior to the completion and installation of the permanent hoisting arrangement in the production shaft.

Concrete and Paste Backfill Plant

The backfill system at the Project area is designed to be a multiproduct system, which during construction will produce concrete and grout for construction and water control. During mine production, the plant will add paste backfill to its products. The paste backfill will be made from leach residue and oxide material produced by the hydromet plant located on site and will fill the voids underground created during mining.

Backfilling is a common practice within many underground mines. This process consists of returning material removed during extraction to the underground mine stopes as a pumpable mixture with water, cement, and fly ash. The backfill provides structural stability to the mine and makes it possible to make the most efficient use of the mineral resource by allowing the extraction of ore blocks that would otherwise by utilized as structural pillars. Backfilling reduces the need for tailings storage space at the surface by returning material underground, improves the aesthetics of the mine and surrounding area, and lessens the environmental impact when the mine is closed at the end of its life cycle. The backfill system is expected to run continuously once the stopes (an underground mining block) become available for backfill, except for planned maintenance.

Concrete production from the plant will be supplied by raw materials from three silos (fly ash and cement) as well as an aggregate bunker. Fly ash is used to reduce the cost and to improve the performance of cement and mine backfill. Typically, 15 percent to 50 percent of the cement can be replaced with the fly ash. Dependent upon the scheduled completion of the plant, the Project will also be able to supply all concrete for foundations, shaft liners and other installations throughout the site. Prior to the completion of the plant, the mine will use concrete supplied by a local third-party producer. Concrete produced either on-site in the plant or off-site from a thirdparty producer will be fed into the shaft slicklines via truck and hopper located within either of the two headframes.

Backfilling

The mine production sequence includes the use of cemented paste backfill to fill the voids left by the stopes to maintain the mine structural integrity. The mine utilizes a high strength backfill paste that has a five percent cement/fly ash content in the primary stopes. For secondary stopes, lower strength paste with two percent cement/fly ash is used to supplement development waste rock, whenever development waste rock is not available to backfill stopes.

A backfill operations crew will install barricades in the lower access drift to the stopes, extends the pipe delivery system from the production shaft via the upper access drift into the stopes, and monitors the backfill as the stope fills. Once the stope is filled the backfill is allowed to cure (approximately 28 days) to design strength of over 1 megapascal before blasting on the adjoining stope.

Tailing Storage Facilities (TSF)

The TSF system includes three TSF cells, Tailings Cell 1, Cell 2, and Cell 3. NioCorp has chosen to design the solids portion of the TSF to include 0.61 m (2 ft) of compacted soil liner with a permeability of 1×10^{-7} centimeters per second (cm/s) or less, overlain by an 80-milimeter (mm) high density polyethylene (HDPE) liner, overlain by an overliner drain system. The water retaining portion of the facility will be lined with a double lined system consisting of a 60mm HDPE secondary liner and 80mm HDPE primary liner with an active leak detection system between. This conservative approach will ensure adequate protection of local groundwater resources. In general, the TSF facilities are located in the uppermost reaches of small catchments in the Elk Creek watershed, and therefore only local diversion of small upstream flows (run-on) around facilities is required. For TSF Cell 1, the topsoil will be stockpiled in the TSF Cell 3 footprint; For TSF Cell 2 and Cell 3, topsoil will be stockpiled in the footprint of the temporary waste rock stockpile, which will have ended its design life and been removed to TSF Cell 1 by the time that these facilities are constructed.

The design of the TSF cells allows for concurrent reclamation in order to reduce the amount of precipitation contact water that will require active management. Once a cell of the TSF has reached design capacity, it will be closed. For purposes of closure, cost estimating and potential future bonding requirements, this approach will assume that only one cell will be active at any given time for which reclamation (and bonding) may be required. In addition, the approach to TSF construction and material placement will allow the operator to concurrently close portions of each cell as they reach capacity. Table 1, below, shows the approximate area and storage capacity of each cell, along with the time required to manage each cell after the closure of the mine. The initial closure cover will consist of surface grading and placement of a geomembrane liner over the graded tailings. This liner requires an over-liner drainage system that discharges to the outer slope of the embankment of each TSF cell, and placement of adequate thickness of cover to allow for vegetation; though a root barrier may be necessary to prevent rooting into the tailings. With respect to post-closure requirements, operators of solid waste disposal areas shall provide for postclosure care for a period of at least 30 years. At this time, there is no anticipated post-closure solution/draindown management consideration for the TSF cells given the dry nature of the tailings materials and the conceptual closure approach. This approach to the closure of the TSF cells is considered conservative and was selected to demonstrate the feasibility and permitability with respect to the State of Nebraska Department of Environment and Energy (NDEE) landfill

regulations and on the advice of the agency. Given the current life of the mine (LOM) expectation, additional technologies and/or approaches to equally effective closure options may likely be developed prior to actual reclamation of the site. Revised planning indicated that a significant portion of the filtered tailings would be used for underground backfill operations, limiting the total tailings tonnage to be disposed of in the TSF cells. A fourth tailings impoundment would be constructed to support facility operations after operational year 18.

Cell No.	Approximate Footprint Area (acres)	Storage Capacity (@ dry density of 1.7t/m³) (Mt ¹)	Time Period (years after commissioning)
1	8.8	1.5	3
2	14.1	3.1	4-10
3	13.9	3.1	10-18
Total	36.8	7.7	-

Table 1: TSF Area, Storage, and Time Characteristics

- 1. Mt=Megatonne
- Source: SRK Consulting, 2019

Site Access

The entire Project will be enclosed with a barbed wire fence, with access being permitted through a manned security gate along County Road 721. The Project access road will lead to the main access points for the mine, and the administration building and the primary traffic destinations on the site. Secondary, emergency, access to the Project area will be connecting to the Nebraska State Route 50 along the east side of the Project area through a secure, locked gate. Other Project area roads will include:

- construction roads to be used during the construction phase of the project;
- haul roads, which will provide access to the plant site, TSFs and salt cells;
- light vehicle access roads, which will provide access to dewatering well pads and infrastructure such as ponds, embankment crest and toe fills.

Construction of the roadways will follow similar construction practices as defined for the TSF embankment construction, which includes the removal of 1 m (+/-) of topsoil, replacement with suitable compacted sub-grade fill, and the provision of structural support for traffic with a durable gravel surface. Geotextile will be installed at the base of the gravel layer to provide stability and a minimum of 0.5 m of compacted gravel will be used for the driving surface. Additionally, all roadways will be designed to promote drainage off the driving surface. This requires the roadways be elevated slightly above the surrounding ground elevations and crowned, and/or a drainage ditch be provided as needed in areas of elevation transition from cut to fill. Safety berms will be included where needed. In areas, where safety berms are not required, shoulder slopes will be

used with a slope not exceeding 3:1 (horizontal to vertical) to reduce the chance of a vehicle rollover should they divert from the roadway.

Water Supply

Once full operations commence, NioCorp anticipates a maximum shortfall of approximately 3,700 gallons per minute (gpm) of operational and processing water after recycling and reuse measures. The underground mine dewatering is expected to produce 1,000 gpm, and additional sources of inflow include meteoric water. The water balance for the project indicates that the sources of inflow are exceeded by evaporative losses and water entrained in the tailings and mine backfill. To make up this shortfall, NioCorp is planning to use the following sources for additional water:

- 1. Tecumseh Board of Public Works water supply line (~2,000 gpm) Tecumseh Board of Public Works, which maintains the infrastructure and supplies residential and commercial users in the City of Tecumseh, might run a line to the Project site to supply all of the necessary shortfalls.
- 2. Local Landowner Well #1 (~500 gpm) A new well on a local landowner's property has the potential to supply up to 500 gpm of the Project's needs. Because there will be a transfer of water from one property to another, a Groundwater Transfer Permit will need to be issued by the Nemaha Natural Resources District pursuant to Chapter 11 of the Management Area Rules and Regulations for Groundwater Quantity Management Areas.
- 3. Local Landowner Well #2 NioCorp has the option to connect to an existing well as well as install a new well to supply an additional 1,500 gpm.

NioCorp is pursuing approval of all three sources to ensure there are no disruptions in the water supply during operations.

Freeze Plant

Key to the sinking plan for the shafts for will be the installation of a freeze plant. This freeze plant will provide super-cooled brine for freezing the ground from the surface through the limestone to the carbonatite interface. The use of this technology allows the Project to complete these excavations without the need for an extensive pumping system. The freeze plant will require a 4 megawatt (MW) cooling facility that will prepare and recirculate supercooled brine through a number of deep boreholes surrounding the two shafts. The boreholes, which will be 8 inches (200mm) in diameter, will utilize insert pipes of a smaller diameter to push the brine down to the carbonatite and allowing it to recirculate to the surface and back to the freeze plant. The plant itself will consist of compressor houses and cooling coil sets in gangs according to the final required capacity. The stabilization of the shaft envelopes down to the carbonatite is critical to the progress of the Project. To this end, the freeze will start three to six months prior to commencement of shaft sinking and will be left in place until one month after the shaft liner is socketed and sealed into the carbonatite

13 Environmental and Social Imnact Assessment (ESIA)

This document describes environmental and social impacts and risks (ESIA) and the measures taken to minimize, mitigate, and off-set adverse environmental or social impacts created by the Project. Detailed information on the studies performed and Project development alternatives are described in other documents, feasibility studies, and engineering studies as referenced herein.

The Project does not require federal funding or federal approvals; thus, a National Environmental Policy Act (NEPA) document was not required for the Project. Although the Project did not require preparation of an environmental document pursuant to NEPA, this assessment will follow the general format of the NEPA process in determining resources affected by the Project and the risks, impacts, and prevention or minimization of adverse environmental and social impacts. The Project has also had all relevant environmental and social elements and aspects addressed under the State of Nebraska laws and regulations and local Johnson County reviews and approvals. The "Illustrative List of Potential Environmental and Social Issues" included in the July 2020 Equator Principles have been considered and are included where applicable and appropriate.

1.4 Elk Creek Land Agreements

The Property consists of one 226-acre parcel of land owned by the company along with eight option to purchase (OTP) agreements covering approximately 565 hectares (ha). Option agreements are between NioCorp's subsidiary Elk Creek Resources Corp. (ECRC) and the individual landowners. The parcel owned by the company contains the majority of the Mineral Resources and Mineral Reserves associated with the project. ECRC is a Nebraska based wholly owned subsidiary of NioCorp. NioCorp retains 100 percent of the mineral rights to the Project and is the operator. The option agreements are in the form of pre-paid Exploration Lease Agreement (ELA), with an OTP the mineral rights and/or the surface rights at any time during the term of the agreement. The individual landowners have title to the surface and subsurface rights, and the agreements are primarily concerned with only the mineral and surface interest of each property. The agreements convey to the Company adequate surface rights to access the land and to complete mineral exploration work. The options agreements that the company currently holds combined with the land owned by the company include all the Indicated and Inferred resources and probable reserves described in this Technical Report.

The options covering the Project are 100% owned by NioCorp and, apart from a two percent NSR royalty attached with the OTPs that include the mineral rights, have no other outstanding royalties, agreements, or encumbrances. The 226-acre parcel of land owned by the company is also subject to a two percent NSR royalty.

1.5 Environmental and Social Impact Assessment Documentation Process

NioCorp has developed information and completed a number of environmental studies related to baseline characterization for the Project. These include:

- Soils
- Climate/Meteorology/Air Quality
- Cultural and Archeological Resources
- Vegetation
- Wildlife
- Threatened, Endangered, and Special Status Species
- Land Use
- Hydrogeology (Groundwater)
- Hydrology (Surface Water)
- Wetlands/Riparian Zones
- Geochemistry
- Socioeconomics
- Power Supply

There are currently no known environmental issues that could materially impact NioCorp's ability to extract the mineral resources or mineral reserves at Elk Creek.

With consideration of the NEPA process in mind, the points below are intended to ensure that relevant environmental information is identified and considered early in the process in order to ensure informed decision making. NEPA procedural documentation requirements generally take into consideration the following:

- The environmental impact of the proposed action; discussion should be in proportion to significance.
- Any adverse effects that cannot be avoided
- Alternatives to the proposed action
- The relationship between local short term uses of man's environment and the maintenance and enhancement of long-term productivity
- Any irreversible and irretrievable commitments of resources that would be involved in the proposed action

The requirements of the July 2020 Equator Principles Exhibit II "Illustrative List of Potential Environmental and Social Issues" have also been considered in this assessment and included where applicable and appropriate. The full list of potential issues included in the Equator Principles can be found at: https://equator-principles.com/wp-content/uploads/2020/05/The-Equator-Principles-July-2020-v2.pdf

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Table 2: Summary of Equator Principles Exhibit II Illustrative List of Potential Environmental and Social Issues and Location or Reference in the EA Narrative.

Exhibit II Item	Section	Equator Principles Exhibit II Issue Overview	
1	4.1.3	Assessment of the baseline environmental and social concerns	
2	3	Consideration of feasible environmentally and socially preferable alternatives	
3	2	Requirements under host country laws and regulations, applicable international treaties and agreements including the 2015 Paris Climate Change Agreement	
4	4.1.5	Protection and conservation of biodiversity (including endangered species and sensitive ecosystems in modified, natural and Critical Habitats) and identification of legally protected areas ¹	
5	3.1, Appendix D	Sustainable management and use of renewable natural resources (including sustainable resource management through appropriate independent certification systems)	
6	2.3	Use and management of dangerous substances	
7	4.1.8	Major hazards assessment and management	
8	4.1.10	Efficient production: total energy consumed per output scaling factor ² , delivery and use of energy	
9	4.1.4 and 4.1.14	Pollution prevention and waste minimization, pollution controls (liquid effluents and air emissions), and waste management	
10	4.1.4	Greenhouse gas emissions level and emissions intensity	
11	4.1.15	Water usage, water intensity, water source	
12	4.1.9	Land cover, land use practices	
134.2.4, Appendix DConsideration of physical climate risks and ada of viability of Project operations under changing conditions		Consideration of physical climate risks and adaptation opportunities, and of viability of Project operations under changing weather patterns/climatic conditions	
14	4.2	Cumulative impacts of existing Projects, the proposed Project, and anticipated future Projects	
15 4.1.8 Considerat none we groups ar		Consideration of actual or potential adverse Human Rights impacts and if none were identified, an explanation of how the determination of the absence of Human Rights risks was reached, including which stakeholder groups and vulnerable populations (if present) were considered in their analysis	
16	4.1.8	Labor issues (including the four core labor standards ³), and occupation health and safety	
17	3.2.1	Consultation and participation of affected parties in the design, review, and implementation of the Project	
18	4.1.11	Socio-economic impacts	
19	4.1	Impacts on Affected Communities, and disadvantaged or vulnerable groups	
20	4.1.7	Gender and disproportionate gender impacts	
21	1.4	Land acquisition and involuntary resettlement	
22	4.1.6	Impacts on Indigenous Peoples, and their unique cultural systems and values including impacts to lands and natural resources subject to traditional ownership or under customary use	
23	4.1.6	Protection of cultural property and heritage	
24	3.2.1 and 4.1.8	Protection of community health, safety, and security (including risks, impacts and management of Project's use of security personnel)	
25	4.1.7.2 and 4.1.8.2	Fire prevention and life safety	

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¹ Projects in some areas may not be acceptable for financing with the possible exception of Projects specifically designed to contribute to the conservation of the area. These areas should be identified during the assessment of Critical Habitats and brought to the attention of the Equator Principles Financial Institution as early as possible in the financing process. They include: United Nations Educational, Scientific, and Cultural Organization Natural and Mixed World Heritage Sites; and Sites that fit the designation criteria of the Alliance for Zero Extinction. Refer to International Finance Corporation's Performance Standards Guidance Note 6 (February 2019).

 2 This modification and those pertaining to 10) – 13) are influenced by Task Force on Climate-related Financial Disclosure implementation annex page 8 of the Equator Principles

³ International Labor Organization privileges a set of four 'core labor standards' (hereinafter CLS), consisting of freedom of association, freedom from forced labor and from child labor, and non-discrimination in employment.

2. PERMITS AND REGULATORY REQUIREMENTS

The Project has considered, and will be held to, permitting requirements that are determined to be necessary by Johnson and Pawnee counties (and other local regulatory authorities), the State of Nebraska, and the Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (USACE) national policies, such as the Clean Water Act (CWA) (33 U.S.C. 1251 et seq.). The list of potentially applicable permits and authorizations for the Project are presented in Tables 3 and 4.

Engagement of local, state, and federal regulators has been underway since 2014. Permits are in hand at the time of writing sufficient to allow for the commencement of construction and are described below in Tables 3 and 4. Operational permitting completion for the Project are dependent upon the completion of final detailed engineering being completed pursuant to the 2019 Technical Report.

As of this assessment, stakeholder engagement has been undertaken in parallel with field operations in Nebraska and has included multiple outreach events in the form of town hall discussions, individual meetings, and presentations regarding the Project with various stakeholders. Outreach events are further detailed in Section 3.1. Additionally, early communications have occurred between NioCorp and Johnson, Pawnee, Nemaha, and Richardson County representatives (including the county commissioners) as well as the Southeast Nebraska Development District.

Due to the lack of specific hardrock mining regulations, there are limited obligatory requirements for reclamation and closure of mining properties in Nebraska. There are provisions, however, within the applicable regulatory framework that are likely to be applied to the Project during the permit and licensing processes, specifically those associated with the TSF and mineral processing facilities. This will include the provision of financial surety for proper closure and reclamation of the site which demonstrates NioCorp will have the financial resources to properly close the facility when its operational life is over or provide the appropriate emergency response in the case of an accidental release. The currently estimated direct costs for closure and reclamation of the Project over the course of construction and a planned minimum of a 36-year operational life, plus financial assurance premiums, is \$50.2 million (US dollars).

The U.S. Department of Labor — Mine Safety & Health Administration (MSHA) is responsible for enforcement of federal mine safety and health legislation through the development and enforcement of safety and health rules for all U.S. mines regardless of size, number of employees, commodity mined, or method of extraction. The Project will be strictly regulated by MSHA under Title 30 of the Code of Federal Regulations, Mineral Resources, Parts 1 through 199 (30 CFR Parts 1 through 199). This includes initial and annual refresher training requirements specified in 30 CFR Parts 46 through 49. Additionally, given the radiological nature of the mineralized material, MSHA will likely institute radon exposure and monitoring requirements on all underground workers in accordance with 30 CFR § 57.5039 thru § 57.5047.

Overall, the Project appears to be sufficiently advanced to continue with operational permitting. Key project permits are summarized in below in Tables 3 and 4.

Permit/Approval	Permit/Approval Issuing Authority Permit Purpose		Status		
Federal Permits Approvals and Registrations					
Explosives Permit	U.S. Bureau of Alcohol, Tobacco and Firearms (BATF)	Storage and use of explosives	MSHA and the Department of Homeland Security (DHS) will also regulate explosives at a mining operation.		
EPA Hazardous Waste ID No.	EPA	Registration as a Very Small Quantity Generator (VSQG) or a Small Quantity Generator (SQG) of waste	NioCorp laboratory facilities are likely to generate small quantities of hazardous waste.		
Spill Prevention, Control, and Countermeasure (SPCC) Plan	EPA	Regulation of facilities having an aggregate aboveground oil storage capacity greater than 1,320 gallons or a completely buried storage capacity greater than 42,000 gallons with a nexus to jurisdictional waters	REQUIRED . Adjacent jurisdictional drainages.		
Notification of Commencement of Operations	MSHA	Mine safety inspections, safety training plan, mine registration	REQUIRED. All mining operations in Nebraska.		
Obstruction Evaluation / Airport Airspace Analysis	Federal Aviation Administration (FAA)	Notification of the Administrator of the FAA for any construction or alteration exceeding 200 ft above ground level.	REQUIRED : If any project components exceed 200 feet in height.		
Federal Communications Commission Permit	Federal Communications Commission	Frequency registrations for radio/microwave communication facilities	REQUIRED . If NioCorp intends to use business radios to transmit on their own frequency.		

Table 3: Project Permits

NioCorp Environmental Assessments

Permit/Approval Issuing Authority Permit Purpose			Status			
State Permits, Authorizations and Registrations						
Permit to Appropriate Water	State of Nebraska Department of Natural Resources (NDNR)	Regulates the use and storage of surface and ground waters.	REQUIRED to appropriate water			
Explosives Permit	Nebraska State Patrol	Regulates the use, storage, or manufacture of explosive materials.	REQUIRED. Also regulated by BATF, MSHA, and DHS.			
Permit to Discharge under the National Pollutant Discharge Elimination System (NPDES)	NDEE	Multiple permits are applicable to the discharge of construction and industrial wastewater and stormwater.	REQUIRED. The project will require construction and industrial stormwater discharge permits. The project will not discharge wastewater.			
Mineral Exploration Permit	NDEE	Regulates the exploration for minerals by boring, drilling, driving, or digging.	OBTAINED for the exploration drilling program.			
Air Construction Permit	NDEE (under Federal PSD Program)	Regulates emissions during construction activities to protect ambient air quality.	OBTAINED. Under Nebraska Administrative Code (NAC) Title 129. Permit was applied for and was issued by the NDEE on June 2, 2020.			
Air Operating Permit	NDEE (under Federal PSD Program)	Regulates emissions during operation to protect ambient air quality. Will be based on a Feasibility Study mine plan.	REQUIRED. Class I (Title V) federal major source PSD operating permit will likely be required as per NAC 129. Application required no sooner than 1 year after operations commence.			
Water Well Installation Declaratory Ruling Request	Nebraska Department of Health and Human Services (NDHHS), Division of Public Health	Water well installation requirements; well must be registered with the Department of Natural Resources.	OBTAINED for the hydrogeological portion of the exploration drilling program.			
Authorization for Class V Well Underground Injection	NDEE	All activities conducted pursuant to Title 122 - Rules and Regulations for Underground Injection and Mineral Production Wells.	OBTAINED for the hydrogeological portion of the exploration drilling program. Will also be required for future disposal of tailings and/or crystalized RO brine gels in underground workings.			
Septic Systems – Permit for Onsite Wastewater Treatment System Construction/Operations	NDEE	Protects surface water and groundwater as well as public health and welfare through the use of standardized design requirements.	REQUIRED. Needed if the septic system does not meet the "Authorization by Rule" requirements due to the quantity or quality of the wastewater, as per NAC 124.			

Permit/Approval	Issuing Authority Permit Purpose		Status
Boiler Inspection Certificate	Nebraska Department of Labor	Protects public safety through an inspection and approval process of boilers.	REQUIRED. For installation of the boiler(s) installed in any of the facility buildings.
Section 401 Water Quality Certification	NDEE	The program evaluates applications for federal permits and licenses that involve discharge to waters of the state and determine whether the proposed activity complies with NAC Title 117 – Nebraska Surface Water Quality Standards. Isolate wetlands are included in NAC Title 117.	NOT REQUIRED. Only required as part of Section 404 Clean Water Act authorization, which is not currently anticipated.
Development Permit	NDEE/Johnson County Floodplain Administrator	The program regulates building requirements for any structures that are constructed on a floodplain.	MAY BE REQUIRED. Will be needed if NioCorp constructs any building on a designated floodplain.
Fire and Life Safety Permit	Nebraska State Fire Marshall	Review of non-structural features of fire and life safety.	REQUIRED. Project proponent to submit operating and building plans. State Fire Marshall will then determine required inspections as per NFPA 101.
State Business License	Nebraska Secretary of State	License to operate in the state of Nebraska.	REQUIRED. All business entities in Nebraska.
Retail Sales Permit or Exemption Certificate	Nebraska State Tax Commissioner	Permit to buy wholesale or sell retail.	MAY BE REQUIRED. Will be required if NioCorp is direct selling niobium product.
Solid Waste Management Permit	NDEE	Regulates the construction and operation of solid waste management facilities.	REQUIRED. Will be needed if NioCorp intends to create an on- site solid waste management facility. This may include the TSF.

Permit/Approval	Issuing Authority	Permit Purpose	Status
Drinking Water Construction Permit	NDHHS	The Drinking Water Construction Permit regulates the design and construction of a public water system.	MAY BE REQUIRED. All drinking water systems that serve more than 25 individuals and are considered to be "non- transient and non- community" are required to obtain a Drinking Water Construction Permit. This will include the use of Reverse Osmosis (RO) permeate produced at the plant site.
Drinking Water Permit to Operate	NDHHS	Defines testing and water quality criteria for public drinking water systems.	MAY BE REQUIRED. All drinking water systems that serve more than 25 individuals and are considered to be "non- transient and non- community" are required to obtain a Drinking Water Permit to Operate.
Radioactive Materials Program and Licensing	NDHHS	Regulates and inspects users of radioactive materials.	REQUIRED. If the plant uses sealed sources for process measurements or if naturally occurring, radioactive materials are possessed as a result of beneficiation activities.
Hazardous Waste Management	NDEE	Management and recycling of hazardous wastes.	REQUIRED. As per Title 128 of the Nebraska Hazardous Waste Regulations NioCorp must notify the NDEE of hazardous wastes generated or transported from the facility.
Dam Safety Approval	NDEE	Regulates the design and construction of any dam (i.e., any artificial barrier with the ability to impound water or liquid-borne materials).	REQUIRED. Will be required for TSF (dam) and may be required for the Mine Water Pond depending on the final design capacity.
Water Storage Permit	NDEE	Regulates any water impoundment that has a normal operating water volume of at least 15 AF below the spillway.	MAY BE REQUIRED. May be required for the Mine Water Pond if it will impound greater than 15 AF below the spillway.

Local Permits for Johnson County					
Permit/Approval	Issuing Authority	Permit Purpose	Status		
Water Well Permit	Nemaha Natural Resources District (NRD)	Regulates installation of groundwater wells.	REQUIRED. This permit will be required to install a new water supply well.		
Water Well Transfer Permit	Nemaha Natural Resources District	Regulates transfer of groundwater off overlying land.	REQUIRED. This permit will be required to transfer water from wells located on a separate property to be used for water supply.		
Building and Construction Permits	Johnson County Zoning Administrator	Ensure compliance with local building standards/requirements.	REQUIRED. This permit will most likely be included with the Permitted Use Zoning Permit		
County Road Use and Maintenance Permit/Agreement	Johnson County Zoning Administrator	Use and maintenance of county roads.	MAY BE REQUIRED. Will be needed if NioCorp intends to maintain any of the area county roads.		
County Road Use and Maintenance Permit/Agreement	Pawnee County Commission	Use and maintenance of county roads.	MAY BE REQUIRED. Will be needed if NioCorp intends to maintain any of the area county roads.		
Permitted Use Zoning Permit	Johnson County Zoning Administrator	Regulates and authorizes permitted uses.	REQUIRED. Application must be submitted 5 days in advance of the start of construction.		
Special Use Permit	Pawnee County Assessor	Regulates and authorizes permitted uses.	REQUIRED. TSF land currently zoned for agriculture. Zoning regulations allow for mineral extraction.		
Special Use Permit	Johnson County Zoning Administrator	Regulates and authorizes permitted uses.	OBTAINED. Issuance of this permit required completion of an application form and one meeting with the county zoning regulators, and an additional public comment meeting. The Permit was issued to NioCorp on December 24, 2019.		

2.1 Water Rights – Nebraska Department of Natural Resources (NDNR)

Water used for all on-site for all process needs and activities will be supplied from mine dewatering activities, local groundwater wells, and the local water utility (Tecumseh Board of Public Works). The NDNR is responsible for regulating the use and storage of surface and ground waters. People who use Nebraska's surface water resources are required in most instances to obtain a surface water right/ permit from the NDNR. The permit(s)/water right(s) are approved for a specific location, amount of water and purpose. Surface water rights are administered by NDNR and are NOT recorded with the deed when land is bought, sold, or transferred. A permit to appropriate water for the Project will be required.

In addition to the NDNR requirements, a water well permit along with a water well transfer permit are required by the Nemaha Natural Resource District. The water well permit will be required to install a new water supply well, while the water well transfer permit will be required to transfer water from wells located on a separate property to be used for water supply.

2.2 Dam Permit - NDNR

The State of Nebraska DNR regulates the design and construction of any dam (i.e., any artificial barrier with the ability to impound water or liquid-borne materials). Anticipating TSFs will be needed for the Project, and each TSF will be treated as a dam by the NDNR. A dam safety approval will be required for the TSF (dam) and may be required for the Mine Water Pond depending on the final design capacity.

2.3 Hazardous Materials Permit – NDHHS

The NDHHS regulates and inspects users of radioactive materials under their Radioactive Materials Program and Licensing program. If the Project uses sealed sources for process measurements or if naturally occurring, radioactive materials are possessed as a result of beneficiation activities a permit will be required.

3. ENVIRONMENTAL AND SOCIAL ALTERNATIVES CONSIDERED

In detailing the scope of a project in a NEPA document, clearly defined proposed actions along with alternatives are critical in the overall analysis of a Project. With respect to the Project, consideration of preferred social and feasible environmental alternatives is limited to the existing technically and economically feasible business opportunities of developing a stand-alone underground mine in the specific location of the ore bodies. The development of infrastructure and associated areas pertaining to Project, are further described in the 2019 Feasibility Study (Nordmin 2019).

NioCorp has made a commitment to integrate key Environmental, Social, and Governance (ESG) principles as it proceeds toward development and commercial operation the Elk Creek Mine and continues to evolve from a developing company into an operating company with a global customer base.

ESG refers to factors that an increasing number of companies are integrating into their business models and operations, such as environmental performance, sustainability, resource use, health and safety, engagement with local residents, corporate governance, respect for human rights, and operational transparency.

The key ESG principles that NioCorp intends to integrate into its business and the Project as NioCorp proceeds toward commercial operation include these:

- Environmental Stewardship: seek improvement in environmental performance quality, such as water stewardship, energy use, and air where technically and economically feasible.
- Sustainability: integrate sustainable development principles into Company policies and practices where technically and economically feasible.
- Governance: apply ethical business practices and sound systems of corporate governance and transparency.
- **Risk Management**: identify, assess, and seek to manage significant social, health, safety, environmental and economic impacts.
- Health & Safety: develop systems that seek to improve the health and safety of employees, contractors, and people in the communities where we operate.
- Engagement: proactively engage key stakeholders on sustainable development • challenges and opportunities in an open and transparent manner.

ESG accomplishments to date include:

- Reducing air emissions: NioCorp plans to utilize several technologies in the Project to reduce planned air emissions including the use of acid regeneration technology, emission baghouse technology, low nitrogen oxide (NOx) burner units and air emission scrubber units. Additional environmental controls will minimize expected air emissions to such a degree that a federal air permit under the EPA's Prevention of Significant Deterioration ("PSD") program for major emitters is not needed.
- Reducing land impacts: NioCorp's designs for the Project have reduced planned land • impacts through minimizing the Project's land footprint, utilizing dry tailings, incorporating tailings as structural underground backfill, and the elimination of a railroad spur line from the Project's infrastructure plans.
- Protecting water resources: NioCorp has designed the Project to reduce potential water impacts through the use of a zero-process liquid discharge facility, minimal permanent

impacts for Federal Jurisdictional Waters, and groundwater protection through artificial ground freezing.

- Social accomplishments: NioCorp has worked hard to engage with local communities in • Nebraska and has received positive support regarding the implementation of the Project through early engagement with local stakeholders, partnerships with local landowners, extensive support for local businesses, planned us of locally manufactured products and royalty payments to local landowners.
- Governance: NioCorp is committed to good corporate governance practices and has implemented board committee charters, a majority voting policy, an advance notice policy, a code of conduct and ethics, and Foreign Corrupt Practices Act training. The board has a committee dedicated to ESG matters, called the Safety and Sustainability Committee.

As a result of the Company's stakeholder outreach and the Company's vision and values with respect to environmental issues, the design of the Project has also incorporated these features:

- Extensive recycling and reuse of water, to minimize demand on local aquifers
- Extensive recycling of key reagents used in the production process, to reduce net reagent consumption and to minimize traffic impacts on the local roads system.
- Reuse of waste products to manufacture structural fill for the underground mine and minimize surface waste disposal.
- Equitable agreements with local landowners to acquire land for the project without recourse to eminent domain and which include perpetual royalty streams for the landowners.
- Design to avoid impacts to key environmental features, such as wetlands and waterbodies.

3.1 Environmental Alternatives Analysis

Throughout the Project design phase, NioCorp has continued to evaluate options to minimize the Project's impact to the environment. For example, at one point the Project considered dewatering of the deep bedrock during shaft sinking, with dewatering water being discharged to the Missouri River. Using a different technology and approach NioCorp determined that the mine shaft areas could be frozen and grouting could be employed in the underground mine in a manner that minimizes groundwater inflow to the mine and results in no need to discharge to the Missouri River.

NioCorp submitted a Permit to Construct Application to the Nebraska Department of Environment and Energy (NDEE) in June 2019. During the application process, NioCorp calculated air emissions resulting from the Project. NioCorp evaluated additional air emissions control devices, as available and appropriate, to reduce air emissions. NioCorp also evaluated potential chemicals for use in the process which would result in lower emissions. NioCorp incorporated process efficiencies, including using process heat in a manner that minimizes the amount of natural gas used, which resulted in reduced the size of natural gas-burning equipment, to the extent that NioCorp did not need to apply for a major Prevention of Significant Deterioration (PSD) source air

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the Project life cycle.

permit. Additionally, use of natural gas-fired equipment lends itself to replacement using gaseous fuels with lower carbon footprint if technically and economically viable; or electrification of select equipment. However, NioCorp's implementation of energy efficient design considerations and use of low carbon fuel will make it infeasible and cost-ineffective to implement such changes given

The Project will use a local energy provider for its onsite energy use: therefore, the Scope 2 GHG emissions for energy used in the Project process will depend on the energy portfolio of the provider (Scope 2 emissions are indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling). However, local energy providers are continuing to add more renewable energy to their portfolio and this trend is expected to continue throughout the Project's life cycle.

NioCorp has completed (August 2021) an evaluation of a wind power alternative for the project, that could theoretically replace the need for grid electrical power. The analysis concluded that 30 to 35 2-MW wind turbines could be installed in reasonable proximity to the project site to provide electrical power. A grid connection would still be needed under this scenario to sustain operations when the wind is not blowing. The estimated capital cost for this system would be \$130-\$170 million. Battery storage of electricity to serve during low wind periods was not considered in this analysis. During the development of this analysis, it became clear that there is substantial community opposition to wind farms in southeast Nebraska. In addition, the incremental increase in capital cost to include the wind power option is substantial for the project and does not appear to be feasible in the context of the current financing environment. Additional information regarding alternatives for the Project is listed below, as well as in Appendix D.

3.2 Stakeholder and Social Alternatives Analysis

As previously stated, due to the nature of mining projects and ore deposits, proposed actions and alternatives are limited. Exploration activities prior to NioCorp ownership were conducted at the Project area by the USGS, Cominco American, Molycorp and Quantum. These activities consisted of airborne magnetic and gravity surveys, geochemical sampling, RC drilling, core drilling and Mineral Resource Estimates. NioCorp has completed metallurgical testing, core drilling, mineral resource updates in 2014, and 2015, two Preliminary Economic Assessments in 2015, and Feasibility Studies in 2017 and 2019. The company examined locating the processing infrastructure in another state, but this would require extensive rail infrastructure and is not economically feasible. The company examined different scales for the project, but larger scale projects have the potential to disrupt the global niobium market and smaller scale projects do not generate adequate returns on capital employed. Project scaling does not impact project schedule or permitting requirements in a substantive way. All facilities were sited based on technically and

economically feasible locations that support the business plan and the need to facilitate long term economic benefit and sustainable development for the project (Nordmin 2019).

Community relations and stakeholder engagement have been undertaken in parallel with field operations in Nebraska and have included town hall and individual meetings with local landowners. Tables 5, 6 and 7 summarize stakeholder consultation dates and purpose. Completion of the operational permitting program for the Project is dependent upon the completion of the final detailed engineering for the project.

3.2.1 Stakeholders

Overall, the Project development strategy is structured to identify and address the various local, state, and federal and international environmental and social requirements and standards applicable to this mining project. These include the statutory requirements, stakeholder interests, and safety, environmental, social, and economic aspects.

The stakeholders involved are:

- State of Nebraska, Johnson and Pawnee Counties and Elk Creek government entities and regulatory agencies;
- Local community (Johnson and Pawnee Counties, Elk Creek and other nearby communities including Tecumseh, Syracuse, Steinauer and Lewiston which are intended to provide local housing) that may benefit from or be affected by the Project);
- Current and prospective employees;
- Current and prospective contractors and suppliers (local, regional, and national);
- Government and regulatory agencies;
- Company shareholders; and
- Financial institutions

Community relations and stakeholder engagement has occurred in parallel with field operations in Nebraska. Engagement has included public town hall style meetings, agency meetings, and individual meetings with local landowners (detailed below). Communications have occurred between NioCorp and Johnson, Pawnee, Nemaha, and Richardson County representatives (including the county commissioners) as well as the Southeast Nebraska Development District. NioCorp is committed to ensuring that a proper Social License is garnered from the community and stakeholders.

Tables 5, 6 and 7 present a summary of stakeholder consultation meeting dates, locations, and meeting purpose.

January 2022

Date	Location	Estimated Attendance	Topics
June 11, 2014	Elk Creek, NE	100	Drilling campaign, Project development plans, site tour
May 21, 2015	Elk Creek, NE	100	Mineral Resource, technical and environmental progress, economic benefits to SE Nebraska, Preliminary Economic Assessment
March 16, 2016	Tecumseh, NE	250	Project economics and technical reports, land agreements, Project permitting, environmental progress, Tecumseh office staffing
September 8, 2017	Syracuse, NE	500	Feasibility Study completion and project economics, permitting, environmental progress
October 2, 2017	Antwerp, Belgium	125	Feasibility Study completion and Project economics, permitting, environmental progress
October 10, 2017	Humboldt, NE	100	Project overview, Feasibility Study, environmental progress, permitting, economic benefits
October 6, 2021	Elk Creek, NE	150	Site tour for investors and community members, financing update

Table 5: Public Town Hall Events and Presentations

Table 6: Individual Meetings with Local Landowners

Year	Number of Meetings
2014	5
2015	39
2016	20
2017	2
2018	3
2019	25
2020	5
2021	2

Date	Location	Organization		
January 29, 2015	Tecumseh, NE	Southeast Nebraska Partners For Progress		
June 24, 2015	Falls City, NE	Southeast Nebraska Resource Network		
July 2, 2015	Pawnee City, NE	Pawnee City Chamber of Commerce		
May 23, 2016	Lincoln, NE	Bold Nebraska		
July 19, 2016	Falls City, NE	Richardson County		
August 2, 2016	Pawnee City, NE	Pawnee County		
August 19, 2016	Lincoln, NE	Bold Nebraska		
October 4, 2016	Tecumseh, NE	Johnson County		
October 5, 2016	Auburn, NE	Nemaha County		
November 3, 2016	Lincoln, NE	Nebraska Legislature – Natural Resources		
November 17, 2016	Lincoln, NE	Nebraska Regulatory Agencies		
February 7, 2017	Tecumseh, NE	Nebraska Regulatory Agencies		
March 6, 2017	Lincoln, NE	Governor's staff		
April 6, 2017	Lincoln, NE	NDEE		
April 20, 2017	Lincoln, NE	Nebraska Regulatory Agencies		
April 21, 2017	Lincoln, NE	Nebraska Regulatory Agencies		
August 16, 2017	Syracuse, NE	Sen. Dan Watermeier		
October 10, 2017	Tecumseh, NE	Nemaha NRD		
October 16, 2017	Tecumseh, NE	SE Nebraska Emergency Responders		
October 27, 2017	Lincoln, NE	NDEE		
December 5, 2017	Lincoln, NE	Nebraska DNR		
January 18, 2018	Lincoln, NE	Nebraska Association of County Officials		
February 6, 2018	Lincoln, NE	Nebraska Regulatory Agencies		
February 8, 2018	Tecumseh, NE	Nemaha NRD		
February 7, 2018	Lincoln, NE	NDEE		
February 23, 2018	Lincoln, NE	Nebraska DHHS		
May 1, 2018	Omaha, NE	Society of American Military Engineers (SAME) Omaha		
May 2, 2018	Lincoln, NE	Midwest CHMM		
June 12, 2018	Tecumseh, NE	Nemaha NRD		
October 3, 2018	Lincoln, NE	Nebraska DNR		
October 1, 2018	Tecumseh, NE	Tecumseh Board of Public Works		
November 16, 2018	Lincoln, NE	NDEE and USEPA		
December 6, 2018	Lincoln, NE	Nebraska DHHS		
April 10, 2019	Tecumseh, NE	Johnson County School Board		
July 16, 2019	Pawnee City, NE	Pawnee County Commissioner		
September 4, 2019	Lincoln, NE	Clark Haberman (Concerned Citizen)		
November 26, 2019	Kearney, NE	Nebraska State Irrigation Association) / Nebraska Water Resource Association Conference		
December 10, 2019	Tecumseh, NE	Nebraska Senator – District 1		
May 3, 2021	Omaha, NE	Kiwanis		
August 3, 2021	Humboldt, NE	Humboldt Shares		

Table 7: List of Project Presentations to Organizations in Nebraska

Thus far, the Project has received positive support from those who have been engaged and informed of the Project. However, as with any project, the potential remains for member of the public and non-governmental organizations who will oppose the Project on principal alone. One non-governmental organization that has shown interest in the project is Bold Nebraska, a citizen

group focused on "taking actions critical to protecting the Good Life." NioCorp has engaged with Bold Nebraska starting on May 23, 2016 and has kept the group informed of major developments. Bold Nebraska has not provided positive or negative feedback on the project to date. It is important to remain engaged and transparent with Bold Nebraska and other stakeholders/nongovernmental organizations throughout the operational permitting process and provide them with an opportunity to participate in any public meetings or town hall discussions. This tends to garner increased trust and transparency when it comes time for formal public comments on permit applications.

3.2.2 Agency Coordination Meetings

An agency coordination meeting was held on October 5, 2016, with the following attendees:

- USACE
- ECRC
- Olsson
- Nebraska Game and Parks
 Commission (NGPC)
- NDEE
- Nemaha NRD
- EPA
- Ponca Tribe of Nebraska (PTON)
- Iowa Tribe of Kansas and Nebraska

The meeting provided information to the agencies on the niobium mine operations along with the pipeline and railway route before the start of the permitting process. ECRC provided a summary of the project and Olsson, Inc. (Olsson) provided a summary of the preliminary environmental resources and potential impacts. The following are key discussion points from the October 5, 2016, meeting regarding the Project:

- The Tribal Historic Preservation Office (THPO) of two tribes (PTON/ Iowa tribe of Kansas and Nebraska) inquired what would become of the mine following operation cessation. ECRC's response stated that a reclamation plan was being developed concurrently with the design of the operation and NioCorp would set funds aside for this aspect of the Project, as well as provide financial assurances to the State of Nebraska. Entrance into the NGPC's Conservation Reserve Program or conversion to wildlife habitat are two of the post-mining land-uses currently being considered. THPO also asked if there was a contingency plan in place for natural disasters, to which ECRC responded; yes, an Emergency Response Plan would be developed for all aspects of the operation.
- The NGPC asked how ECRC would assess for the western massasauga (*Sistrurus tergeminus*) species around the mining facility and recommended a habitat assessment be conducted to identify potential habitat. Olsson was able to accomplish this during their wetland delineation in 2015. Entry to the site, which will be along County Road 721 and Highway 50, was discussed with the USACE.
- Other additional questions were raised from multiple agencies present regarding the waterline from the Project area to the Missouri River; however, this aspect of the Project has been eliminated from plans and is no longer pertinent.

A meeting between the USACE, ECRC, Olsson, the NGPC, the EPA, and the United States Fish and Wildlife Service (USFWS) was held on November 17, 2016. The meeting provided an update

to USFWS on the Project from the October 5, 2016 meeting and discussed the project purpose and need, as well as alternatives analysis. Topics at this meeting were primarily focused on the mine dewatering process and issues regarding the diffuser which would be located at the end of the waterline leading into the Missouri River. Due to the elimination of the waterline and diffuser from the project, all water would be recycled and reused onsite and these issues with the agencies are no longer relevant to the project as currently proposed.

One additional meeting between ECRC, Olsson, and the NDEE was held on February 7, 2018. The meeting was held to provide a presentation on the process used to determine reclamation costs as part of the study. Post-closure land use was discussed, and it was determined that a Conservation Reserve Program (CRP) or other wildlife usage was preferred. Post closuring monitoring and maintenance is estimated at 15 years.

3.3 Land Ownership

As described in Section 1.4, the Property consists of one 226-acre parcel of land owned by the company along with eight OTP agreements covering approximately 565 hectares (ha). Option agreements are between NioCorp's subsidiary Elk Creek Resources Corp. (ECRC) and the individual landowners. The parcel owned by the company contains the majority of the Mineral Resources and Mineral Reserves associated with the project. ECRC is a Nebraska based wholly owned subsidiary of NioCorp. NioCorp retains 100 percent of the mineral rights to the Project and is the operator. The option agreements are in the form of pre-paid ELA, with an OTP the mineral rights and/or the surface rights at any time during the term of the agreements are primarily concerned with only the mineral and surface interest of each property. The agreements convey to the Company adequate surface rights to access the land and to complete mineral exploration work. The options agreements that the company currently holds combined with the land owned by the company include all the Indicated and Inferred resources and probable reserves described in this Technical Report.

The options covering the Project are 100 percent owned by NioCorp and, apart from a two percent NSR royalty attached with the OTPs that include the mineral rights, have no other outstanding royalties, agreements, or encumbrances. The 226-acre parcel of land owned by the company is also subject to a two percent NSR royalty.

3.3.1 Industrial Development

The Project currently has no plans for industrial development of the mining facilities once mining operations have ceased. Post-mining, the Project anticipates actions involving a surface reclamation plan, which will be executed concurrently with the operation of the project, with a principal objective of returning disturbed land to productive post-mining land-use. Soils, vegetation, wildlife, and radiological baseline data will be used as guidelines for the reclamation

program. Final surface reclamation landforms will blend affected areas with adjacent undisturbed lands so as to re-establish original slope and topography and present a natural appearance. Surface reclamation efforts will strive to limit soil erosion by wind and water, sedimentation, and re-establish natural drainage patterns and vegetation / wildlife communities.

3.4 Facility Considerations

NioCorp's designs for the Project have minimized land impacts. These design features include mining the orebody via underground methods, recycling key reagents which allows for the elimination of a proposed railroad spur line, and a design for dry tailings, which minimizes the footprint of surface tailings impoundments and which facilitate the use of the tailings back into the mine as structural underground backfill. The Project has also been designed for minimal permanent impacts to federal jurisdictional waters. Planned environmental controls have minimized expected air emissions to such a degree that a federal air permit under the EPA's Prevention of Significant Deterioration (PSD) program is not needed. NioCorp will achieve this level of environmental performance through the utilization of several technologies including acid regeneration, baghouses for particulates and metals control, low NOx burner units and air emissions scrubber units. While no habitat within the Project boundaries has been designated as "critical for threatened and endangered species" by the USFWS, the avoidance of wetland areas and Waters of the U.S. (WOUS) generally lends itself as a benefit for local wildlife, as often beneficial habitat is found in these areas.

Further details about regarding the specifications of the Project infrastructure can be found in the 2019 Feasibility Study on the NioCorp website.

3.5 Facility Alternatives

Due to the nature of the ore deposit, situating mining and processing alternatives were examined and determined unfeasible. The locations of the underground mine and Project facilities are fixed by the physical location of the ore bodies and shipping the ore to a distant processing facility is not economic. All facilities were sited primarily based on being technically and economically feasible locations that support the business plan and the need to facilitate long term economic benefit and sustainable development for southeast Nebraska.

Preliminary investigations performed by SRK included a comparison of potential TSF sites for both slurry and filtered (dewatered) tailings disposal options. This comparison considered potential engineering, strategic, permitting and closure issues, including:

Engineering: Containment area, required reclaim for water balance on tailings • impoundment, relative embankment heights, distance to plant, pumping head for slurry (plant to impoundment) and reclaim water (impoundment to plant), upstream stormwater management, major road crossings, potential residential relocations, and potential road relocations.

- Strategic: Proximity to major roadways, churches and cemeteries, visual embankment heights, and property ownership.
- Permitting: Major drainage crossings and major road encroachment.
- Closure: Closure cover areas and volumes, seepage potential, and mass stability.

Of eight potential sites, Area 7 (a previous site consideration for additional TSFs, located southeast of the current Project site), and Area 1 (current Project site) ranked first and second for both slurried and filtered tailings, respectively. This evaluation included the development and implementation of a preliminary foundation characterization plan for both Area 1 and Area 7 and development of preliminary water balance spreadsheets for both slurried and filtered tailings options for both sites.

Following the development of the 2015 Preliminary Economic Assessment, the decision was made to only generate dry tailings, by calcining and filtration processes, and a more detailed foundation characterization investigation was performed for Area 7. Revised planning indicated that a significant portion of the filtered tailings would be used for underground backfill operations, limiting the total tailings tonnage to be disposed of in the TSF cells to around 1,070 dry tonnes per day (t/d) for a life of 36 years (from the original plan for 4,930 t/d for 30 years). This significant decrease in deposition rate, as well as the finding that the calcined tailings material will be a dry "clinker" with a sandy gravel or gravelly sand gradation (i.e., well drained), led to NioCorp's decision to evaluate the plant site (refer to Future Tailings Cells 1, 2 and 3 in Figure 2) as feasible tailings storage and stormwater management locations for the life of operations, with the following significant advantages:

- No access roads or conveyors crossing Elk Creek.
- Shorter distance from Plant Area for tailings transport and reclaim water management.
- Reduction in stormwater management.
- Consolidation of disturbance into a much smaller area (without Area 7).

The plant area was therefore considered the best option for management and storage of dry tailings (in three, State-approved "solid waste" disposal facilities or cells), and management of precipitation contacting the tailings via runoff and infiltration in separate double-lined leachate collection ponds (LCPs). Limiting the tailings tonnage through the incorporation of tailings into underground backfill led to the selection of TSF cells 1, 2, and 3 as part of future operations, while moving Area 7 to an option to sustain future operations.

Due to the presence of groundwater in the geological formation containing the resource, deep water dewatering will be required. Prior Project plans for the dewatering process included the installation of numerous wells into the carbonatite formation containing the resource. These wells would pump groundwater to a settling pond, where it would equilibrate and allow any residual

solids to settle out. Furthermore, a buried waterline would have been constructed to transmit this water to the Missouri River, approximately 35 miles east of the Project area. However, following consultations with multiple state and federal agencies regarding various waterline concerns, alternative solutions were developed to avoid impacts within the Missouri River. Key to the revised plan to develop the shafts for the mine access will be the installation of a freeze plant that will provide super-cooled brine to be utilized for freezing the ground from the surface through the limestone to the carbonatite interface. The use of this technology allows the Project to complete these excavations without the need for an extensive bedrock dewatering system.

4. ENVIRONMENTAL ASPECTS AND ELEMENTS

4.1 Environmental Aspects & Elements

The International Organization for Standardization (ISO) under the Environmental Management System 14001:2015 defines environmental elements as the "surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans and their interrelationships". For example, placement of mine waste rock is an aspect that can affect all the environmental elements listed above. The following sections briefly identify environmental aspects which have been analyzed in detail to support the regulatory permit requirements and to ensure that the Project has the lowest practicable impact on the environment.

4.1.1 Environmental Aspects

Environmental aspects which could potentially be associated with the Project are provided in an overview list below. Each of these have been described in detail for the permit applications and supporting documents.

- Noise
- Access
- Lighting
- Haul Roads
- Onsite Access Roads
- Offsite Streets, Roads, and Traffic •
- Underground Mine Workings
- Mineral Process-Beneficiation Facilities
 - Crushing, Grinding and Flotation
 - Hydrometallurgical
 - Pyrometallurgical
 - o Acid Plant
 - Ore and Tailings Conveyors
 - Paste Backfill Facilities
- Chemical Storage Facilities

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- Reagents
- Lime Handling & Storage
- Pipelines
 - Natural Gas
- Water Treatment Plant
- Wastewater/Equalization Tank
- Temporary Waste Rock Stockpile
- Tailing Storage and Associated Facilities
- Freeze Plant
- Surface Drilling Activities
- Fuel Storage Facilities (Tanks and Pipelines)
- Electrical Generation Facilities
- Electrical Transmission Facilities

4.1.2 Environmental Elements

The Environmental Elements list is based on the Council on Environmental Quality's (CEQ) NEPA regulations (40 CFR Parts 1500–1508). According to the regulations, "The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment" [40 CFR 1500.1(c)]. Elements from the NEPA listings that were present and potentially affected by the Project were selected and included in the analysis below.

Supplemental environmental elements that are subject to requirements specified by statute or executive order as well as those that are not necessarily subject to requirements in statute or executive order were also considered. Table 8 lists the supplemental environmental elements and their status in the Project area.

Resource	Authority	Present Yes/No	Potentially Affected Yes/No	Rationale
Air Quality	The Clean Air Act as amended (42 USC 7401 et seq.)	Yes	Yes	See Section 4.1.4
Cultural Resources	National Historic Preservation Act, as amended (16 USC 470)	No	No	Based on the 2017 archeological resources investigations, no significant archeological resources will be impacted by construction of the Elk Creek Mine and associated infrastructure
Fish Habitat	Magnuson-Stevens Act Provision: Essential Fish Habitat : Final Rule (50 CFR Part 600; 67 FR 2376, January 17, 2002).	Yes	No	Several water resources are present within the Project boundary.

Table 8: Supplemental Environmental Elements

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Resource	Authority	Present Yes/No	Potentially Affected Yes/No	Rationale
Forests and Rangelands	Healthy Forests Restoration Act of 2003 (P.L. 108-148)	No	No	No National Forest System lands are present within the Project area.
Native American Religious Concerns	American Indian Religious Freedom Act of 1978 (42 USC 1996)	No	No	The four federally recognized Indian tribes and one state- recognized tribe of Nebraska are the Omaha Tribe of Nebraska, Winnebago Tribe of Nebraska, Iowa Tribes of Kansas and Nebraska, Ponca Tribe of Nebraska, and Santee Sioux Tribe of Nebraska. Tribes were engaged as a part of 2016 agency coordination process.
Threatened or Endangered (T&E) Species	Endangered Species Act of 1983, as amended (16 USC 1531)	No	No	Several T&E species have the potential for occurrence within the Project boundaries. Species are discussed further in Section 4.1.5.1
Wastes,	Resource Conservation and Recovery Act of 1976 (43 USC 6901 et seq.)	Yes	Yes	
Hazardous or Solid	Comprehensive Environmental Repose Compensation, and Liability Act of 1980, as amended (43 USC 9615)	Yes	Yes	See Section 4.1.16
Water Quality Drinking—Ground	Safe Drinking Water Act (SDWA), as amended (43 USC 300f et seq.) Clean Water Act of 1977 (33 USC 1251 et seq.)	Yes Yes	Yes Yes	See Section 4.1.17 and Section 4.1.18
Wild and Scenic Rivers	Wild and Scenic Rivers Act, as amended (16 USC 1271)	No	No	NA – No federally designated Wild and Scenic rivers in the Project Area
Wilderness	Federal Land Policy and Management Act of 1976 (43 USC 1701 et seq.); Wilderness Act of 1964 (16 USC 1131 et seq.)	No	No	NA – No federally recognized wilderness areas in the Project Area
Environmental Justice	E.O. 12898, "Environmental Justice" February 11, 1994	Yes	No	See Section 4.1.7 and Section 4.1.8
Floodplains	E.O. 11988, as amended, Floodplain Management, 5/24/77	Yes	Potential	Will be needed if NioCorp constructs infrastructure within a designated floodplain.
Migratory Birds	E.O. 131186, "Responsibilities of Federal Agencies to Protect Migratory Birds" January 10, 2001	Yes	No	See Section 4.1.5.1

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Resource	Authority	Present Yes/No	Potentially Affected Yes/No	Rationale
Wetlands- Riparian Zones	E.O. 11990 Protection of Wetlands 5/24/77	Yes	No	See Section 4.1.5.3
Fire Management	N/A	Yes	Yes	See Section 4.8.2
Greenhouse Gas Emissions	EPA Clean Air Act	Yes	Yes	See Section 4.1.4
Land Use Authorization	Local Zoning Authorities	Yes	Yes	See Section 4.1.9
Livestock Grazing	N/A	Yes	Yes	See Section 4.1.9
Minerals		Yes	Yes	See Section 4.1.9
Power Supply	N/A	Yes	Yes	See Section 4.1.10
Socioeconomics	N/A	Yes	Yes	See Section 4.1.11
Soils		Yes	Yes	See Section 4.1.12
Travel Management	NDOT	Yes	Yes	See Section 4.1.11.1
Vegetation	Endangered Species Act of 1983, as amended (16 USC 1531)	Yes	Yes	See Section 4.1.5.2
Visual Resources	N/A	Yes	Yes	See Section 4.1.13

Supplemental environmental elements determined to be not present or present, but not affected were not carried forward or discussed further in the document. Only those supplemental environmental elements determined to be present and may be affected are discussed further. The following sections provide a summary (by each affected environmental element) of the existing environment, baseline studies performed, impacts, and mitigation measures taken to reduce potential impacts. The detailed reports related to each affected resource topic are referenced in each section.

4.1.3 Baseline Environment

Since the settlement of Johnson County, farming for livestock, crops, and pasture has been the most important land use enterprise. Over the years, crop production has shifted from orchards, oats, barley, and rye to corn, soy, wheat, alfalfa, and grain sorghum. During the 2015 wetland delineation, performed by Olsson wetland scientists, baseline site conditions were assessed. At the time of the site visit, the study area consisted of existing agricultural fields, pastures, farmsteads, and unnamed tributaries to Elk Creek. All of these tributaries consisted of riparian areas and ponds that drained to Elk Creek. Many of the riparian areas that were not situated along drainages were located along fence lines as windbreaks. Most of the area has been impacted by livestock grazing. Approximately 4,046 ha (10,000 acres) in Johnson County is irrigated cropland, while approximately 16,996 ha (42,000 acres) is used for pasture. Approximately 12,949 ha (32,000 acres) of Johnson County is used for rangeland, which includes both native prairie that was never broken from sod and areas that were cultivated and then reseeded.
4.1.4 Air Quality

The Project is located in an area designated as attainment/unclassifiable with the National Ambient Air Quality Standards.

The Project is also located within the jurisdiction of the NDEE for purposes of air quality permitting. Because the Project is located in an attainment area, the Project is subject to either Prevention of Significant Deterioration (PSD) major source permitting; or, to the State of Nebraska minor source air construction permitting requirements. As described in the following sections, the Project does not trigger PSD permitting and as such a minor source air construction permit from the NDEE was obtained. The air construction permit for the Project was issued in June 2020.

A dedicated meteorological station was installed at Elk Creek in July 2014. Parameter measurements included in the overall instrument package include:

- Wind Speed •
- Wind Direction •
- Temperature •
- Temperature Difference •
- **Dew Point Temperature** •
- Precipitation
- Pressure •
- Solar Radiation •

The meteorological data thus far collected includes continuous monitoring that has been audited by a third party and can subsequently be used in air quality modelling and permitting. In September 2016, NioCorp met with the NDEE regarding the on-site air monitoring program and the air quality permit application process. It was decided that the ambient monitoring program needed to include particulate matter (PM_{2.5}) data collection, in light of the attention that this parameter has been given recently by the EPA. Air guality monitoring was conducted from March 6 to August 20, 2017: the PM_{2.5} monitoring was initiated at the Project area in February 2017; a PM₁₀, monitor was added in March 2017, along with co-located PM_{2.5}, and monitoring for four gasses including carbon monoxide (CO), NOx, sulfur oxides (SOx) and ozone (O3). Due to the limited months for which air quality data was collected, and because of concerns about wildfire impacts in nearby states on the data collected, the NDEE determined that the monitoring data would not be used to evaluate compliance with the U.S. National Ambient Air Quality Standards (NAAQS); rather, NDEE-established background concentrations were provided by the NDEE for use in evaluating whether Project impacts would result in an exceedance of the NAAQS. This is addressed further in Section 4.1.4.1 below.

4.1.4.1 Potential Air Quality Impacts

The Project consists of three principal production processes – above and below ground mining, hydrometallurgical process, and pyrometallurgical process - as well as associated support operations, including an acid recycling plant and wastewater treatment facility. The facility operates under Standard Industrial Classification code 1099 - Miscellaneous Metal Ores, Not Elsewhere Classified and 3313 – Electrometallurgical Products, Except Steel. Air emissions from the Project are generated primarily from material processing and handling; fuel combustion; and chemical use.

The potential emissions for the Project, including fugitive emissions, are shown in the potential to emit (PTE) table (Table 9) below:

	PTE	PTE
Regulated Pollutant	including fugitives	non-fugitive
	(tons/year)	(tons/year)
Particulate Matter (PM)	177	88
PM smaller than or equal to 10 microns (PM ₁₀)	91	70
PM smaller than or equal to 2.5 microns (PM _{2.5})	50	46
Sulfur Dioxide (SO ₂)	130	129
Oxides of Nitrogen (NO _x)	213	206
Carbon Monoxide (CO)	263	236
Volatile Organic Compounds (VOC)	75	75
Sulfuric Acid Mist (H ₂ SO ₄)	121	121
Lead (Pb)	0.5	0.1
Greenhouse Gases (GHGs), (mass basis)	785,117	785,117
Carbon Dioxide Equivalents (CO ₂ e)	785,587	785,587
Hazardous Air Pollutants (HAPs):		
Largest Individual HAP: Hexane	7	7
Radionuclides	3	1
Total HAPs	19	14

Table 9: Potential to Emit

Air Quality Impact Analysis

The air quality impact analysis for the proposed Project consists of a cumulative impact analysis to demonstrate that the Project will not cause or contribute to any violations of applicable Ambient Air Quality Standards (AAQS) for those pollutants with concentrations above their respective significant impact levels (SILs), pursuant to Nebraska Administrative Code Title 129, Chapter 17 Section 009.02. A cumulative impact analysis was completed for one-hour and eight-hour CO, one-hour and three-hour SO₂, 24-hour and annual PM_{2.5}, 24-hour PM₁₀, and one-hour and annual NO₂, because these are the pollutants and averaging periods that were predicted to exceed the SILs.

Refined Modeling Analysis for NAAQS Compliance

The purpose of the refined modeling analysis is to demonstrate that the Project will not cause or contribute to violations of applicable AAQS for CO (one-hour and eight-hour), SO₂ (one-hour and three-hour), PM_{2.5} (24-hour and annual), PM₁₀ (24-hour), and NO₂ (one-hour and annual). The Nebraska and National AAQS are identical. The AAQS are shown below:

Pollutant	Averaging Period	Ambient Air Quality Standards (µg/m ³							
		National	Nebraska						
CO	1-hour	40,000	40,000						
	8-hour	10,000	10,000						
SO ₂	1-hour	196	196						
	3-hour	1300	1300						
PM _{2.5}	24-hour	35	35						
	Annual	12.0	12.0						
PM ₁₀	24-hour	150	150						
NO ₂	1-hour	188	188						
	Annual	100	100						

Table 10: Nebraska and National Ambient Air Quality Standards

This ambient air quality impact analysis considers the combined impacts of emissions from the Project, nearby major and minor sources not adequately accounted for by ambient monitoring data, and background concentrations attributable to natural sources, unidentified sources in the vicinity of the Project, and regional transport contributions from distant sources.

Based on the permitted emissions from the Project and nearby major and minor sources, this analysis demonstrates that the facility is expected to be in compliance with the AAQS for CO, SO₂, PM_{2.5}, PM₁₀, and NO₂.

CO Results

The CO results for AAQS compliance are shown in the table below for one-hour and eight-hour CO concentrations, including contributions from existing sources of CO emissions in the Project area. As shown in the table, the ambient air concentrations are predicted to be below the ambient standards.

	Table 11: 1-hour and 6-hour CO Ampleht Air Concentrations								
	Not To Be Exceeded More Than Once Per Year								
			(Hig	hest 2nd Hi	gh)				
Averaging	ng Year XUTM YUTM Elevation Background Modeled Total					AAQS			
Period		(m)	(m)	(m)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	
1-hour	2012	740060.00	4461505.50	356.70	7570	1006.0	8576.0	40,000	
	2013	740210.00	4461405.50	350.60		796.2	8366.2		
8-hour	2012	740210.00	4461455.50	352.10	2330	350.3	2680.3	10,000	
	2013	740260.00	4461405.50	351.19		229.3	2559.3		

Table 11: 1-hour and 8-hour CO Ambient Air Concentrations

SO₂ Results

The SO₂ results for AAQS compliance are shown in Tables 12 and 13, below, for one-hour and three-hour SO₂ concentrations, including contributions from existing sources of SO₂ emissions in the Project area. As shown in the tables below, the ambient air concentrations are predicted to be below the ambient standards.

Table 12 : 1-hour SO	Ambient Air	Concentrations
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99 ^{ti}	99 th Percentile, 1-hour Daily Maximum Concentrations, Averaged Over 2 Years							
	(Highest 4th High)							
Averaging	Year	XUTM	YUTM	Elevation	Background	Modeled	Total	AAQS
Period		(m)	(m)	(m)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
1-hour	2015-	739810.00	4462255.50	354.74	9.6	154.8	164.4	196
	2016							

Table 13: 3-hour Ambient SO₂ Concentrations

Not To Be Exceeded More than Once Per Year									
	(Highest 2th High)								
Averaging	Year	XUTM	XUTM YUTM Elevation Background Modeled Total				AAQS		
Period		(m)	(m)	(m)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	
3-hour	2015	739759.60	4462255.00	356.13	120	120.87	240.87	1,300	
	2016	739767.40 4462005.10 361.98 91.41 211.41							

PM_{2.5} Results

The PM_{2.5} results for AAQS compliance are shown in the table below for 24-hour and annual PM_{2.5} concentrations, including contributions from existing sources of PM_{2.5} emissions in the Project area. As shown in the table, the ambient air concentrations are predicted to be below the ambient standards.

98 th Pe	98th Percentile, of 1-hour Daily Maximum Concentrations, Averaged Over 5 Years								
	(24-hour, Highest 8th High; Annual, Highest 1 st High)								
Averaging	Year	XUTM	YUTM	Elevation	Background	Modeled	Total	AAQS	
Period		(m)	(m)	(m)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	
24-hour	2013- 17	739681.9	4461273.5	348.02	17	8.72	25.7	35	
Annual	2013- 17	739110.0	4462253.4	369.59	6.9	2.68	9.6	12.0	

Table 14: 24-hour and Annual Ambient PM_{2.5} Concentrations

PM₁₀ Results

The PM_{10} results for AAQS compliance are shown in the table below for 24-hour and annual PM_{10} concentrations, including contributions from existing sources of PM_{10} emissions in the Project area. As shown in the table below, the ambient air concentrations are predicted to be below the ambient standards.

 Table 15: 24-hour Ambient PM₁₀ Concentration

1	Not To Be Exceeded More Than Once Per Year On Average Over 2 Years							
	(Highest 3th High of a 2 Year Concatenated Met File)							
Averaging	Year	XUTM	YUTM	Elevation	Background	Modeled	Total	AAQS
Period		(m)	(m)	(m)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
24-hour	24-hour 2015- 739784.5 4461455.4 353.65 60 58.60 118.6 15							150

NO2 Results

The NO₂ results for AAQS compliance are shown in the tables below for one-hour and maximum annual NO₂ concentrations, including contributions from existing sources of NO₂ emissions in the project area. As shown in the tables below, the ambient air concentrations are predicted to be below the ambient standards.

Table 16: 1	-hour	Ambient	NO ₂	Concentration
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98 th	98 th Percentile, of 1-hour Daily Maximum Concentrations, Averaged Over 5 Years							
	(Highest 8th High)							
Averaging	Year	XUTM	YUTM	Elevation	Background	Modeled	Total	AAQS
Period		(m)	(m)	(m)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
1-hour	2015-	739681.90	4461273.50	348.02	40.1	102.9	142.9	196
	16							

Not To Be Exceeded								
(Highest 1st High)								
Averaging	Year	XUTM	YUTM	Elevation	Background	Modeled	Total	AAQS
Period		(m)	(m)	(m)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
Annual	2015	739681.9	4461273.5	348.02	15	7.96	22.96	100
	2016	739681.9	4461273.5	348.02		9.07	24.07	

Table 17: Maximum Annual Ambient NO2 Concentrations

Air Quality Impact Summary

The analyses of the Project demonstrate the facility will comply with all applicable short-term (1hour, 8-hour, 24-hour) and annual Ambient Air Quality Standards.

To ensure that assumptions used in the modeling remain valid, the Project will have to meet the modeled design parameters for stack height requirements of the various point sources (e.g., baghouses, scrubbers), to restrict public access to the facility (e.g., installing a fence in accordance with Department guidelines or implementing other equivalent public access restrictions), to implement a Fugitive Dust Control Plan specifying best management practices for maintenance of the haul roads, restrict non-emergency operation (including maintenance and testing) hours of the three emergency engines to between 11:00 AM and 4:00 PM, and to conduct performance testing to verify emissions from significant point sources. If the results of the testing are significantly higher than the corresponding values used in the modeling, then the facility may need to remodel to show compliance with the NAAQS and increment.

Title 129, Chapter 17 – Construction Permits - When Required

The Project has obtained a pre-construction permit under the authority of Chapter 17 of the Nebraska air quality regulations for the Project facility because potential emissions exceed the thresholds listed in Section 001.01 of Chapter 17. Unrestricted (e.g., without federally enforceable restrictions or emission controls) potential emissions exceed PSD major source thresholds. In order to avoid the requirement to obtain a PSD permit pursuant to Chapter 19, ECRC has requested federally enforceable limitations pursuant to Chapter 17, Section 014.01 that restrict potential emissions by the use of emissions control technology to below the PSD major source threshold. Future relaxation of any of these limitations would require Department review to make sure the requirements of 40 CFR 52.21(r)(4) are met.

When determining the applicability of permitting requirements under Chapter 17, ECRC must include fugitive emissions for each of the nested source groups, comprised of the fossil-fueled boilers and the sulfuric acid plant.

Title 129, Chapter 19 - Prevention of Significant Deterioration (PSD)

The Project is an underground mine and production facility, which is not one of the sources required to count fugitives as specified in Nebraska air quality regulations under Title 129, Chapter 2, Section 002 (and at 40 CFR 52.21(b)(1)(iii)) or subject to the 100 tons per year (tpy) threshold for a major source with respect to the PSD program as specified in Section 008 of that chapter (and at 40 CFR 52.21(b)(1)(i)(a)). As limited under the air construction permit, facility-wide potential emissions from the Project are less than 250 tpy of any regulated New Source Review pollutant. Therefore, the Project is a minor source with respect to the PSD program. As such, a minor source air construction permit was applied for from the NDEE and was obtained. The air construction permit for the Project was issued in June 2020.

Several sources at the Project constitute named source groups listed under Chapter 2, Sections 002 and 008. These sources are referred to as "nested" source groups, as they exist underneath the primary facility that is not a named source group. The two natural gas fired 160 million British thermal units per hour (MMBtu/hr) steam boilers – 975-BO-001 and 975-BO-010 – together constitute "fossil-fuel boilers (or combination thereof) totaling more than 250 MMBru/hr heat input". Therefore, the boilers at the Project are subject to a 100 tpy threshold and must include fugitive emissions when evaluating PSD applicability. As limited under this permitting action, potential emissions from the nested boiler source group are less than 100 tpy and are consequently not subject to PSD review.

Emission Point ID#	Emission Unit ID#	Emission Point Description	Heat Input (MMBtu/hr)
EP-975-001	975-BO-001	LP Steam Boiler #1	160
EP-975-005	975-BO-010	LP Steam Boiler #2	160

Table 18	: Nested	Named	Source	Group:	Fossil-fuel	Boilers	>250 MMBtu/hr
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The sulfuric acid recycling and reuse plant at the Project also constitutes a nested source group, under the named category of "hydrofluoric, sulfuric, and nitric acid plants". The nested source group consists of the sulfuric acid plant (760-SAP-001) as well as the ancillary equipment directly necessary to support its operation, including a converter preheater (760-HTR-001). Therefore, the sulfuric acid plant nested source group is subject to a 100 tpy threshold and must include fugitive emissions when evaluating PSD applicability. As limited under the construction air permit, potential emissions form the sulfuric acid plant source group are less than 100 tpy and are consequently not subject to PSD review.

Emission Point ID#	Emission Unit ID#	Emission Point Description
EP-760-002	760-SAP-001	Sulfuric Acid Plant
EP-760-003	760-HTR-001	Sulfuric Acid Plant Converter Preheater

Table 19: Nested Named Source Group: Sulfuric Acid Plant

Note that the applicability determination of the PSD nested source group for the sulfuric acid plant stands separate from the determination of the applicability of New Source Performance Standards (NSPS), Subpart H. The NDEE found no indication that in providing an exemption for scavenger acid plants in the NSPS program that EPA intended to provide any exemption within the PSD program. Further, the Department has not found any indication of Congressional intent to exclude scavenger plants in the promulgation of the major emitting facilities list at Section 169(1) of the Clean Air Act.

4.1.4.2 Measures Taken to Reduce Potential Air Quality Impacts

Numerous measures have been taken to reduce potential air quality impacts from the Project. These are described in detail in the air quality construction permit and supporting fact sheet and are summarized here:

- Use of clean burning natural gas, as a low-carbon fuel capable of supplying the thermal load required by the mine and plant
- Optimizing equipment sizes to improve efficiencies
- Identifying and taking advantage of process heat and efficiencies to minimize the amount of fossil fuel that needs to be combusted
- Using baghouses and scrubbers to control and minimize air emissions
- Recycling 97 percent of the sulfuric acid used in the process to reduce chemical use; the process design and associated control and recovery equipment also minimize the release of sulfuric acid mist to the environment. Acid losses are made up with the addition of native sulfur to acid plant feed stream
- Recycling 99 percent of hydrochloric acid used in the process and replacing the losses with sodium chloride (table salt)
- Development and implementation of a Fugitive Dust Control Plan
- Siting of the facility and the location and size of exhaust stacks in a manner as to minimize ambient air concentrations

Controls specific to hazardous air pollutants from the project include the following best available control technology (BACT) and work practices:

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Process	BACT Control Equipment and Work Practices
	- Wet suppression equipment, weekly periodic equipment
100: Underground Mining Operations	inspections
	- Visible emissions observations
500 [.] Above Ground Mineral	- Dust collector (CE-540-DUC-001) with design specification
Processing Operations	not to exceed 0.002 gr/dscf (grains per dry standard cubic foot)
	- PM ₁₀ , filterable emission limitation
	- Control by scrubber (CE-953-SCR-001) designed and
	operated to achieve control efficiency in excess of 98%
605: Hydrochloric Acid Leach	- Capture and conveyance system designed to operate under
	Negative pressure
	- weekiy periodic inspection of the capture and conveyance
	Dust collectors (CE 625 DUC 001 and CE 625 DUC 002)
	- Dust collectors (CE-625-DUC-001 and CE-625-DUC-002) and hin yent filter (CE-625-BIV-001) with design specifications
	not to exceed 0.002 ar/dscf
	- Control by scrubber (CE-630-SCR-001) designed and
	operated to achieve control efficiency in excess of 98%
625: Niobium Precipitation	- PM ₁₀ , total emission limitation
	- Capture and conveyance system designed to operate under
	negative pressure
	- Weekly periodic inspection of the capture and conveyance
	system
	- Control by scrubber (CE-630-SCR-001) designed and
	operated to achieve control efficiency in excess of 98%
630: Oxide Calcining	- Capture and conveyance system designed to operate under
3	negative pressure
	- vveekiy periodic inspection of the capture and conveyance
	- Dust collector (CE-635-DUC-001) with design specifications
635: Titanium Precipitation	not to exceed 0.002 ar/dscf
	- PM ₁₀ total emission limitation
	- Dust collector (CE-645-DUC-001) with design specification
645: Scandium Purification	not to exceed 0.002 grains per dry standard cubic foot (gr/dscf)
	- PM ₁₀ , total emission limitation
	- Control by scrubber (CE-953-SCR-001) designed and
	operated to achieve control efficiency in excess of 98%
660: Hydrochloric Acid Regeneration	- Capture and conveyance system designed to operate under
	negative pressure
	- Weekly periodic inspection of the capture and conveyance
	system
	- Control by scrubber (CE-740-SCR-001) designed and
	- Capture and conveyance system designed to operate under
	- Weekly periodic inspection of the capture and conveyance
700: Pyrometallurgical Operations	system
	- Dust collector (CE-540-DUC-001) with design specification
	not to exceed 0.002 grains per dry standard cubic foot (gr/dscf)
	- PM ₁₀ , filterable emission limitation
	- PM _{2.5} , filterable emission limitation

Table 20: BACT technology and Work Practices

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Process	BACT Control Equipment and Work Practices
800: Tailings Neutralization & Tailings Storage Facilities	 Dust collectors (CE-840-DUC-001 and CE-860-DUC-001) and bin vent filters (CE-810-BIV-001, CE-810-BIV-002, CE- 860-002, and CE-860-003) with design specifications not to exceed 0.002 gr/dscf PM₁₀, filterable emission limitation Pneumatic loading of fly ash and cement silos
900: Reagent Storage	 Control by scrubber (CE-953-SCR-001) designed and operated to achieve control efficiency in excess of 98% Capture and conveyance system designed to operate under negative pressure Weekly periodic inspection of the capture and conveyance system HCI emission limitation
Plant Utilities (Process Areas 930, 970, 975)	- Good combustion practices and proper operation and maintenance of combustion equipment, as required under Standard Condition I.(I)
Haul Roads and Storage Piles	 Develop, maintain, and implement a Fugitive Dust Control Plan (FDCP) Daily visible emission observations -

4.1.4.3 Supporting Documents

Section 107 Attainment Status Designations. 40 CFR Part 81.328

Nebraska Administrative Code, Title 129

NDEE Air Construction Permit and Fact Sheet for Elk Creek Resources, Facility ID #97622, signed June 2, 2020

4.1.5 Biological Resources

Biological resources are broadly defined as plant and animal species in the Project area. This section also includes a discussion of state and federally protected species, their habitats, and the potential for the project to impact them."

The Project and surrounding areas are part of the Southeast Prairies Biologically Unique Landscape within the Tallgrass Prairie Ecoregion of Nebraska (Schneider et al., 2011). Nebraska's Tallgrass Prairie Ecoregion is home to more than 300 species of resident and migratory birds and 55 mammal species, most of which can also be found in central and western Nebraska. The small mammal fauna of the Tallgrass Prairie Ecoregion consists of species such as the plains pocket gopher (*Geomys bursarius*), prairie vole (*Microtus ochrogaster*), thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), and Franklin's ground squirrel (*Spermophilus franklini*). White-tailed deer (Odocoileus virginianus) are the common big game species in the region. The most abundant large predator of the region is the coyote (*Canis latrans*), but other predators such as the red fox (*Vulpes vulpes*) and American badger (*Taxidea taxus*) can be found in the Tallgrass Prairie Ecoregion as well. The bobcat (*Lynx rufus*), least weasel

(Mustela nivalis), and American mink (Neovison vison) can be found in wooded areas, wetlands and along river valleys (Schneider et al. 2011). Species discussed in this section are species that are not listed as threatened or endangered, but are protected under the Fish and Wildlife Coordination Act (16 USC 661-667e), the Endangered Species Act of 1973, as amended (16 USC §1531 et seq), and Nebraska Nongame and Endangered Species Conservation Act (Neb. Rev. Stat. 37-801 to 37-811).

4.1.5.1 Threatened and Endangered Species

According to the NGPC CERT Tool (Appendix B), one state-listed threatened and one federallyand state-listed threatened species have the potential to occur within the immediate vicinity of the Project. The USFWS IPaC tool (Appendix B) identifies one additional federally-listed endangered species and one federally-listed threatened species with the potential to be affected by activities in the Project location.

No threatened or endangered plants were identified as potentially occurring within the Project area via the NGPC CERT tool; however, the USFWS IPaC tool identified the western prairie fringed orchid as a species with the potential to occur.

Aforementioned threatened and/or endangered species are listed below:

- Northern Long-eared Myotis (*Myotis septentrionalis*)
- Western Massasauga (Sistrurus tergeminus)
- Whooping Crane (Grus americana)
- Western Prairie Fringed Orchid (*Platanthera praeclara*)

Northern Long-eared Bat (NLEB)

Myotis septentrionalis Federal Status: Threatened State Status: Threatened

A medium-sized bat, the NLEB is between 3-4 inches long with a wingspan of 9-10 inches. It has medium to dark brown fur on its back while its underside is tan or light brown. This species also has a relatively long tail which is approximately one-third its total length. It is a member of the Myotis bat family; the term "Myotis" means "mouse ears." That said, the Northern-long eared bat is easily distinguished by its long ears. The NLEB weights between 6-9 grams – about the weight of 3 pennies. Females are usually slightly larger than males.

In the summer months, NLEB can be found in woodland areas. They roost singly or in colonies under bark of trees and in tree cavities. Males and non-reproductive females can also be found roosting in cooler locations such as mines. Occasionally, they have been known to roost in structures including buildings or barns, but this is rare. In the winter months, NLEB do not migrate but rather find hibernating spots (hibernacula) in caves and mines with a constant temperature and little to no air movement. They often squeeze into tiny cracks or crevices within these caves or mines (NGPC 2021-Northern Long-eared Bat).

Western Massasauga

Sistrurus tergeminus State Status: Threatened Federal Status: None

The massasauga is the smallest rattlesnake in Nebraska. It can be 18-39 inches long. It is gray and brown with dark, round brown blotches on the back and other smaller and less-distinct blotches on the sides. It has light and dark bands on the tail. Along the side of the head there are two narrow white lines circling a dark brown band. They have a moderately developed rattle at the end of a stocky tail.

Massasaugas are found in a grassland habitats, such as tallgrass prairie and grassy fields. They favor moist areas, such as marshland, wet prairies, and flood plains. Wet meadows provide habitat for cravifsh. During the winter months, massasaugas use these cravifsh burrows to hibernate. Without the crayfish burrows, many massasaugas do not survive through the winter (NGPC 2021-Western Massasauga).

Whooping Crane

Grus americana Federal Status: Endangered State Status: Endangered

Whooping cranes are the tallest bird in North America, reaching almost five feet in height. This species is covered in white feathers, with red markings on its face and crown and black feathers on the outer ends of its wings. This species is distinguishable during flight since cranes fly with the necks straight out.

While migrating through Nebraska, whooping cranes use the central Platte, Middle Loup, North Loup and Niobrara rivers and a variety of wetland habitats as stopover sites during both spring and fall migration. This species typically stops at shallow wetlands, marshes, pond and lake margins, sandbars and shorelines of rivers, wet prairies, and crop fields near wetlands. This species forages in marshes, shallow wetlands, wet meadows, and occasionally crop fields.

Western Prairie Fringed Orchid (WPFO)

Platanthera praeclara Federal Status: Threatened State Status: Threatened

WPFO is a non-woody perennial. The WPFO can grow to 3 feet in height, but an average height is 18 to 30 inches. The flowers form an open arrangement at the top of the stem. Approximately two dozen creamy white or greenish flowers are present on each stalk. The lower lip of the flowers is divided into three feathery and fringed lobes, hence the common name. Together with the upper petals and sepals they form a hood.

The WPFO can be found in the tallgrass prairie landscape in upland prairies and loess soils. They occur most often in mesic to wet unplowed tallgrass prairies and meadows but have been found in old fields and roadside ditches.

4.1.5.2 Vegetation (Flora)

Cultivated cropland (corn, soy, and alfalfa) makes up the majority of the surface area within the Project area. Native and non-agricultural vegetation exist primarily in the form of hedgerows and windbreaks along field margins, and in riparian areas along surface water drainages. According to ecosite descriptions from the Natural Resources Conservation Service (NRCS) (2015), plant communities within the vicinity of the Project consist of annual and perennial weedy forbs and less desirable grasses from abandoned farmland, as well as:

- big bluestem (Andropogon gerardii)
- smooth brome (*Bromus inermis*)
- tall fescue (Schedonorus arundinaceus)
- switchgrass (*Panicum virgatum*)
- Indiangrass (*Sorghastrum nutans*)
- sideoats grama (Bouteloua curtipendula)
- little bluestem (Schizachyrium scoparium)

- Scribner's rosette grass (Dichanthelium oligosanthes var. scribnerianum)
- porcupinegrass (Hesperostipa spartea)
- multiple species of sedges (Carex sp.)
- leadplant (Amorpha canescens), •
- Bur oak (*Quercus macrocarpa*) •
- honey locust (Gleditsia triacanthos) •
- smooth sumac (*Rhus glabra*) •

4.1.5.3 Potential Impacts to Biological Resources

Mining and exploration activities will disturb the tracts of land needed to construct surface facilities associated with the Project. Disturbance due to construction activities generally consists of vegetation removal and stockpiling the upper 0.5 to one foot of soil and vegetation and grading of the area to facilitate construction. Future disturbance associated with the underground mine and associated infrastructure is estimated at approximately 364 acres. Other related activities, such as truck traffic, could result in wildlife mortality.

4.1.5.4 Measures Taken to Reduce Potential Impacts to Biological Resources

Multiple agency meetings involving the USFWS and the NGPC, beginning October 5, 2016, were held to address any potential concerns regarding impacts to biological resources. Discussions at the meetings involved potential impacts to western massasauga habitat the Project may have, for which the NGPC recommended the area be surveyed for. This was accomplished during the 2015

wetland delineation performed by Olsson biologists. No suitable habitat for the western massasauga was identified during the survey. Additional concerns were raised involving the waterline as part of the previous Project design; however, this aspect has been eliminated from consideration. Additional Agency meeting dates are detailed in Table 7, above.

To promote beneficial conditions following the closure of the mine and related activities, a surface reclamation plan has been constructed with the overarching objective of returning disturbed lands to productive post-mining land use. Previous information gathered regarding soils, vegetation, wildlife, and radiological baseline data will be used as guidelines for the completion of surface reclamation concurrently with operations wherever possible. Final surface reclamation will blend affected areas with adjacent undisturbed lands so as to re-establish original slope and topography and present a natural appearance. Surface reclamation efforts will strive to re-establish natural drainage patterns through limiting soil erosion by wind, water, and sedimentation.

Northern Long-eared Bat

Although the site is within the known range of the NLEB, it is unlikely the species would be adversely impacted due to construction. In areas that provide potential habitat for the NLEB, tree clearing will be avoided as much as possible during the maternity roosting season (approximately June 1 to July 31). For tree clearing that cannot be avoided, roost surveys are required in areas of potential habitat during the maternity roosting season. A known hibernaculum is located approximately five miles south of the Project area (D. Fogell, personal communication, October 19, 2021).

Western Massasauga

Although the site is within the known range of the western massasauga, it is unlikely the species would be adversely impacted due to construction. The western side of the proposed tailings area contains potential massasauga habitat; however, no snakes were observed during the wetland delineation effort in 2015. Additional surveys may be required by NGPC. A known massasauga hibernaculum is located approximately 4.5 miles south of the Project area (D. Fogell, personal communication, January 25, 2017). This location is the closest known observation of massasauga to the Project area. Based on the distance to the nearest known habitat, lack of suitable habitat (crayfish burrows) found onsite, and lack of prior observations surrounding the Project area, the Project is not likely to affect massasauga. Under no circumstances should massasauga be harmed, destroyed, or handled by inexperienced persons.

Western Prairie Fringed Orchid

Declines in the orchid populations in Nebraska have been primarily caused by the conversion of native grasslands to cropland. The process and tailings areas are located within agricultural lands with wooded riparian corridors and do not contain suitable wet meadow areas for WPFO. Due to the lack of suitable habitat within the Project area, the Project is unlikely to affect western fringed prairie orchid.

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January 2022

Whooping Crane

While migrating through Nebraska, whooping cranes use the central Platte, Loups, and Niobrara rivers and a variety of wetland habitats as important stopover and resting spots during both spring and fall migration (Nebraska Rare Species 2013). Whooping cranes prefer shallow braided riverine habitats and wetlands for roosting. Nebraska is one of the only places where a considerable amount of time is spent in rivers (Nebraska Rare Species 2013). They use agricultural fields, wet meadows, marsh habitats, and shallow rivers for feeding. No playa wetlands, which provide stopover habitat for whooping cranes, were identified during the wetland delineation (Olsson 2015).

The nearest recorded whooping crane observation from the processing area is approximately 8.5 miles northeast of the Project area. The western edge of the Project area is approximately 35 miles east of the migration corridor where 95 percent of whooping cranes sighting occur (USFWS 2008). Within the Project area, the presence of wooded riparian corridors would appear to detract whooping cranes based on the closed viewshed. The processing and tailings areas are located outside of open floodplains. Wetland and riparian habitats located in the Project area are generally wooded, lacking the whooping cranes preferred open viewshed. Given the lack of sightings near the Missouri River within Nebraska and Iowa, whooping cranes are unlikely to be impacted due to the Project.

Eagles, Raptors and Migratory Birds

In addition to whooping crane considerations, the Bald and Golden Eagle Protection Act (BGEPA) (16 USC § 668-668d) and Migratory Bird Treaty Act (MBTA) (16 USC 703-712) ensure protection for many raptor and bird species. Any activity, intentional or unintentional, resulting in take of protected bird species, including eagles, is prohibited unless otherwise permitted by the USFWS (50 CFR Sec. 10.12 and 16 USC Sec. 668(a)). The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. Take includes harm to the living bird (directly or indirectly), any part of the bird, its nests, or eggs. A list of migratory bird species protected by the law can be found under Title 50 Part 10.13, which was updated in 2020.

Potential bald and golden eagle habitat was reviewed for the Project area. Small to large trees are present within the Project area. Because the Project area is located in close proximity to the Missouri River, habitat for the bald eagle may be present. No known eagle nests are present within the Project area.

The Project is located in an area including small to large sized trees which may provide nesting habitat to migratory bird species. If construction occurs during the primary nesting season (April 1 to September 1), MBTA nest surveys will be completed by a qualified biologist prior to the removal of any trees within the Project area.

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Typical measures taken to reduce any potential impacts to migratory bird species includes:

- Voluntarily avoid tree removal or impacts to vegetation during the primary nesting season of breeding birds (April 1 to September 1).
- Installation of underground rather than overhead, powerlines whenever possible/appropriate to minimize environmental disturbances. For all new overhead lines or modernization of old overhead lines, the USFWS recommends incorporating measures to prevent avian electrocutions.
- If a new Meteorological tower is necessary, placement of the new tower near other existing structures is recommended to concentrate the risk posed by the towers to relatively small areas. Minimization of tower height (below 200 feet to preclude the need for Federal Aviation Administration lighting requirements), use of only strobe or flashing lights (no steady-burning lights), and avoidance of guy wires (a great deal of avian mortality is a result of collisions with supporting guy wires) are important components intended to minimize potential impacts to migratory birds.
- Marking overhead power lines that in situations where these lines are adjacent to wetlands or where waters exist on opposite sides of the lines to make them more visible to birds. Because it does not entirely preclude mortality from line strikes, marking of additional, existing, overhead lines is recommended to further offset the potential for avian line strike mortality.

4.1.5.5 Supporting Documents

- Schneider, R., K. Stoner, G. Steinauer, M. Panella, and M. Humpert (Eds.), (2011). The Nebraska Natural Legacy Project: State Wildlife Action Plan. 2nd ed. The Nebraska Game and Parks Commission, Lincoln, NE
- Threatened and endangered species, Northern Long-eared Bat. Nebraska Game and Parks. (2021, August 17). Retrieved October 4, 2021, from <u>http://outdoornebraska.gov/endangeredspecies/</u>.
- Threatened and endangered species, Western Massasauga. Nebraska Game and Parks. (2021,
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http://outdoornebraska.gov/endangeredspecies/.
- Brown, M.B. (2014). Endangered Species in Pawnee and Johnson Counties. Email. Nebraska: School of Natural Resources, University of Nebraska. May 27. Recipient: Scott Honan, NioCorp.
- NRCS, (2015). United States Department of Agricultural Natural Resources Conservation Service Web Soil Survey. http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed April 7, 2015.
- Birds of Conservation Concern. 2021. U.S. Fish & Wildlife Service Department of the Interior. (n.d.). Retrieved October 18, 2021, from <u>https://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php</u>.
- Nebraska Rare Species. 2013. Nebraska Rare Species, Education for Conservation. http://rarespecies.nebraska.gov/.

Olsson Associates (Olsson). 2015. Wetland delineation report.

- USFWS. 2011. Cooperative Whooping Crane Tracking Project (CWCTP) GIS Database. Nebraska Field Office.
- USFWS. 2008. Nebraska Whooping Crane Migration Corridor using State Sightings. https://www.fws.gov/nebraskaes/images/NE Central Flyway State NE.jpg.

4.1.6 Cultural and Historical Resources

There were at least 15 Native American tribes that have inhabited the Great Plains region now incorporated in the State of Nebraska, including the Kansas and Otoe tribes of southeastern Nebraska. Of these original inhabitants, there are four federally recognized Indian tribes that remain in Nebraska today, and one state-recognized tribe including:

- Iowa Tribes of Kansas and Nebraska—state recognized;
- Omaha Tribe of Nebraska—federally recognized;
- Winnebago Tribe of Nebraska—federally recognized;
- Ponca Tribe of Nebraska—federally recognized; and
- Santee Sioux Tribe of Nebraska—federally recognized.

Reservations associated with these tribes are located in the northeastern part of the state, over 124 miles to the north of Elk Creek. The Otoe Tribe once lived south of the Platte River in the region of the Project. Additionally, the Iowa Tribe of Kansas and Nebraska and Sac and Fox Nation of Missouri have service areas in both Kansas and Nebraska with tribal headquarters in Kansas; and the Oglala Sioux Tribe also owns land in Nebraska with many tribal members living in Nebraska, but tribal headquarters are in South Dakota. Recently, land was returned to the Pawnee near Dannebrog, Nebraska although their headquarters are in Oklahoma. The four remaining tribes in Nebraska, along with the Iowa Tribe of Kansas and Nebraska were contacted in regards to the Project development.

In January 2017, Cultural Resources Consulting of Hickman, Nebraska (CRC) conducted archeological resources investigations within the proposed area of potential effect, including the Project area and a waterline corridor to the Missouri River which was being considered for the Project at the time of the investigation. The investigation was intended to determine if there are known archeological sites recorded, or currently unknown, but potentially significant cultural resources that may be impacted within the defined area of potential effect. The archeological investigation determined no significant archeological resources will be impacted by construction of the Project and processing area, the holding pond, and tailings impoundment area (CRC 2017).

4.1.6.1 Potential Cultural and Historical Resources Impacts

Based on the archeological resource investigation (CRC 2017), no impacts to cultural and historical resources are anticipated due to Project activities.

4.1.6.2 Measures Taken to Reduce Potential Cultural and Historical Resources Impacts

As with any project, there is a remote chance additional undiscovered properties could be encountered. They must be immediately reported under the National Historic Preservation Act and the Native American Graves Protection and Repatriation Act regulations.

4.1.6.3 Supporting Documents

- Nordmin. (2019). (tech.). NI 43-101 TECHNICAL REPORT FEASIBILITY STUDY, ELK CREEK SUPERALLOY MATERIALS PROJECT, NEBRASKA. NioCorp Ltd. Retrieved October 21, https://secureservercdn.net/198.71.233.33/gx0.d43.myftpupload.com/wp-2021, from content/uploads/180001 FINAL 43-101 FS NioCorp AS FILED.pdf.
- Parks, Stanley M., CRC, (2017). Archeological Investigation for NioCorp Developments Ltd. Mining Project in Johnson and Nemaha Counties, Nebraska. Prepared by CRC in Hickman, NE, January 2017.

4.1.7 Gender

The total workforce for the project will be 430 people, and the facility will operate 24 hours a day/ seven days a week /365 days a year.

According to the Bureau of Labor Statistics (BLS), approximately 86 percent of the mining workforce consists of male workers (BLS 2021). If we assume the Project employment will generally follow industry trends, we can assume the general workforce for the Project would consist of approximately 370 male workers and 60 female workers over the life of the Project.

Workforce levels are estimated based on the production schedule and equipment needs. The productivities used reflect a mix of local and skilled labor with an experienced management team.

4.1.7.1 Potential Gender Impacts

All extractive and heavy industry projects have potential for accidental injury or loss of life as a result of project activity. NioCorp is an Equal Opportunity Employer (EEO) and would provide equal opportunities for males and females. However, assuming the Project will follow industry trends, the majority of the mining workforce will likely be comprised primarily of male workers. NioCorp will follow all applicable MSHA safety standards, which limits the potential for workplace accidents that may result in socioeconomic impacts to employees and their families. If accidental injury or loss of life were to occur, there is a higher probability that males would be directly impacted, based on the likelihood that the mining workforce could be comprised primarily of males.

However, the United States and the State of Nebraska have equal opportunity regulations that prohibit discrimination in areas of employment based on gender. According to the Nebraska Department of Labor (NDOL), approximately 84.2 percent of women in Nebraska are actively employed (NDOL 2019). The Nebraska Equal Opportunity Commission, established in 1965 by Legislative Bill 656, known as the Nebraska Fair Employment Practice Act, enforces the public policy of the state against discrimination in areas such as hiring/promotion, compensation, and discipline. In addition NioCorp and its subsidiary ECRC are equal opportunity employers.

4.1.7.2 Measures Taken to Reduce Gender Impacts

All hiring will be conducted on basis of merit irrespective of candidate gender, race, or creed. All community consultation will be conducted without regard to gender, race, or creed. Equal pay will be furnished for equal work.

To facilitate safe working environments within the proposed operation, MSHA safety standards are incorporated in the mine design and include dual secondary means of mechanical egress, backup power for both auxiliary hoists, partial ventilation system, and one air compressor which feeds compressed air to the underground. Twelve-person mobile refuge chambers are included and will be in active working areas over the LOM. In addition, construction of the mine will include two permanent 30-person refuge chambers. The mine will have a communications system that has both mine phones and wireless communication. A mine rescue team will be required to support the mine's underground operation. The mine safety program will integrate with local providers in case of any mine emergency. Additionally, a stench gas emergency warning system will be installed in the mine's intake ventilation system. This system can be activated to warn underground employees of a fire situation or other emergency whereupon emergency procedures will be followed. The shop areas and underground fueling station will be equipped with automatic closure doors that will operate in case of fire (Nordmin 2019). NioCorp will follow all applicable laws and regulations regarding site specific safety measures, including things such as: a Fire and Life Safety Permit, Boiler Inspection Certificate, and MSHA safety inspections.

The surface plant will also follow the same set of MSHA safety standards, with safety incorporated into designed features and personnel trained and equipped to provide emergency response services.

4.1.7.3 Supporting Documents

- United States Bureau of Labor Statistics. (2021, July 30). Employed persons by detailed industry, sex, race, and Hispanic or Latino ethnicity. Retrieved October 21, 2021, from https://www.bls.gov/cps/cpsaat18.htm.
- Women's Labor Availability in Nebraska. (2019, May). Nebraska Workforce Trends, Nebraska Department of Labor (May 2019), 6-6. Retrieved October 19, 2021, from: https://dol.nebraska.gov/webdocs/Resources/Trends/May%202019/Trends%20May%202 019.pdf
- Nordmin, (2019), (tech.), NI 43-101 TECHNICAL REPORT FEASIBILITY STUDY, ELK CREEK SUPERALLOY MATERIALS PROJECT, NEBRASKA. NioCorp Ltd. Retrieved October 21,

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4.1.8 Human and Labor Rights, Safety, and Security

Labor rights are regulations established by the Nebraska Department of Labor. Nebraska adopted Fair Labor Standards Act regulations, which provides worker protection standards all Nebraska companies must adhere to. The Nebraska Department of Labor establishes minimum wage, overtime requirements, equal pay regulations, child labor regulations, and recordkeeping requirements.

Miner safety and rights in the U.S. are extensively regulated with more than a century of development and precedent. Safety regulation is federally codified in Federal Mine Safety and Health Act of 1977 (Mine Act) as amended by numerous other statutes through April 2016. The MSHA, created in 1977 with the passage of the Mine Act, works to prevent death, illness, and injury from mining and promote safe and healthful workplaces for U.S. miners. MSHA regulations apply to the totality of any operation that contains an identifiable mining unit.

Occupational Safety and Health at the Project will be strictly regulated by MSHA under Title 30 of the Code of Federal Regulations, Mineral Resources, Parts 1 through 199 (30 CFR Parts 1 through 199) and by OSHA under that agency's enabling regulations. This includes all of the training requirements specified in 30 CFR Parts 46 through 49. Given the radiological nature of the mineralized material, MSHA will likely institute radon exposure and monitoring requirements on all underground workers in accordance with 30 CFR § 57.5039 thru § 57.5047. Because Nebraska has not enacted any workplace safety and health rules, the federal Occupational Safety and Health Act governs workplace health and safety requirements in private (private businesses and non-profit organizations) sector workplaces. In addition, the Nebraska Occupational Safety and Health Surveillance Program, established in 2010 under the Nebraska Department of Health & Human Services, provides state-based occupational health surveillance, while the NDOL Office of Safety is charged with the protection of people and property through enforcement of the Nebraska Amusement Ride, Boiler Inspection, and Conveyance Safety Acts. With respect to the Project, NDOL safety staff will inspect boilers and pressure vessels to ensure that they are properly installed and maintained.

Workforce levels within the mine are estimated based on the production schedule and equipment needs. The productivities used reflect a mix of local and skilled labor with an experienced management team. The estimate is based on the utilization of a contractor for mining development and operations with an ownership senior management team to oversee mining activities. The rotating contractor crews will be using an operating schedule consisting of 12 hours per shift, two shifts per day, and seven days per week. A four-crew arrangement supports the 12hour shift with two crews onsite at any given time (per rotation). The ownership, senior

management and technical team are planned to work five 8-hour days per week. Table 21 shows the maximum required workforce. There are 96 people on a two-week rotation and 24 ownership senior management and technical team on a weekly basis. The workforce increases over time to a maximum of 216 in year five. There will be a maximum of 120 people onsite at any given time. These estimates do not include work required to build Project infrastructure.

Management / Technical Support		Total Quantity	
Mining Manager	1		
Mine Superintendent	1		
Maintenance Superintendent		2	
Chief Engineer		1	
Geotechnical Engineer		1	
Long Term Mine Planner		1	
Short Term Mine Planner		1	
Project Engineer (ventilation, water construction)		2	
Chief Geologist		1	
Resource Geologist		1	
Grade Control Geologist		2	
Administrative / Mine Clerks		1	
Chief Surveyor		1	
Mine Surveyor		3	
Material Handling / Shaft Shift Supervisor		2	
Mine Services Shift Supervisor – Construction		1	
Maintenance Shift Supervisor – Fixed Equipment		1	
Electrical General Foreman		1	
Total Management / Technical Support		24	
Rotating Crews	Per Rotation Quantity	Total Quantity	
Shaft Services	2	4	
Hoistperson	2	4	
Deckman	2	4	
Skip Tender / Crusher	2	4	
Safety Technician / Trainer	2	4	
Development / Production Shift Supervisor	2	4	
Vertical Development Crew	2	4	
Blasting/Powder Crew	4	8	
Blasting/Powder Crew Helper	4	8	
Jumbo Operator	4	8	
Longhole Drill Operator	3	6	
LHD Operator	7	14	
Haul Truck Operator	8	16	
Bolter Operator	8	16	
Cable Bolter Operator	2	4	
Nipper	4	8	
Shift Supervisor – Logistics	1	2	
Utility / Construction Crew	4	8	
Grouting Lead	1	2	
Grader Operator	1	2	
Conveyor Attendant	2	4	

Table 21: Typical Mining Labor

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Maintenance Supervisor – Mobile Fleet	2	4
Mine Electrician	7	14
Heavy Equipment Mechanic	12	24
Welder	2	44
Instrumentation Technician	2	4
Total Rotating Crews	96	192
Grand Total	-	216

Figure 7 below shows the projected size of the workforce for the Project, including all phases required for the construction and operation of the mine, by year, for the first 11 years of the project. Workforce levels are anticipated to peak in the 3rd year of construction/operation with workforce levels above 1200 employees, then leveling off in the following years to near 400 employees which will be the approximate standard operating workforce following the first several years of construction.



Figure 7 – NioCorp Elk Creek Project Projected Workforce by Year

4.1.8.1 Potential Human and Labor Rights, Safety, and Security Impacts

All extractive and heavy industry projects have potential for accidental injury or loss of life as a result of project activity. MSHA reported 24 fatalities occurred during metal/non-metal mining operations in 2020 (MSHA 2020).

The EPA Environmental Justice Screening and Mapping Tool (EJScreen) is intended to help identify areas that may warrant additional consideration, analysis, or outreach and may help identify potential areas of Environmental Justice concern. The EJScreen provides data as percentiles which provide perspective on how the selected block group or in this case, buffer area compares to the entire state, EPA region, or United States. For example, if a given location is at the 95th percentile nationwide, this means that only five percent of the U.S. population has a higher block group value than the average person in the location being analyzed. According to the EPA, the years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators.

In reviewing the results from the EJScreen tool (Appendix C), demographic indicators for people of color and low-income populations are generally higher in the Elk Creek, Tecumseh and Johnson County areas, when compared to the Nebraska state-wide average. However, the Project will not result in any barriers or create difficult access to local services, facilities, institutions, or other parts of Johnson County/Elk Creek. Additionally, it is anticipated that the Project may act as a beneficial economic driver for the area through opportunities provided by NioCorp and associated contractors. No adverse socio-economic issues are anticipated to people of color or low-income populations as a result of the Project.

4.1.8.2 Measures Taken to Support Human and Labor Rights, Safety, and Security MSHA safety standards, developed from the 1977 Mine Act which works to prevent death, illness,

and injury from mining and promote safe and healthful workplaces for U.S. miners, are incorporated in the mine design as are OSHA standards. Design features include dual secondary means of mechanical egress, backup power for both auxiliary hoists, redundant mine ventilation system and a compressed air system for the mine. Twelve-person mobile refuge chambers are included and will be in active working areas over the LOM. In addition, there is a cut-out on both the 530 Level and 650 Level to facilitate the installation of two permanent 30-person refuge chambers. The mine will have a communications system that has both mine phones and wireless communication through a leaky feeder system. A mine rescue team will be required to support the mine's underground operation. The mine safety program will integrate with local providers in case of any mine emergency. Additionally, a stench gas emergency warning system will be installed in the mine's intake ventilation system. This system can be activated to warn underground employees of a fire situation or other emergency whereupon emergency procedures will be followed. The shop areas and underground fueling station will be equipped with automatic closure doors that will operate in case of fire. Additionally, NioCorp will follow all applicable laws and regulations regarding site specific safety measures, including things such as a Fire and Life Safety Permit, Boiler Inspection Certificate and MSHA safety inspections.

Every effort is made to reduce and eliminate potential for safety hazards for all Project workers. NioCorp and its subsidiary ECRS will maintain a robust safety program compliant with OSHA and MSHA requirements. Mine facilities (surface and underground) are inspected randomly a minimum of once per quarter by MSHA inspectors. The MSHA regulations are publicly available and made available to all employees. OHSA also has powers of entry and inspection.

All employees of NioCorp and its subsidiary ECRS are required to complete MSHA Training and retain corresponding certificates pursuant to 30 Code of Federal Regulations Part 48. This involves either a 3 day or 5-day initial training course, followed by a one day annual refresher on or before the anniversary of the initial training. NioCorp and ECRS will conduct regular additional safety meetings and training. NioCorp and its subsidiary ECRS will include fire safety and prevention training with regular safety training. Fire suppression equipment will be kept in all vehicles and inspected monthly. Employees will be trained regularly on use of fire suppression equipment.

No employees will be hired under the age of 18. No employees or other services will be unpaid. Prison labor will not be used at any time. NioCorp and its subsidiary ECRS are equal opportunity employers. All hiring will be conducted on basis of merit irrespective of candidate gender, race, or creed. All community consultation will be conducted without regard to gender, race, or creed. Equal pay will be furnished for equal work.

The entire site will be enclosed with a barbed wire fence. Site access will be permitted through a manned security gate for vehicles, or through employee turnstiles operated electronically by card key. A security network will be installed, allowing for control of gate access and security camera control (Nordmin 2019).

Fire Management

A fire water distribution system will be installed throughout the site. The fire water system will be comprised of two 225,000-gallon insulated fire water tanks and two independent fire water pumps capable of delivering 2,000 gpm for a minimum period of four hours. The primary pump will be electrically driven while the backup pump will be diesel powered. Dry and wet sprinkler systems, hydrants, hose reels and fire extinguishers will be utilized for fire suppression. All infrastructure facilities on the surface, except for the gate house, will include fire suppression systems. Process building fire suppression systems will include wet sprinklers in all office spaces and control rooms. Dry sprinkler systems will be utilized in the hydrometallurgical buildings within specified high hazard areas. The remaining open process/factory areas of these two process facilities, as well as the open areas of the mineral processing building, will utilize fire hose protection from outside hydrants, as well as interior located fire hose reels.

Fire suppression considerations also extend to the fixed facilities of the Project, such as the garage and shaft bottom area. Current design plans incorporate air from the garage to flow directly to a return air raise that ventilates directly into the ventilation/exhaust shaft. This way, in the event of a fire within the garage area, smoke and fumes cannot contaminate the mine. Fire doors are included in all fuel bays and the garage to prevent the spread of fumes in the event of a fire with remote controlled doors. Interlocked equipment doors with sliding regulators will be used to regulate the quantity of air delivered to various levels of the mine. Several different types of remote sensors have been considered for installation at the mine. These sensors can help predict wear on the fans, alarm in the event of a fire, low temperature or harmful gasses and can tie into the ventilation modelling software. Considerations for the mine also include bundled air quality and quantity sensors for each fan installation, intake shaft, fixed facilities, and each working level. These include fan monitoring, air quality, air quantity, and psychrometric sensors.

4.1.8.3 Supporting Documents

- MSHA. 2019. Metal/nonmetal mining fatality statistics: 1900-2019. (n.d.) Retrieved October 4. 2021, from https://arlweb.msha.gov/stats/centurystats/mnmstats.asp.
- Nordmin. (2019). (tech.). NI 43-101 TECHNICAL REPORT FEASIBILITY STUDY, ELK CREEK SUPERALLOY MATERIALS PROJECT, NEBRASKA. NioCorp Ltd. Retrieved October 21, 2021, https://secureservercdn.net/198.71.233.33/gx0.d43.myftpupload.com/wpfrom content/uploads/180001_FINAL_43-101_FS_NioCorp_AS_FILED.pdf.

4.1.9 Land Use

Based on known soil types, land use in the vicinity of the Project is best suited for rangeland and native hay, introduced or domestic grasses for pasture and, if irrigated, corn, sorghum, and soybeans (USDA SCS, 1984). The Project area is currently used for a mixture of crop and pastureland.

4.1.9.1 Livestock Grazing and Exploration

Since the settlement of Johnson County, farming for livestock, crops, and pasture has been the most important land use enterprise. Over the years, crop production has shifted from orchards, oats, barley, and rye to corn, soy, wheat, alfalfa, and grain sorghum. Livestock in the county generally consists of hogs, cattle, and milk cows (USDA SCS, 1984). Approximately 4,046 ha (10,000 acres) in Johnson County is irrigated cropland, while approximately 16,996 ha (42,000 acres) is used for pasture. Approximately 12,949 ha (32,000 acres) of Johnson County is used for rangeland, which includes both native prairie that was never broken from sod and areas that were cultivated and then reseeded.

4.1.9.2 Potential Livestock Grazing and Exploration Impacts

The Project parcel encompasses approximately one square-mile; however, infrastructure and associated mining activities are not anticipated to disturb the entire parcel and the project design avoids impacts to the riparian areas around Elk Creek on the south side of the parcel. Other readily available livestock grazing areas should be available within the 42,000 acres currently used for pastureland within Johnson County; therefore, impacts to potential livestock grazing from Project activities are considered minimal.

4.1.9.3 Measures Taken to Reduce Potential Livestock Grazing and Exploration Impacts

The principal objective of the surface reclamation plan developed by NioCorp will be to return disturbed lands to productive post-mining land use. Soils, vegetation, wildlife, and radiological baseline data will be used as guidelines for the completion of surface reclamation. Final surface reclamation will blend affected areas with adjacent undisturbed lands so as to re-establish original slope and topography and present a natural appearance. Surface reclamation efforts will strive to limit soil erosion by wind and water, sedimentation, and re-establish natural drainage and vegetation patterns.

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4.1.9.4 Supporting Documents

USDA SCS, (1984). United States Department of Agriculture (USDA) Soil Conservation Service (SCS), Soil Survey of Johnson County, Nebraska. National Cooperative Soil Survey. 1984.

Nordmin. (2019). (tech.). NI 43-101 TECHNICAL REPORT FEASIBILITY STUDY, ELK CREEK SUPERALLOY MATERIALS PROJECT, NEBRASKA. NioCorp Ltd. Retrieved October 21, https://secureservercdn.net/198.71.233.33/gx0.d43.mvftpupload.com/wp-2021. from content/uploads/180001_FINAL_43-101_FS_NioCorp_AS_FILED.pdf.

4.1.10 Power and Natural Gas Supply

In accordance with NioCorp's previously described sustainability goals, NioCorp intends to integrate key ESG principles incorporating environmental stewardship into the Project, including seeking improvement in energy use performance.

Electrical Power Line & Substation

The local power utility (OPPD) will provide power to the site, and will be a separate project managed and paid for by the utility. This will require approximately 18 miles of new transmission line to be installed by the utility to provide power to the Project's main sub-station to meet the required power demand. The local power utility will also design and install the main substation that will be owned and maintained by the utility. This infrastructure will be paid back through rate charges on electrical usage.

Electrical Power Distribution - Plant and Facilities

The main substation will feed the site distribution substation with 44 kV. A 44 kV pole line will be constructed on the Project area to supply main power throughout the site and to the mine sub yard. In addition, this substation will include two 20/25 mega volt ampere transformers to provide 13.8 kV for distribution through the above ground facilities with approximately 3,610 ft (1,100 m) of power cables in vaults, and approximately 5,250 ft (1,600 m) of overhead lines.

Electrical Power Distribution

The underground electrical distribution will be fed from both the production and vent shafts, at 13.8 kV. Duplex fused disconnect switches will be present at several levels to allow power to be selected from either 13.8 kV feeder, providing redundancy. Power for utilization is accomplished through portable mine power centers, located at each production level. The duplex fused switches are not on every level but are distributed to adjacent levels through medium voltage junction boxes and boreholes.

Emergency Power Generation

Independent emergency power generation at the hoist house and vent shaft switchgear will be provided for back-up generation for surface infrastructure. Ventilation and hoisting are all powered from the surface, and thus, no emergency power is fed to the underground electrical distribution. Emergency power generation for the hoisting and ventilation systems will be supplied from two diesel-powered generators, one at the hoist house and one at the vent shaft.

Supply contracts for electric power with the OPPD, natural gas transportation from Tallgrass Energy and natural gas supply from Tenaska have been executed at the time of the 2019 Technical Report.

Natural Gas and Distribution

Natural gas, to be used throughout the Project during the construction and operation phases of the Project, will be brought to the Project area via pipeline from the local utility company. NioCorp has a natural gas transportation contract with Tallgrass Energy, which operates the Rockies Express (REX) pipeline. Tallgrass will construct a 45 km (28 mile) gas pipeline lateral from the main REX pipeline system in Kansas to the Project area. The lateral will be managed and paid for by Tallgrass as a separate project from the Elk Creek Mine. The lateral will be sized to provide a minimum of 27.5 dekatherms of gas per day. Natural gas will be distributed to all on-site facilities utilizing buried HDPE natural gas distribution pipe. Natural gas piping above ground and located inside of facilities will consist predominately of carbon steel pipe. Maximum on-site pipeline distribution pressure will be 100 pounds per square in gauge (psig). Natural gas will be used for facility heating, water heating, and for natural gas-fired process equipment.

4.1.10.1 **Potential Power Supply Impacts**

As described above, the building of new transmission lines and a main substation will be required to meet the energy requirements of the Project. OPPD will design and install infrastructure associated with these two requirements. Overall, the Project will increase energy consumption of the area. However, once required infrastructure is constructed, energy requirements will be within the capabilities of OPPD.

4.1.10.2 Measures Taken to Reduce Power Supply Impacts

No adverse impacts to the local utility provider are expected due to Project infrastructure. OPPD's 2016 Integrated Resource Plan details their analysis used in determining the optimum combination of resources from a full range of alternatives, which include supply-side, demandside and energy storage, in order to meet present and future power needs (OPPD 2017).

The supply contract with Tallgrass Energy and Tenaska have been executed as of 2019 and are expected to provide the supply necessary for the Project.

4.1.10.3 Supporting Documents

OPPD. (2017). (tech.). 2016 Integrated Resource Plan (pp. 8-101). Omaha, NE: OPPD. Retrieved online on October 18, 2021 from: https://www.oppd.com/media/247147/oppdintegrated-resource-plan.pdf

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Nordmin. (2019). (tech.). NI 43-101 TECHNICAL REPORT FEASIBILITY STUDY, ELK CREEK SUPERALLOY MATERIALS PROJECT. NEBRASKA, NioCorp Ltd. Retrieved October 21. https://secureservercdn.net/198.71.233.33/gx0.d43.myftpupload.com/wp-2021. from content/uploads/180001_FINAL_43-101_FS_NioCorp_AS_FILED.pdf.

4.1.11 Socioeconomics and Environmental Justice

Community is a term which commonly refers to people living within a defined geographic area such as a neighborhood or a small town. Communities can be highly diverse or highly homogeneous places; they can be strictly residential or characterized by mixed land uses. Central to the definition of community is both the presence of a residential population and a sense of common bond and collective identity which defines the community as distinct from other neighborhoods or communities. In performing this assessment, it is important to be aware of the social networks and institutions which characterize a neighborhood. In many cities neighborhoods exist where residents have strong ties to the area, each other, local stores, and institutions. Often these are ethnic areas where residents share a common cultural and religious heritage. NioCorp intends to conserve these bonds, create additional economic opportunities and institutional relationships for communities surrounding the Project. As detailed in Section 3.2.1, NioCorp has communicated proactively with numerous stakeholder groups, not only in communities closest to the Project but throughout the state of Nebraska.

Fire, police, and ambulance services are concerns that should be considered in terms of the adequacy of existing services for the project site. Although many communities have sophisticated protective services, the consistency of adequate service is different from place to place. Within communities, one site may be better served than another. Key variables within each city are emergency equipment, emergency service personnel, response time, and access. These factors influence the availability and adequacy of emergency services that may be required at a proposed project. NioCorp intends to manage the majority of emergency response internally and will train staff on emergency procedures. Local emergency services would be required should the response exceed the capacity of the on-site staff.

As shown in Table 7, a meeting with southeast Nebraska Emergency Responders was held on October 16, 2017. Information regarding the Project was presented at the meeting, along with potential needs in the future as the Project proceeds. Ongoing coordination with local emergency responders will continue throughout the life of the Project. NioCorp intends to familiarize emergency responders with Project facilities and operations by hosting them on an annual basis to further aid response/treatment services local emergency responders are able to render if needed.

4.1.11.1 Access and Roads Main Access Road to Site

The primary access to the Project area will be from County Road 721. Access into the Project area will be controlled by security personnel. The Project's access road will be leading to the main access points for the mine and the surface plant and the primary traffic destinations on the site.

Secondary Site Access Roads

A second, emergency access to the Project area will be connecting to Nebraska State Highway 50. The entrance to the emergency access road will be secured with a locked gate.

Secondary Site Roads (to tailings, etc.)

Secondary roads at the Project site include haul roads connecting the plant site to TSF cells and light vehicle access roads connecting infrastructure throughout the site. Haul traffic is expected to include 40-tonne haul trucks delivering tailings and water treatment system residual salt to the active TSF and salt cells and support equipment for the haul fleet. Light vehicles include light-duty pickups and service vehicles supporting infrastructure.

Light Vehicle Access Roads

Light vehicle access roads are located throughout the Project area. They provide access to infrastructure such as ponds, embankment crest and toe fills. Expected traffic on light duty roads includes light-duty pickup trucks, maintenance equipment, and the occasional haul truck. Light vehicle roads assume occasional use, single-lane traffic with areas to safely pull out of the traffic lane should vehicles meet. A typical light-duty vehicle is approximately three meters wide. Road widths are designed at six meters in width. Speeds are expected to be slow (20 to 30 km/h).

Construction

Geotechnical information for soils underlying road alignments is not available at this time. The construction of the roadways assumes similar construction practices as defined for the TSF embankment construction, including removal of one meter (+/-) of topsoil, replacement with suitable compacted sub-grade fill, and the provision of structural support for traffic with a durable gravel surface. Geotextile fabric will be installed at the base of the gravel layer to provide stability. A minimum of one-half meter of compacted gravel is assumed for the driving surface. All roadways will be designed to promote drainage off of the driving surface. This requires that the roadways be elevated slightly above the surrounding ground elevations and crowned, and/or a drainage ditch be provided as needed in areas of elevation transition from cut to fill. In areas where berms are required, notches in the berms should be provided at regular intervals to allow stormwater to discharge off of the roadways. In areas where safety berms are not required, shoulder slopes should not exceed 3:1, and 4:1 is preferred to reduce the chance of a vehicle rollover should they divert from the roadway.

The layout of the site along with associated roads and infrastructure are depicted on Figure 2, Appendix A.

4.1.11.1.1 Potential Access and Roads Impacts

Project infrastructure will not impede any existing roadways or access to existing roadways within Johnson County, however, increases in local traffic are expected as employees' access and leave the Project area. In addition, supplies and equipment will be transported to the site via truck.

4.1.11.1.2 Measures Taken to Reduce Potential Access and Roads Impacts

Due to the minimal impacts to the surrounding roads of the Project, no mitigation measures are currently planned.

4.1.11.2 Socioeconomics - Land Uses

The Project is located along NE State Highway-50 in rural southeast Johnson County, Nebraska. Historically, the majority of Johnson County economy has been supported by farming for livestock, crops and pasture, which remain the main economic drivers today. Land use both within the Project area and within the general area surrounding Elk Creek reflect the typical Johnson County property in this regard. As part of Project agreements, two life estates, one along the west side of NE Highway-50 (Beethe) and the other on the north side of 720th Road (Woltemath), can be created at the option of the landowner when their land is purchased. At the time of this report, the Beethe property has been purchased and the life estate option was invoked. The Woltemath land has not been purchased yet.

According to the NGPC, more than 97 percent of the state of Nebraska is privately owned (NGPC 2021). Taking into consideration the landscape of the area, the possibility exists for this land to provide hunting opportunities to residents of the area; however, the Project area is not listed in the NGPC Open Fields and Waters (OFW) Program Lands. Thus, the Project area does not present any publicly available recreational activities, due to the land being completely privately owned or leased (Section 1.4). The square mile to the south of the Project does contain two areas listed as OFW Conservation Reserve Program Lands Open to Hunting and Trapping and OFW Open to Hunting and Trapping alongside 620 Ave and extending eastward toward Elk Creek.

4.1.11.2.1 Potential Land Use Impacts

Project activities are not anticipated to alter any aspects of the homestead contained within the Project boundaries. Long-term land-use impacts are anticipated to be minimal and limited to landowners of the property.

4.1.11.2.2 Measures Taken to Reduce Potential Land Use Impacts

A post-mining plan for surface reclamation is in place to facilitate productive lands following disturbance due to Project activities. The strategy for this plan includes measures to blend

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affected areas with adjacent undisturbed lands so as to re-establish original slopes and topography and present a natural appearance. Surface reclamation efforts will strive to limit soil erosion by wind and water, sedimentation, and re-establish natural drainage patterns along with vegetation.

Hunting and fishing recreation opportunities can be directed to the many fishing and camping areas that are located near Tecumseh and within Johnson County. The Nemaha NRD lists several lakes but the closest is Wirth Brothers Lake. According to the NGPC website, there are several Wildlife Management Areas (WMA) located in Johnson County. An additional 5 WMAs can be found in Pawnee County to the south. Access to these lands is free, and no entry permit is necessary. However, to protect these areas and their many assets, there are certain rules that all found NGPC website: must abide bv which can be on the http://outdoornebraska.gov/wheretohunt/

4.1.11.3 Environmental Justice

Environmental Justice means ensuring that the environment and human health are protected fairly for all people regardless of race, color, national origin, or income. Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations" (2/94) requires certain federal agencies to consider how federally assisted projects may have disproportionately high and adverse human health or environmental effects on minority and low-income populations. While this Project is not federally required to follow Executive Order 12898, NioCorp has taken it into account to assure environmental justice concerns are addressed.

Table 22 below, examines the demographic characteristics of the nearby village of Elk Creek, and the City of Tecumseh, as well as Johnson County overall, in comparison to Nebraska and United States average values. The Project location in relation to these areas is shown on Figure 3, Appendix A.

Characteristic	Elk Creek Area Value ¹	Tecumseh Area Value ¹	Johnson County Area Value ¹	State of Nebraska Value	EPA Region Average Value	United States Value
Approximate Population	118	1,769	5,197	1,934,4048 ²		331,449,281 ²
Demographic Index ³	30%	34%	26%	25%	25%	36%
People of Color Population	31%	27%	19%	21%	20%	39%
Low Income Population	29%	45%	32%	29%	31%	33%
Linguistically Isolated Population	5%	7%	4%	3%	2%	4%

Table 22. EJ Screen Results for Elk Creek, Tecumseh, and Johnson County

1. Alignment plus one-mile buffer area

2. 2020 U.S. Census Population Estimate

3. Demographic Index is based on the average of two demographic indicators; Percent Low-Income and Percent Minority when compared to the state and/or national average.

4.1.11.3.1 Potential Environmental Justice Impacts

In reviewing the results from the EJScreen tool (Appendix C), demographic indicators for people of color and low-income populations are generally higher in the Elk Creek, Tecumseh, and Johnson County areas, when compared to the Nebraska state-wide average. However, the Project will not result in any barriers or create difficult access to local services, facilities, institutions, or other parts of Johnson County/Elk Creek. The Project is sited outside of municipality limits and would not require any displacement of individuals. NioCorp has entered into options agreements with two landowners, which include a two percent royalty. Additionally, it is anticipated that the Project may act as a beneficial economic driver for the area through opportunities provided by NioCorp and associated contractors and the business that will be created in the local economy as a result of the Project. No adverse socio-economic issues are anticipated to people of color or low-income populations as a result of the Project.

4.1.11.1 Supporting Documents

- Nordmin. (2019). (tech.). NI 43-101 TECHNICAL REPORT FEASIBILITY STUDY, ELK CREEK SUPERALLOY MATERIALS PROJECT, NEBRASKA. NioCorp Ltd. Retrieved October 21, 2021. from https://secureservercdn.net/198.71.233.33/gx0.d43.myftpupload.com/wpcontent/uploads/180001 FINAL 43-101 FS NioCorp AS FILED.pdf.
- Where to hunt. Nebraska Game and Parks. (2021, August 31). Retrieved October 18, 2021, from http://outdoornebraska.gov/wheretohunt/.

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4.1.12 Soils

According to the NRCS, soils in the vicinity of the Project are primarily comprised of clay, silty clay, silt loam, and clay loam within an ecological site that is typified as "Rangeland." For all soil types, the depth to any soil restrictive layer is more than 200 cm below ground surface, and the infiltration is generally "slow" to" very slow." Soils in the area are generally eroded and range in slopes from 2 percent to 30 percent, with the majority of the area having slopes of between 6 percent and 11 percent. (NRCS, 2015). The USDA NRCS identifies the following soils located within the Project area:

- 7153 Kennebec silt loam, rarely flooded
- 7231 Judson silt loam, 2 to 6 percent slopes •
- 7296 Malcolm silt loam, 6 to 11 percent slopes
- 7350 Malmo clay, 3 to 11 percent slopes, eroded •
- 7418 Morrill clay loam, 6 to 11 percent slopes •
- 7422 Morrill clay loam, 6 to 11 percent slopes, eroded •
- 7511 Pawnee clay loam, 6 to 11 percent slopes •
- 7515 Pawnee clay, 6 to 11 percent slopes, eroded •
- 7596 Shelby clay loam, 17 to 30 percent slopes •
- 7669 - Mayberry clay loam, 3 to 11 percent slopes
- 7693 Wymore silty clay loam, 2 to 6 percent slopes •
- 7695 Wymore silty clay, 3 to 6 percent slopes, eroded •
- 7750 Nodaway silt loam, occasionally flooded •
- 7867 Nodaway silt loam, channeled, frequently flooded •

Soil Survey Geographic Database Mapped soils are shown on Figure 4. Appendix A.

4.1.12.1 **Potential Soils Impacts**

The Project is estimated to disturb approximately 364 acres over the LOM. Typically, prior to construction, the upper one half to one foot of soil (also referred to as growth medium) is removed from a construction site and stockpiled for later reclamation. Soils may be covered or displace, or soil properties may be degraded by mining activity. Displacement of soil may also occur due to erosion caused by run-on or run-off from mine facilities.

Measures Taken to Reduce Potential Soils Impacts 4.1.12.2

Prior soils studies and samples collected in the feasibility stage of the Project will lend themselves as baseline data to be used during the surface reclamation process following mine cessation. These reclamation efforts will strive to limit soil erosion through wind, water and sedimentation and re-establish natural drainage patterns to the disturbed area. Additionally, a blending of affected areas with adjacent undisturbed lands will be undertaken so as to re-establish original slope and topography and present a natural appearance.

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4.1.12.3 Supporting Documents

NRCS, (2015). United States Department of Agricultural Natural Resources Conservation Service Web Soil Survey. http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed April 7, 2015.

Nordmin. (2019). (tech.). NI 43-101 TECHNICAL REPORT FEASIBILITY STUDY, ELK CREEK SUPERALLOY MATERIALS PROJECT, NEBRASKA. NioCorp Ltd. Retrieved October 21, https://secureservercdn.net/198.71.233.33/gx0.d43.mvftpupload.com/wp-2021. from content/uploads/180001_FINAL_43-101_FS_NioCorp_AS_FILED.pdf.

4.1.13 Visual Characteristics

The Project landscape is visible from several points along NE Highway-50, particularly from the higher elevations near the intersection of NE Highway-50 and NE Highway-62, as well as along 721st Road at the northern end of the Project and from various points along Highway 62 east of the Project. In addition to the line-of-sight view from the highways and 721st Road, the Project will ultimately be viewable from the two Life Estates present within the site boundaries. The Project area is not visible from the village of Elk Creek.

4.1.13.1 **Potential Visual Characteristics Impacts**

Mining infrastructure will be the most visually evident impacts imposed by the Project. Outside of the two Life Estates and passing views from NE Highway-50 and 721st Road, no additional impacts to visual characteristics of the area are expected.

Measures Taken to Reduce Visual Characteristics Impacts 4.1.13.2

Currently, there are no planned measures being undertaken regarding visual characteristic impacts other than the planned concurrently reclamation of the project as operations proceed.

4.1.14 Waste

Small quantities of waste rock will be temporarily stored on the surface (on a lined pad) prior to final disposal underground or within the lined tailings impoundment. The TSF are designed for storage of dry tailings solids in lined facilities permitted under State of Nebraska Industrial Solid Waste regulations. Separate lined LCPs will be used for management of precipitation contacting the tailings solids. Further information detailing waste generated by the Project is listed below:

Solid Waste

The solid waste generated by the Project, as defined by 40 CFR § 261.2, will be collected and transported to the Pheasant Point Landfill, located near Elk City in northwest Douglas County, 140 km (87 miles) from the Project area. Under current management practices, the Pheasant Point Landfill has approximately 90 years of projected remaining life (NDEE, 2012). Reject brines from the proposed RO water treatment plant are currently anticipated to be evaporated (crystallized) and the solid residue disposed of in the engineered and lined Salt Management Cells. Alternatively, these RO brines may be piped away from the mine site and reinjected into

the deep underground aquifer, though this option still requires considerable evaluation before being considered viable.

Waste Storage

A waste storage area will include a concrete diked containment area for the storage of wastes, including any hazardous wastes generated at the facility prior to offsite disposal.

Hazardous Waste

The geochemistry and characterization/classification of the ore and waste materials (including the final process waste streams making up the bulk of the tailings mass and the crystallized RO water treatment salts), directly influences the management of these materials given the presence of NORMs (i.e., uranium and thorium) and the potential for limited reaction to contact with water. These materials currently classify as non-hazardous based on regulatory testing. Small guantities of hazardous waste may be generated during routine maintenance and laboratory operations and will be disposed of at permitted off-site facilities. Site-wide management of non-contact and contact stormwater will be essential to Project compliance.

Sanitary Wastewater System

Sanitary wastewater will be transported from the on-site holding tanks to the municipal wastewater treatment plant located approximately six miles north, in Tecumseh. The facility will not generate process wastewater for discharge. Process wastewater will be treated through reverse osmosis and either recycled into the production process or continue through evaporation and crystallization and disposed of as solid waste. Wastewater from all site facilities will be collected in the on-site sanitary wastewater system through an underground PVC SR35 sewer piping network combining manholes and sewage lift stations. The system is designed for a peak flow rate of 750 gpm during peak shower usage and 27,300 gpd daily nominal volume.

Temporary Waste Rock Stockpile

The temporary waste rock stockpile will be used during the sinking of the shaft for storage of topsoil, waste rock and limited quantities of ore. The feasibility design incorporates the following parameters and details:

- i. The facility has been divided into three cells (Figure 2, Appendix A) to enable waste materials to be stockpiled separately.
- A minimum of 1 m of subbase soils will be removed prior to construction of the TSF ii. and stockpiled at the location shown in Figure 2, Appendix A.
- iii. Based on the current geochemical analysis of the waste rock and ore, the temporary waste rock stockpile will be geomembrane-lined. The liner system for the facility will incorporate:
- A minimum of 0.6 m of glacial till, amended if necessary, with bentonite, and compacted in layers to result in hydraulic conductivity of less than or equal to 1×10-7 cm/s; and
- b. An 80-mil HDPE geosynthetic liner placed over the low permeability basin and inside embankment sideslopes.
- iv. Runoff from the stockpile will gravity drain into a water management pond located to the south of the facility (Figure 2, Appendix A). The water management pond liner system will incorporate:
 - A minimum of 0.6 m of glacial till, amended if necessary with bentonite, and compacted in layers to result in hydraulic conductivity of less than or equal to 1×10-7 cm/s;
 - b. A 60-mil HDPE secondary liner comprised of either an Agru DrainLiner® or geonet and smooth liner;
 - c. An 80-mil HDPE primary liner; The DrainLiner or geonet/geomembrane secondary liner will route intercepted flows into a leak collection and recovery system (LCRS) that facilitates pumping of collected seepage water back into the water management pond via a submersible pump and riser pipeline arrangement. The riser pipeline will be contained in a "port" pipeline installed between the two liners. The LCRS sumps are gravel-filled containment areas between the primary and secondary liners, with a horizontal perforated pipe section within the gravel for pumping.
- v. Once the plant is operational, the ore will be removed and processed. Waste rock will be used as overliner during TSF construction, and any remaining material will be placed in Plant Site TSF Cell 1 for final disposal.
- vi. It is currently anticipated that all waste material will be removed from the temporary waste rock stockpile by Year 2.

4.1.14.1 Potential Waste Impacts

Potential impacts could be from the result of spills, equipment malfunction or human error and could include, but not limited to, petroleum and chemical spills resulting in contaminated soil or water. The presence of NORMs in the mineralized ore and several of the process waste streams will necessitate the need for comprehensive site-wide monitoring. At a minimum, the Radioactive Materials License will require the development and implementation of a formal Radiation Safety program for the facility, including environmental and personnel monitoring programs, which are discussed further in the following sections (4.1.15 & 4.1.16) regarding surface and groundwater.

Any hazardous waste generated by the Project will be transported by licensed operators to the Clean Harbors Environmental Services facility in Deer Trail, Colorado, 756 km (470 miles) away, in accordance with hazardous waste manifest and pre-transport requirements.

4.1.14.2 Measures Taken to Reduce Waste Impacts

Because of the potential presence of low levels of NORMs in some of the waste rock brought to the surface, NioCorp will take the conservative approach of placing this material on a lined containment facility from which any surface water runoff or seepage can be controlled and managed. It is not anticipated that any of these materials will remain on the surface post closure.

Geotechnical monitoring of the TSF facility will also occur on a regular basis as per state regulatory requirements. The Project has considered and will be held to permitting requirements that are determined to be necessary by Johnson County, the State of Nebraska, and the EPA and USACE national policies, such as NEPA (42 U.S.C. 4321) and CWA (33 U.S.C. 1251 et seq.). The list of potentially applicable permits and authorizations for the Project are presented in Section 1.2, Tables 3 and 4. Since the definition of Solid Waste in Chapter 1 of Title 132 -Integrated Solid Waste Management Regulations includes material generated from mining operations, the TSF and the Salt Management Cells at the Project will likely be subject to all or part of the Title 132 regulations, including the closure requirements. With respect to post-closure requirements, operators of solid waste disposal areas shall provide for postclosure care for a period of at least 30 years. At this time, there is no anticipated post-closure solution/draindown management consideration for the TSF cells given the nature of the tailings materials and the conceptual closure approach. This approach to the closure of the TSF cells is considered conservative and was selected to demonstrate the feasibility and permit ability with respect to the NDEE landfill regulations and on the advice of the agency. Given the current LOM expectation, additional technologies and/or approaches to equally effective closure options may likely be developed prior to actual reclamation of the site. The Salt Management Cells will be closed in a manner similar to the TSF. Financial assurance will be maintained to guarantee closure.

Supporting Documents 4.1.14.3

Nordmin. (2019). (tech.). NI 43-101 TECHNICAL REPORT FEASIBILITY STUDY, ELK CREEK SUPERALLOY MATERIALS PROJECT, NEBRASKA, NioCorp Ltd. Retrieved October 21, 2021. from https://secureservercdn.net/198.71.233.33/gx0.d43.myftpupload.com/wpcontent/uploads/180001 FINAL 43-101 FS NioCorp AS FILED.pdf.

4.1.15 Water – Groundwater

The Project is located within the Nemaha NRD which regulates well waters within the area. A water well permit will be required to install a new water supply well, while the water well transfer permit will be required to transfer water from wells located on a separate property to be used for water supply.

Sources of recharge to the groundwater system include precipitation infiltration and irrigation water either applied to fields or lost as seepage from canals or return-flow ditches. As detailed in the 2019 Feasibility Study (Nordmin 2019), a hydrogeological characterization of the deposit was conducted during the core drilling program. The program included frequent measurement of water levels in open core holes and piezometers over six months.

A hydrogeological characterization was completed for the site in 2014, 2015, and 2017 which indicated that ground freezing for the shafts and spot grouting are feasible for the mine. Water treatment for the Project will be manageable with a reverse osmosis system. This is anticipated to reduce the mine water inflow to around 1,000 gpm. Water treatment can now be effectively handled with RO treatment. While water samples collected from these deep holes, NEC 14-014 and Met-1, and the follow-up investigation by Nordmin, indicate very similar quality, overall, water sampling results are variable across the site. This includes total dissolved solids which can range in concentrations of over 18,000 ppm, with the major contributors being sodium and chloride. There were no detectable pesticides or herbicides. Results from the well tests are summarized below in Table 23.

Well ID	Maximum Containment Level Exceeded?	Chemical(s)/Particles Exceeding Maximum Contaminant Level (MCL)	Pesticides or Herbicides Found	Drinking Water Source?
NEC 14-014	Yes	Arsenic, Gross alpha, Ra-226, Ra-228, chloride, fluoride, manganese, sulphate, aluminum, and total dissolved solids	None	No
Met-1	Yes	Arsenic, Gross alpha, Ra-226, Ra-228, chloride, fluoride, manganese, sulphate, and total dissolved solids	None	No

Table 23: Well Testing	Results for NEC	14-014 and Met-1 -	Background W	Vater Quality
			Buonground I	rator gaunty

Although the deep groundwater is not currently a drinking water source, concentrations were compared to drinking water standards as a reference to possible regulatory and management implications of groundwater disposal from future mine dewatering. Given the variability of water quality across the Project area, additional testing may be necessary to appropriately characterize the deep aguifer. The deep groundwater chemistry data indicate a low-oxygen, chemically reducing groundwater system that is out of chemical equilibrium with surface conditions. Supporting evidence of this conclusion includes:

- Nitrogen species are mostly dominated by ammonia rather than nitrate or nitrite.
- Iron is elevated at neutral pH, a condition which is unlikely to occur in an oxygenated, natural system.
- Groundwater brought to the surface at some boreholes is initially black, changes to orange over a time period ranging from hours to days, then eventually turns clear while forming an orange precipitate. This is characteristic of water initially containing reduced ferrous iron that eventually oxidizes to ferric iron.

Because of difficulties in handling these waters once they have been pumped to the surface, the additional testing remains a recommendation and must wait until surface management structures (ponds) and permitting have been completed.

Once full operations commence, NioCorp anticipates a shortfall of approximately 3,700 gpm of operational and processing water, as the underground mine dewatering is only expected to produce 1,000 gpm. To make up this shortfall, NioCorp proposes the following sources for additional water:

- 1. Tecumseh Board of Public Works water supply line (approximately 2,000 gpm) -Tecumseh Board of Public Works, which maintains the infrastructure and supplies residential and commercial users in the City of Tecumseh, might run a line to the Project area to supply all of the necessary shortfalls.
- 2. Local Landowner Well #1 (approximately 500 gpm) A new well on a local landowner's property has the potential to supply up to 500 gpm of the Project's needs. Because there will be a transfer of water from one property to another, a Groundwater Transfer Permit will need to be issued by the Nemaha NRD pursuant to Chapter 11 of the Management Area Rules and Regulations for Groundwater Quantity Management Areas.
- 3. Local Landowner Well #2 NioCorp has the option to connect to an existing well as well as install a new well to supply an additional 1,500 gpm.

NioCorp is pursuing approval of all three sources as insurance that there are no disruptions in the water supply during operations. None of the permitting for these alternative water sources is considered particularly onerous or time-consuming. Once tailings begin depositing in the TSF, internal contact water (from residual moisture in the tailings and precipitation falling within the impoundment footprint) will need to be actively managed. This water will be collected and treated using lime softening to precipitate hydroxide and carbonate solid forms for many of the inorganic constituents. The treated water will be filtered to remove the solids (which will be returned to the TSF for disposal), and the clean water will be pumped to the process plant RO system for further treatment. The clean water from the process plant RO unit will be used in the process plant, and the reject concentrate will be crystallized and deposited back into the Salt Management Cells.

In the event that crystallization of the RO water treatment brines becomes impractical. NioCorp may alternatively opt to reinject the reject waters back underground. This activity will, necessarily, require a permit. The Underground Injection Control (UIC) Program of the NDEE Water Division issues and reviews permits, conducts inspections, and performs compliance reviews for wells used to inject fluids into the subsurface. The program must ensure that injection activities are in compliance with state and federal regulations, and that groundwater is protected from potential contamination. Injection wells are classified by activity, with most activity concentrating on Class I, II, III, and V wells. Class II wells are associated with oil and gas production and are regulated by the Nebraska Oil and Gas Conservation Commission. NDEE has authority over and manages, Class I, III and V wells. A water treatment system brine re-injection well is likely to be a Class V well. The EPA delegates the UIC program to the NDEE and provides authority for the program through the SDWA. NRDs across the state have also developed sets of rules and regulations regarding permitting requirements and the installation of wells based on specific Groundwater Management Plans. Additionally, the NDNR requires that all wells installed in the state must be registered. The NDNR is also charged with issuing permits for industrial use of groundwater.

4.1.15.1 Potential Groundwater Impacts

Groundwater tests at the Project site concluded there are two separate aquifers (a shallow soil aquifer and a deep bedrock aquifer), as indicated by the different characteristics displayed by water samples, quantified during groundwater testing procedures. The shallow soil aguifer in the glacial till is separated from the deep bedrock aquifer by a thick limestone aquitard. Where water is re-infiltrated, local groundwater elevations will increase. Where water is pumped, local groundwater elevations will decrease. A portion of pumped water will be consumed by the process with some process water becoming entrained in the tailings. Mine activities may alter groundwater chemistry. Potential incidental losses and accidental releases of petroleum products and other substances used for equipment operation and maintenance or mineral beneficiation could potentially infiltrate into the ground and eventually reach the groundwater zone. Exposure of underground environments to oxygen via underground workings may also alter groundwater chemistry.

4.1.15.2 Measures Taken to Reduce Potential Groundwater Impacts

Surface water and groundwater monitoring will continue throughout the LOM, to complement the baseline study program that has been completed. Additional monitoring locations may be added during the regulatory review process. The tailings pond will be used for the initial dewatering of the mine, and current plans incorporate this water back into the mine. Future activities involving the water in the mine will be through a close looped system, meaning water will ultimately not exit the mine processes. The use of this method is intended to eliminate the need for groundwater monitoring downgradient of the tailings storage facilities and mine water collection pond under the state solid waste permitting program. Following initial dewatering processes, the pond is intended to serve solely for solid materials, which could necessitate solid waste permitting. Upon cessation of mining, the limited subsurface dewatering operations will be halted, and the underground mine workings will be allowed to flood. Until such time that the TSF closure cover can be constructed, and any residual water or seepage eliminated, the TSF contact water will require active management. Whether the singular TSF brine stream from the RO plant can continue to be crystallized and deposited in the Salt Management Cells or if another disposal method needs to be considered (i.e., disposal in the deep mine workings of off-site disposal facility), will be evaluated during the final years of operation. NioCorp will develop a comprehensive SPCC to be implemented in the event of a spill or release of petroleum products per EPA requirements.

NioCorp has chosen to design the solids portion of the TSF to include 0.61 m (2 ft) of compacted soil liner with a permeability of 1×10-7 cm/s or less, overlain by an 80-mil HDPE liner, overlain by an overliner drain system. The water retaining portion of the facility will be lined with a double

lined system consisting of a 60-mil HDPE secondary liner and 80-mil HDPE primary liner with an active leak detection system between. This conservative approach will likely ensure adequate protection of local groundwater resources. Additional details regarding the TSF are provided in Section 18.11 of the 2019 Feasibility Study; closure of the TSF is discussed in Section 20.5.3. The 2019 Feasibility Study can be found on the NioCorp website.

4.1.15.3 Supporting Documents

Nordmin. (2019). (tech.). NI 43-101 TECHNICAL REPORT FEASIBILITY STUDY, ELK CREEK SUPERALLOY MATERIALS PROJECT, NEBRASKA. NioCorp Ltd. Retrieved October 21, 2021, from https://secureservercdn.net/198.71.233.33/gx0.d43.myftpupload.com/wpcontent/uploads/180001 FINAL 43-101 FS NioCorp AS FILED.pdf.

4.1.16 Water - Surface Water, Wetlands, and Floodplains

The Project is located primarily in the Elk Creek Watershed, near its confluence with Todd Creek. Todd Creek is a tributary of North Fork Big Nemaha River which becomes Big Nemaha River approximately 48 km (30 miles) downstream and joins the Missouri River approximately 72 km (45 miles) downstream.

Under Section 402 of the CWA, in 1990, the US Environmental Protection Agency (EPA) published final regulations in 40 CFR 122 identifying construction as an industrial activity requiring an NPDES permit (incorporated by NDEE in Nebraska Administrative Code Title 119, Rules and Regulations Pertaining to the Issuance of Permits Under the NPDES (July 2, 2017)). Work within the Project area would need to comply with the NPDES General Permit for Construction Stormwater, which applies to construction activities that disturb more than 1 acre of land and requires that a Storm Water Pollution Prevention Plan (SWPPP) be prepared prior to submission of the Construction Storm Water Notice of Intent. NDEE is ultimately responsible for ensuring compliance with the NPDES regulations regarding the construction general permit. Goals of the NPDES construction general permit are:

- Require, review, inspect, and enforce proper management practices and material disposal on construction sites, including procedures for site plan review, inspections during construction
- Require the construction site owners or operators to implement erosion and sediment control best management practices (BMPs) and to control other waste such as discarded building materials.

Post–Construction Stormwater Management Minimum Control Measures.

The Project would develop and implement comprehensive planning procedures and enforcement controls to reduce the discharge of non-point source pollutants after construction is complete from areas of new development and considerable redevelopment. The Project would also develop and implement strategies that include a combination of structural and/or non-structural BMPs; ensure adequate long-term operation and maintenance of BMPs.

These program elements outline the construction and post-construction requirements that must be considered for the Project. The goals are to minimize water quality impacts from the Project to the maximum extent practicable; conform to the requirements of the CWA; and achieve Nebraska Administrative Code Title 117 Water Quality Standards (NDEE 2009).

Surface water samples were collected as part of a baseline sampling in effort 2014. Surface water sampling locations were selected to establish a baseline monitoring perimeter both upstream and downstream from all proposed facilities in the Project area. All samples were analyzed by Midwest Laboratory in Omaha, Nebraska for a comprehensive suite of metals and other inorganic analytes plus a panel of pesticides and herbicides. The preliminary results of the baseline program are as follows:

- Surface water in and around the Project area exhibits minor water quality impairment, as indicated by concentrations outside the limits of several secondary drinking water standards and several aquatic life criteria (i.e., aluminum, iron, and manganese).
- Average stream TDS concentrations fluctuate appreciably; however, this variability is most likely the result of post-harvest runoff containing excess sediments.
- Stream pH is consistently circum-neutral, ranging from about 6.6 to 8.2 standard units.
- Gross alpha, beta, Ra-226 and Ra-228 have been detected in several surface water samples, but at concentrations below their respective EPA MCL.

Surface water contacting the tailings will be managed via dedicated pump arrangements for the active tailings cell that comprises the slotted HDPE riser pipes located above the liner system at the impoundment low topography on the embankment inside slopes. Submersible pumps will be used to pump collected water into the LCPs. The submersible pumps will be maintained above the current tailings elevation at all times. Any infiltrating surface water will be collected in the TSF above-liner drainage system.

Non-contact surface water will be managed via channels, spillways, and culverts as described in Section 18.9.1 of the Technical Report Feasibility Study (Nordmin 2019) and shown in Figure 2, Appendix A. Spillways are sized to pass the PMF storm event, and all other stormwater controls are designed to accommodate 100-year, 24-hour storm event precipitation.

Wetlands

Wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328). Wetland resources are afforded protection under the CWA, as amended. Wetlands and WOUS are regulated by the US Army Corps of Engineers (USACE). Wetlands and WOUS are also afforded protection from Title 117 of the Nebraska Administrative Code (NDEE 2009).

A wetland delineation was completed by Olsson for the Project in 2015. The wetland delineation identified wetland and drainage features within the proposed Project boundary that were likely to be classified as jurisdictional WOUS, and therefore be subject to permitting requirements by the USACE. Following the delineation, a USACE jurisdictional determination (2015-00226-WEH) was approved for the project on September 6, 2016 and indicated many of the features located on the Project site as isolated and non-jurisdictional.. The study area consisted of agricultural fields, pastures, farmsteads and unnamed tributaries to Todd and Elk Creeks. All unnamed tributaries within the Project boundaries consisted of riparian areas and ponds that drained to Elk Creek. Many of the wooded areas not situated along drainages were located along fence lines as windbreaks. Most of the study area had been impacted by grazing livestock. The 2015 wetland delineation identified a total of 16 wetlands encompassing a total area of approximately 0.755 acres. One intermittent and two ephemeral channels were found during the field investigation for a total length of 8,887 feet. All three channels are unnamed tributaries to Elk Creek. Additionally, eight open water features were identified within the Project boundary, totaling 0.745 acre. Tables 24 and 25 summarize the delineation findings. The locations of the delineated features are shown on Figure 5, Appendix A.

Cowardin Classification [*]	Number of Wetlands	Total Size (Acres)
PEMA / C	15	0.244
PSSA	1	0.003
PFOA	1	0.508
TOTAL	16 ¹	0.755

Table 24. Delineated Wetlands

1. Wetland 23 is classified as both a PEMA / C and a PFOA.

PEMA/C = Palustrine Emergent Temporarily/Seasonally Flooded PSSA = Palustrine Scrub-Shrub Temporarily Flooded *(Cowardin et al. 1979)

Feature	Number of Feature Type	Total Length (Linear Feet)/ Size in Acres
Intermittent Channel	1	4,741 ft
Ephemeral Channel	2	4,146 ft
Open Water	8	0.745 ac
TOTAL	11	8,887 ft/ 0.745 ac

Floodplains

FEMA is the primary agency responsible for evaluating impacts to the floodway and the 100-year floodplain; however, FEMA has given the Nebraska DNR authority to administer their program. The 100-year floodplain is the land area covered by the floodwaters of the 100-year flood. On FEMA Flood Insurance Rate Maps, this area is referred to as a Special Flood Hazard Area. The Flood Insurance Rate Map for Johnson County (Panel Number [No.] 310228 0169D, effective date January 6, 2012) indicates that the unnamed creek west of US-50 is within a special flood hazard area (100-year floodplain) and regulatory floodway as shown on Figure 6 Appendix A. The Johnson County Floodplain Administrator is responsible for administering and permitting work in the floodplain, which requires no net rise to the 100-year base flood elevation. The FEMA floodplain in shown on Figure 6, Appendix A.

4.1.16.1 Potential Surface Water Impacts

The Project would disturb approximately 364 acres of land thereby requiring a CSW Permit from NDEE. An associated SWPPP would be prepared prior to submission of the permit application. Because NDEE administers the stormwater and 303(d) programs for EPA, NioCorp would not need additional approvals from EPA for the SWPPP or stormwater permit (EPA, 2018).

Although not anticipated, potential incidental losses and accidental releases of petroleum products and other substances used for equipment operation and maintenance or mineral beneficiation could potentially affect surface soils or drainages resulting in impacts to surface water quality if not addressed in a timely manner. Disturbed areas may be eroded and increase sediment loads in surface water flow or ephemeral drainages.

The Project is not anticipated to build in or encroach upon a floodplain or floodway. Therefore, a floodplain development permit is not required for the Project.

4.1.16.2 Measures Taken to Reduce Potential Surface Water Impacts

The TSF and associated ponds will all be located outside and above the limits of the FEMA approximate Zone A flood zone (Figure 6, Appendix A). Hydrologic and hydraulic analyses were performed to evaluate stormwater control requirements for the Elk Creek TSF and supporting facilities. In general, the TSF facilities are located in the uppermost reaches of small catchments in the Elk Creek watershed, and therefore only local diversion of small upstream flows (run-on) around facilities is required. The design of the TSF cells allows for concurrent reclamation in order to reduce the amount of precipitation contact water that will require active management. Stormwater control designs include spillways on the TSF cell and water management pond embankments, and channels on the embankment crests for management of storm runoff from the closed and re-graded surfaces. External stormwater controls include triangular channels (v-ditches) and sediment traps located at the toe of embankments for sediment and erosion control, and culverts to pass flows in drainages through access road crossings (Figure 2, Appendix A). All

TSF cell and pond spillways are configured as a 0.5 m deep by 3 m wide trapezoidal channel (notch) with 10:1 sideslopes, oriented perpendicular to the embankment crest and can pass the PMF storm event; a channel (down-chute) lined with riprap (or HydroTurf) will convey flows down embankments and into stilling basins (Nordmin 2019).

During construction, it is anticipated that the Project would require a NPDES permit. As part of standard construction inspection requirements. NioCorp would ensure that environmental commitments are followed throughout the construction process. NioCorp would incorporate soil erosion and sediment control practices as detailed in the CSW Permit and Project-specific SWPPP. Permanent drainage and water guality facilities (i.e., BMPs) would be included with the final design to mitigate negative impacts caused by stormwater runoff. These BMPs would protect water quality and provide a discharge velocity that is equal to or better than current conditions.

The Project-specific SWPPP would outline mitigation measures for construction activities and maintenance requirements for all permanent BMPs. A detailed Erosion and Sediment Control Plan would be included as part of the roadway design set. These plans would show temporary measures, such as silt fences, hay bales, soil retention blankets, inlet protection, and stabilized construction entrances. The design of measures to be taken would be determined during final design for the Project.

Stormwater will be collected on-site by a stormwater collection system that will consist of a combination of buried HDPE pipe and surface swales and ditches. Surface water from disturbed areas will be collected in a stormwater retention basin prior to its release into the local stream or natural drainage channel. Stormwater that is collected from areas of potential contamination from hazardous material from process areas will be collected separately from other surface water sources and analyzed prior to discharge to the stormwater collection system or pumped to the water treatment system. The fuel island, as well as the retention pond pipe inlet, will include oily water separators to ensure any petroleum that is in the surface water is not discharged to local waters and is collected for off-site disposal.

If there is a release of petroleum or hazardous materials are encountered, then all work within the immediate area of the discovered hazardous material should stop until a plan to address the release has been developed. Then NDEE shall be consulted as necessary. The potential exists to have contaminants present resulting from minor spillage during fueling and service associated with construction equipment. Should contamination be found on the Project area during construction, the NDEE would be contacted for consultation and appropriate actions taken to clean up impacted areas.

4.1.16.3 Supporting Documents

USACE, (2016). U.S. Army Corps of Engineers, Hydrologic Engineering Center, Hydrologic Modeling System (H EC-HMS) Version 4.5, 2016.

- Federal Highway Administration (FHWA), (2016). Federal Highway Administration, HY-8 v 7.5, developed in coordination with Aquaveo LLC, and Environmental Modeling Research Laboratory, FHWA Task Order DTFH61-05- T-63053, build date July 28, 2016.
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4.2 Cumulative Effects

The combined, incremental effects of human activity are referred to as cumulative impacts. While individual actions may be insignificant by themselves, cumulative impacts accumulate over time, from one or more sources, and can result in the degradation of important resources. Under NEPA, federal agencies are required to assess cumulative impacts in NEPA documents as required by CEQ regulations (CEQ, 1987). The CEQ's document, "Considering Cumulative Effects Under the National Environmental Policy Act", provides a framework for advancing environmental impact analysis by addressing cumulative effects in either an environmental assessment or an environmental impact statement. Cumulative effects as defined in NEPA are "the impact on the environment which results from the incremental impact of the action when added to other past. present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions (40 CFR § 1508.7)." Although the Project is not a federal project and will not utilize federal funding as of the time of writing, a discussion of cumulative effects is presented to provide context and insight to how the Project is associated with the greater environment.

4.2.1 Time Frame of Effects

The 2019 Feasibility Study produced by NioCorp assumes an overall LOM of 36 years. Following cessation of mining related activities, the surface reclamation plan produced by NioCorp will begin with the overarching objective of returning disturbed lands to productive post-mining land use. It is not anticipated that the project would have long term environmental effects once final reclamation is complete and the land is returned to post-mining productive use.

4.2.2 Past and Present Actions

The USGS completed the initial regional geological work. The details of the initial ownership of the complete Project area are not clear, but it is reported that land packages were initially controlled by Cominco American Inc. (Cominco American) and Molycorp during the early 1970s. The majority of the historical exploration over the Project area was completed by Molycorp before 1984 (ECRC). On May 4, 2010, Quantum announced the acquisition of the mineral rights to the Project. On March 3, 2013, Quantum announced an official name change from Quantum Rare Earth Developments Corp. to NioCorp Developments Ltd. (NioCorp). NioCorp's focus is to develop the Project and has undertaken stakeholder engagement and permitting needed for the Project to move forward with construction and operations upon the receipt of adequate funding. Overall site history is further described within the 2019 Feasibility Study (Section 6; pages 91-102). Prior to the initial geological work, no mining activities occurred in the Project area and the site has been used for agricultural use (row crop and grazing) and prior to settlement of Nebraska under the Homestead Act of 1862, the area was covered with tallgrass prairie, over gently rolling glaciated till plains and hilly loess plains. It is anticipated the land would be returned to agricultural use or wildlife habitat upon project completion and final reclamation.

Present development activities in the area of the Project are limited and would be expected to be limited to maintenance of existing infrastructure and land uses. No publicly available or known, large-scale development projects are being constructed within 5 miles of the project area at this time.

4.2.3 Reasonably Foreseeable Future Actions

The adequacy of cumulative impact analysis depends on how well the analysis considers impacts that are due to past, present, and reasonably foreseeable actions. Using the NEPA process as a model, a cumulative analysis should consider the following:

- 1) Whether the environment has been degraded, and if so, to what extent
- Whether ongoing activities in the area are causing impacts
- The trends for activities and impacts in the area.

Considering the past, present, and reasonable foreseeable future actions (RFFAs) provides a needed context for assessing cumulative impacts. The inclusion of other actions occurring in proximity to the proposed action is a necessary part of evaluating cumulative effects. Although the Project is not a federal project and will not utilize federal funding at the time of writing, a discussion of RFFAs is presented to provide context and insight to how the Project is associated with the greater environment.

Current Conditions

Since the settlement of Johnson County, farming for livestock, crops, and pasture has been the most important land use enterprise. Over the years, crop production has shifted from orchards, oats, barley, and rye to corn, soy, wheat, alfalfa, and grain sorghum. Livestock in the Johnson County generally consists of hogs, cattle, and milk cows (USDA SCS, 1984). Approximately 4,046 ha (10,000 acres) in Johnson County is irrigated cropland, while about 16,996 ha (42,000 acres)

is used for pasture. About 12,949 ha (32,000 acres) of Johnson County is used for rangeland, which includes both native prairie that was never broken from sod and areas that were cultivated and then reseeded. The Project and surrounding areas are part of the Southeast Prairies Biologically Unique Landscape within the Tallgrass Prairie Ecoregion of Nebraska (Schneider et al., 2011). Cultivated cropland (principally corn, soy, and alfalfa) makes up the majority of the surface area within the Project area. Native and non-agricultural vegetation exist primarily in the form of hedgerows and windbreaks along field margins, and in riparian areas along surface water drainages. According to ecosite descriptions from the NRCS (2015), plant communities within the vicinity of the Project consist of annual and perennial weedy forbs and less desirable grasses from abandoned farmland.

There are several local communities near the Project, including Elk Creek, Tecumseh, Steinauer, Pawnee City, Syracuse and Lewiston that are intended to provide local housing for the Project construction and operating staff. Overall, the Project and surrounding lands are largely rural and agricultural in nature. In reviewing other projects within the area, little data exists beyond the agricultural trends mentioned above; however, it is worth noting this Project has not identified any known environmental issues with regards to the mine, beyond those for which mitigation measures are either already planned or will be undertaken once Project activities begin.

RFFA Trends

As future issues are unpredictable in nature, speculation of issues, that may arise as the Project is undertaken, is limited to currently available data and trends. Mining and exploration activities will disturb the tracts of land needed to construct surface facilities associated with the Project. Disturbance due to construction activities will generally consists of vegetation removal and stockpiling the upper one half to one foot of soil and vegetation and grading of the area to facilitate construction. Future disturbance associated with the underground mine and associated infrastructure is estimated at approximately 364 acres. Other related activities, such as truck traffic, could result in wildlife mortality. It is noted that reclamation is integrated into the project execution plan on a concurrent basis, so at no point will all 364 acres be disturbed at the same time.

Previous information gathered regarding soils, vegetation, wildlife, and radiological baseline data have been and will continue to be used as guidelines for the completion of surface reclamation. To promote beneficial conditions following the closure of the mine and related activities, a surface reclamation plan with the overarching objective of returning disturbed lands to productive postmining land use has been developed and costed. Final surface reclamation will blend affected areas with adjacent undisturbed lands so as to re-establish original slope and topography and present a natural appearance. Surface reclamation efforts will strive to re-establish natural drainage patterns through limiting soil erosion by wind, water, and sedimentation and by establishing vegetation on disturbed areas.

In reviewing the results from the EJScreen tool included in Appendix C, demographic indicators for socio-economic issues (people of color, low income) are higher in the Elk Creek, Tecumseh, and Johnson County areas, when compared to the Nebraska state-wide average. Although these values for the area are higher, the Project is not anticipated to limit and prohibit access to local services, facilities, institutions, or other parts of Johnson County/Elk Creek. Project infrastructure will not impede any existing roadways or access to existing roadways within Johnson County, however, increases in local traffic are expected as employees access and leave the site and materials are delivered and products are shipped via truck. Furthermore, the Project is anticipated to act as a beneficial economic driver for the area through job openings provided by NioCorp and associated contractors. No adverse socio-economic issues are anticipated.

Development in the surrounding communities is anticipated to continue at rates similar to present. The City of Tecumseh Comprehensive Plan (2018) indicates action steps for growth and identified the Project as a potential contributor to the future economy and housing demand within Tecumseh.

4.2.4 Climate Change Risk Assessment Acute Risks

Several hundred personnel will be working outside or in the mine and the operation will run 24/7, so short-term weather events may affect operations; however, almost all of the operational activity will occur indoors within a climate-controlled setting. In its most recent assessment report, the International Panel on Climate Change (IPCC) cites strengthened "evidence of observed changes in extremes such as heatwaves, heavy precipitation, droughts, and tropical cyclones," compared to just four years ago.

More frequent rain events can accelerate erosion, which is typically already a concern with mining operations. The related risks to the Project range from slips and trips over muddy ground to potential stormwater infiltration of the underground mine. Therefore, erosion risks resulting from climate change are considered low for the Project.

The Project will be located outside and above the limits of the Federal Emergency Management Agency (FEMA) approximate Zone A flood zone. Additionally, the Project will have stormwater controls designed to withstand either the PMF or the peak flow rate from the 100-year, 24-hour storm event. Pumps will be installed to manage surface water contacting tailings, with the 100year, 24-hour storm event taken into consideration during the design process. Therefore, the risks associated with heavy and/or frequent rain events are considered moderate.

Temperatures in the Project's area range from over 100°F in the summer to well below 0°F in the winter. While global climate change increases temperature extremes, worker health and safety will be a primary priority for NioCorp. Risks to the Project and its workers include heatstroke, hypothermia, and frostbite. Seasonal air temperature evaluations have been completed for the underground mine as part of the design of the mine ventilation system, and a mine air heating system has been incorporated into the engineering design to ensure comfortable working conditions in the mine during the winter months. Administrative controls will be crucial in maintaining the health and safety of NioCorp employees., including monitoring the seriousness of extreme hot or cold days and adjusting work schedules and PPE requirements accordingly. Therefore, temperatures are considered a low risk for the Project.

The IPCC reports "limited evidence and low agreement" between Climate Impact Driver (CID) indices associated with tornadoes. Due to the high number of variables and scarcity of data, it is difficult to model and predict the effects of global climate change on frequency and strength of severe windstorms such as tornadoes. While models cannot directly correlate climate change to tornado occurrence, the Project location is nonetheless in an at-risk location. A tornado in the area is most likely to occur in May, June, or July. NioCorp will develop an Emergency Preparedness and Response Plan (EPRP) which will include procedures to respond to weatherrelated emergency situations and provision has been made for sheltering employees from tornado events in the project's design. While the EPRP will be designed to protect workers, a tornado could inevitably cause severe damage to the Project. Therefore, tornadoes are considered a high risk for the Project.

Long-Term Risks

The Equator Principles Guidance Note on Climate Change Risk Assessment cites increased frequency of droughts as a potential long-term physical risk. The Project will require approximately 4,700 gallons per minute (gpm) of water once full operations commence, which makes water availability in the region a major consideration. The sources of water listed in Section 4.1.15 are projected to distribute enough water for consistent operation despite any long-term changes in precipitation patterns that result in droughts or water stresses. Therefore, drought is considered a low risk for the Project. Rising mean temperatures are another long-term risk that has similar concerns to acute temperature spikes. NioCorp has engineering controls, training programs, and temperature controls to protect workers that will be exposed to high temperatures in the workplace. Rising temperatures are considered a low risk for the Project. The Project is not located near the coast or in a floodplain near surface water which could be impacted by rising sea levels. Therefore, rising sea levels are considered to be a low risk for the Project.

Additional climate change assessment information, including analysis of the four transitional risks (policy and legal risks, technology risks, market risks, and reputation risks) recommended by the Task Force on Climate-Related Financial Disclosures (TCFD), is included in Appendix D.

4.2.5 Effects Analysis

None of the resources evaluated are considered to have strong or lasting negative cumulative effects. Although the Project itself is an industrial development, the mitigation practices developed for the Project will reduce or eliminate lasting negative effects as a result of the Project. The Project will likely facilitate economic expansion in the surrounding communities. However, due the Project's rural location, it is not anticipated that the Project would increase the rate at which private development encroaches on agricultural lands. Historically, the majority of Johnson County economy has been supported by farming for livestock, crops and pasture, which remain the main economic drivers today. Land use both within the Project area and within the general area surrounding Elk Creek reflect the typical land use within Johnson County. The Project is expected to produce up to 430 potential new jobs, which does not include work contracted for the building of Project infrastructure and associated facilities. The local economy will not only benefit through the production of new jobs, but by tax revenues generated via the Project once constructed. Thus far, support for the Project has been positive from those who have been engaged and notified of the pending Project.

Construction of the Project would not result in a loss of habitat for species of concern. Suitable habitat within the study area exists for the northern long-eared bat, which is a federally listed as threatened. This species may roost in trees that are present within the study area. However, habitat losses from construction of the Project would be minor. Future land use changes as a result of project are not expected to impact species of concern or result in additional habitat loss. Wetlands impacts would be minimal as a result of the Project. If the Project were to impact to wetlands and other WOUS due to future land use changes, these impacts would be permitted through the USACE and NDEE and mitigated if appropriate.

Temporary impacts may result from the loss of available livestock grazing pastures, however multiple other grazing opportunities exist within the immediate vicinity of the Project. Additionally, livestock grazing within the Project Area can be restored post-mining. If the lands are converted to other post-mining land uses that does not allow future livestock grazing, up to approximately 364 acres could be eliminated from this use.

Because the site is privately owned and is not listed under the NGPC's Open Fields and Waters Program, no public recreational opportunities currently exist within the Project area; therefore, little to no impacts are expected with respect to the Project. The Project is expected to be accessed via 721 Road along the northern border of the Project area. Travel management efforts should not be necessary, as the area around the Project site consists mainly of rural land with small amounts of local traffic.

4.2.5.1 Wastes, Hazardous or Solid

Since the definition of Solid Waste in Chapter 1 of Title 132 – Integrated Solid Waste Management Regulations includes material generated from mining operations, the TSF and the Salt Management Cells at the Project will likely be subject to all or part of the Title 132 regulations, including the closure requirements. With respect to post-closure requirements, operators of solid waste disposal areas shall provide for post-closure care for a period of at least 30 years. At this time, there is no anticipated post-closure solution/draindown management consideration for the TSF cells given the nature of the tailings materials and the conceptual closure approach. This approach to the closure of the TSF cells is considered conservative and was selected to demonstrate the feasibility and permitability with respect to the NDEE landfill regulations and on the advice of the agency. Given the current LOM expectation, additional technologies and/or approaches to equally effective closure options may likely be developed prior to actual reclamation of the site. The Salt Management Cells will be closed in a manner similar to the TSF.

Any future activities will be required to comply with applicable local. State, and federal laws and regulations pertinent to hazardous or solid wastes.

4.2.5.2 Recreation and Travel Management

Because the site is privately owned and is not listed under the NGPC's Open Fields and Waters Program, no public recreational opportunities exist within the Project area; therefore, little to no impacts are expected with respect to the Project. The Project is expected to be accessed via 721 Road along the northern border of the Project area. Travel management efforts should not be necessary, as the area around the Project area consists mainly of rural land with small amounts of local traffic.

4.2.5.3 Minerals

NioCorp's Project is highly unique. Once in production, it will initiate the first production in the U.S. in decades of niobium and scandium as well as the potential production of the rare earths. It is North America's only niobium / scandium / titanium project and would develop the highest-grade niobium project in North America. Additionally, if built, the project would become one of the largest prospective producers of scandium in the world. The current projections for the life of the mine extend to the 36-year planning horizon., Future mining activities in the area of the deposit beyond this timeframe are considered beyond the reasonable foreseeable future of anticipated actions.

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Environmental and Community Assessment Summary for Elk Creek

Project No. 021-06507

NioCorp Environmental Assessments

January 2022

6. ACRONYMS

BATF - Bureau of Alcohol, Tobacco and Firearms CERT – Conservation and Environmental Review Tool CEQ – Council on Environmental Quality cm/s - centimeter per second CO – carbon monoxide CRC – Cultural Resource Consulting CSW- Construction Storm Water General Permit CWA – Clean Water Act DHS – Department of Homeland Security ECRC – Elk Creek Resources Corp. EJScreen – EPA Environmental Justice Screening and Mapping Tool **ELA – Exploration Lease Agreement** EPA – Environmental Protection Agency ESG - Environmental, Social, and Governance FAA – Federal Aviation Administration FEMA – Federal Emergency Management Agency FHWA – Federal Highway Administration ft – feet GHG – greenhouse gas(es) gpm – Gallons per minute ha - hectares HDPE – High density polyethylene IPaC – Information for Planning and Consultation km – Kilometers kV – Kilovolts LCP – Leachate Collection Pond LCRS – Leak Collection and Recovery System LOM – Life of Mine m – meters MBTA – Migratory Bird Treaty Act MCL - Maximum containment levels mm – millimeter MSHA – Mine Safety and Health Administration MW – megawatt NAAQS -- U.S. National Ambient Air Quality Standards NDEE – Nebraska Department of Environment and Energy NDHHS - Nebraska Department of Health and Human Services NDOL - Nebraska Department of Labor NEPA – National Environmental Policy Act NGPC – Nebraska Game and Parks Commission NLEB – Northern Long-eared Bat NOAA - National Oceanic and Atmospheric Administration NORM – Naturally Occurring Radioactive Material NOx – nitrogen oxide NPDES – National Pollutant Discharge Elimination System NRCS - USDA Natural Resource Conservation Service NRD – Natural Resource District

Project No. 021-06507

NioCorp Environmental Assessments

January 2022

NSPS – New Source Performance Standards NSR – net smelter return NWRA – Nebraska Water Resource Association **OE** – Obstruction Evaluation OFW – Open Fields and Waters Program OPPD – Omaha Public Power District OTP - Option to Purchase PM_{2.5} – particulate matter PSD – prevention of significant deterioration psig – Pounds per square in gauge **RC** – Reverse Circulation **RO** – Reverse Osmosis SDWA – Safe Drinking Water Act SILs – significant impact levels SMC – Salt Management Cell SOx – sulfur oxides SPCC - Spill Prevention, Control and Countermeasure SQG – Small Quantity Generator SRK – SRK Consulting t/d - tonnes per day tpa - tonnes per annum TSF - Tailings Storage Facility UIC – Underground Injection Control USACE – Army Corps of Engineers USDA – United States Department of Agriculture USGS – United States Geological Survey USFWS - United States Fisheries and Wildlife Service VSQG - Very Small Quantity Generator WMA – Wildlife Management Area

APPENDIX A

Location Map Site Map Area Map SSURGO Soils Map Wetland Map FEMA Floodplain Map





WGS 1984 ARC System Zone 11





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Basemap: Google Maps Imagery

WGS 1984 ARC System Zone 11





WGS 1984 ARC System Zone 11

APPENDIX B NGPC CERT and USFWS IPaC



Environmental Review Report

Project Information

Report Generation Date: Project Title: User Project Number(s): System Project ID: Project Type: Project Activities: Project Size: County(s): Watershed(s): Watershed(s) HUC 8: Watershed(s) HUC 12: Biologically Unique Landscape(s): Township/Range and/or Section(s): Latitude/Longitude: 9/29/2021 03:09:26 PM Elk Creek NE-CERT-004981 Other None Selected 635.32 acres Johnson Nemaha Big Nemaha Todd Creek Southeast Prairies T04R11ES28; T04R11ES33 40.269603 / -96.189066

Contact Information

Organization: Contact Name: Contact Phone: Contact Email: Contact Address: Prepared By: Submitted On Behalf Of: Olsson Jake Vencil 4029702329 jvencil@olsson.com 2111 s 67th suite 200 omaha NE 68106

Project Description

Development of North America's only niobium / scandium / titanium advanced materials manufacturing facility colocated with an underground mine.

Introduction

The Nebraska Game and Parks Commission (Commission) and the U.S. Fish and Wildlife Service (Service) have special concerns for endangered and threatened species, migratory birds, and other fish and wildlife and their habitats. Habitats frequently used by fish and wildlife species are wetlands, streams, riparian areas, woodlands, and grasslands. Special attention is given to proposed projects which modify wetlands, alter streams, result in loss of riparian habitat, convert/remove grasslands, or contaminate habitats. When this occurs, the Commission and Service recommend ways

to avoid, minimize, or compensate for adverse effects to fish and wildlife and their habitats.

CONSULTATION PURSUANT TO THE NEBRASKA NONGAME AND ENDANGERED SPECIES CONSERVATION ACT (NESCA)

The Commission has responsibility for protecting state-listed endangered and threatened species under authority of the Nongame and Endangered Species Conservation Act (NESCA) (Neb. Rev. Stat. § 37-801 to 37-811). Pursuant to § 37-807 (3) of NESCA, all state agencies shall, in consultation with the Commission, ensure projects they authorize (i.e., issue a permit for), fund or carry out do not jeopardize the continued existence of state-listed endangered or threatened species or result in the destruction or modification of habitat of such species which is determined by the Commission to be critical. If a proposed project may affect state-listed species or designated critical habitat, further consultation with the Commission is required.

Informal consultation pursuant to NESCA can be completed by using the Conservation and Environmental Review Tool (CERT). The CERT analyzes the project type and location, and based on the analysis, provides information about potential impacts to listed species, habitat questions and/or conservation conditions.

- If project proponents agree to implement conservation conditions, as outlined in the report and applicable to the project type, then this document serves as documentation of consultation and the following actions can be taken to move forward with the project:
 - Sign the report in the designated areas.
 - Upload the signed PDF as part of their "final" project submittal.
 - By agreeing to and implementing the conservation conditions as outlined (if applicable), then further consultation with the Commission is not required.
- If the report indicates the project may have impacts on state-listed species, then the following actions must be taken:
 - Project proponent is required to contact and consult with the Commission. Contact information can be found within this document.

TECHNICAL ASSISTANCE AND CONSULTATION PURSUANT TO THE ENDANGERED SPECIES ACT (ESA)

The Service has responsibility for conservation and management of fish and wildlife resources for the benefit of the American public under the following authorities: 1) Endangered Species Act of 1973 (ESA); 2) Fish and Wildlife Coordination Act; 3) Bald and Golden Eagle Protection Act; and 4) Migratory Bird Treaty Act. The National Environmental Policy Act (NEPA) requires compliance with all of these statutes and regulations.

Pursuant to section 7(a)(2) of ESA, every federal agency, shall in consultation with the Service, ensure that an action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat.

If a proposed project may affect federally listed species or designated critical habitat, Section 7 consultation is required with the Service. It is the responsibility of the lead federal action agency to fully evaluate all potential effects (direct and indirect) that may occur to federally listed species and critical habitat in the action area. The lead federal agency provides their effect determination to the Service for concurrence. If federally listed species and/or designated/proposed critical habitat would be adversely affected by implementation of the project, the lead federal agency will need to formally request further section 7 consultation with the Service prior to making any irretrievable or irreversible commitment of federal funds (section 7(d) of ESA), or issuing any federal permits or licenses.

The information generated in this report DOES NOT satisfy consultation obligations between the lead federal agency and the Service pursuant to ESA. For the purposes of ESA, the information in this report should be considered as TECHNICAL ASSISTANCE, and does not serve as the Service's concurrence letter, even if the user signs and agrees to implement conservation conditions in order to satisfy the consultation requirements of NESCA.

Overall Results

The following result is based on a detailed analysis of your project.

• Potential impacts on listed species may occur as a result of this project. Please proceed with the following: Sign and date the certification section. Upload the document as "final." Email a copy of the report with a request for review to the Nebraska Game and Parks Commission (ngpc.envreview@nebraska.gov) and copy the U.S. Fish and Wildlife Service (nebraskaes@fws.gov) for further consultation.

Additional Information

Potential impacts on listed species may occur as a result of this project. Further consultation with the Nebraska Game and Parks Commission and the U.S. Fish and Wildlife Service is required.

Certification

I certify that ALL of the project information in this report (including project location, project size/configuration, project type, project activities, answers to questions) is true, accurate, and complete. If the project type, activities, location, size, or configuration of the project change, or if any of the answers to any questions asked in this report change, then this information is no longer valid and we recommend running the revised project through CERT to get an updated report.

Applicant/project proponent signature

Date

Additional Considerations

Bald and Golden Eagle Protection Act

The federal Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. 668-668c) provides for the protection of the bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*). Under the Eagle Act, "take" of eagles, their parts, nests or eggs is prohibited. Disturbance resulting in injury to an eagle or a decrease in productivity or nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior is a form of "take."

Bald eagles use mature, forested riparian areas near rivers, streams, lakes, and wetlands and occur along all the major river systems in Nebraska. The bald eagle southward migration begins as early as October and the wintering period extends from December-March. The golden eagle is found in arid open country with grassland for foraging in western Nebraska and usually near buttes or canyons which serve as nesting sites. Golden eagles are often a permanent resident in the Pine Ridge area of Nebraska. Additionally, many bald and golden eagles nest in Nebraska from mid-February through mid-July. Disturbances within 0.5-miles of an active nest or within line-of-sight of the nest could cause adult eagles to discontinue nest building or to abandon eggs. Both bald and golden eagles frequent river systems in Nebraska during the winter where open water and forested corridors provide feeding, perching, and roosting habitats, respectively. The frequency and duration of eagle use of these habitats in the winter depends upon ice and weather conditions. Human disturbances and loss of wintering habitat can cause undue stress leading to cessation of feeding and failure to meet winter thermoregulatory requirements. These affects can reduce the carrying capacity of preferred wintering habitat and reproductive success for the species.

To comply with the Eagle Act, it is recommended that the project proponent determine if the proposed project would impact bald or golden eagles or their habitats. This can be done by conducting a habitat assessment, surveying nesting habitat for active and inactive nests, and surveying potential winter roosting habitat to determine if it is being used by eagles. The area to be surveyed is dependent on the type of project; however for most projects we recommend surveying the project area and a ½ mile buffer around the project area. If it is determined that either species could be affected by the proposed project, the Commission recommends that the project proponent notify the

Nebraska Game and Parks Commission as well as the Nebraska Field Office, U.S. Fish and Wildlife Service for recommendations to avoid "take" of bald and golden eagles.

Migratory Bird Treaty Act and Nebraska Revised Statute §37-540

We recommend the project proponent compliy with the Migratory Bird Treaty Act (16 U.S.C. 703-712: Ch. 128 as amended) (MBTA). The project proponent should also comply with Nebraska Revised Statute §37-540, which prohibits take and destruction of nests or eggs of protected birds (as defined in Nebraska Revised Statute §37-237.01). Construction activities in grassland, wetland, stream, woodland, and river bank habitats that would result in impacts on birds, their nests or eggs protected under these laws should be avoided. Although the provisions of these laws are applicable year-round, most migratory bird nesting activity in Nebraska occurs during the period of April 1 to July 15. However, some migratory birds are known to nest outside of the aforementioned primary nesting season period. For example, raptors can be expected to nest in woodland habitats during February 1 through July 15, whereas sedge wrens, which occur in some wetland habitats, normally nest from July 15 to September 10. If development in this area is planned to occur during the primary nesting season or at any other time which may result in impacts to birds, their nests or eggs protected under these laws, we request that the project proponent arrange to have a qualified biologist conduct a field survey of the affected habitats to determine the absence or presence of nesting migratory birds. If a field survey identifies the existence of one or more active bird nests that cannot be avoided by the planned construction activities, the Nebraska Game and Parks Commission and the Nebraska Field Office, U.S. Fish and Wildlife Service should be contacted immediately. For more information on avoiding impacts to migratory birds, their nests and eggs, or to report active bird nests that cannot be avoided by planned construction activities, please contact the U.S. Fish and Wildlife Service and/or the Nebraska Game and Parks Commission (contact information within report). Adherence to these guidelines will help avoid unnecessary impacts on migratory birds.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) requires consultation with the U.S. Fish and Wildlife Service (Service) and the State fish and wildlife agency (i.e., Nebraska Game and Parks Commission) for the purpose of preventing loss of and damage to fish and wildlife resources in the planning, implementation, and operation of federal and federaly funded, permitted, or licensed water resource development projects. This statute requires that federal agencies take into consideration the effect that the water related project would have on fish and wildlife resources, to take action to prevent loss or damage to these resources, and to provide for the development and improvement of these resources. The comments in this letter are provided as technical assistance only and are not the document required of the Secretary of the Interior pursuant to Section 2(b) of FWCA on any required federal environmental review or permit. This technical assistance is valid only for the described conditions and will have to be revised if significant environmental changes or changes in the proposed project are being considered under FWCA, the lead federal agency must notify the Service in writing of how the comments and recommendations in this technical assistance letter are being considered into the proposed project.

Section 404 of the Clean Water Act

In general, the Nebraska Game and Parks Commission and the U.S. Fish and Wildlife Service have concerns for impacts to wetlands, streams and riparian habitats. We recommend that impacts to wetlands, streams, and associated riparian corridors be avoided and minimized, and that any unavoidable impacts to these habitats be mitigated. If any fill materials will be placed into waterways or wetlands, the U.S. Army Corps of Engineers Regulatory Office in Omaha should be contacted to determine if a 404 permit is needed.

Agency Contact Information

Nebraska Game and Parks Commission Environmental Review Team 2200 North 33rd Street Lincoln, NE 68503

phone: (402) 471-5554 email: <u>ngpc.envreview@nebraska.gov</u>

U.S. Fish and Wildlife Service

Nebraska Ecological Services 9325 South Alda Road Wood River, NE 68883 phone: (308) 382-6468 email: <u>nebraskaes@fws.gov</u>



Elk Creek Aerial Image Basemap With Locator Map

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community



Elk Creek Topographic Basemap With Sections and Protected Areas

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community


Elk Creek Web Map As Submitted By User

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Table 1 Protected Areas in Immediate Vicinity of Project (project review area)

This table has no results.

Table 2 Documented Occurrences in Immediate Vicinity of Project (project review area): Natural communities and special areas

Name	Other Information	SRank	GRank
Lowland Tall-grass Prairie	Lowland Tall-grass Prairie	S1	GNR
Upland Tall-grass Prairie	Upland Tall-grass Prairie	S1S2	G2
Southeast Prairies Biologically Unique Landscape	Link to BUL document		

Large Intact Block of Habitat for At-risk Species

Regional Documented Occurrences of Species within 1 Mile of Project Review Area										
Scientific Name	Common Name	USFWS	State	SGCN	SRank	GRank	Taxonomic Group			
Arnoglossum atriplicifolium	Pale Indian-plantain			Tier 2	S2	G4G5	Vascular Plant - Dicots			
Boechera dentata	Short's Rock Cress			Tier 2	S2	G5	Vascular Plant - Dicots			
Carex brachyglossa	Yellow-fruit Sedge			Tier 2	S1S3	G5	Vascular Plant - Monocots			
Carex bushii	Bush's Sedge			Tier 2	S1S2	G4	Vascular Plant - Monocots			
Carex frankii	Frank's Sedge			Tier 2	S1S2	G5	Vascular Plant - Monocots			
Coreopsis palmata	Finger Coreopsis			Tier 2	S1S3	G5	Vascular Plant - Dicots			
Cornus obliqua	Pale Dogwood				S2S4	G5	Vascular Plant - Dicots			
Desmodium cuspidatum var. longifolium	Long-leaf Tick-clover			Tier 2	S1S3	G5T5?	Vascular Plant - Dicots			
Desmodium perplexum	Dillen's Tick-clover				S2S4	G5	Vascular Plant - Dicots			
Dichanthelium linearifolium	Slender-leaf Spring-panicum				S1	G5	Vascular Plant - Monocots			
Eryngium yuccifolium	Button-snakeroot			Tier 2	S1	G5	Vascular Plant - Dicots			
Erynnis brizo	Sleepy Duskywing			Tier 2	S2	G5	Invertebrate Animal - Butterflies and Skippers			
Erynnis horatius	Horace's Duskywing			Tier 2	S3	G5	Invertebrate Animal - Butterflies and Skippers			
Euphorbia missurica var. missurica	Missouri Spurge			Tier 2	S1S3	G5TNR	Vascular Plant - Dicots			

Table 3 Regional Documented Occurrences of Species within 1 Mile of Project Review Area

Scientific Name	Common Name	USFWS	State	SGCN	SRank	GRank	Taxonomic Group		
Haliaeetus leucocephalus	Bald Eagle			Tier 2	S3	G5	Vertebrate Animal - Birds		
Lampropeltis calligaster	Prairie Kingsnake		NC	Tier 2	S2	G5	Vertebrate Animal - Reptiles		
Liatris hirsuta	Hairy Gayfeather			Tier 2	S1S3	G5T4?	Vascular Plant - Dicots		
Liatris pycnostachya var. pycnostachya	Thickspike Gayfeather			Tier 2	S1S3	G5T5	Vascular Plant - Dicots		
Lilium michiganense	Turk's Cap Lily				S2S4	G5	Vascular Plant - Monocots		
Melica nitens	Three-flower Melic Grass			Tier 2	S1	G5	Vascular Plant - Monocots		
Nothoscordum bivalve	False-garlic			Tier 2	S1	G4	Vascular Plant - Monocots		
Penstemon tubiflorus var. tubiflorus	Tube Penstemon			Tier 2	S1	G5T4T5	Vascular Plant - Dicots		
Potamogeton diversifolius	Water-thread Pondweed			Tier 2	S2	G5	Vascular Plant - Monocots		
Pycnanthemum tenuifolium	Narrow-leaf Mountain-mint			Tier 2	S1	G5	Vascular Plant - Dicots		
Scleria triglomerata	Whip Nut-rush			Tier 2	S1S2	G5	Vascular Plant - Monocots		
Senna marilandica	Southern Wild Senna			Tier 2	S1S3	G5	Vascular Plant - Dicots		
Sistrurus tergeminus	Western Massasauga		Т	Tier 1	S1	G3G4	Vertebrate Animal - Reptiles		
Solidago petiolaris	Downy Goldenrod				S2S4	G5	Vascular Plant - Dicots		
Sturnella magna	Eastern Meadowlark			Tier 2	S3	G5	Vertebrate Animal - Birds		
Veronicastrum virginicum	Culver's Root			Tier 2	S1	G4	Vascular Plant - Dicots		

 Table 3

 Regional Documented Occurrences of Species within 1 Mile of Project Review Area

Table 4

Potential Occurrences in Immediate Vicinity of Project (project review area):

Special status species (Tier	1 at-risk species and	Bald and Golden Eagle),	based on models or range maps
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Scientific Name	Common Name	Data Type	USFWS	State	SGCN	SRank	GRank	Taxonomic Group
Ammodramus henslowii	Henslow's Sparrow	Range			Tier 1	S1	G4	Vertebrate Animal - Birds
Apobaetis lakota	Lakota Mayfly	Range			Tier 1	SNR	G2G3	Invertebrate Animal - Mayflies
Asio flammeus	Short-eared Owl	Range			Tier 1	S2	G5	Vertebrate Animal - Birds
Atrytone arogos iowa	Iowa Skipper	Range			Tier 1	S1	G2G3T2T3	Invertebrate Animal - Butterflies and Skippers
<u>Boloria selene</u> <u>nebraskensis</u>	Nebraska Fritillary	Range			Tier 1	SNR	G5T3T4	Invertebrate Animal - Butterflies and Skippers

Table 4Potential Occurrences in Immediate Vicinity of Project (project review area):Special status species (Tier 1 at-risk species and Bald and Golden Eagle), based on models or range maps

Scientific Name	Common Name	Data Type	USFWS	State	SGCN	SRank	GRank	Taxonomic Group
Calidris subruficollis	Buff-breasted Sandpiper	Range			Tier 1	S2N	G4	Vertebrate Animal - Birds
Catocala nuptialis	Married Underwing	Range			Tier 1	SNR	G3	Invertebrate Animal - Underwing Moths
Catocala whitneyi	Whitney Underwing	Range			Tier 1	S1	G2G3	Invertebrate Animal - Underwing Moths
<u>Danaus plexippus</u>	Monarch	Range			Tier 1	S2	G4	Invertebrate Animal - Butterflies and Skippers
<u>Erynnis martialis</u>	Mottled Duskywing	Range			Tier 1	S2	G3	Invertebrate Animal - Butterflies and Skippers
Haliaeetus leucocephalus	Bald Eagle	Range			Tier 2	S3	G5	Vertebrate Animal - Birds
Hesperia ottoe	Ottoe Skipper	Range			Tier 1	S2	G3	Invertebrate Animal - Butterflies and Skippers
Hybognathus argyritis	Western Silvery Minnow	Range			Tier 1	S2	G4	Vertebrate Animal - Fishes
Hylocichla mustelina	Wood Thrush	Range			Tier 1	S 3	G4	Vertebrate Animal - Birds
Lanius Iudovicianus	Loggerhead Shrike	Range			Tier 1	S 3	G4	Vertebrate Animal - Birds
Lasionycteris noctivagans	Silver-haired Bat	Range			Tier 1	S3	G3G4	Vertebrate Animal - Mammals
Lasiurus borealis	Eastern Red Bat	Range			Tier 1	S 3	G3G4	Vertebrate Animal - Mammals
Lasiurus cinereus	Hoary Bat	Range			Tier 1	S3	G3G4	Vertebrate Animal - Mammals
Myotis lucifugus	Little Brown Myotis	Range			Tier 1	SNR	G3	Vertebrate Animal - Mammals
Myotis septentrionalis	Northern Long-eared Myotis	Range	Т	Т	Tier 1	S1S2	G1G2	Vertebrate Animal - Mammals
Perimyotis subflavus	Tricolored Bat	Range			Tier 1	S3	G2G3	Vertebrate Animal - Mammals
<u>Problema byssus</u> <u>kumskaka</u>	Byssus Skipper	Range			Tier 1	S1	G4TNR	Invertebrate Animal - Butterflies and Skippers
Sistrurus tergeminus	Western Massasauga	Range		Т	Tier 1	S1	G3G4	Vertebrate Animal - Reptiles
<u>Speyeria idalia</u>	Regal Fritillary	Range			Tier 1	S3	G3?	Invertebrate Animal - Butterflies and Skippers

CONSULTA

IPaC Information for Planning and Consultation **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location



Local office

Nebraska Ecological Services Field Office

५ (308) 382-6468๗ (308) 384-8835

MAILING ADDRESS 9325 B South Alda Rd., Ste B Wood River, NE 68883-9565

PHYSICAL ADDRESS 9325 South Alda Rd., Ste B Wood River, NE 68883-9565

http://www.fws.gov//nebraskaes

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

- 1. Draw the project location and click CONTINUE.
- 2. Click DEFINE PROJECT.
- 3. Log in (if directed to do so).
- 4. Provide a name and description for your project.
- 5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the <u>Ecological Services Program</u> of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact <u>NOAA Fisheries</u> for <u>species under their jurisdiction</u>.

- 1. Species listed under the <u>Endangered Species Act</u> are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the <u>listing status page</u> for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
- 2. <u>NOAA Fisheries</u>, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME

STATUS

Northern Long-eared Bat Myotis septentrionalis Wherever found

No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/9045 Threatened

Birds

NAME

Whooping Crane Grus americana

There is **final** critical habitat for this species. The location of the critical habitat is not available.

Endangered

STATUS

Insects

NAME

Monarch Butterfly Danaus plexippus

Wherever found

No critical habitat has been designated for this species.

http://ecos.fws.gov/ecp/species/9743

Flowering Plants

NAME

STATUS

Candidate

STATUS

Western Prairie Fringed Orchid Platanthera praeclara Wherever found No critical habitat has been designated for this species. <u>http://ecos.fws.gov/ecp/species/1669</u> Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act^{1} and the Bald and Golden Eagle Protection Act^{2} .

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described <u>below</u>.

- 1. The <u>Migratory Birds Treaty Act</u> of 1918.
- 2. The <u>Bald and Golden Eagle Protection Act</u> of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <u>http://www.fws.gov/birds/management/managed-species/</u> <u>birds-of-conservation-concern.php</u>
- Measures for avoiding and minimizing impacts to birds <u>http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/</u>

conservation-measures.php

 Nationwide conservation measures for birds <u>http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf</u>

THERE ARE NO MIGRATORY BIRDS OF CONSERVATION CONCERN EXPECTED TO OCCUR AT THIS LOCATION.

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

<u>Nationwide Conservation Measures</u> describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. <u>Additional measures</u> or <u>permits</u> may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS <u>Birds of Conservation Concern (BCC)</u> and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the <u>Avian Knowledge Network (AKN)</u>. The AKN data is based on a growing collection of <u>survey</u>, <u>banding</u>, <u>and citizen science datasets</u> and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (<u>Eagle Act</u> requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the <u>AKN Phenology Tool</u>.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the <u>Avian Knowledge Network (AKN)</u>. This data is derived from a growing collection of <u>survey, banding, and citizen science datasets</u>.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: <u>The Cornell Lab of Ornithology All About Birds Bird Guide</u>, or (if you are unsuccessful in locating the bird of interest there), the <u>Cornell Lab of Ornithology Neotropical Birds guide</u>. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

- 1. "BCC Rangewide" birds are <u>Birds of Conservation Concern</u> (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
- 2. "BCC BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
- 3. "Non-BCC Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the <u>Eagle Act</u> requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the <u>Northeast Ocean Data Portal</u>. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the <u>NOAA NCCOS</u> <u>Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf</u> project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the <u>Diving Bird Study</u> and the <u>nanotag studies</u> or contact <u>Caleb Spiegel</u> or <u>Pam Loring</u>.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to <u>obtain a permit</u> to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

Wildlife refuges and fish hatcheries

REFUGE AND FISH HATCHERY INFORMATION IS NOT AVAILABLE AT THIS TIME

Wetlands in the National Wetlands Inventory

Impacts to <u>NWI wetlands</u> and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the <u>NWI map</u> to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

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IPaC: Explore Location resources

1

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

20019

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APPENDIX C U.S. EPA EJ Screen





City: Elk Creek village, NEBRASKA, EPA Region 7

Approximate Population: 101 Input Area (sq. miles): 0.13

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	59	61	45
EJ Index for Ozone	62	62	45
EJ Index for NATA [*] Diesel PM	63	64	49
EJ Index for NATA [*] Air Toxics Cancer Risk	60	64	49
EJ Index for NATA [*] Respiratory Hazard Index	59	64	48
EJ Index for Traffic Proximity and Volume	65	64	50
EJ Index for Lead Paint Indicator	35	36	23
EJ Index for Superfund Proximity	71	72	54
EJ Index for RMP Proximity	43	30	14
EJ Index for Hazardous Waste Proximity	72	74	56
EJ Index for Wastewater Discharge Indicator	61	57	39



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.





City: Elk Creek village, NEBRASKA, EPA Region 7

Approximate Population: 101 Input Area (sq. miles): 0.13



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0





City: Elk Creek village, NEBRASKA, EPA Region 7

Approximate Population: 101

Input Area (sq. miles): 0.13

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in μg/m³)	8.16	8.02	39	8.17	50	8.55	36
Ozone (ppb)	42.8	43	69	44.4	29	42.9	50
NATA [*] Diesel PM (µg/m ³)	0.178	0.336	22	0.367	<50th	0.478	<50th
NATA [*] Cancer Risk (lifetime risk per million)	21	22	42	27	<50th	32	<50th
NATA [*] Respiratory Hazard Index	0.28	0.3	40	0.36	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	8.2	360	15	330	17	750	10
Lead Paint Indicator (% Pre-1960 Housing)	0.4	0.36	57	0.34	63	0.28	70
Superfund Proximity (site count/km distance)	0.011	0.13	10	0.098	6	0.13	5
RMP Proximity (facility count/km distance)	1.3	1.5	60	0.95	75	0.74	82
Hazardous Waste Proximity (facility count/km distance)	0.024	1.2	8	1.3	3	5	1
Wastewater Discharge Indicator	6E-09	0.22	21	4	24	9.4	33
(toxicity-weighted concentration/m distance)							
Demographic Indicators							
Demographic Index	30%	25%	72	25%	71	36%	50
People of Color Population	31%	21%	79	20%	80	39%	50
Low Income Population	29%	29%	57	31%	51	33%	51
Linguistically Isolated Population	5%	3%	82	2%	88	4%	71
Population With Less Than High School Education	18%	9%	86	9%	84	13%	74
Population Under 5 years of age	2%	7%	7	6%	10	6%	12
Population over 64 years of age	15%	15%	55	16%	51	15%	56

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

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the User Specified Area, NEBRASKA, EPA Region 7

Approximate Population: 5,197 Input Area (sq. miles): 378.30

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	58	60	45
EJ Index for Ozone	61	62	45
EJ Index for NATA [*] Diesel PM	64	65	49
EJ Index for NATA [*] Air Toxics Cancer Risk	60	64	49
EJ Index for NATA [*] Respiratory Hazard Index	60	64	49
EJ Index for Traffic Proximity and Volume	69	68	52
EJ Index for Lead Paint Indicator	29	28	19
EJ Index for Superfund Proximity	70	71	53
EJ Index for RMP Proximity	46	33	16
EJ Index for Hazardous Waste Proximity	71	73	56
EJ Index for Wastewater Discharge Indicator	61	57	39



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.





the User Specified Area, NEBRASKA, EPA Region 7

Approximate Population: 5,197 Input Area (sq. miles): 378.30



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0





the User Specified Area, NEBRASKA, EPA Region 7

Approximate Population: 5,197

Input Area (sq. miles): 378.30

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in μ g/m ³)	8.13	8.02	39	8.17	49	8.55	35
Ozone (ppb)	42.8	43	57	44.4	26	42.9	49
NATA [*] Diesel PM (µg/m ³)	0.172	0.336	21	0.367	<50th	0.478	<50th
NATA [*] Cancer Risk (lifetime risk per million)	21	22	40	27	<50th	32	<50th
NATA [*] Respiratory Hazard Index	0.28	0.3	38	0.36	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	14	360	18	330	20	750	13
Lead Paint Indicator (% Pre-1960 Housing)	0.51	0.36	68	0.34	72	0.28	77
Superfund Proximity (site count/km distance)	0.011	0.13	11	0.098	7	0.13	6
RMP Proximity (facility count/km distance)	1.6	1.5	64	0.95	80	0.74	86
Hazardous Waste Proximity (facility count/km distance)	0.027	1.2	9	1.3	4	5	1
Wastewater Discharge Indicator	1.2E-08	0.22	21	4	24	9.4	33
(toxicity-weighted concentration/m distance)							
Demographic Indicators							
Demographic Index	26%	25%	64	25%	62	36%	42
People of Color Population	19%	21%	63	20%	66	39%	36
Low Income Population	32%	29%	62	31%	57	33%	56
Linguistically Isolated Population	4%	3%	78	2%	84	4%	66
Population With Less Than High School Education	14%	9%	80	9%	77	13%	66
Population Under 5 years of age	4%	7%	26	6%	32	6%	35
Population over 64 years of age	18%	15%	67	16%	65	15%	70

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City: Tecumseh, NEBRASKA, EPA Region 7

Approximate Population: 1,790 Input Area (sq. miles): 1.50

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	74	74	55
EJ Index for Ozone	75	75	54
EJ Index for NATA [*] Diesel PM	76	75	55
EJ Index for NATA [*] Air Toxics Cancer Risk	75	75	55
EJ Index for NATA [*] Respiratory Hazard Index	75	75	55
EJ Index for Traffic Proximity and Volume	79	79	59
EJ Index for Lead Paint Indicator	63	67	44
EJ Index for Superfund Proximity	77	77	57
EJ Index for RMP Proximity	70	62	40
EJ Index for Hazardous Waste Proximity	77	77	57
EJ Index for Wastewater Discharge Indicator	83	82	73



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City: Tecumseh, NEBRASKA, EPA Region 7

Approximate Population: 1,790 Input Area (sq. miles): 1.50



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0





City: Tecumseh, NEBRASKA, EPA Region 7

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Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in μg/m³)	8.16	8.02	39	8.17	50	8.55	36
Ozone (ppb)	42.8	43	69	44.4	29	42.9	50
NATA [*] Diesel PM (µg/m³)	0.178	0.336	22	0.367	<50th	0.478	<50th
NATA [*] Cancer Risk (lifetime risk per million)	21	22	42	27	<50th	32	<50th
NATA [*] Respiratory Hazard Index	0.28	0.3	40	0.36	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	31	360	23	330	28	750	19
Lead Paint Indicator (% Pre-1960 Housing)	0.53	0.36	70	0.34	74	0.28	78
Superfund Proximity (site count/km distance)	0.011	0.13	10	0.098	6	0.13	5
RMP Proximity (facility count/km distance)	2.2	1.5	76	0.95	88	0.74	92
Hazardous Waste Proximity (facility count/km distance)	0.024	1.2	8	1.3	3	5	1
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	1.7E-08	0.22	21	4	24	9.4	33
Demographic Indicators							
Demographic Index	34%	25%	78	25%	77	36%	56
People of Color Population	27%	21%	74	20%	76	39%	46
Low Income Population	45%	29%	80	31%	77	33%	74
Linguistically Isolated Population	7%	3%	86	2%	92	4%	78
Population With Less Than High School Education	18%	9%	86	9%	85	13%	75
Population Under 5 years of age	6%	7%	47	6%	54	6%	56
Population over 64 years of age	17%	15%	63	16%	61	15%	66

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

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APPENDIX D Climate Change Risk Assessment

CLIMATE CHANGE RISK ASSESSMENT, ELK CREEK SUPERALLOY MATERIALS PROJECT

Prepared for: NioCorp Developments, Ltd. Centennial, CO

January 2022 Olsson Project No. 021-06507



Project No. 021-06507

ACRONYMS AND ABBREVIATIONS

FEMA	Federal Emergency Management Agency
FeNb	Ferroniobium
GHG	Greenhouse Gas
gpm	gallons per minute
IPCC	International Panel on Climate Change
kg	kilogram
NDEEN	lebraska Department of Environment and Energy
PSD	Prevention of Significant Deterioration
TCFDTas	sk Force on Climate-Related Financial Disclosure

January 2022

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1. INTRODUCTION

NioCorp Developments Ltd. (NioCorp) Elk Creek Superalloy Materials Project (Project) is committed to following the Equator Principles throughout the Project Development Lifecycle. The Equator Principles are a set of guidelines which "serve as a common baseline and framework for financial institutions to identify, assess and manage environmental and social risks when financing Projects"¹. The Equator Principles aim to encourage clients to evaluate and address potential or actual negative risks and impacts that may be result from completion of a project. This Climate Change Risk Assessment (CCRA) serves to fulfill the requirements contained in the Equator Principles on climate change risk assessment. This CCRA addresses the following questions:

- 1) What are the current and anticipated Physical Risks of the project's operations?
- 2) What are the current and anticipated Transition Risks of the project's operations?
- 3) Does the client have plans, processes, policies and systems in place to manage these risks? i.e., to mitigate, transfer, accept or control?

The Project also has a combined Scope 1 (direct combustion) and Scope 2 (electricity usage) emissions of more than 100,000 tons of carbon dioxide (CO_2) equivalent annually. Therefore, this CCRA also includes an alternatives analysis to evaluate lower Greenhouse Gas (GHG) intensive alternatives.

2. PHYSICAL RISKS

This section will analyze the potential impacts on the Project of physical risks resulting from climate change. Per the Task Force on Climate-Related Financial Disclosure (TCFD), physical risks from climate change fall under two categories: Event-driven (acute) risks and chronic (long-term) risks. Acute risks include damage from more frequent or severe storms, hazards to workers from extreme temperatures, or site damage from tornadoes. Long-term risks are related to slower, gradual changes in climate, such as drought, more extreme average seasonal temperatures, and rising sea levels.

2.1 Acute Risks

Several hundred personnel will be working outside or in the mine and the operation will run 24/7, so short-term weather events will affect operations; however, almost all of the operational activity

¹ www.equator-principles.com

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will occur indoors within a climate-controlled setting. In its most recent assessment report, the International Panel on Climate Change (IPCC) cites strengthened "evidence of observed changes in extremes such as heatwaves, heavy precipitation, droughts, and tropical cyclones," compared to just four years ago.²

More frequent rain events can accelerate erosion, which is typically already a concern with mining operations. The related risks to the Project range from slips and trips over muddy ground to potential stormwater infiltration of the underground mine. The Project involves only below-ground blasting, minimizing risks associated with erosion. Therefore, erosion risks resulting from climate change are considered **low** for the Project.

The Project will be located outside and above the limits of the Federal Emergency Management Agency (FEMA) approximate Zone A flood zone⁵. Additionally, the Project will have stormwater controls designed to withstand the peak flow rate from the 100-year, 24-hour storm event. Pumps will be installed to manage surface water contacting tailings, with the 100-year, 24-hour storm event taken into consideration during the design process. Therefore, the risks associated with heavy and/or frequent rain events are considered **moderate**.

Temperatures in the Project's area range from over 100°F in the summer to well below 0°F in the winter.³ While global climate change increases temperature extremes, worker health and safety will be a primary priority for NioCorp.¹ Risks to the Project and its workers include heatstroke, hypothermia, and frostbite. Seasonal air temperature evaluations have been completed for the underground mine as part of the design of the mine ventilation system, and a mine air heating system has been incorporated into the engineering design to ensure comfortable working conditions in the mine during the winter months. Administrative controls will be crucial in maintaining the health and safety of NioCorp employees., including monitoring the seriousness of extreme hot or cold days and adjusting work schedules and PPE requirements accordingly. Therefore, temperatures are considered a **low** risk for the Project.

The IPCC reports "limited evidence and low agreement" between Climate Impact Driver (CID) indices associated with tornadoes. Due to the high number of variables and scarcity of data, it is difficult to model and predict the effects of global climate change on frequency and strength of severe windstorms such as tornadoes. While models cannot directly correlate climate change to tornado occurrence, the Project location is nonetheless in an at-risk location. A tornado in the area is most likely to occur in May, June, or July.^{4,5} NioCorp will develop an Emergency Preparedness and Response Plan (EPRP) which will include procedures to respond to weather-

² https://www.ipcc.ch/report/ar6/wg1/

³ https://www.weather.gov/wrh/climate?wfo=oax

⁴ https://www.weather.gov/gld/tornado-nebraska

⁵ https://www.niocorp.com/elk-creek-project/elk-creek-project-technical-reports/

related emergency situations and provision has been made for sheltering employees from tornado events in the project's design. While the EPRP will be designed to protect workers, a tornado could inevitably cause severe damage to the Project. Therefore, tornadoes are considered a **high** risk for the Project.

2.2 Long-Term Risks

The Equator Principles Guidance Note on Climate Change Risk Assessment cites increased frequency of droughts as a potential long-term physical risk. The Project will require approximately 4,700 gallons per minute (gpm) of water once full operations commence, which makes water availability in the region a major consideration. Initial construction will require limited dewatering. NioCorp expects the groundwater already available from this mine dewatering will produce 1,000 gallons per minute (gpm). The additional water needed for operation, approximately 3,700 gpm, will come from three sources, per the Project's 2019 Technical Feasibility Study:

- Tecumseh Board of Public Works water supply line (~2,000 gpm) Tecumseh Board of Public Works, which maintains the infrastructure and supplies residential and commercial users in the City of Tecumseh, would run a line to the project site to supply potable water subject to a cost recovery agreement with the Company
- 2) Local Landowner Well #1 (~500 gpm) A new well on a local landowner's property has the potential to supply up to 500 gpm of the project's needs. Because there will be a transfer of water from one property to another, a Groundwater Transfer Permit will need to be issued by the Nemaha Natural Resources District pursuant to Chapter 11 of the Management Area Rules and Regulations for Groundwater Quantity Management Areas.
- Local Landowner Well #2 NioCorp has the option to connect to an existing well as well as install a new well to supply an additional 1,500 gpm.⁴

The sources of water listed are projected to distribute enough water for consistent operation despite any long-term changes in precipitation patterns that result in droughts or water stresses. Therefore, drought is considered a **low** risk for the Project.

Rising mean temperatures are another long-term risk that has similar concerns to acute temperature spikes. NioCorp has engineering controls, training programs, and temperature controls to protect workers that will be exposed to high temperatures in the workplace. Rising temperatures are considered a **low** risk for the Project.

The Project is not located near the coast or in a floodplain near surface water which could be impacted by rising sea levels. Therefore, rising sea levels are considered to be a **low** risk for the Project.

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3. TRANSITION RISKS

This section will analyze the potential impacts on the Project of transition risks resulting from climate change. The TCFD Recommendations identify four transition risks from climate change: policy and legal risks, technology risks, market risks, and reputation risks.

3.1 Policy and Legal Risks

This subsection analyzes the potential impacts of new policies and regulatory actions aimed at combatting adverse effects of climate change or promoting adaptation or transition in the industry.

The Nebraska Department of Environment and Energy (NDEE) regulates air emissions. As the Project will be a generator of air emissions, NioCorp has obtained a Permit to Construct for the Project. Notably, the air emissions from the Project are not at levels that required a major or Prevention of Significant Deterioration (PSD) permit. The greenhouse gas (GHG) emissions, including the process gas greenhouse emissions, are not insignificant. It may be possible that future climate legislation or regulation will include a carbon tax or other cost component that could impact the Project. A Permit to Operate will be obtained following construction. NioCorp anticipates it is unlikely that any policy changes such as emissions limits or implementing additional controls will be required after the Project is constructed and operational. Therefore, future policy or regulatory requirements are likely to be a **low** risk for the Project, and are primarily anticipated to be an increased cost for GHG emissions.

The Project is not located in an area with severe water shortage. Therefore, water use is not regulated in the Project area and is not anticipated to be regulated throughout the Project lifetime. Policies associated with water usage management are considered a **low** risk for the Project.

Minerals produced from the Project may be used in applications which support alternative fuels or improve efficiency of products. For example, fuel efficiency standards addressing carbon emissions in the European Union are anticipated to increase scandium and niobium usage in the transportation sector (including niobium's use in lithium-ion batteries), as well as an increasing application of rare earth magnets in vehicle electrification and wind power generation. The federal government has recognized all of the commodities produced by the project as "critical minerals" and has taken policy actions to support domestic production. Therefore, policies associated with climate change may result in a positive impact on the Project.

NioCorp has evaluated site conditions to ensure ecosystem safety on the project site. The location is not on a cultural heritage site, historical monument, or ecologically sensitive site that would otherwise be at an increased risk due to climate effects and Project operations. Initial surveying and public involvement were implemented to ensure mitigated risks to the Project from these biodiversity risks. Therefore, legal risks associated with these aspects are considered a **low** risk for the Project.

3.2 Technology and Market Risks

This subsection analyzes the potential impacts of new lower emissions technology that leads to demand shifts and market advantage for operators who adapt faster. Market risks include shifts in supply and demand for certain commodities, products, and service as climate-related risks and opportunities are acted on. This subsection will describe the potential impacts of these shifts on the Project.

The Project is not located in an area with anticipated water use restrictions or significant reduction in water availability. The Project will also implement water recycling in its processes, reducing the volume of water used. Therefore, increased costs associated with water use are considered a **low** risk.

In its technical feasibility study, NioCorp shows a price sensitivity analysis that yields positive rates of return assuming two worst-case scenarios:

- 1) Niobium prices fall to US \$0/kilogram (kg) while Scandium and Titanium prices remain constant
- 2) Scandium prices fall to US \$0/kg while Niobium and Titanium prices remain constant

NioCorp, at the time of the report publishing, also has "two committed offtake customers signed up for 10-year terms with all remaining annual FeNb [ferroniobium] production sold on a spot basis."⁶ and has a significant offtake agreement for the project's scandium production. Considering the applications of the rare earth metals are in several industries with growing market demand, technological advancements that significantly hinder the Project's financial viability are unlikely.⁶ As greenhouse gas reductions and electrification move forward at an accelerated pace, it is likely that markets will favor increased use of the Project's products.

3.3 Reputation Risks

Reputation risks stem from changing customer or community perception of the Project. This subsection will describe risks posed by public perception of NioCorp's positive or negative impact on the transition to a lower emissions economy.

There are significant stakeholder interests in the Project. The nearby communities will be affected by traffic, noise, and population increases. In general, large-scale mining is a highly visible and public operation and there have been cases in the past where large-scale surface mining

⁶ https://www.niocorp.com/resource-center/niobium/

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operations on public lands have not been managed responsibly, resulting in long-term environmental liabilities and their associated costs. Visible emissions and landscape alteration associated with project execution will continue to come under public scrutiny.

NioCorp conducts regular public and stakeholder outreach to communicate company operations and visions in recognition of the Project's effects on these groups. The stakeholder outreach has included one on one meetings with local landowners, community events and group tours of the project site. Management maintains open lines of communications with key members of the local community.

As a result of the Company's stakeholder outreach and the Company's vision and values with respect to environmental issues, the design of the project has incorporated features to address reputation risks, including:

- Underground mining instead of surface mining to minimize the surface footprint of the operation
- Extensive recycling and reuse of water, to minimize demand on local aquifers
- Extensive recycling of key reagents used in the production process, to minimize traffic impacts on the local roads system
- Reuse of waste products to manufacture structural fill for the underground mine and minimize surface waste disposal.
- Equitable agreements with local landowners to acquire land for the project without recourse to eminent domain and which include perpetual royalty streams for the landowners
- Design to avoid impacts to key environmental features, such as wetlands and waterbodies.

The Company has also incorporated Environmental, Social and Governance (ESG) considerations in its management systems, including at the Board of Directors level where the Board's Safety and Sustainability Committee meets to discuss ESG matters on a regular basis.

4. ALTERNATIVES ANALYSIS

The Project will generate more than 100,000 tons/year of GHG emissions. Therefore, this section includes the alternatives analysis to evaluate lower GHG emissions.

Throughout the Project design phase, NioCorp has continued to evaluate options to minimize the Project impact to the environment. For example, at one point the Project included piping wastewater for discharge to the Missouri River; however, NioCorp determined that the mine shafts could be frozen and grouting could be employed in the underground mine in a manner that minimizes groundwater inflow to the mine and results in no need to discharge to the Missouri River.

NioCorp submitted a Permit to Construct Application to the Nebraska Department of Environment and Energy (NDEE). During the application process, NioCorp calculated air emissions resulting from the Project. NioCorp evaluated additional air emissions control devices, as available and appropriate, to reduce air emissions. NioCorp also evaluated potential chemicals for use in the process which would result in lower emissions. NioCorp incorporated process efficiencies, including using process heat in a manner that minimizes the amount of natural gas used, which resulted in reduced the size of natural gas-burning equipment, to the extent that NioCorp did not need to apply for a major PSD source air permit. Additionally, use of natural gas-fired equipment lends itself to replacement using gaseous fuels with lower carbon footprint if technically and economically viable; or electrification of select equipment. However, NioCorp's implementation of energy efficient design considerations and use of low carbon fuel will make it infeasible and costineffective to implement such changes given the Project life cycle.

The Air Quality Permit to Construct was issued for the Project by the NDEE on June 2, 2020. This permit establishes emissions limits as well as operation, monitoring, measuring, and reporting requirements. GHG emissions will be monitored and reported annually. The potential emissions estimated project are approximately 785,000 tons per year, including approximately 325,000 tons per year of process gas emissions; the remainder are combustion related.

The Project will use a local energy provider for its onsite energy use; therefore, the Scope 2 GHG emissions for energy used in the Project process will depend on the energy portfolio of the provider. However, local energy providers are continuing to add more renewable energy to their portfolio and this trend is expected to continue throughout the Project's life cycle.

The Company has completed (August 2021) an evaluation of a wind power alternative for the project, that could theoretically replace the need for grid electrical power. The analysis concluded that 30 to 35 2 MW wind turbines could be installed in reasonable proximity to the project site to provide electrical power. A grid connection would still be needed under this scenario to sustain operations when the wind is not blowing. The estimated capital cost for this system would be

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\$130-\$170 million. Battery storage of electricity to serve during low wind periods was not considered in this analysis. During the development of this analysis, it became clear that there is substantial community opposition to wind farms in southeast Nebraska. In addition, the incremental increase in capital cost to include the wind power option is substantial for the project and does not appear to be feasible in the context of the current financing environment.

NIOCORP ENVIRONMENTAL AND COMMUNITY ASSESSMENT SUMMARY

Elk Creek, Nebraska - 2022

January 2022

Olsson Project No. 021-06507