

Project Summary Table

Proponent name:	Source Energy Services Holdings Ltd	Date:	September 30, 2021
Project name:	Peace River Mine	Company contact name and information:	Ray Zavery Director, Business Development 500, 438 -11 Avenue SE Calgary, AB T2G 0Y4 T (403) 262-1312 Ext. 238 C (403) 589-5278
Name of company that will hold approval:	Source Energy Services Holdings Ltd	Company website:	https://www.sourceenergy.com/
Type of project (e.g., water management, hydroelectric, etc.):	Open pit silica sand mine	New project, expansion, additional phase or modification:	New Project
Project location (legal land description and municipality):	E 33-084-21 W5M; Northern Sunrise County	Total project area (ha):	The mine area will be approximately 120 ha; however, the final size will be confirmed through detailed engineering
Indicate whether the project is on private, federal or provincial land:	Private Land	List any parks/protected areas/conservation areas that may be impacted:	None affected
Nearest First Nation Reserve(s) and Métis Settlements (name and km):	Duncans No 151A; ~45 km southwest William McKenzie No. 151K; ~45 km southeast Woodland Cree No. 226; ~ 40 km northeast Woodland Cree No. 227; ~ 56 km northeast Peavine Metis Settlement; ~60 km southeast Gift Lake Metis Settlement; ~80 km southeast	Nearest waterway/ water body (name and km):	Peace River; approximately 600 m from the centre of NE 33-084-21 W5M

<p>Nearest provincial highway (# and distance):</p>	<p>Highway 688 (approximately 10 km due east) Highway 2 (approximately 12 km due south)</p>	<p>Potential annual water usage and source:</p>	<p>Typical usage is 80,000,000 gallons or approximately 370,000 m³ annually. The wash plant operations are a closed loop system.</p> <p>Water sources are being confirmed but may include groundwater or surface water from the Peace River. If water is required from the Peace River, it will be transported using a temporary pump and hose to fill water trucks; no permanent intake is required.</p>
<p>Expected types of air emissions (e.g., SO₂, NO_x, CO₂, etc.):</p>	<p>Sources of emissions are from the dryers in the drying plant, haul trucks, vehicle traffic and fugitive sources (haul roads/stockpiles)</p> <p>The following are the typical annual emissions based on SES' operation of silica mines in other jurisdictions:</p> <ul style="list-style-type: none"> • CO: 14.79 metric tonnes • NO_x 7.62 metric tonnes • SO_x below reporting limit (<1.3 metric tonnes) • Particulate: 87.83 metric tonnes • Coarse Particulate (Pm10): 85.94 metric tonnes • O₃ 0.02 metric tonnes 	<p>Types of wastes generated and disposal location:</p>	<p>Waste generated by the project activities will be limited. Expected waste may include domestic waste and general garbage from packaging, scrap metals, which will be recycled, general plastic or cardboard, which will also be recycled and sanitary waste.</p> <p>Small quantities of waste oil and grease may be generated from vehicle maintenance. This will be stored in a manner that does not cause leakage and will be disposed of at an approved waste management facility or recycled at an appropriate recycling facility.</p>

Brief Project Description

Include major project processes and products, components including capacity and size, infrastructure requirements and general project location.

Source Energy Services Holdings Ltd. (SES) has a Metallic and Industrial Mineral (MIM) Permit (No. 930850787) that encompasses approximately 22 quarter sections located within portions of Sections 2 and 3, Township 85 Range 21 W5M and portions of Sections 21, 27, 28, 22 and 34, Township 84, Range 21 W5M. The Permit area is divided into the "East Block" and "West Block". The East Block is located in Northern Sunrise County and the West Block is located in the County of Northern Lights. Land ownership in both blocks is a mixture of Crown Land and freehold land. SES has applied for a mineral lease for the entirety of the MIM Permit.

The proposed silica sand mine will occur on the east side of the Peace River within the E 33-084-21 W5M and is located approximately 10 km north of the town of Peace River. The proposed mine site is owned by Northern Sunrise County. NE 33-084-21 W5M is an active aggregate mine operated by Northern Sunrise County under the Environmental Protection and Enhancement Act (EPEA) registration number 16399-01-00. SE 33-084-21 W5M is currently forested land but is included as part of the aggregate operations approved under the EPEA registration for the aggregate mine. Both quarter sections are designated for natural resource extraction in the Land Use Bylaw.

Site Development Overview

The initial phase of development is proposed within the NE quarter section within the existing Northern Sunrise County gravel pit mine with expansion into the SE quarter section. The proposed silica sand mine will have a similar footprint to the existing silica sand mine located in NW 28-084-21 W5M. The mine area will be approximately 120 ha; however, the final size will be confirmed through detailed engineering. Typical operations will have approximately 15 ha of active mining area but this size may vary depending on market demand.

The processing plant and other buildings will be placed on the NE 33-084-21 W5M. The site layout will likely include several buildings/trailers (e.g., office building, maintenance building, scale house, lunchroom), the processing plant, stockpile areas, and the active mining area. The area used for the buildings, processing plant and stockpiles is typically around 16 ha.

Mining Operations

The proposed mining process is surface mining with extraction rates greater than 45,000 tonnes of material per year but less than 3,500,000 tonnes per year. The exact amount will be confirmed based on resource availability and market demand. Mining operations will include:

- topsoil stripping and stockpiling for future reclamation
- excavation of overburden and silica sand. The overburden deposit is a marketable commodity and will either be stockpiled and sold or reused in reclamation. SES will work with the County to coordinate aggregate extraction under their existing EPEA registration 16399-01-00.
- transport of sand to the plant site
- washing, sorting and drying (see description below)
- loading and transport (see description below)
- reclamation. SES will use progressive reclamation and will target a 50:50 ratio of active mining areas to reclaimed mining areas.

The extracted silica sand will be sorted into the various particle sizes in the processing plant. The processing plant includes both a wet and a dry portion. The wet portion uses hydrosizing to complete the initial separation of material based on particle size. Sorted silica sand is then stockpiled and dewatered. Once the material is dry, it is processed in the dry plant that uses screens to sort and separate the silica sand. The material from the dry plant is stored in silos and then loaded onto trucks for shipping.

The processing plant may operate 24 hours per day but other activities (e.g., mining, trucking) will likely not occur 24 hours per day. It is anticipated that at least 25-40 people will be employed directly on the site to operate the mining activities and processing plant. The initial mining activities and construction may employ additional staff.

Water Use

Water is required to operate the wet plant. SES is still in the process of determining if the water source will be from groundwater or surface water and requires additional studies (e.g., hydrogeological investigation) to make this decision based on availability. If surface water is required, water from the Peace River will be used. Water will be collected using a temporary submersible pump and transported using a water cart. No permeant water intakes are required. Typical water use for SES' similar operations is 50,000,000 gallons or approximately 200,000 m³ annually. Water extraction is greatest when the wet plant is first operated as the storage tanks need to be filled. However, once the plant is operating, the wet plant is a closed loop system and water is filtered and recycled for reuse. Surface water runoff from the stockpiles will be collected and reused in the wet plant. There is no expected discharge of water into the Peace River

The mine plan will also evaluate surface water runoff and will include perimeter ditches and stormwater management ponds for collection of surface water runoff.

Transportation

The transportation route is proposed to follow the existing route used by the adjacent silica sand operation. This truck route follows range road 213 south, east on township road 842 and then either south on Highway 688 to Highway 986 or south on Highway 688 to Highway 2. It is expected that the silica sand will be transported for use in and around the Grande Prairie area.

Air, Noise and Waste

Air emission sources and expected annual quantities are summarized above along with waste management.

Noise sources include trucks, construction equipment and dryers. Noise generated from mining activities are expected to be below 60 decibels at the property boundary edge based on SES's other operations.