



Decision Document

Environmental Protection Act 1986, Part V

Proponent: Independence Nova Pty Ltd

Licence: L8880/2015/1

Registered office: Suite 4, Level 5, South Shore Centre,
85 South Perth Esplanade
South Perth
Western Australia 6151

ACN: 146 091 527

Premises address: Nova Nickel Project
Eyre Highway
FRASER RANGE WA 6443
Being Mining Tenement M28/376

Issue date: Thursday, 30 April 2015

Commencement date: Monday, 4 May 2015

Expiry date: Wednesday, 3 May 2023

Decision

Based on the assessment detailed in this document the Department of Water and Environmental Regulation (DWER), has decided to issue a licence amendment. DWER considers that in reaching this decision, it has taken into account all relevant considerations and legal requirements and that the Licence and its conditions will ensure that an appropriate level of environmental protection is provided.

Decision Document prepared by: Katrina Burke
Licensing Officer

Decision Document authorised by: Tim Gentle
Delegated Officer



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1 Purpose of this Document

This decision document explains how DWER has assessed and determined the application and provides a record of DWER's decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to DWER's assessment and decision making under Part V of the *Environmental Protection Act 1986*. Other approvals may be required for the proposal, and it is the proponent's responsibility to ensure they have all relevant approvals for their Premises.

2 Administrative summary

Administrative details		
Application type	Works Approval ☐ New Licence ☐ Licence amendment ☒ Works Approval amendment ☐	
Activities that cause the premises to become prescribed premises	Category number(s)	Assessed design capacity
	54	192 cubic metres per day
	64	1,000 tonnes per year
	5	1,750,000 tonnes per year
	52	19.5 MW load (diesel)
Application verified	Date: 14/11/2016	
Application fee paid	Date: 28/11/2016	
Works Approval has been complied with	Yes ☒ No ☐ N/A ☐	
Compliance Certificate received	Yes ☒ No ☐ N/A ☐	
Commercial-in-confidence claim	Yes ☐ No ☒	
Commercial-in-confidence claim outcome		
Is the proposal a Major Resource Project?	Yes ☐ No ☒	
Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the	Yes ☒ No ☐	Referral decision No: n/a Public Advice Letter ref: 14-



Environmental Protection Act 1986?		848947 Managed under Part V ☒ Assessed under Part IV ☐
Is the proposal subject to Ministerial Conditions?	Yes ☐ No ☒	Ministerial statement No: EPA Report No:
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the <i>Environmental Protection Act 1986</i>)?	Yes ☐ No ☒	Department of Water consulted Yes ☐ No ☒
Is the Premises within an Environmental Protection Policy (EPP) Area Yes ☐ No ☒ If Yes include details of which EPP(s) here.		
Is the Premises subject to any EPP requirements? Yes ☐ No ☒ If Yes, include details here, eg Site is subject to SO ₂ requirements of Kwinana EPP.		

3 Executive summary of proposal and assessment

The entity name of the Licence Holder has been altered since the last amendment to this licence. Sirius Gold Pty Ltd was renamed Independence Nova Pty Ltd (Owned by Independence Group NL [IGO]) on 18 April 2016. The ACN remains the same and a relevant ASIC Certificate of Registration on Change of Name was appended to the application. The Licence Holder is hereafter named 'Independence Nova'.

The previous Licence Holder developed the greenfield site the Nova Nickel Project (the Project) approximately 8 km east of the Fraser Range ridge for the underground mining of nickel and copper deposits on mining tenement M28/376. The estimated total area of disturbance for the Project is 1,100 hectares (ha) comprising 400 ha for the mine and 700 ha for the access road and associated borrow pits. The Project life of mine is estimated to be approximately 10 years although exploration is ongoing and extension of project life may occur.

Premises Description

Category 5 – Processing Plant, Paste Plant and Tailings Storage Facility (TSF)

Approximately 12 million tonnes (Mt) of tailings (dry) will be produced from the Processing Plant over the life of the project. This will comprise two tailings streams referred to as flotation tailings and pyrrhotite tailings that will be disposed of by:

- formation of a paste from a portion of flotation tailings for disposal into mined stopes underground. Approximately 5.7 Mt (61% of the flotation tailings mass) is likely to be disposed in this manner over the life of the project; and
- combining the remaining 3.7 Mt of flotation tailings and pyrrhotite tailings (2.6 Mt) prior to disposal into the TSF.

The Processing Plant throughput is anticipated to be up to 1,750,000 tonnes per year producing greater than 220,000 tonnes of nickel concentrate and 45,000 tonnes of copper concentrate per



annum. Concentrate is transferred directly from the Processing Plant filter discharge into an enclosed concentrate shed. The concentrate is stockpiled to form separate product windrows. From here, the concentrate is loaded in sealed containers onto trucks and transported offsite.

The Paste Plant

The Paste Plant generates fill from low pyrrhotite Process Plant tailings which is used to fill underground mine voids. The maximum Paste Plant throughput is anticipated to be 815,000 tonnes per year.

Tailings Storage Facility

Prior to commissioning of the Processing Plant in 2016, the TSF stored dewater from the underground mining area. The TSF is composite lined with 2.0mm thick HDPE geosynthetic liner over 300 mm of clay, which combined have a permeability of less than 10^{-9} m/s. This was designed and installed to reduce seepage potential as the facility receives excess dewater/ water from underground mining, two streams of tailings slurry from the Processing Plant thickener, RO brine and filter backwash, excess water from the raw water tank and treated wastewater from the Waste Water Treatment Plant (WWTP). Excess water within the TSF is removed via decant facility and transferred via pipeline to the Process water tank at the Processing Plant for recycling.

Category 52 – Power Station

The Power Station comprises diesel fuelled generator sets: five GE12V250 (3.0 MW) and three MWM TCD20 (1.7 MW). The load is 14.2 MW, with an average demand of 12.5 MW. The total premises production will total 19.5 MW capacity. The Power Station will consume approximately 3000 L of fuel an hour running at 12.5 MW. Power distribution is via overhead power lines, distributing 11kV power to the site.

Category 54 – Waste Water Treatment Plant

The Modular Submerged Aerated Filter (SAF) WWTP is currently licenced under L8880/2015/1 and can treat an instantaneous peak maximum flow of 192 m³/day. The previous disposal location for this WWTP was (monitoring) point L1, a 4 hectare irrigation area. The Class A treated effluent disposal location is being altered as part of this amendment, with the treated effluent being piped to the TSF. The irrigation area has not been decommissioned. The WWTP has a contingency storage capacity for up to two days of normal flow if discharge is suspended.

Category 64 – Class II or III putrescible landfill site

The Project operates a putrescible landfill capable of accepting up to 1,000 tonnes per annual period. The landfill accepts putrescible and inert wastes from the accommodation village, offices, clean fill as well as waste tyres and plastics. The landfill was originally constructed under Works Approval W5613/2014/1 as a category 89 putrescible landfill but was later revised to increase the throughput volumes.

Other non-prescribed activities

Other activities that are not prescribed but have the potential to generate discharges and emissions on site include:

- Batch Plant (Concrete) (see Map Schedule 1) – complying with *Environmental Protection (Concrete Batching) Regulations 1998*. Loose materials will either be stored in silos or open storage areas that will be constructed to obstruct wind and fitted with sprays for dust suppression.
- Fuel farm (bulk and satellite storage) – All stored in accordance with the Dangerous Goods (Storage and Handling of Non-explosives) Safety Regulations 2007 and Australian Standards 1940 and 1692;
- Washdown and waste oil facility – Runoff from the washdown facility will accumulate in a sump which is sized to enable a loader to clean out the solids periodically. Overflow water from the sump



will enter an oily water treatment system to enable any hydrocarbons to be collected.

- Bioremediation pad – 50m x 50m bunded and lined with a high density polyethylene (HDPE) liner.
- Reverse osmosis (RO) plants – Brine water (68,000 mg/L TDS) and RO filter backwash will be discharged to the TSF for reuse in processing.. The potable water RO plant is located near the WWTP and the RO Plant for processing requirements is located immediately to the north of the concentrate shed.
- Pipeline network delivering tailings, raw water, potable water, WWTP influent and effluent and RO brine and filter backwash.

Location and siting

Sensitive landuses

There are landuses within 40 km of the Project that are considered by DWER to be sensitive.

Specified Ecosystems

The project is located within the Great Western Woodlands. A Priority 1 Ecological Community (Fraser Range PEC) is located partially within the M28/376 Premises boundary, in a northern section of the Premises. The Fraser Range PEC 'Fraser01, FraserR(NB80)' has a 500m buffer. ID number 169, Unique OCC 433 - Fraser Range vegetation complex. The northern portion of the Processing area encroaches into the Fraser Range PEC buffer, with 2 access roads to the north and northeast of the Premises entering into the Fraser Range PEC, itself.

Topography

The Project lies approximately 8 km to the east of the main Fraser Range ridge, which extends from approximately 130 km in a southwest to northeast direction with a maximum elevation of 570 m (Mount Pleasant). Topography within the Project area is almost flat to gently undulating, with elevations ranging from 290 to 310 mAHD.

Geology and soils

The Project is located within the Albany-Fraser province which extends along the southern and south western margin of the Yilgarn Craton. It consists mainly of orthogneiss and granite but also includes large sheets of metagabbro (including the Fraser Complex), remnants of mafic dykes and widespread metasedimentary rocks¹.

The Project consists of two deposits, Nova and Bollinger. The Project site is overlain with a thin (between 0 and 35 m) cover of surficial materials ranging from clay to sands. A sequence of saprolite clay lies under this layer and is less than 50 m in depth. Meta-sedimentary units intruded by a sequence of mafic (trending to ultramafic) gabbro composes the basement geology. This gabbro hosts the mineralisation of the Nova and Bollinger deposits; however, there are large areas of un-mineralised gabbro that form sections of the hanging wall units at the east of the deposits. Nickel-copper mineralisation at Nova consists of a primary assemblage of pyrrhotite (FeS), pentlandite ((Ni, Fe)S) and chalcopyrite (CuFeS₂), with small amounts of magnetite (Fe₃O₄) and garnet. Pyrrhotite is the dominant sulphide mineral, often forming a mosaic of interlocking crystals. Pentlandite stringers often separate and cross cut pyrrhotite crystals, and are usually 1 to 20 mm wide and relatively short in length (5 to 30 cm). Chalcopyrite mineralisation can form either in patches or be hosted in veins segregated within and peripheral to massive and disseminated ores.

Eleven composited ore samples were submitted to ALS Environmental for fibrous material determination. In all cases no asbestos/fibrous material was detected (Sirius 2014²).

Regional and local hydrogeology and hydrology

The Project is located within the Goldfields Groundwater area, Subarea Lefroy-Dundas from within



Combined - Fractured Rock West - Fractured Rock. The Project sub-surface area is characterised by low relief and east to south east draining palaeodrainage systems, underlain by deeply weathered Archaean sequences. Investigations have indicated that groundwater below the Project is saline (TDS 35,000 to 41,000mg/L ([GRM, 2014]) and is at least 40 m below the surface. Groundwater typically occurs in surficial aquifers forming part of the palaeochannel sequence and in fresh and weathered fractured rock aquifers. The depth to groundwater varies between approximately 40 m to 65 m below ground surface. Groundwater is recharged by direct rainfall infiltration or by stream flow during episodic rainfall events. The recharge occurs mainly on or adjacent to the catchment divides, beneath which are corresponding, subdued groundwater divides.

Modelling indicated that surface runoff from Fraser Range drains in a northeast direction, flowing to the south of the Project. Runoff from the Project joins this channel adjacent to the eastern boundary of the Project area. In the central eastern section of the study area there are a number of small depressions which drain local catchments. In the southeast of the project area are a number of large catchments which drain to a series of depressions (probably salt lakes) (JDA 2013 ³).

Meteorology

The climate of the Project area is semi-arid to arid with period of intense but sporadic rainfall during the summer months. The Fraser Range Rainfall Station (BOM Station number 12029) has records from 1901 that indicate a mean annual rainfall of 313.2 mm. Higher rainfall volumes were recorded in the summer months between December and March. The nearest BOM weather monitoring site that accesses climate statistics additional to rainfall is the Balladonia Station (BOM Station number 011017, 110km east south east of the Project). Records from this station are from 1901 to current day. The recorded mean maximum temperatures vary between 17.6°C in July and 31.3°C in January. The Project falls within the 2000 to 2400mm annual average total pan evaporation contours (BoM, 2016 ⁴)

Clearing

Several purpose permits have been granted to allow clearing for the Project. These comprise:

- purpose permit (CPS 6357/1): granted by the DMP on 31/12/2014 expiring 31/1/2020 for the purpose of airstrip and associated infrastructure construction. This was to clear up to 80 hectares of native vegetation within a total boundary of approximately 256 hectares. The vegetation condition within the area was classed as very good to excellent.
- purpose permit (6253/1) was granted by the DMP on 31/12/2014, expiring 31/1/2020 for the purpose of Mineral Production and Associated Activities. This was to clear up to 460 hectares of native vegetation within a total boundary of approximately 4666 hectares. The vegetation condition within the area was classed as very good to excellent.

Part IV of the EP Act

The Project was referred (ID: 14-848947) to the EPA in June 2014 by the former owner, Sirius Gold Pty Ltd. The project was determined by the EPA as 'Not Assessed – Public Advice Given' in August 2014.

The preliminary environmental factors that may be impacted were identified by the EPA as Flora and vegetation, terrestrial fauna, rehabilitation and closure. The EPA considered that any potential impacts could be evaluated and mitigated under Part V of the EP Act and the *Mining Act 1978*. The EPA noted that the majority of tailings would be placed underground. With regard to the surface tailings storage facility, the EPA noted that the tailings are predominantly pyrrhotite and therefore generally less reactive than pyrites. Testing also indicated that provided the tailings were kept saturated, the primary potential issue for tailings management is likely to be highly saline seepage. To maintain saturation it was noted that the facility would be lined and at closure would have a moisture store and release cover to manage oxidation potential of the tailings and subsequent generation of acid and metalliferous



drainage (AMD). The EPA further noted that no asbestiform materials (which can sometimes be associated with nickel deposits) have not been detected.

There is no Ministerial Statement for this Project.

Other approvals

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The Project was not referred under the EPBC Act.

Rights in Water and Irrigation Act 1914 (RiWI Act)

Groundwater Licence (GWL) 176816 for an allocation of 2,090,000kL expires on 20/2/2025. The licence area covers M28/376 (Nova Project) and L69/22, E63/1517, E28/2177, E69/2663.

Mining Act 1978 (Mining Act)

Seven Mining Act Mining Proposals have been decided for the Project by the DMP since 2014. These comprise:

- Stage 1 Mining Proposal - Nova Nickel Project, (Reg ID 52685) decided 16/12/2014
- MP Amendment Additional Water Bores M28/376, (Reg ID 54486) decided 5/5/2015
- Nova Project Solar PV & Infrastructure Mining Proposal on M28/376, (Reg ID 57784) decided 25/11/2015
- Mining Proposal Additional Fresh Air Rises, M28/376, (Reg ID 58224) decided 8/1/2016
- Mining Proposal Additional Underground Infrastructure M28/376, (Reg ID 59325) decided 17/6/2016
- Underground Waste Transfer Pad and Other Minor Items Mining Proposal, (Reg ID 60172) decided 21/9/2016.
- A 'Borefield Extension Mining Proposal Nova Project M28/376' (Reg ID 64905) was lodged with DMP on 24/03/2017. This proposal was decided on 7 April 2017.

Works Approval W5752/2014/1

The Project received a Part V works approval W5752/2014/1 in January 2015 and carried out construction and subsequent licencing in stages.

Stage 1 comprised: Mine dewatering infrastructure, water pipeline, turkeys nest construction.

Stage 2 comprised: TSF, landfill and WWTP construction.

Stage 3 comprised: Processing Plant, Paste Plant and Power Station (construction completed October 2016).

There was one amendment to the works approval in July 2015 to allow a change to the crushing circuit of the processing facility. Originally crushed ore from the surge bin would overflow, forming an emergency stockpile to be fed into the milling circuit via front end loader. The amendment allowed for material to overflow onto a conveyor system to an emergency stockpile. The amendment allowed stockpile height to be (nominal) 6.4 m high with a capacity of 750 tonnes, equating to four hours of feed. The ROM (Run of Mine) pad height nominal height was also amended to allow a maximum height of 8 m.

Licence L8880/2015/1

There have been two licence amendments since the issue of the first licence on 30/4/2015. The first amendment (on 2/7/2015) was to permit a larger WWTP and the second (on 24/9/2015) was to permit the operation of the (12,000m³) TSF as a containment facility for mine dewater. The TSF was constructed under Works Approval W5752/2014/1. As the TSF was HDPE lined, dewatering into the TSF was not considered a discharge to land. Therefore category 6 (mine dewatering) and category 5 (processing or beneficiation of ore) was not applied to the last amendment of the Licence.

Current Licence amendment – July 2017



This licence amendment is to incorporate constructed category 5 (Processing Plant) and Category 52 (Power Station) onto Licence L8880/2015/1. This will allow the TSF to receive tailings from the Processing Plant and will also allow the operation of the Paste Plant. Excess Paste Plant tailings are to be disposed at the licenced TSF via the Tailings Thickener. The licence amendment will also allow the Power Station to operate.

Water collected underground during operations will be stored in underground sumps and re-used for underground services (drilling and dust control). Excess water will be transferred from underground to the TSF where it will be recovered via a floating decant system.

The TSF will receive a combination of tailings (comprising low and high pyrrhotite tailings) from the Processing Plant, excess water from underground mining, RO brine and treated effluent from the WWTP. Decant water from the TSF will be fed via pipeline back to the Process Water Tank at the Processing Plant for reuse.

Trucks will be washed down to limit transfer of nickel and copper concentrate (via wheels or body of the truck) within the site and off site. Wash down of trucks will take place at a hardstand area at the copper and nickel concentrate shed. Wash down water is retained within a closed system. Although not currently in use, independence Nova have requested that the existing WWTP irrigation area be retained for future use should the need to dispose back to that location, arise. Only minor amendments have been applied to the monitoring of emissions to land at (WWTP irrigation) monitoring point L1. These are to allow for the recommencement of parameter monitoring, should deposition of treated wastewater recommence at L1.

The expiry date of the licence has been updated as per previous notice of amendment dated 29 April 2016.

There are no alterations to the Landfill (Category 64) conditions as a result of this amendment.

DWER's risk assessment is provided in Section 4, with further amendment-specific details in Appendices A to D.

References

¹ Martinick Bosch Sell Pty Ltd, 2014. *Works Approval Nova Nickel Project*, M28/376 Sirius Gold Pty Ltd October 2014.

² Sirius Gold Pty Ltd, 2014. *Nova Nickel Project Definitive Feasibility Study*. Report prepared by and for Sirius Gold 2014.

³ JDA Consultant Hydrologists (JDA), 2013. *Nova Nickel Project, Fraser Range Surface Water Management 2D Surface Water Modelling*. Unpublished report prepared for Sirius Resources NL.

⁴ BoM, 2017. *Evaporation: Average Monthly & Annual Evaporation - Average pan evaporation Annual map*. Date website accessed 5/4/2017. Based on records between 1975 and 2005.



4 Risk Assessment

The following table (Table 1) provide the assessed risks for the operation of Categories 5 and 52. The risk assessment was conducted in accordance with the risk criteria and rating matrix as provided within DWER's Guidance Statement Risk Assessments Part V, Division 3, *Environmental Protection Act 1986* (February 2017) and as provided in Tables 2 and 3 within this document.

Table 1: Risk assessment for proposed amendment during operation

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
Cat 5 Processing or beneficiation of metallic or non-metallic ore	Movement of tailings and decant water via HDPE pipeline (includes brine from RO plant)	Tailings, brine or decant spillage from pipeline failure outside TSF	Groundwater below the operation area Land and vegetation near the operation area	Land: Seepage of tailings/decant water through soil profile	Contamination of surrounding soils with hypersaline tailings, brine from RO plant, metals and metalloids affecting soil and groundwater quality, causing vegetation stress or death and reducing rehabilitation potential.	Moderate	Unlikely	Medium	The overall risk has been determined taking the following into consideration, providing a likelihood of 'unlikely': Pipelines are located within bunds to ensure all liquors are captured and are not released to the environment, pipelines have isolation valves at appropriate intervals, sumps occur along above ground pipeline corridors to ensure leaks or spillages are contained, tailings and return water pipelines are fitted with flow and leak detection sensors to alert personnel of a potential leak.



Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
	Tailings and brine (from RO plant) deposition and storage in the TSF	Seepage from the TSF	Groundwater below the TSF Land and vegetation near the TSF	Land: Seepage of combined tailings liquor and RO brine through soil profile	Groundwater contamination/ alteration of groundwater chemistry Groundwater mounding creating adverse impacts to the health and survival of adjacent native vegetation	Moderate	Possible	Medium	The overall risk has been determined taking the following into consideration: Investigations have indicated that groundwater below the Project is saline (TDS 35,000 to 41,000mg/L ([GRM, 2014]) and at least 40 m below the surface. There is a network of six licenced monitoring bores located around the TSF. Monitoring of these bores conducted since bore installation have indicated that all bores are consistently dry, indicating that groundwater seepage or mounding is not likely to have occurred whilst the facility has been used as a water storage facility. Readings from vibrating wire piezometers installed in the TSF embankment have also been dry during monitoring. This information suggests that whilst the TSF has



Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
									been a water storage facility, prior to tailings being deposited during commissioning, that the facility has not displayed evidence of seepage. The likelihood has therefore been deemed as 'possible'. The risk remains as 'medium' given the proximity of the TSF to native vegetation (Great Western woodlands) including the Fraser Range Priority Ecological Community.
	Tailings pond	Overtopping of TSF from heavy rainfall resulting in tailings liquor outside of containment infrastructure	Terrestrial ecosystems - surrounding soils, vegetation and minor drainage lines	Land and water	Contamination of surrounding soils with acid, hypersaline tailings, metals and metalloids, dissolved solids affecting soil and groundwater quality and causing vegetation stress or	Moderate	Rare	Medium	Overtopping of the TSFs is anticipated to be 'rare' given the designed freeboard of 500mm, decant operation removing excess water and inspection management measures proposed by Independence Nova.



Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
					death.				
	Tailings pond	Pooled tailings/ brine and WWTP effluent	Birds, bats or other wildlife	Birds or other wildlife drinking or coming into contact with tailings pond	Consumption of tailings /decant water containing acidic, hypersaline water, metals, metalloids and other dissolved solids could cause fauna mortality	Slight	Unlikely	Low	It is unlikely that birds or other fauna will access the TSF pond as research conducted on birds (in the context of gold mines in the Goldfields) has determined that birds will not drink hypersaline solutions (i.e. above 50, 000 mg/L TDS) (Adams M.D., et al (2008)). The RO plant discharges brine with 70,000mg/L TDS, which is significantly higher than the tolerance level discussed in the research.
	Overflow or leakage of stored decant water at the Processing Plant	TSF return water	Land and vegetation near the Processing Plant	Land	Contamination of surrounding soils with acid, hypersaline tailings, metals and metalloids affecting soil and groundwater quality and	Moderate	Unlikely	Medium	The high level alarm fitted to the Return Water Tank (nickel circuit process water tank) to prevent overflow of the tank is deemed appropriate to alert the workforce and reduce the possibility of decant water reaching the surrounding



Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
					causing vegetation stress or death				environment. The tanks have been designed and built for the purpose of decant water storage and are located within a bunded area to capture any tank leakage. As a result, the likelihood has been deemed as 'unlikely'.
	Exposed surfaces of TSF (internal basin and external embankments)	Dust associated with operational activities and drying of tailings surface	Land and vegetation near the TSF (Great Western Woodlands vegetation including the Fraser Range PEC)	Air	Adverse impacts to the health and survival of vegetation	Slight	Possible	Low	The surface of the TSF basin is likely to be wet for the majority of operations given the input of multiple liquid waste sources (tailings, raw water, treated effluent and RO brine). As a result, dust lift off is not anticipated during operation of the TSF. Dust lift off from external TSF embankments is anticipated to be infrequent but still possible. The consequence of the onsite impact and nearby PEC vegetation is anticipated to be minimal and as such, rated as 'slight'.



Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
	Embankment failure at TSF	Pooled tailings/ brine and WWTP effluent spillage outside TSF	Terrestrial ecosystems – surrounding soils, vegetation and surface water	Land and water	Contamination of surrounding soils with acid, hypersaline tailings, metals and metalloids affecting soil and groundwater quality and causing vegetation stress or death.	-	-	-	The risk of TSF embankment failure is regulated by the Department of Mines, Industry Regulation and Safety (DMIRS)
	Operation of Processing Plant (including Paste Plant and movement of concentrate)	Dust associated with operational activities	Land and vegetation near the Processing Plant (Great Western Woodlands vegetation including the Fraser Range PEC)	Air	Adverse impacts to the health and survival of vegetation	Slight	Possible	Low	The overall risk has been determined taking the following into consideration: A dust collector operates on the crusher discharge conveyor, concentrate storage in an enclosed shed with designated vehicle wash down to reduce concentrate fly-off, water carts and fixed sprays at the ROM pad and fixed sprays on conveyor



Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
									transfer points employed. Consequence of dust vegetation on vegetation is only deemed to be minimal and therefore given a consequence rating of 'slight'.
		Hydrocarbons	Terrestrial ecosystems – surrounding soils, vegetation	Spillage onto land	Soil contamination	Slight	Possible	Low	The overall risk has been determined taking the following into consideration: Ore processing where hydrocarbon spills are most likely (eg: from failure of hydraulic hose) is conducted within bunded areas draining to sumps with recovery pumps. Storage of hydrocarbons on site is in accordance with AS 1940 and AS 1692 and appropriately bunded or double skinned, self bunded tanks. Spill kits will be operated in non-bunded areas. Taking the operation of these constructed facilities into account, the likelihood is



Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
									considered to still be 'possible' but the 'consequence is 'slight'.
		Chemical reagents	Terrestrial ecosystems – surrounding soils, vegetation	Spillage onto land	Soil contamination	Minor	Unlikely	Medium	The overall risk has been determined taking the following into consideration: Chemical storage is conducted within bunded areas draining to sumps with recovery pumps, storage is in accordance with AS 1940 and AS 1692 and appropriately bunded or double skinned, self bunded tanks. Spill kits will be operated in non-bunded areas.
		Tailings	Terrestrial ecosystems – surrounding soils, vegetation	Spillage of tailings onto Land	Soil contamination	Minor	Unlikely	Medium	The overall risk has been determined taking the following into consideration: A high level alarm has been installed on the tailings storage tanks within the Paste Plant to prevent overflow of the tank. Concrete bunding has also been installed around the Paste Plant to retain



Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
									spillage. Given these management measures, the likelihood of a Paste Plant spill causing onsite impacts has been deemed 'unlikely'.
		Spillage of nickel or copper concentrate outside of the concentrate storage shed	Offsite human receptors	Air (wind blown dust)	Health and amenity impacts	N/A	N/A	N/A	No sensitive (human) receptors within 40km of the project area. Closest receptor is the Fraser Range Caravan Park, which is located approximately 40 km to the southwest of the project area
			Terrestrial ecosystems – surrounding soils, vegetation	Air (wind blown dust) Deposited onto land via truck tyres or spillage during transport	Contamination of local drainage lines	Minor	Possible	Medium	The overall risk has been determined taking the following into consideration: Transport of the product, commencing within the storage shed is within sealed containers to limit spill potential. Residues around the concentrator will be periodically removed and either discharged to the tailings stream or fed through the plant to minimise land contamination. The consequence of



Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
									the spill has been determined as 'minor' as only small quantities of concentrate are anticipated to be spilt on site at any one time before operational staff are aware of the emission occurring. The small quantities are deemed to be limited enough to generate only low level on-site impacts. Residential receptors have not been considered at risk due to the nearest residence being 40 km (away) to the southwest of the project area.
		Odour and noise from the Processing Plant	Offsite human receptors	Air	Amenity impact to humans	N/A	N/A	Nil	No sensitive (human) receptors within 40km of the project area. Nearest receptor is the Fraser Range Caravan Park, which is located approximately 40 km to the southwest of the project area.
		Noise from the Processing Plant	Nearby fauna	Air	Impact by noise disturbing fauna	Slight	Unlikely	Low	There is unlikely to be significant impacts to fauna



Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
Cat 52 Electric power generation		Noise from the Power Station	Nearby fauna	Air	Impact by noise disturbing fauna	Slight	Unlikely	Low	Unlikely to be significant impacts to fauna
			Offsite human receptors	Air	Amenity impact to humans	N/A	N/A	No	No sensitive (human) receptors within 40km of the project area. Nearest receptor is the Fraser Range Caravan Park, which is located approximately 40 km to the southwest of the project area
		Hydrocarbons	Terrestrial ecosystems – surrounding soils, vegetation	Spillage to land	Soil contamination	Slight	Possible	Low	The overall risk has been determined taking the following into consideration: Hydrocarbon storage at the Power Station is conducted in accordance with AS 1940 and AS 1692 and appropriately bunded or double skinned, self bunded tanks and in bunding that complies with Australian Standards for the retention of spills. Spill clean-up procedures for the site exist and will limit the likelihood for soil contamination. Spills will still be 'possible' however their



Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
									consequence has been deemed 'slight'.
		Air emissions from diesel power generation	Offsite human receptors	Air	Adverse impact to human health or amenity	N/A	N/A	N/A	There are no sensitive receptors within 40km of the Prescribed Premises. The nearest receptor is the Fraser Range Caravan Park, which is located approximately 40 km to the southwest of the project
		Air emissions from diesel power generation	Fauna and vegetation	Air (particulate emissions and gases such as NO _x and SO ₂)	Adverse impact to vegetation or fauna health	Slight	Unlikely	Low	The overall risk is considered 'low' as likely impacts are not considered to be significant.
Cat 54 Sewage facility premises	Transfer of treated sewage effluent to TSF via overland pipeline	Treated effluent	Terrestrial ecosystems – surrounding soils, vegetation and surface water	Land: Seepage of treated effluent through soil profile	Contamination of soil / surface water and possible negative impacts on vegetation	Slight	Unlikely	Low	The overall risk has been determined taking the following into consideration: Sumps have been constructed along above ground pipeline corridor routes to ensure leaks or spillages are contained within the sumps. This management measure is deemed adequate to



Risk Event					Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway				
								isolate treated effluent spills to a localised point, therefore limiting the potential pathway into the surrounding environment.



Table 2: Emissions Risk Rating Matrix

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost Certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

Table 3: Risk Criteria Table

Consequence			Likelihood	
The following criteria will be used to determine the consequences of a risk event occurring:			The following criteria will be used to determine the likelihood of the risk event occurring:	
	Environment	Public Health ^a and Amenity (such as air and water quality, noise, and odour)		
Severe	- on-site impacts: catastrophic - off-site impacts local scale: high level or above - off-site impacts wider scale: mid level or above - Mid to long term or permanent impact to an area of high conservation value or special significance^a - Specific Consequence Criteria (for environment) are significantly exceeded	- Loss of life - Adverse health effects: high level or ongoing medical treatment - Specific Consequence Criteria (for public health) are significantly exceeded - Local scale impacts: permanent loss of amenity	Almost Certain	The risk event is expected to occur in most circumstances
Major	- on-site impacts: high level - off-site impacts local scale: mid level - off-site impacts wider scale: low level - Short term impact to an area of high conservation value or special significance^a - Specific Consequence Criteria (for environment) are exceeded	- Adverse health effects: mid level or frequent medical treatment - Specific Consequence Criteria (for public health) are exceeded - Local scale impacts: high level impact to amenity	Likely	The risk event will probably occur in most circumstances
Moderate	- on-site impacts: mid level - off-site impacts local scale: low level - off-site impacts wider scale: minimal - Specific Consequence Criteria (for environment) are at risk of not being met	- Adverse health effects: low level or occasional medical treatment - Specific Consequence Criteria (for public health) are at risk of not being met - Local scale impacts: mid level impact to amenity	Possible	The risk event could occur at some time
Minor	- on-site impacts: low level - off-site impacts local scale: minimal - off-site impacts wider scale: not detectable - Specific Consequence Criteria (for environment) likely to be met	- Specific Consequence Criteria (for public health) are likely to be met - Local scale impacts: low level impact to amenity	Unlikely	The risk event will probably not occur in most circumstances
Slight	- on-site impact: minimal - Specific Consequence Criteria (for environment) met	- Local scale: minimal impacts to amenity - Specific Consequence Criteria (for public health) criteria met	Rare	The risk event may only occur in exceptional circumstances

^a Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting*

* In applying public health criteria, DER may have regard to the Department of Health's, *Health Risk Assessment (Scoping) Guidelines*

"on-site" means within the prescribed premises boundary

Note: These matrices are taken from the DER Guidance Statement Risk Assessments Part V, Division 3, *Environmental Protection Act 1986* (February 2017).



5 Conditions summary table

The following Conditions Summary table (Table 4) has been updated to inform the changes to the previous licence based on the risks identified in Tables 1 and 2 for the addition of Categories 5 and 52. Where other references have been used in making the decision they are also detailed in the table. Text deleted from the previous instrument has been displayed with strikethrough.

Table 4: Conditions Summary Table

CONDITIONS SUMMARY TABLE			
Licence section	Condition number L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
Licence Duration	N/A	The licence expiry has been extended as part of this amendment in line with the general notice of amendment issued by the Director General on 29 April 2016.	Notice of amendment of licence expiry dates
General conditions	L1.1.2	Updated to add relevant definitions and removal of definitions no longer required.	N/A
1.1 Interpretation	L1.1.5	Redundant condition (1.1.5) has been removed as part of the Departmental reform as the conditions were not enforceable. 1.1.5 — Nothing in the Licence shall be taken to authorise any emission that is not mentioned in the Licence, where the emission amounts to: (a) pollution; (b) unreasonable emission; (c) discharge of waste in circumstances likely to cause pollution; or (d) being contrary to any written law.	DWER web page and administrative changes.
1.2 General conditions	L1.2.1 L1.2.2 L1.2.3	Redundant conditions (1.2.1 to 1.2.3) have been removed (and replaced with conditions that were previously in Section 1.3) as part of the Departmental reform as the conditions were not enforceable. 1.2.1 The Licensee shall operate and maintain all pollution control and monitoring equipment to the manufacturer's specification or any relevant and effective internal management system.	DWER web page and administrative changes.



CONDITIONS SUMMARY TABLE

Licence section	Condition number L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		1.2.2 The Licensee shall immediately recover, or remove and dispose of spills of environmentally hazardous materials outside an engineered containment system. 1.2.3 The Licensee shall: (a) implement all practical measures to prevent stormwater run-off becoming contaminated by the activities on the Premises; and (b) treat contaminated or potentially contaminated stormwater as necessary prior to being discharged from the Premises.⁴ Note⁴: The Environmental Protection (Unauthorised Discharges) Regulations 2004 make it an offence to discharge certain materials into the environment. <u>Risk description:</u> Nil alteration to risk. General provisions of the EP Act apply.	
1.2 Premises operation	L1.2.2 and L1.2.3	Minor edit to condition to cross-reference Table 1.2.1 (Waste acceptance) Table number updated, administrative change only. <u>Risk description:</u> Nil alteration to risk, administrative change only.	N/A
	L1.2.4, Table 1.2.2	Table number updated, administrative change only. <u>Risk description:</u> Nil alteration to risk, administrative change only.	N/A
	L1.2.6, Table 1.2.3	Table number updated, administrative change only. <u>Risk description:</u> Nil alteration to risk, administrative change only.	N/A
	L1.2.8	This condition was removed as it is not enforceable. 1.2.8 The Licensee shall take all reasonable and practical measures to ensure that no wind-blown waste escapes from the landfill and that wind-blown waste is	N/A



CONDITIONS SUMMARY TABLE

Licence section	Condition number L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		collected on at least a weekly basis and returned to the tipping area.	
	L1.2.9	Update to clarify irrigation is at emission point L1. <u>Risk description:</u> Nil alteration to risk, administrative change only.	N/A
	L1.2.10	This condition was removed as it is not enforceable. L1.2.10 The Licensee shall ensure that any saline dewatering effluent shall only be used for dust suppression and in a manner that minimises damage to surrounding vegetation.	N/A
	L1.2.11 and Table 1.2.4	Minor wording update to L1.2.11 to include additional material, not just excess mine dewater. The Containment Infrastructure table (Table 1.2.4) was amended to include the vessel or compound relevant to the Processing Plant, Power Station, Concentrate Shed, TSF and associated pipelines.	Application supporting documentation dated 26 October 2016.
	L1.2.12(b)	Minor wording amendment to replace 'containment infrastructure' with 'TSF' and the word 'minimise' with 'reduce' and to clarify the 'embankments' as being the 'TSF embankments'.	
	L1.2.13 and Table 1.2.5	A new condition (L1.2.13) and Table 1.2.5 was included to require inspection of key facilities. <u>Risk description:</u> The requirement and frequency of inspections has been included for infrastructure that, if not inspected or maintained, poses a greater risk to the environment should a failure occur. Each scope of inspection aligns with the Licensee's proposed controls.	Application supporting documentation dated 26 October 2016.
	L 1.2.14 and Table 1.2.6	A new condition (1.2.14) and Table (1.2.6) was included to licence the assessed throughput for the Processing Plant and Power Station.	Application supporting documentation dated 26 October 2016.



CONDITIONS SUMMARY TABLE			
Licence section	Condition number L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<u>Risk description:</u> The proposal has been assessed using the upper processing limit of 1,500,000 tonnes per year for the Processing Plant and 19.5MW for the Power Station. The risk of the maximum production limit being exceeded is that the facilities proposed to manage the emissions have not been assessed, and the environmental impacts are unknown.	
2 Emissions	L2.2.1	Minor text update. <u>Risk description:</u> Nil alteration to risk, administrative change only.	
	L2.2.2	Clarification that emission loads should not be <i>above</i> the specified limits. <u>Risk description:</u> Nil alteration to risk.	N/A
3 Monitoring	L3.1.3	Update to text to require the recording of production or throughput data. Removal of reference to CEMS data. 3.1.3 The Licensee shall record production or throughput data and any other process parameters relevant to any non-continuous or CEMS monitoring undertaken monitoring undertaken of the prescribed premises.	N/A
	L3.1.4	Alteration to text for readability purposes. 3.1.4 The Licensee shall ensure that all monitoring equipment used on the Premises to comply with the conditions of this Licence complies with the conditions of this Licence and is calibrated in accordance with the manufacturer's specifications.	
	Table 3.2.1	Clarification of (discharge) flow rate parameter and update to averaging period and frequency of emission monitoring. The parameter was further clarified to be 'effluent'. As outlined in the ' <i>Licence amendment – April 2017</i> ' section (above), the Licence Holder has requested that the existing WWTP irrigation area be retained for future	(email) FW: Nova Project L8880/2015/1 Licence amendment and Works Approval W5752/2014/1 compliance (dated 24



CONDITIONS SUMMARY TABLE

Licence section	Condition number L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		use. <u>Risk description:</u> Taking into consideration that the environmental risk of the construction and operation of this monitoring point has already been assessed in W5752/2014/1 and L8880/2015/1, no additional conditions, other than those which help the re-commencement of effluent quality monitoring at L1, have been added.	March 2017).
	Table 3.3.1	Clarification of (in) flow rate parameter and addition of TSF input and decant volumes. Addition of treated effluent volumetric discharge flow rate to TSF and treated effluent to TSF water quality parameter testing at the TSF outfall point. Addition of volumetric inflow rate and water quality parameter testing at TSF outfall point. <u>Risk description:</u> This requirement for testing has been included for Independence Nova to determine if the plant is operating in accordance with the limits for which it was assessed in W5752/2014/1 and L8880/2015/1 and also to determine the characteristics of tailings being received into the TSF. This data will assist in providing a comparison with groundwater monitoring that may be required in the future. This water quality assessment requirement has been added to Table 3.3.1 and not Table 3.2.1 as it was determined in a previous licence amendment that discharge (of dewatering water) to the lined TSF was not a discharge to land.	Australian Standard AS/NZS 5667.1 – Water Quality – Sampling – Guidance on the Design of sampling programs, sampling techniques and the preservation and handling of samples
	Table 3.4.1	Update to the water quality parameter of Iron – Total and to add Molybdenum to align with baseline water quality samples obtained for the area during site establishment. Total Nitrogen and Phosphorous in relation to the recent treated effluent input into the TSF. This will allow further clarity, as required, for TSF seepage testing using groundwater samples. Averaging period and Frequency updated to enable sampling to commence and	Australian Standard AS/NZS 5667.1 – Water Quality – Sampling – Guidance on the Design of sampling programs, sampling techniques and



CONDITIONS SUMMARY TABLE

Licence section	Condition number L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		continue when water is identified within the monitoring bores. <u>Risk description:</u> Given the presence of the liner within the entire TSF and the high TDS of existing groundwater, the likelihood of seepage has been determined as 'unlikely' and the environmental consequence, 'moderate'. The addition of the new water quality parameters will provide a wider suite of information to detect whether seepage has occurred, given the new TSF inputs as a result of this amendment.	the preservation and handling of samples
4 Information	L4.1.2	This condition was removed as it is not enforceable.	N/A
	L4.1.3	Update to Annual Compliance Reporting to align with recent DWER administrative control amendments.	N/A
	Table 4.2.1	Update to the Environmental Report Parameters to clarify investigations, outcomes, impacts and actions taken following an environmental incident. Inclusion of comparison against sampled background water quality parameters to enable detection of change in groundwater. Addition of reference to Table 8 within 2014 Nova Hydrogeological Study. Addition of footnote reference. <u>Risk description:</u> No change to level of environmental risk from the additions to this table. The table was updated to enable Independence Nova to demonstrate effective incident closure and prevention of incident recurrence. The inclusion of comparison against sampled background water quality parameters is to better enable detection of changes in groundwater quality.	Groundwater Resource Management (GRM). 2014. Hydrogeological Study for the Nova Nickel Project. Unpublished report prepared for Sirius Resources NL.
	Table 4.2.2	Update to Non-annual reporting requirements to remove the requirements for reports from only 'third parties'. Format updated to N/A as monitoring reports can be varied in format as appropriate.	N/A
	Table 4.3.1	Update to Notification requirements commensurate with above amendments to the Licence and completion of relevant 2016 SRK Audit Report recommendations. Addition of footnote reference. <u>Risk description:</u> The assessment of this amendment has been conducted based on the assumption that Independence Nova has carried out (or intends to in the near	SRK Consulting 2016, Nova TSF 2016 Audit. Report Prepared for Independence Group NL. SRK Consulting (Australasia) Pty Ltd.



CONDITIONS SUMMARY TABLE

Licence section	Condition number L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		future), the recommendations of the Audit Report. These recommendations, such as provision of bunding for spill containment and rock fill armouring for exposed embankments are measures taken into account by the DWER that will reduce the risk of an environmental incident from the new facilities which are being added to this licence. Therefore, the risk of an environmental incident from or around the TSF infrastructure has been assumed to be lower given the mitigation aspects afforded by the implementation of the recommended Audit Report actions.	IDG005, September 2016.
Map Schedule 1	Premises map	Updated Site map (Figure 1) to include labels for all facilities as provided by MBS Environmental, January 2017. Two new maps have been requested in the 'comments' section of Schedule 1: Maps. 1) For overview of the site and monitoring information 2) Pipeline locations and contents.	RE: Queries regarding Nova Project L8880/2015/1 Licence amendment and Works Approval W5752/2014/1 compliance dated 19 January 2017.
	Map of monitoring locations	This map has been removed and is to be replaced with a new map as requested in Schedule 1 (see above).	N/A
Schedule 2	Introductory text	The introductory text has been updated to describe the N1 notification form. Name of Licensee and Operator has been updated to read 'Independence Nova Pty Ltd' in Part A and Part B.	N/A
	Section A	The 'Annual Audit Compliance Report Proforma' has been deleted and is replaced by the 'Annual Audit Compliance Report Form' as available on the DWER website.	Annual Audit Compliance Report Form available on the DWER website. www.dwer.wa.gov.au/
	Section B	The 'Details of Non-Compliance with Licence Condition' has been deleted and is replaced by Section B of the 'Annual Audit Compliance Report Form' as available on the DWER website.	Annual Audit Compliance Report Form available on the DWER website. www.dwer.wa.gov.au/
	Section C	The 'Signature and Certification' section has been deleted and is replaced by Section F of the 'Annual Audit Compliance Report Form' as available on the	Annual Audit Compliance Report Form available on



CONDITIONS SUMMARY TABLE

Licence section	Condition number L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		DWER website.	the DWER website. www.dwer.wa.gov.au/



6 Consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
11/09/2015	Proponent sent a copy of draft instrument	1) Request to allow the discharge of a small amount of tailings during wet commissioning of the Nova Processing Facility. 2) Request to monitor only from bores that have intercepted groundwater. Monitoring bores have been drilled at a depth of 25 mbgl whereas groundwater is expected to be below 40 mbgl.	1) To allow for wet commissioning the Licence has been amended to allow for the discharge of commissioning tailings to the TSF. A licence amendment will be required for the ongoing discharge of tailings to the TSF. 2) A note has been added to the table to clarify that sampling is only required when there is an amount of seepage present within the bore, indicating the presence of seepage that will allow for a sample to be collected. Sampling is not required when there is no seepage being collected within the bore.
17/07/2017	Proponent sent a copy of draft instrument	3) Feedback was provided by Independence Nova on 07/08/2017 with regard to DWER queries contained within the draft documents. The queries were addressed and updated Prescribed Premise layout figure provided. 4) Request for amendment to include assessment of additional 250,000 tonnes per year increase to Category 5 throughput, within this amendment. The requested throughput was to increase from the previously assessed 1,500,000 tonnes per year to 1,750,000 tonnes per year.	3) DWER have included all relevant comments as provided in the response document. 4) The Schedule 1: Maps, Premises map has been updated.
04/09/2017	DWER referred the request for the additional 0.25 Mtpa throughput to the	5) Comment from DMIRS was received on 29/09/2017.	5) DWER have taken DMIRS feedback into consideration and conclude that the Risk



Date	Event	Comments received/Notes	How comments were taken into consideration
	DMIRS on 4/09/2017 for advice with respect to whether DMIRS had assessed whether the TSF was capable of handling the increased throughput (of tailings waste) from both a capacity and stability perspective.	DMIRS feedback noted that 'approved Mining Proposal (Reg ID 52685) indicates an approximate process plant throughput of 1,500,000 tonnes per year with the tailings waste stream reporting to both the Tailings Storage Facility (TSF) and the underground as paste fill. The TSF constructed at the Nova Project is a Life of Mine facility that is sufficient to contain the tailings generated as part of the current approved Life of Mine for the project, which at the time of approval was 12 years. It is understood that an increase in throughput would result in the facility reaching current design capacity at an earlier stage. Any expansion to operations beyond that point would require further approvals under the Mining Act. DMIRS further advised that they did not consider that this rate of throughput increase would impact the competence of the facility provided that the facility is managed in accordance with the TSF Operating Manual and that any increase in deposition rates and rates of TSF lift are managed appropriately.'	Event and Reasoning applied within the Risk Assessment is not altered by the proposed 250,000 tonnes per year increase to Category 5 throughput. Independence Nova will be required to apply for additional amendments to DMIRS and DWER should further alterations to the Premise, be required.
28/09/2017	Proponent sent additional queries regarding additional waste volumes, TSF capacity to cater for additional waste inputs, any additional paste plant throughput and any additional changes to infrastructure required to cater for the 250,000 tonnes per year increase	6) Feedback was provided by Independence Nova on 06/10/17 confirming that: • throughput capacity for the Processing Plant is only that, not an increase in the resource; • the TSF has been designed for additional'	6) DWER have taken Independence Nova's comment into consideration and conclude that the Risk Event and Reasoning applied within the Risk Assessment is not altered by the feedback provided.



Date	Event	Comments received/Notes	How comments were taken into consideration
	to Category 5 (as mentioned as Point 4, above).	capacity and was designed to contain far more water than has been abstracted so there is additional freeboard should it be required; • the throughput of the paste plant will not change; and • there are no other changes to any other infrastructure or capacities that may be impacted. Independence Nova confirmed on 11/10/17 following additional DWER query, that there have been no changes made to the life of the project as a result of the proposed 250,000 tonnes per year increase to Category 5 throughput.	



7 References

Adams M. D., et al (2008), Adams, M.D., Donato, D.B., Schulz, R.S. and Smith, G.B. (2008) *Influences of Hypersaline Tailings on Wildlife Cyanide Toxicosis; MERIWA Project M398(II); Cyanide Ecotoxicity at Hypersaline Gold Operations - Final Report Volume 2 – Definitive Investigation*, 26 August 2008

BoM, 2017. Evaporation: Average Monthly & Annual Evaporation - Average pan evaporation Annual map. Date website accessed 5/4/2017. Based on records between 1975 and 2005

Groundwater Resource Management (GRM), 2014. *Hydrogeological Study for the Nova Nickel Project*. Unpublished report prepared for Sirius Resources NL

JDA Consultant Hydrologists (JDA), 2013. *Nova Nickel Project, Fraser Range Surface Water Management 2D Surface Water Modelling*. Unpublished report prepared for Sirius Resources NL

Martinick Bosch Sell Pty Ltd, 2014. *Works Approval Nova Nickel Project, M28/376* Sirius Gold Pty Ltd October 2014

Sirius Gold Pty Ltd, 2014. *Nova Nickel Project Definitive Feasibility Study*. Report prepared by and for Sirius Gold 2014

SRK Consulting, 2016. *Nova TSF 2016 Audit*. Report Prepared for Independence Group NL. SRK Consulting (Australasia) Pty Ltd. IDG005, September 2016.



Appendix A

TSF

TSF design

The TSF has a footprint of 66ha and is a maximum height of 13.5m. The storage capacity of the TSF is in total 5.7 Mm³ which comprises 6.5 Mt (4.1 Mm³) tailings plus 1.6 Mm³ (capacity), which was allocated for early dewatering water storage. Early dewatering water storage occurred prior to commissioning of the Processing Plant. The TSF is composite lined with 2.0mm thick HDPE geosynthetic liner over 300 mm of engineered clay, which combined have a permeability of less than 10⁻⁹ m/s to reduce seepage. Excess water within the TSF is designed to be removed via decant facility and transferred via pipeline to the Process Water Tank at the Processing Plant for recycling.

Tailings deposition has been designed to occur sub-aerially and an underdrainage system with collection piping has been installed to aid in consolidation of tailings. Tailings supernatant water will infiltrate through tailings into this system where it will be recovered for re-use in operations. The underdrainage system consists of the following:

- Drainage media (Flownet®).
- Protective geotextile layer.
- Perforated HDPE collection pipes.
- Underdrain sump, including two side-slope underdrain riser pipes.
- Submersible pump for manual reclaim of tailings liquids.

Sufficient groundwater needs to be abstracted for the safe operation of the underground mine. An excess of water was initially forecast from the groundwater modelling for the site, however prior to commencement of operations it became apparent that greater water recycling activities would be required due to a potential water shortage during operation.

To enable water recycling, excess dewater/ water from underground mining, tailings slurry from the Processing Plant (low and high pyrrhotite tailings), RO brine, excess water from the raw water tank and treated wastewater from the WWTP will be discharged to the TSF for recovery. Spigots will be managed to promote formation of a decant pond at the float-mounted pump. Supernatant and storm water is designed to collect against the north embankment and will be reclaimed via a floating platform with pump. About 115 million litres per year of water is anticipated to be returned from the TSF to the Processing Plant whilst water is of acceptable salinity for reuse. Where water (quality) is not acceptable for re-use, it will be left in the TSF to evaporate and new (abstracted ground) water will be used. The TSF has been designed to contain additional water storage capacity over and above that for just tailings storage, alone.

Diversion drains and channels exist around the perimeter of the TSF to prevent upstream uncontaminated stormwater from coming into contact with the TSF embankment.

Tailings characteristics

The Project sources its ore from two ore bodies (Nova and Bollinger). There are two tailings streams that are piped via separate pipelines to associated spigots and discharged into the TSF from the crest. Nova (ore) flotation tailings are characterised by very low sulphur content and moderately high

Acid Neutralisation Capacity provided by reactive magnesium silicate minerals. The tested Nova flotation tailings were classified as Non Acid Forming. The Bollinger (ore) flotation tailings are expected to have higher sulphur content, lower Acid Neutralisation Capacity and have been classified as Potentially Acid



Forming. Tailings from both ore bodies are likely to have low concentrations of soluble metals and metalloids.

The Processing of the ore removes the copper concentrate first, with the residual copper floatation tailings then being pumped to the nickel rougher floatation cells. A nickel concentrate stream and tailings are produced in the nickel rougher floatation cells. The tailings from this process undergo nickel pyrrhotite scavenger floatation which produce a high pyrrhotite concentrate with some associated nickel. Low pyrrhotite tailings are also generated here when the pyrrhotite scavenger concentrate is combined with nickel cleaner tails, re-processed and recombined with nickel cleaner tails to produce low pyrrhotite tailings. The low pyrrhotite tailings are then pumped to the Paste Plant for generation of paste to fill mine voids or, where there is excess tailings, these are pumped directly to the tailings thickener. The nickel concentrate from the scavenger floatation process is re-ground then re-cleaned at the nickel cleaner floatation cells, then transferred to the concentrate thickener for final processing. High pyrrhotite tailings generated from the nickel cleaner scavenger cell floatation are directed to the flotation tailings thickener and disposed via pipeline and spigots at the lined TSF. The low pyrrhotite tailings processed at the tailings thickener are disposed at the TSF via a separate pipeline from the high pyrrhotite tailings. Blending of the two tailings streams may occur within the TSF, although there is no control over the degree of blending that will occur between the two tailings streams in the facility. It is unknown how the addition of extra liquid (raw water, RO brine, treated wastewater, etc) will affect the consolidation of tailings.

Tailings water is expected to be saturated with respect to gypsum (calcium sulphate). The presence of gypsum in the tailings water is predicted to form a layer of gypsum on the surface of the TSF and in doing this, limiting the exposed TSF surface to oxidation. However, this process cannot be confirmed until the facility is in operation and gypsum consolidation is evident.

Tailings density is anticipated to be 58% solids from the Processing Plant.

Proponent Controls

IGO has installed a composite lining system of 2.0mm thick HDPE geosynthetic liner over 300 mm of clay across the entire TSF, which combined have a permeability of less than 10^{-9} m/s. In addition, the installation of an under-tails water recovery system above the liner and floating barge decant system that feeds water directly to the Processing Plant is proposed to reduce the liquid content of the slurry at the base of the TSF. IGO have committed to maintaining a freeboard of at least 500mm in the TSF to allow capture of rainfall from a one in one hundred year 72 hour ARI event, and further committed to conducting regular scheduled inspections and visual monitoring of the TSF.

The practice of discharging additional water with tailings slurry is not common and increases the hydraulic pressure on the base of the TSF. However, the measures taken by IGO (during construction) to line the TSF with an HDPE liner and to recover water within the TSF are expected to significantly reduce the potential for seepage.

Regulatory Controls

The structural stability of the TSF has been reviewed by DMP (now DMIRS) as presenting an insignificant risk of embankment failure. Therefore the surrounding environment is not expected to be impacted by the discharge of tailings as a result of an embankment failure. Freeboard conditions currently on the licence reduce the likelihood of an overtopping event.

The depth to groundwater in the area was found to be over 40 m below the surface. Therefore the likelihood of groundwater mounding is 'unlikely'. However, DWER has determined that quarterly monitoring of standing water levels will assist in determining seasonal fluctuations of groundwater depths.



Total nitrogen, Total phosphorous, Iron - Total and Molybdenum have been added to the groundwater quality parameters to allow for more comprehensive comparison with baseline sampling conducted by a consultant commissioned by IGO (GRM, 2014).

A condition regarding the recording of flow rates of tailings inputs to the TSF (including the treated effluent) and decant water output to the Process Water Tank has been added as a condition. This monitoring is to allow for real-time knowledge of flows across the site and management of levels within the TSF and Process Water Tank to prevent overflows. Water quality monitoring (eg: TDS and pH) of the decant water will indicate the TSF salinity level and salinity of water potentially requiring management at the Processing Plant.

A condition regarding the inspection of the decant barge, TSF perimeter, freeboard, TSF pipelines and condition of any exposed liner has been added to the licence to assist in the prevention of infrastructure failure by recording condition of the infrastructure for maintenance purposes.

DWER has also imposed a condition specifying containment infrastructure requirements for management of tailings deposition, TSF seepage, freeboard maintenance and pipeline condition during operation of the TSF. Further information on the pipelines within the project area is in Appendix B.



Appendix B

Pipelines

Groundwater investigations have indicated that water abstracted for the Project is saline (TDS 35,000 to 41,000mg/L ([GRM, 2014])). As a result, there will be numerous water pipelines that will contain water of varying salinities and contents (including tailings). On site pipelines include the RO Brine pipeline which will contain hypersaline liquid (approximately 69,800 mg/L to 70,000 mg/L TDS), Raw water pipelines and the TSF tailings delivery and decant pipelines.

Other pipelines will transfer waste water or RO treated water around the site. This includes pipelines from the WWTP. The site pipeline network consists of both above ground and buried pipelines.

Raw water (untreated, abstracted groundwater) is currently used for above and below ground dust suppression. The decant pipeline returns saline water from the TSF decant system (floating platform with a pump and return water system) to the Process Water Tank for redistribution at the Processing Plant.

Proponent Controls

All pipelines are separated from clean/ stormwater runoff culverts by containment in either dedicated service corridor bunds or buried pipeline corridor. Within the pipeline corridor, the buried pipes are generally buried at approximately 500mm bgl for the full pipeline length with leak detection sensors. Sumps occur along above ground pipeline corridors to ensure tailings and return water line leaks or spillages are contained. Tailings and return water pipelines are fitted with flow and leak detection sensors.

Regulatory Controls

A condition requiring regular inspection of pipelines has been added to the licence. Containment infrastructure requirements have also been included.

References

Groundwater Resource Management (GRM). 2014. Hydrogeological Study for the Nova Nickel Project. Unpublished report prepared for Sirius Resources NL.



Appendix C

Processing Plant and Paste Plant

The Processing Plant throughput is anticipated to be 1,500,000 tonnes per year producing up to 220,000 tonnes of nickel concentrate and up to 45,000 tonnes of copper concentrate per annum. Concentrate is transferred directly from the Processing Plant filter discharge into an enclosed concentrate shed where it is stockpiled to form separate product windrows. From here, the concentrate is loaded in sealed containers onto trucks and transported offsite.

The Processing Plant includes the following components:

- Primary crushing
- Grinding and classification circuit (including a SAG mill, ball mill and hydrocyclone clusters)
- SkimAir flash flotation cell
- Copper flotation circuit
- Nickel flotation circuit
- Concentrate thickeners, filters and storage shed
- Pyrrhotite flotation cells, followed by separation of a pyrrhotite concentrate by a Low Intensity Magnetic Separator (LIMS) and a regrind mill
- Tailings thickener and disposal pumps
- Services and reagents

Approximately 12 million tonnes (Mt) of tailings (dry) will be produced from the Processing Plant over the life of the project. This will comprise two tailings streams referred to as flotation tailings and pyrrhotite tailings that will be disposed of by:

- formation of a paste from a portion of flotation tailings for disposal into mined stopes underground. Approximately 5.7 Mt (61% of the flotation tailings mass) is likely to be disposed in this manner over the life of the project; and
- combining the remaining 3.7 Mt of flotation tailings and pyrrhotite tailings (2.6 Mt) prior to disposal into the TSF.

The Paste Plant

The Paste Plant generates fill from low pyrrhotite Process Plant tailings which is used to fill underground mine voids.

The characteristics of the Paste Plant comprise:

- throughput is anticipated to be 815,000 tonnes per year
- design rate of 73 m³/hr of paste backfill
- produces a tails feed of 120 t/hr of low sulfur tails
- mass paste production rate of 157 t/hr of total instantaneous mass of paste.

The Paste Plant is located above the ore body to allow paste to be gravity fed into mined stopes below ground.

Proponent Controls

Process plant operations are monitored and controlled by a Programmable Logic Controller (PLC) system which has been installed with Human Machine Interface (HMI) and Supervisory Control and Data Acquisition (SCADA) system, StarCS advanced process control platform to provide additional control to stabilise the feed rate, mass pull and grade/recovery in the flotation circuits. Blue Cube Systems, MQi Slurry Analysis provide online measurement to give real-time plant performance monitoring.



Overflows at the crushing circuit are directed to allow material to overflow onto a conveyor system to the emergency stockpile at the Emergency ROM. This is to limit spills from the surge bin by directing spills to the designated conveyor for feed into the milling circuit.

Water sprays have been fitted on the transfer points (eg: tipping area of the crusher) and on the head of conveyors to minimise the generation of dust through throughout the crushing circuit.
A dust collector has been installed on the discharge conveyor.

The ROM pad HDPE lined containment ponds have sufficient storage capacity for the one in one hundred year 72 hour ARI rainfall event. Contents will either be recovered or re-used in the processing plant or treated as required. All runoff at the ROM area is directed to the containment ponds.

Entrance and exit roads at the enclosed concentrate sheds have been concreted for 20 m outside the shed. A truck wash spray bar has been fitted at the exit of the shed to ensure all residual concentrate is removed from truck wheels prior to leaving the site. Water from the wheel wash down is recycled in a closed system at the concentrate shed.

Reagent mixing will occur in well ventilated facilities to minimise build-up of odours.
Plant will be regularly maintained and air compressors are housed in sound attenuating enclosures to limit noise output.

Ore processing activities will be conducted within bunded areas draining to sumps with recovery pumps.

All chemical reagents will be stored within tanks in appropriately bunded facilities whereby 110% of the largest vessel is contained and 25% of the total volume is contained according to Australian Standards 1940 and AS1692.

The reagent area has a sump pump to collect spills and a hoist for lifting and splitting bulk bags.

All residues around the concentrator will be periodically removed and either discharged to tails or fed through the plant.

High level alarms are fitted to the tailings storage tanks within the Paste Plant to prevent overflow of the tank.

Excess tails or paste materials will not be placed in open stockpiles, with tailings being pumped directly to the TSF and excess paste is discharged into a concrete bunker capable of storing the paste in a manner to prevent discharge to the environment.

Regulatory Controls

A condition regarding the approved production limit of the Processing Plant has been added to the licence as this is the limit at which DWER has assessed the potential risks from the operation of the facility. Containment infrastructure requirements have also been included to capture the management of sediment runoff, hydrocarbons, bulk reagents, tailings and decant (return) water during operation of the Processing Plant.



Appendix D

Power Station

The Power Station comprises diesel fuelled generator sets: five GE12V250 (3.0 MW) and three MWM TCD20 (1.7 MW). The load is 14.2 MW, with an average demand of 12.5 MW. The total premises production will total 19.5 MW capacity. The Power Station will consume approximately 3000 L of fuel an hour running at 12.5 MW. Power distribution is via overhead power lines, distributing 11kV power to the site.

Proponent Controls

Generator sets will be maintained and serviced to manufacturer's specifications to ensure efficient running and optimum fuel consumption, thereby minimising exhaust emissions and noise generation. Low-sulphur diesel will be used to reduce atmospheric contaminants.

Engines and generators incorporate exhaust mufflers and other sound attenuating measures, will be operated and serviced in accordance with the manufacturer's specifications.

Transformer stations are in bunded areas which meet the requirements of Australia Standards AS1940, AS 2067 and AS 3007.

All hydrocarbon and chemical storages have been designed and constructed in accordance with Australian Standards AS1940 and AS1692.

The Power Station day tank, waste oil tank and lubricants are located in a bund that complies with Australian Standards.

Diesel generators for the power station are located within impermeable compounds.

Regulatory Controls

A condition regarding the approved capacity of the Power Station has been added to the licence. Containment infrastructure requirements were also included.