Spring Creek Mine – Assessment of Environmental Effects

3 May 2024

Background

This document sets out a high level assessment of the anticipated and known adverse environmental effects of reopening Spring Creek Mine. At the time of writing, Terra Firma has yet to be granted a mining permit from NZ Petroleum and Minerals (NZP&M), and so has not commenced the process to secure resource consents from Grey District and West Coast Regional Councils.

The previous operator held a suite of resource consents for various activities from West Coast Regional Council and Terra Firma will be seeking to reconsent many of these activities, albeit at a smaller scale. In addition, Terra Firma requires a land use consent from Grey District Council for mineral extraction and ancillary activities (previously these activities were covered by a coal mining licence (CML)).

Coal Mining Process - Overview

There will be two distinct stages of activity on the site. Stage 1 will include dewatering the mine, repairing / replacing site infrastructure, constructing a third roadway from surface into the mine, building offices and the bathhouse, and other activities necessary for re-establishing the site for mining operations. Stage 2 will be mining operations, commencing with the development of Panel 9B, from the existing underground roadways.

Stage 1 – Site Re-establishment Activities

During Stage 1, site activity is likely to be on weekdays only from 7.00am to 7.00pm. A small team of staff and contractors will be travelling to and from the site on a daily basis. An unknown quantity of mine water will need to be removed from the mine and discharged to Seven Mile Creek, following treatment if necessary. There will be some truck movements associated with transport of plant and machinery, supplies and waste rock from roadway construction. It is intended that much of the waste rock is placed on the mine site, although some may be placed as fill nearby. New offices will be constructed at the mine carpark for surface staff. The bathhouse location has yet to be determined but will be remote from residents.

Stage 1 activities are expected to take between 12 and 18 months.

Stage 2 – Mining Operations

Coal will be extracted by continuous miners and brought out from the mine by a system of conveyors, discharging into a loading bin on the surface. Trucks will transport the coal approximately 2km on a sealed mine haul road to the existing Rocky Creek coal processing plant owned and operated by Birchfield Coal Mines Ltd (BCML). The mined coal will be classified, blended and processed off site.

Underground water use for dust suppression, drilling, mechanised coal cutting and motor cooling will be reticulated from surface.

The mine will operate 24 hours a day on three shifts. Buses and cars will transport staff to and from the bathhouse and to and from Greymouth, for each shift. Shift changeover periods will be 6.30 to 7.30am, 1.30 to 3.30pm and 9.30pm to 10.30pm. Approximately 15-20 people will be on each shift Monday to Friday and a small team of 3 to 6 people will work Saturday and Sunday carrying out maintenance and ancillary functions.

Surface activities include operation of the main ventilation fan, operation and maintenance and plant and equipment, general workshops, the conveyor/loading system, supplies storage, equipment storage and the explosives magazine. Power is currently in place and conveyed to the site via overhead powerlines.

Water is required for general surface activities and underground activities. The take point on Seven Mile Creek has yet to be determined. Rain water will be collected from roof tops and stored in 5 x 30,000L tanks to provide additional stored water for fire fighting and emergency use. Water pumped from the mine together with surface stormwater will be treated and recycled or discharged to Seven Mile Creek.

Site stormwater and groundwater (pumped from the mine as part of normal operations) will be collected in a sump and treated as necessary before discharge to Seven Mile Creek. Wastewater will be collected and treated as necessary before discharge to land.

Visual and Amenity Effects

The mine site is located in a steep sided, bush-clad valley adjacent to Seven Mile Creek and rises towards the northeast. Dunollie is located southwest of the mine site, with the nearest dwelling at least 850m from the site. Most of the existing structures on site are single storey, with the exception of the two storey conveyor system and loading bin. New single storey offices will be constructed in the carpark area. Structures will not be visible to the public from outside the Spring Creek Road controlled access gate. With the addition of the new offices, building coverage will be approximately 100m^2. Mine operation will be 24 hours a day, seven days a week and will require outdoor task and amenity lighting at night. Lighting structures will be oriented to minimise leakage beyond the site.

The bathhouse location has not been determined, but due to limited level land available on the mine site is likely to be closer to Dunollie, although not near residential areas. The single storey building is likely to be up to 120m^2 and painted in a receding colour, with landscaped grounds and carpark. Night lighting will be designed to minimise light leakage.

Considering the above, the visual and amenity effects of the mine operation and bathhouse activities are likely to be less than minor.

Noise Effects

During Stage 1, noise sources will be associated with the repair, maintenance and recommissioning of the site, plant and equipment and buildings, plus mine dewatering activities and construction of the third tunnel, site offices and bathhouse.

Once the mine is operational (Stage 2), potential noise generating activities will occur throughout the 24 hour shift and include:

- Mining equipment
- Ventilation fan operation
- Maintenance workshop activities
- Conveyor operation
- Coal trucks
- Other heavy and light vehicles
- Pumps, compressors and generators
- Alarms, radios and signals.

Due to the confined nature of the site, distance from residents and the prevailing westerly wind, mine site noise is unlikely to be detectable by residents, particularly given other background noise in the area (Rocky Creek coal processing plant, traffic on State Highway 6 and railway movements).

Sources of noise at the bathhouse during shift changes will be vehicle arrivals / departures and people. These routine events will be managed through speed restrictions and staff protocols to minimise noise disturbance, although the bathhouse will be remote from residents.

Overall, while the noise levels at the mine site are currently unknown, noise effects on nearby residents are expected to be less than minor.

Effects from Underground Blasting

Underground blasting could take place at any time in the 24 hour shift, principally during development of the third roadway. Strict blasting controls and the distance from the mine means that blasting noise and vibration effects will be undetectable by residents.

Traffic Effects

Vehicle access to Spring Creek Mine is from Spring Creek Road, via a controlled entry gate. The road beyond the gate up to the mine site has been constructed to a standard suitable for coal trucks and there will be protocols to reduce conflict between light and heavy vehicles.

During Stage 1, a combination of light and heavy traffic will travel to and from the mine site, transporting plant and equipment, and personnel involved in the initial mine dewatering and site re-establishment. The route to the site will be via Inverness Street.

Once routine mine operations commence in Stage 2, traffic movements will mostly comprise commuting staff and coal transport. As noted above, shift staff (expected to be 15-20 persons per shift) will travel to and from the mine at the start and finish of each shift either by bus or car. A car park will be created to accommodate the expected number of vehicles.

Coal trucks will travel between the mine and the coal processing plant via the haul road, which is a private access to the coal processing plant. There will be approximately 20 return trips a day.

Visitors to the mine including suppliers, contractors and regulatory authorities will make a small contribution to traffic movements.

The proposed use of shuttle vehicles, and the restriction of public access to Spring Creek Road and the haul road means that traffic effects of both light and heavy vehicles are likely to be less than minor.

Dust Effects

Potential dust sources include unsealed roads within the mine site, transport of material from construction of the third tunnel, waste rock placement and coal transport (conveyors and trucks). Additionally, dust may be present in the ventilation discharge from 'stone dust', a limestone product used to coat exposed coal surfaces. Dust control methods including water spraying and covering truck loads are well understood and will be used as necessary to reduce dust effects on the mine site, roads and surrounding properties. Dust effects will be less than minor.

Underground Gas Effects

Underground workings will be ventilated with fresh air to reduce the concentration of potentially dangerous gases generated through mining, people and the operation of diesel plant and equipment. The main fan and underground auxiliary fans will deliver fresh air throughout operational areas.

Air discharged from the mine will contain very small concentrations of carbon monoxide, carbon dioxide, methane, nitrogen and volatile organic compounds. These will be at lower concentrations than previously consented, due to the lower production rate, even though the ventilation rate will be similar.

There will not be any adverse air quality effects from the discharge of ventilated mine gases.

Earthworks/Mineral Extraction

During Stage 1 and following mine dewatering, a third tunnel will be constructed to the east of the two existing underground roadways using a combination of drill and blast and mechanical excavation to remove an estimated 9,000m^3 of *in situ* sandstone. The excavated material will be transported by truck from the tunnel entrance, with some used as fill on-site and the remainder taken off site for placement at location/s yet to be confirmed, but likely to be near Rocky Creek processing plant. The estimated total rock volume is 11,000m^3.

Wherever the rock fill is placed, control measures such as cutoff drains and settling ponds will be implemented to capture and treat sediment-laden water, prior to discharge to Seven Mile Creek.

Due to the depth and geological setting, surface subsidence is not expected. A surface monitoring programme and ongoing geotechnical assessment will be established.

Terra Firma will seek technical expertise from Dr Paul Weber of Mine Waste Management to characterise mined material and design waste rock piles and run off treatment.

Effects on Water Quality

Seven Mile Creek drains through lowland native forest to the northwest of Mt Davy and runs immediately alongside the mine site, passing to the north of Dunollie before discharging to the sea at Rapahoe. West Coast Regional Council (WCRC) monitors for water quality and ecological parameters at four points in this waterway:

- Upstream of Tillers Mine Creek (i.e. upstream of Spring Creek Mine)
- Dunollie 400 m upstream of Oxidation Ponds
- 300 m downstream of Raleigh Creek
- At SH6 Rapahoe.

The water quality monitoring portal Land Air Water Aotearoa (LAWA) website www.lawa.org.nz) notes that that Seven Mile Creek is impacted by municipal oxidation ponds and septic tank discharges, along with historical and current mining activity. There is also agricultural runoff in the catchment.

Resource consents held by the previous operator authorised the discharge of treated water to Seven Mile Creek. Currently, site stormwater and groundwater (discharging naturally from the mine) drain to a sump located near the bridge over Seven Mile Creek, prior to discharge. This existing system, along with site drains and bunds around diesel and chemical storage areas will be checked and repaired if necessary prior during site re-establishment, and possibly reconnected to a lamella treatment plant that was understood to be in use during previous mine operation.

Although the groundwater pumped from the mine during the dewatering process will be free of sediment, it is unknown whether it requires chemical treatment e.g. pH adjustment, prior to discharge. If the water chemistry is favourable, it could be discharged directly to Seven Mile Creek without treatment. After dewatering, groundwater will continue to enter the mine and will be collected in underground sumps then pumped out for settling and possible treatment before discharge to Seven Mile Creek.

The wastewater collection and treatment systems for the mine site and the bathhouse will be designed and operated in accordance with West Coast Regional Plan rules and will have minimal effects on water quality.

The dominant rock in the Spring Creek geology is sandstone which is unlikely to result in acidic mine water. Boron may be naturally present along with very small traces of nitrates and nitrites produced when blasting activities take place. Terra Firma will engage technical expertise to characterise the chemistry of discharge streams, to inform design of treatment systems.

As noted above, the WCRC monitors for ecological health at four points on Seven Mile Creek, so some data is available. Looking at median data for the past five years, macroinvertebrate indices show a degradation in health between upstream of Tillers Mine Creek (upstream of Spring Creek Mine) and at Dunollie 400m upstream of the municipal oxidation ponds. Terra Firma will undertake background ecological monitoring prior to commencing mine operations, to quantify ecological health of Seven Mile Creek and inform discharge water quality conditions. Conditions of the previous discharge permits will also be a consideration.

Effects on Stream Flows

The total quantity and rate of water take from Seven Mile Creek is not yet known but will be less than was previously consented, and will be undertaken to minimise adverse effects on stream flows. The 150,000L of stored water in the storage tanks at the mine site will assist with managing the rate of water take in dry weather conditions.

Ecological Effects

The Proposed TTPP maps indicate that a small area in the west of the mining permit area potentially overlaps with a Significant Natural Area (SNA). No surface activities are proposed in this area and there will be no effects on vegetation, SNA or otherwise. There are no SNAs indicated on the physical mine site or any other land likely to be associated with mining activities (such as the bathhouse). There is a possibility that additional drill sites may need to be established within the mining permit area. The timing and location of these have not yet been determined but will not be required for at least 10 years after mining has commenced. Terra Firma will apply for the necessary resource consent/s and address any potential ecological effects at that time.

Although there will be minimal ecological effects, Terra Firma considers that as part of its social licence to operate it should contribute to improved environmental outcomes. Accordingly, Terra Firma proposes to implement a significant pest eradication programme within the Paparoa Range. However, after consultation with DoC the company will consider funding a focused programme at another location where this might contribute to a better environmental outcome.

Hazardous substances and waste management

Mining activities require certain hazardous materials including grout, resins and explosives. Other hazardous substances used onsite include diesel, oils and greases. Hazardous substances management, such as storage design and bunding, is well-understood and will be implemented to avoid adverse effects. Waste generated during mining activities, such as waste oil, and general site waste, will be removed for lawful disposal off site.

Recreational Effects

There is a swimming spot in Seven Mile Creek at State Highway 6, Rapahoe. This is monitored by WCRC and has a long term quality rating of ‘Poor’. It is understood there are other swimming spots on the waterway. The quality of discharges from the Spring Creek mining operations will not have any adverse impact on recreational water quality.

There is public access to a walkway that follows the south bank of Seven Mile Creek along an old rail trail through historic mine sites. The Spring Creek Mine site (on the north side of the creek) is currently visible from part of the walkway and will not change much in appearance once mining commences. Mine operation noise will be detectable when passing the site. Walkway access will be reviewed once mining operations commence to ensure safety of users.

Cultural and Archaeological Effects

The Grey District Plan maps do not indicate any cultural or archaeological features on the Spring Creek Mine site. Maps 45 and 51 of the TTPP show a Pounamu Management overlay. None of the mining or ancillary activities will have any impact on pounamu recovery. Terra Firma has engaged with Te Rununga o Ngati Waewae, which has indicated strong support for the project and for becoming a project partner. Terra Firma will continue to engage with Ngati Waewae as the project commences.

Heritage Effects

Neither the Grey District Plan maps nor the Proposed Te Tai O Poutini maps indicate any heritage features on the Spring Creek Mine site. Proposed activities will have no adverse heritage effects.