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Scoping Report and SEARs Application for Biomass Fuel Use at Redbank Power Station

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Executive Summary

This scoping report has been prepared for a proposed development at the Redbank Power Station located at 112 Long Point Road West, Warkworth (Lot 450 DP 1119428).

The Redbank Power Station was originally commissioned in July 2001 as an electricity generating facility. It was designed to operate on low value fuels and operated on beneficiated dewatered coal tailings (BDT) to create electricity. The tailings were transferred by conveyor from the Warkworth mine. The power station has been in care and maintenance since October 2014. Verdant Earth Technologies Limited has acquired Redbank and is planning to restart the plant. It is seeking a new approval to add the ability to use 100% biomass as a fuel for its operations and to remove Condition 22 on the existing consent regarding expiry (DA183/93).

Restarting of the Redbank Power Station to operate as an electricity generation facility on waste biomass would create between 200-300 construction jobs and 50 permanent jobs following recommissioning. It will also create or support a large number of direct and indirect jobs in the fuel supply line over the plant's life. When fully operational the power plant would produce into the grid approximately 1 million megawatt hours of baseload electricity per year, equivalent to supplying around 200,000 homes. The project will also drive significant progress towards the NSW Government's *Net Zero Plan Stage 1: 2020-2030*, being the foundation for NSW's action on climate change and goal to reach net zero emissions by 2050. The conversion of Redbank Power Station to operate on waste biomass fuel will result in the first major green baseload power station for the country.

The biomass fuel sources proposed to be used at Redbank Power Station will be '*eligible waste fuels*' as defined by the NSW Environment Protection Authority's (EPA's) *Energy from Waste Policy Statement*. These include existing forestry and sawmill residues and uncontaminated wood waste that is generated in primary and secondary manufacturing processes. Biomass would be sourced from the waste products of existing industry. The project does not propose harvesting trees solely for fuel.

The existing plant consists of two fluidised bed combustion steam generator units of FiCirc® design and a single 151MW steam turbine, and the associated balance of plant equipment. The technology is characterised by a deep fluidised bed, configured to provide a high degree of bed fines recirculation to enhance the gas to solids contact. The result is a highly efficient combustion system producing low NO_x, SO_x, carbon monoxide and particulate emissions due to the ability to control the combustion chamber temperatures and the addition of sorbent material if required. This style of unit has demonstrated excellent performance and emissions profiles with a wide range of fuels including coal, petroleum coke, and biomass. Minor adjustments to the existing plant and equipment will be needed, along with a set of mobile conveyors, to allow the use and storage of biomass in place of coal at the facility. The facility will potentially accept up to 900,000 tonnes per year of biomass as fuel for conversion into electricity.

The facility is located on land zoned RU1 under the *Singleton Local Environmental Plan 2013*. The proposed development is permissible as a '*electricity generating works*' with consent in RU1 zoning under Division 4 of the *State Environmental Planning Policy (Infrastructure) 2007*.

The proposed project is considered a Designated Development (DD) under Clause 18(1c) of Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* as it involves an electricity generating station supplying or capable of supplying "*more than 30 megawatts of electrical power*" from bio-material. Therefore, the project requires assessment under Part 4 of the *Environmental Planning and Assessment Act 1979* and the consent authority for the development will be the Singleton Council. An Environmental Impact Statement (EIS) will need to accompany the development application. A licence from the NSW EPA under Schedule 1 of the *Protection of the Environment Operations Act 1997* will be required.

This scoping report has found that consideration will need to be given as a priority to additional traffic generation on the regional network, air quality due to emissions from combustion of biomass, bushfire risks and hazards from storage and management of biomass, and stormwater collection and management. Impacts are expected to be minimised by maintaining best practice operations and strict infrastructure process controls.

Verdant Earth Technologies Limited is committed to complying with all laws that affect its operations and understands that development approval and appropriate licensing is required prior to the proposed development occurring. The proponent seeks the Secretary's Environmental Assessment Requirements (SEARs) with respect to the proposed Environmental Impact Statement.

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1. Introduction

1.1. Overview

This scoping report has been prepared for a proposed development at the Redbank Power Station located at 112 Long Point Road West, Warkworth (Lot 450 DP 1119428).

The Redbank Power Station was originally commissioned in July 2001 as an electricity generating facility. It was designed to operate on low value fuels and operated on beneficiated dewatered coal tailings (BDT) to create electricity. It has been in care and maintenance since October 2014. Verdant Earth Technologies Limited has acquired Redbank and is planning to restart the plant. It is seeking a new approval to add the ability to use 100% biomass as a fuel for its operations and to remove Condition 22 on the existing consent regarding expiry (DA183/93).

Restarting of the Redbank Power Station to operate as an electricity generation facility on waste biomass would create between 200-300 construction jobs and 50 permanent jobs following recommissioning. It will also create or support a large number of direct and indirect jobs in the fuel supply line over the plant's life. When fully operational the power plant would produce into the grid approximately 1 million megawatt hours of baseload electricity per year, equivalent to supplying around 200,000 homes.

The biomass fuel sources proposed to be used at Redbank Power Station will be '*eligible waste fuels*' as defined by the NSW Environment Protection Authority's (EPA's) *Energy from Waste Policy Statement*. These include forestry and sawmill residues and uncontaminated wood waste that is generated in primary and secondary manufacturing processes. Biomass would be sourced from the waste products of existing industry. The project does not propose harvesting trees solely for fuel.

The existing fluidised bed combustion steam generator have demonstrated excellent performance and emissions profiles with a wide range of fuels including coal, petroleum coke, and biomass. Minor adjustments to the existing plant and equipment will be needed, along with a set of mobile conveyors, to allow the use and storage of biomass in place of coal at the facility. An operational overview of the existing plant and equipment versus what is proposed is provided in this report.

The proposed project is considered a Designated Development (DD) under Clause 18(1c) of Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* as it involves an electricity generating station supplying or capable of supplying "more than 30 megawatts of electrical power" from bio-material. Therefore, the project requires assessment under Part 4 of the *Environmental Planning and Assessment Act 1979* and the consent authority for the development will be the Singleton Council. An Environmental Impact Statement (EIS) will need to accompany the development application. A licence from the NSW EPA under Schedule 1 of the *Protection of the Environment Operations Act 1997* will be required.

The proposed development is well located at an established power plant with existing technology in place. The site has been previously cleared and disturbed to establish the power plant, and the nearest dwellings are over 1km away to the east. Impacts on local residents are expected to be low.

Verdant Earth Technologies Limited is committed to complying with all laws that affect its operations and understands that development approval and appropriate licensing is required prior to the proposed development occurring. The proponent seeks the Secretary's Environmental Assessment Requirements (SEARs) with respect to the proposed Environmental Impact Statement.

1.2. Purpose of Report

A separate development modification application (DA183/93) with Singleton Council under Section 4.56 of the *Environmental Planning and Assessment Act 1979* is currently in process and unresolved.

To minimise planning approval and delay risks with the Section 4.56 modification application, Verdant Earth Technologies Limited has prepared this scoping report in preparation for a Designated Development (DD) application under Clause 18(1c) of Schedule 3 of the *Environmental Planning and Assessment Regulation 2000*. Under the clause, development is considered DD when it involves an electricity generating station supplying or is capable of supplying “more than 30 megawatts of electrical power” from bio-material:

18 Electricity generating stations

(1) Electricity generating stations, including associated water storage, ash or waste management facilities, that supply or are capable of supplying—

(a) electrical power where—

(i) the associated water storage facilities inundate land identified as wilderness under the Wilderness Act 1987, or

(ii) the temperature of the water released from the generating station into a natural waterbody is more than 2 degrees centigrade from the ambient temperature of the receiving water, or

(b) more than 1 megawatt of hydroelectric power requiring a new dam, weir or inter-valley transfer of water, or

(c) more than 30 megawatts of electrical power from other energy sources (including coal, gas, wind, bio-material or solar powered generators, hydroelectric stations on existing dams or co-generation).

(2) This clause does not apply to power generation facilities used exclusively for stand-by power purposes for less than 4 hours per week averaged over any continuous 3-month period.

Pursuant to Part 2, Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*, ‘...before preparing an environmental impact statement, the responsible person must make a written application to the Director-General (now the Secretary) for the environmental assessment requirements with respect to the proposed statement.’

The investigation has been undertaken in accordance with the Department of Planning and Environment (2017) *Scoping an Environmental Impact Statement - Draft Environmental Impact Assessment Guidance Series*.

1.3. Site Description

Verdant Earth Technologies Limited’s Redbank Power Station is located at 112 Long Point Road West, Warkworth (Lot 450 DP 1119428). The lot itself is approximately 18 hectares, and the existing Redbank Power Station comprises approximately 10 hectares on the east side of the lot.

There are two separate access points to the site from Long Point Road West.

The development is located on land zoned as RU1 Primary Production under the Singleton Local Environmental Plan 2013. Whilst the LEP prohibits development that may be classified as a ‘*electricity generating works*’, this development is considered permissible with consent under Clause 34 of the *State Environmental Planning Policy (Infrastructure) 2007* as:

(1) Development for the purpose of electricity generating works may be carried out by any person with consent on the following land—

(a) in the case of electricity generating works comprising a building or place used for the purpose of making or generating electricity using waves, tides or aquatic thermal as the relevant fuel source—on any land,

(b) in any other case—any land in a prescribed rural, industrial or special use zone.

A prescribed rural, industrial or special use zone includes RU1 Primary Production zoning under Clause 33 of the *State Environmental Planning Policy (Infrastructure) 2007*.

And further, under Clause 34 of the *State Environmental Planning Policy (Infrastructure) 2007*:

(3) Development for the purpose of, or resulting in, a change of fuel source of an existing coal or gas fired generating works by a proportion of more than 5 per cent in any 12 month period may only be carried out with consent.

The area of land occupied by the power station infrastructure has been previously disturbed and cleared. The western portion of the lot still contains native bushland and Sandy Hollow Creek.

1.4. History & Approvals

The facility was originally assessed as designated development (electricity generating station) under Part IV of the *Environmental Planning and Assessment Act 1979* and approved under DA183/93 to construct and operate a fluidised bed combustion power plant, fuelled from coal washery tailings supplied by the Warkworth and Lemington Mines.

The development application was submitted to Singleton Shire Council and accompanied by an Environmental Impact Statement (EIS) to demonstrate that appropriate consideration was given to the impact that the development, and to address the NSW Department of Planning impact assessment requirements.

The original EIS was lodged in December 1992. An amended EIS was prepared in December 1993 to assess any additional potential impacts associated with locating the Redbank Project adjacent to the Warkworth Mine at a site approximately 5 kilometres east of the site proposed in the original EIS. The development consent (DA183/93) was granted by Singleton Council on 10 November 1994 and a subsequent modification to that consent was granted by the NSW Land and Environment Court on 27 March 1997 pursuant to the prepared statements of Roy Alper and Thor Hibbler containing information pertaining to the modification (circa February 1997).

Figure 1.1 and Figure 1.2 show two perspective photos of the south and west sides, respectively, of the existing power plant facility. The photos were taken on 28 May 2021.

In October 2020, Hunter Energy lodged a development modification application with Singleton Council under Section 4.56 of the *Environmental Planning and Assessment Act 1979* to modify the fuel as approved under DA183/93 so as to add the ability to operate on up to 100% biomass fuel (as defined under the NSW Environment Protection Authority's Eligible Waste Fuel Guidelines [2016]).

The outcome of the modification application is pending.



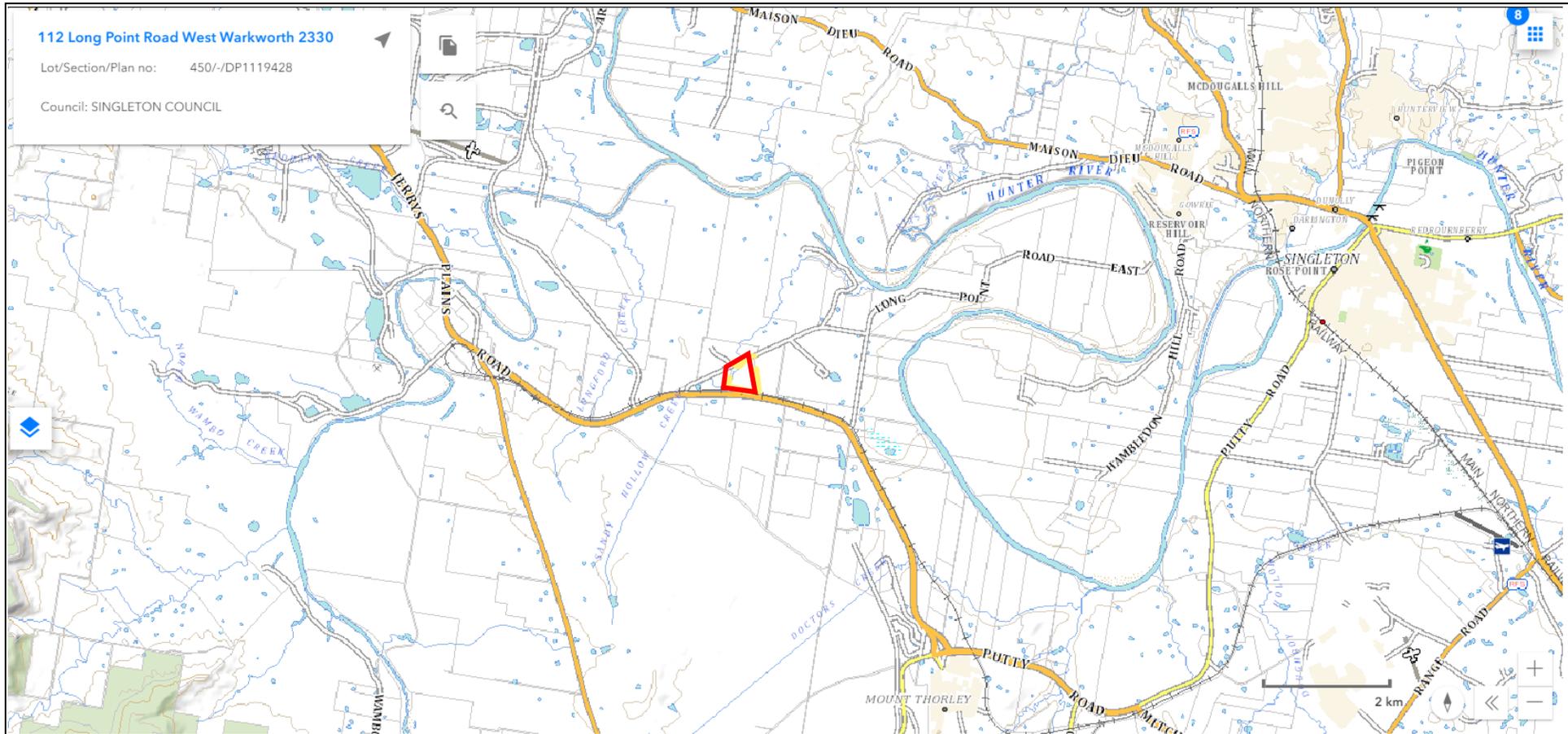
Figure 1.1 View of the south side of the Redbank Power Station.



Figure 1.2 View of the west side of the Redbank Power Station.



Figure 1.3. Site location. Lot boundary shown in red.



Date	Revision	Drawn By	Site description	Jackson Environment and Planning Pty Ltd	Client
4/06/21	Revision A	E. Larson	112 Long Point Road West, Warkworth (Lot 450 DP1119428)	Strategy Infrastructure Compliance Procurement A: Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060 E: admin@jacksonenvironment.com.au T: 02 8056 1849 W: http://www.jacksonenvironment.com.au	Verdant Earth Technologies Limited
					Project Redbank Power Station
					Title Site location
					Scale Per image
					Source NSW Planning Portal

2. Description of the Project

2.1. Overview of the Proposed Development

The Redbank Power Station was originally commissioned in July 2001 as an electricity generating facility and operated on beneficiated dewatered coal tailings (BDT) as main fuel and run-of-mine coal as a backup fuel. Tailings were transferred by conveyor from the Warkworth mine. The power station has been in care and maintenance since October 2014. Verdant Earth Technologies Limited are planning to restart the plant on waste timber residues and are seeking approval to add the ability to utilise up to 100% woody biomass as a fuel.

The plant was originally approved for the use of up to 700,000 tonnes of coal tailing for use as fuel in the power station to generate electricity. The proposal will see up to 900,000 tonnes of woody biomass being used as a substitute fuel for conversion into electricity. Woody biomass will be transported by trucks into the site, utilising the existing fuel storage and modified fuel handling equipment to enable the plant to use the new fuel type. Appendix A provides two scaled layout plans of the entire existing Redbank Power Station site.

A summary of the specific plant and process changes to enable the use of woody biomass fuel is summarised below:

1. Weighbridges to be installed near site entry and exit for measurement of mass of woody biomass fuels being delivered to the site;
2. The delivery of woody biomass to the plant will be done via B-doubles between 6am and 6pm six days per week (Monday to Saturday). The existing conveyor from the Warkworth for transfer of coal tailings into the plant will remain, in case the plant is required to accept coal tailings as a fuel in future;
3. The proposal will involve the conversion of the power station to enable the use of up to 900,000 tonnes of woody biomass as fuel for electricity generation with net zero CO₂ emissions equivalent. The fuel source will be eligible waste fuels as defined by the EPA and includes forestry and sawmill residues and uncontaminated wood waste that is generated in primary and secondary manufacturing processes;
4. Establishment of a new fuel delivery area along the Eastern site boundary. The system would incorporate a mobile conveyor system that includes two drive over truck unloaders, and three additional conveyors that supply a single radial telescopic conveyor to unload the woody biomass to the existing fuel storage area (i.e. the area approved for storage of coal tailings);
5. Modifications to two reversing conveyors within the power station to transfer the woody biomass into one of six fuel silos that will store the woody biomass. These silos previously stored coal tailings for delivery into the plant's fluidized bed combustion chambers;
6. Widening of the 'trouser legs' of the six fuel silos within the power station to enable the more efficient flow of woody biomass into the plant's fluidized bed combustion chambers;
7. Ash generated from the combustion process will be sampled, tested and potentially used as a fertiliser in accordance with the EPA's *The Ash from Burning Biomass Order 2014*. The existing ash slurry system previously used for coal tailings ash that transferred ash back to Warkworth mine will remain in place, though it will not be used.

No other power station upgrades or changes are proposed.

2.2. Existing Fluidised Bed Combustion Technology

The existing plant consists of two fluidised bed combustion steam generator units of FiCirc® design and a single 151MW steam turbine and associated balance of plant equipment.

FiCirc® technology was initially developed by Combustion Power Corp of California in the 1970’s to provide a low emission combustion system for a variety of fuels. The technology is characterised by a deep fluidised bed, configured to provide a high degree of bed fines recirculation to enhance the gas to solids contact and results in highly efficient combustion system producing low NO_x, SO_x, carbon monoxide and particulate emissions due to the ability to control the combustion chamber temperatures and the addition of sorbent material if required. This style of unit has demonstrated excellent performance and emissions profiles with a wide range of fuels including coal, petroleum coke, and biomass.

The principal components of the fluidised bed technology comprise boilers, a turbo generator, cooling tower and a stack. Figure 2.1 provides an overview illustration of the Fluidized Bed Technology and Figure 2.2 provides a diagram of fluidised bed furnace technology.

Figure 2.1. Existing Fluidised Bed Process Overview.

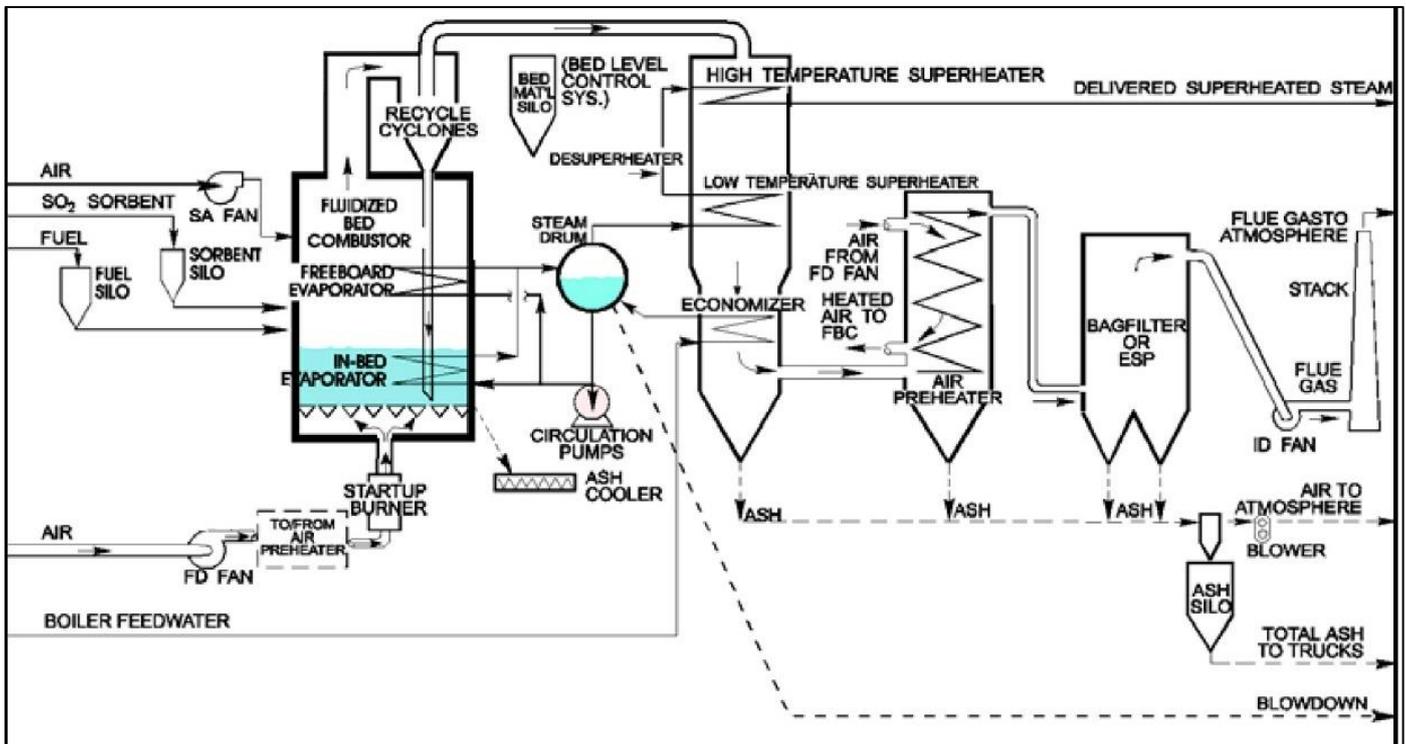
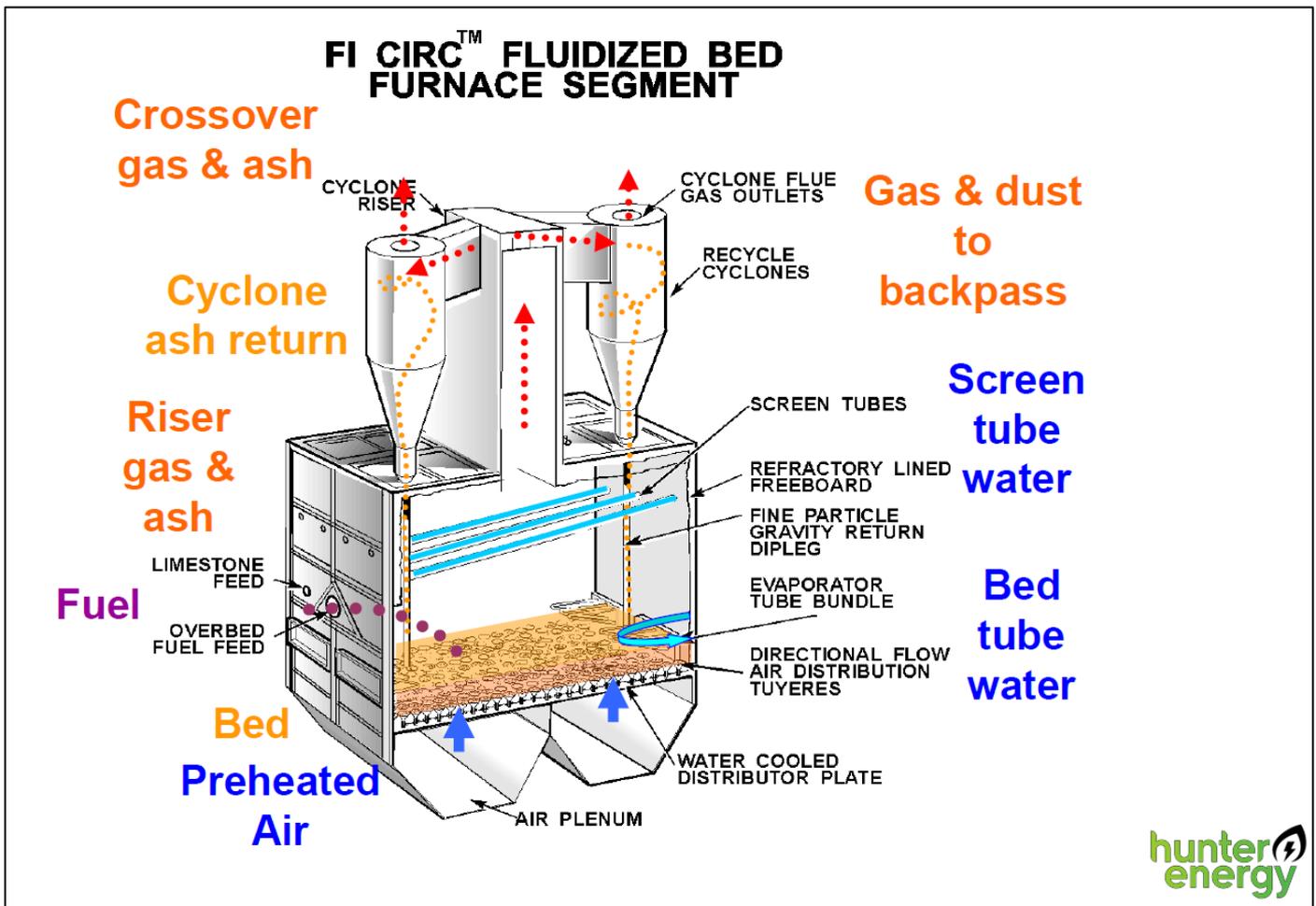


Figure 2.2. Existing Fluidized Bed Furnace Technology.



2.3. Proposed Plant Changes

2.3.1. Biomass Fuel Sources

The proposal will involve small modifications of materials handling systems of the power station to enable the use of up to 900,000 tonnes of woody biomass as fuel for electricity generation. The fuel source will be *eligible waste fuels* as defined by the EPA and includes forestry and sawmill residues and uncontaminated wood waste that is generated in primary and secondary manufacturing processes.

“Biomass” means primarily woodchips and/or synthesized wood-pellets. All preparation including drying, chipping and screening will be performed off site. Biomass fuel will be delivered within the specification required for the plant.

A capacity of 4 days storage will be required, equal to a stockpile in the order of 32,000 m³. At an assumed density of 320kg/m³ in a stored pile of wood chips (25% moisture content), this would equal approximately 10,240 tonnes.

The boiler fuel storage consists of three (3) silos for each of the two boilers. Based on steady unit operation and six (6) silos averaging a nominal 4.5 hours of storage (depending on the fuel storage density), this equals an approximate rate of 225m³/hour of wood chips for 40 minutes per silo for continuous reclaim and silo when operating at full load.

2.3.2. Modified Fuel Delivery and Handling Arrangements

The power station will accept approximately 900,000 tonnes of woody biomass at a 25% moisture content per annum in predominantly B Double rated semi-trailer configurations averaging a payload of 42-44 tonnes per load.

It is envisioned deliveries will be accepted between 6am and 6pm six days per week (Monday to Saturday) although there may be the occasional out of hours delivery to meet operational needs.

The process of accepting and storing these materials will consist of two weighbridges. The weighbridges will be placed on the entrance road and the exit roads which will enable the accurate gross weight and tare weights to be recording allowing for recording of woody biomass weights utilised on the site.

All woody biomass will be stored in the existing coal tailings fuel storage areas on the southern side of the plant. This is shown in the site plan given in Figure 2.5, Figure 2.6 and Appendix A.

An overview of the proposed woody biomass receival process is summarised in Figure 2.3.

Figure 2.3. Summary of the biomass fuel receival, handling and storage process.

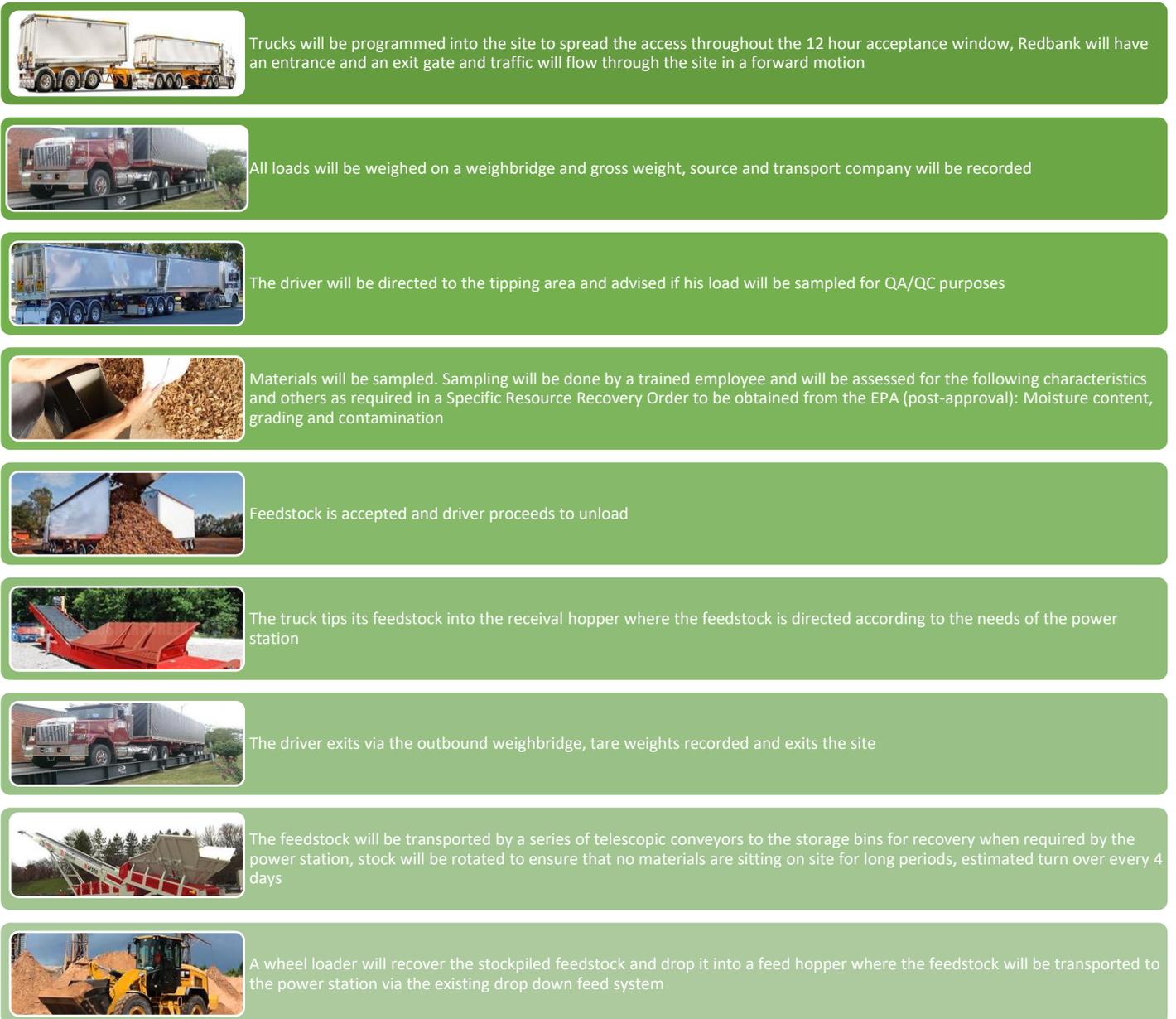
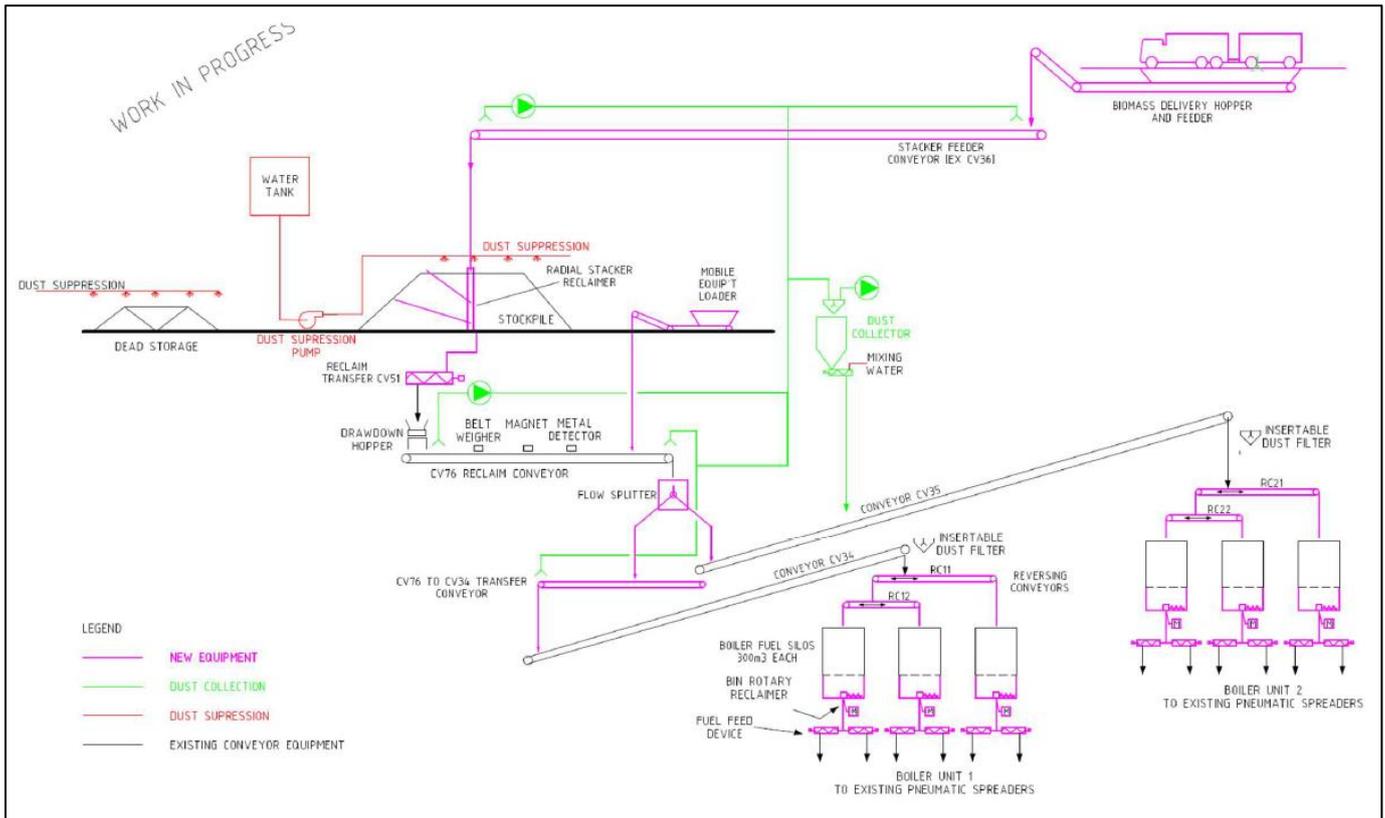


Figure 2.4 illustrates the proposed changes to the conveyor and biomass delivery system to accommodate biomass fuel unloading and delivery to the silos that feed the boilers.

A substantial portion of the existing stockpile reclaiming equipment will be re purposed for biomass. In order to provide sufficient system capacity, both existing conveyors CV34 and CV35 (shown in Figure 2.4) would be run in parallel to feed boiler units 1 and 2 simultaneously.

The modified fuel delivery area is proposed along the Eastern site boundary. The system would incorporate a mobile conveyor system that includes four drive over truck unloaders, and three additional conveyors that supply a single radial telescopic conveyor to unload the woody biomass to the storage area (as shown in Figure 2.5).

Figure 2.4. Proposed modifications to the conveyor and feed system to accommodate the use biomass fuel at the power station. Process and plant changes proposed are shown in purple (Source: B&PPS 2020).



2.3.3. Internal Plant Changes

To accommodate the change of fuel type to woody biomass, minor modifications to the fuel delivery conveyors and fuel feeding devices within the power station will be required. This will involve:

- Modifications to reversing conveyors RC11 and RC12 that transfer the woody biomass into one of three large silos that will store the woody biomass. These silos previously stored coal tailings for delivery into the plant’s fluidized bed combustion chambers (see plant changes highlighted in purple in Figure 2.3 and Figure 2.5);
- Widening of the ‘trouser legs’ of the six fuel silos to enable the more efficient flow of woody biomass into the plant’s fluidized bed combustion chambers. This is shown in Figure 2.5.

No other internal plant changes will be required to accommodate the use of woody biomass as a substitute fuel.

2.3.4. Connection to the Grid

The existing configuration includes a turbo-alternator power generating unit at 11 kilovolts (kV). The existing connection to the Shortland electrical system is via a 132 kV electrical interconnect line less than one kilometre (km)

2.3.5. Access and Biomass Haulage

It is estimated that 140 movements (70 trips) per day would be needed to haul the required biomass using primarily B-double trucks. Trucks hauling woody biomass to the site will enter the site via the eastern gate, and empty trucks leaving the site will exit via the western gate along Long Point Road. Refer to Figure 2.6.

The key roads providing access for the Site and for the haulage routes heading north and south are the Golden Highway (Jerry Plains Road) and Long Point Road West.

2.3.6. Modified Ash Management Arrangements

Ash generated from the combustion process will be sampled, tested and potentially used as a fertiliser in accordance with the EPA's *The Ash from Burning Biomass Order 2014*. This ash will be stored in existing storage silos for this purpose in the plant, and will be trucked off-site for reuse.

The existing ash slurry system previously used for coal tailings ash that transferred ash back to Warkworth mine will remain in place, though it will not be used.

2.3.7. Water Requirements

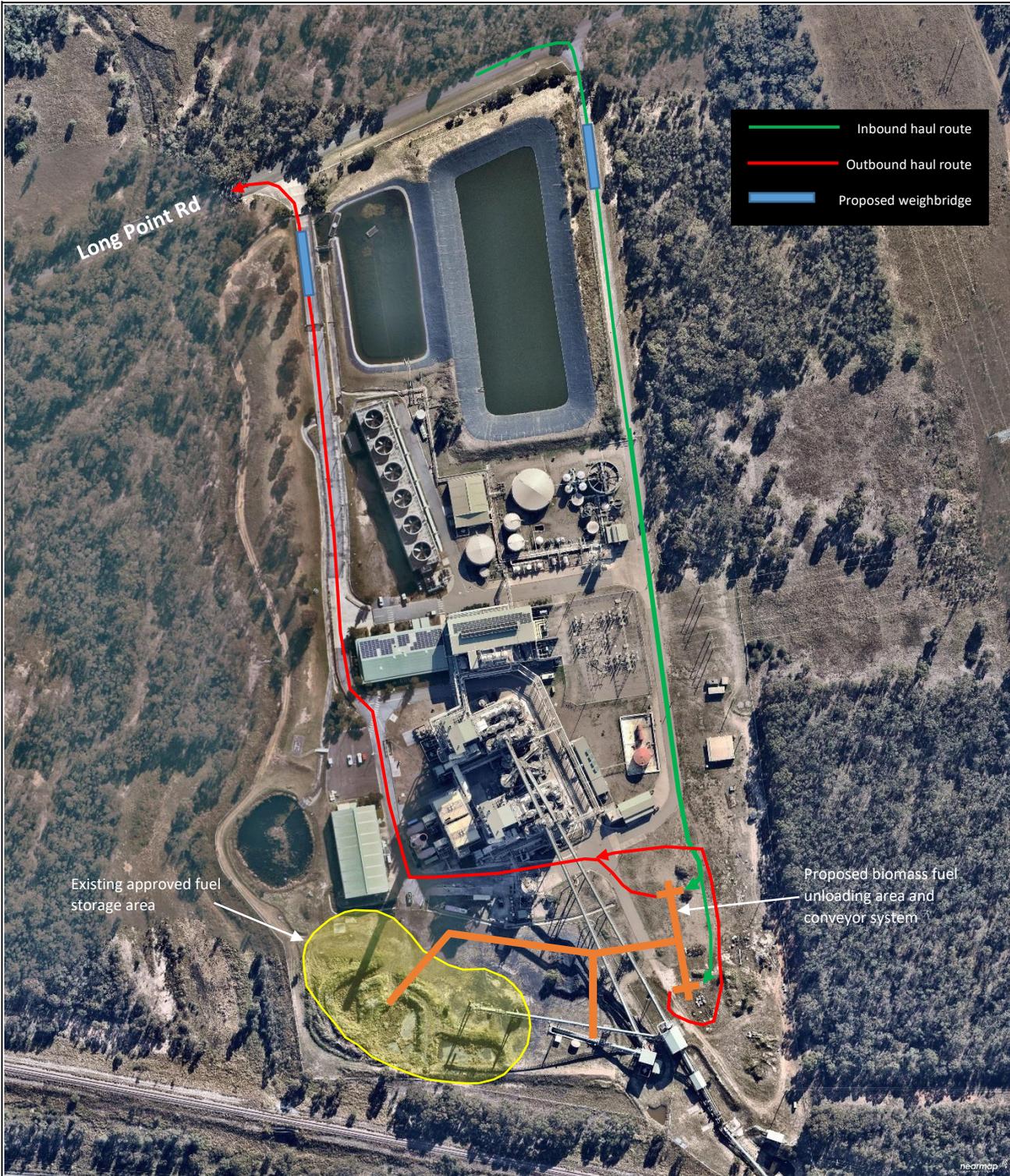
Water is required for the cooling towers in amounts similar to when BDT coal was used as fuel. The existing stormwater detention basins are often used for supply when adequate rainfall is available.

Approximately 3,000ML of water per annum is required for the power plant. Approximately 2,500ML per annum is lost through evaporative cooling and 500ML is used to generate steam for the turbines. Hunter Energy owns an offtake on the Hunter River and will need to seek adequate water licenses to supply the power plant in accordance with the *Water Management Act 2000*. Regional mine water licences are available and would be adequate to the amount of water required.

2.3.8. Removal of Existing Consent Expiry Date

Verdant Earth Technologies Limited are seeking a new Development Approval to also remove Condition 22 on the existing consent (DA183/93) regarding expiry. Condition 22 sets the current consent expiry date at 30 years after commencement of commercial operation of the project, and therefore July 2031. Verdant Earth Technologies Limited aim to operate an ongoing green energy power station to provide baseload energy to NSW well beyond that date.

Figure 2.6. Site Access to Redbank Power Station and internal haul route arrangements.



Date	Revision	Drawn By	Site description	Client	Verdant Earth Technologies Limited
08/06/21	Revision A	E. Larson	112 Long Point Road West, Warkworth (Lot 450 DP1119428)	Project	Redbank Power Station
18/06/21	Revision B	M. Jackson		Title	Access to site
				Source	Near Maps

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3. Planning and legislative requirements

3.1. Project approval

The development will occupy land that is already cleared and contains the existing Redbank Power Plant facility. It is unlikely that any bushland will need to be cleared to allow space for all aspects of the development, including access and storage of biomass.

A capacity of 4 days storage will be required at any one time, equal to a stockpile in the order of 32,000 m³, or approximately 10,240 tonnes. The power plant would consume about 900,000 tonnes of biomass per annum.

The proposed project is considered a Designated Development under Clause 18(1c) of Schedule 3 of the *Environmental Planning and Assessment Regulation 2000*, requiring an EIS to be submitted with the development application. In this regard, pursuant to Part 2, Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*, Verdant Earth Technologies Limited seeks the Secretary's Environmental Assessment Requirements with respect to the proposed EIS.

The planning consent authority for this proposed development will be Singleton Council.

3.2. Commonwealth Legislation

Relevant Commonwealth legislation includes the *Environmental Protection and Biodiversity Conservation Act 1999*. There are some High Value Biodiversity lands associated with the riparian corridor to the west of the site within the parcel. However it is unlikely to be impacted as the development will be maintained within the existing footprint of the power station. Biodiversity issues will be addressed in the Environmental Impact Statement (EIS) for the site.

3.3. NSW State Legislative Requirements

3.3.1. Environmental Planning and Assessment Act 1979

The proposed development is consistent with the overall objectives of the *Environmental Planning and Assessment Act 1979*. Section 5 of the *Environmental Planning and Assessment Act 1979* and the accompanying Regulation provide the framework for environmental planning in NSW and include provisions to ensure that proposals which have the potential to impact the environment are subject to detailed assessment, and to provide opportunity for public involvement.

The proposed development is consistent with the nominated objectives of the Act and is considered capable of fulfilling the statutory requirements. The site investigations have determined that the proposed development will not result in any significant negative impacts that cannot be adequately mitigated or managed. This will be assessed in detail at the development application stage.

The proposed project is a Designated Development (DD) requiring assessment under Part 4 of the *Environmental Planning and Assessment Act 1979* and the consent authority for the development will be Singleton Council.

As the project is considered DD, it is also considered "integrated development" under section 4.46 of the EP&A Act as the project will require licensing and permitting under the *Protection of the Environment Operations Act 1997* and the *Water Management Act 2000*.

3.3.2. Environmental Planning and Assessment Regulation 2000

While the EP&A Act provides the overarching framework for the planning system in NSW, the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) supports the day-to-day requirements of this system. It also contains key operational provisions relating to the development assessment and consent process, and requirements associated with public participation.

The proposed project is considered a Designated Development (DD) under Clause 18(1c) of Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* as it involves an electricity generating station supplying or capable of supplying “more than 30 megawatts of electrical power” from bio-material. Therefore, the project requires assessment under Part 4 of the *Environmental Planning and Assessment Act 1979* and the consent authority for the development will be the Singleton Council. An Environmental Impact Statement (EIS) will need to accompany the development application.

As a DD project, Clause 4.12(8) of the *Environmental Planning and Assessment Act 1979* applies, and an Environmental Impact Statement in the form prescribed by the Regulations must accompany the development application.

3.3.3. Protection of the Environment Operations Act 1997

The *Protection of the Environment Operation Act 1997* (POEO Act) prohibits any person from causing pollution of waters, or air and provides penalties for air, water and noise pollution offences. Section 48 of the Act requires a person to obtain an Environment Protection License (EPL) from the NSW Environment Protection Authority before carrying out any of the premise-based activities described in Schedule 1 of the Act.

Schedule 1 of the Act (clause 12) details what constitutes a ‘scheduled activity’ and therefore requires an EPL. The relevant activities which applies to this development are Clause 17 and Clause 18:

- ‘Electricity generation’ (Clause 17), meaning the generation of electricity by means of electricity plant that, wherever situated, is based on, or uses, any energy source other than wind power or solar power; and
- ‘Energy recovery from general waste’ (Clause 18), meaning the receiving from off site of, and the recovery of energy from, any waste (other than hazardous waste, restricted solid waste, liquid waste or special waste).

Wood and wood derived waste including biomass from agriculture, forestry and sawmilling residues, and uncontaminated wood waste are defined by the EPA’s *Energy from Waste Policy Statement* as ‘eligible waste fuels.’

Eligible waste fuels may be thermally treated using a range of treatment technologies, provided a resource recovery order and exemption has been granted by the EPA. The origin, composition and consistency of these wastes must ensure that emissions from thermal treatment will be known and consistent over time.

The EPA’s *Energy from Waste Policy Statement* requires that facilities proposing to use eligible waste fuels must meet the following criteria:

- Ability to demonstrate to the EPA that the proposed waste consistently meets the definition of an EPA-approved eligible waste fuel;
- Confirm there are no practical, higher order reuse opportunities for the waste;
- Fully characterise the waste and/or undertake proof of performance;
- Meet the relevant emission standards as set out in the *Protection of the Environment Operations (Clean Air) Regulation 2010*.

The policy also states that eligible waste fuels that also fall under the definition of a ‘standard fuel’ as defined in the *Protection of the Environment Operations (Clean Air) Regulation 2010* would not need to meet the above criteria but still require appropriate approval for their use.

standard fuel means any unused and uncontaminated solid, liquid or gaseous fuel that is—

- (a) a coal or coal-derived fuel (other than any tar or tar residues), or
- (b) a liquid or gaseous petroleum-derived fuel, or
- (c) a wood or wood-derived fuel, or
- (d) bagasse.

A Specific Resource Recovery Order and Exemption application under Clause 93 of the *Protection of the Environment Operations (Waste) Regulation 2014* will be required to lawfully permit the use of wastes defined as ‘eligible waste fuels’ in the project.

The development will need to meet monitoring and reporting requirements and air emission limits. An EPL will be required for the scheduled activities listed in Clause 17 and Clause 18 of Schedule 1 in the POEO Act.

3.3.4. Protection of the Environment Operations (Clean Air) Regulation

Under the *Protection of the Environment Operations (Clean Air) Regulation 2010*, scheduled plants belong to one of six (6) Groups, depending on the year in which the plant commenced operating. The Clean Air Regulation includes emission standards for a range of pollutants that apply to each Group and these standards become stricter in moving from Group 1 through to Group 6.

An assessment of potential emissions against the Group substances listed in Schedule 3 of the *Protection of the Environment Operations (Clean Air) Regulation 2010* will be undertaken for the EIS.

3.3.5. Protection of the Environment Operations (General) Regulation 2009

The use of native forest biomaterial for electricity generation is regulated through the *Protection of the Environment Operations (General) Regulation 2009*, clauses 96 to 98. These clauses expressly prohibit the use of native forest biomaterials in electricity generation, but also provide exemptions for certain types of native vegetation or woody waste from the definition of native forest biomaterials.

The material exempted from the definition is able to be burned for the purpose of electricity generation. Native forestry biomaterial can be used in electricity generation if it is:

- Invasive native species cleared in accordance with property vegetation plans that have been approved under the *Native Vegetation Act 2003* or an invasive native species order under the *Native Vegetation Regulation 2013*;
- Pulp wood logs and heads and off-cuts from clearing carried out in accordance with a private native forestry property vegetation plan or forestry operations carried out in accordance with an integrated forestry operations approval under the *Forestry Act 2012*;
- Trees cleared as a result of thinning carried out in accordance with a private native forestry property vegetation plan or an integrated forestry operations approval.

It is noted that the forestry biomass proposed as fuel will comprise of off-cuts and thinnings associated with approved forestry operations. As a consequence, the proposed fuel from forestry is exempted from the provisions of the *Protection of the Environment Operations (General) Regulation 2009*.

3.3.6. Protection of the Environment Operations (Waste) Regulation 2014

As a licensed waste facility, the project will be required to accurately measure all waste received and leaving the facility. The amount of waste received and transported off-site will need to be reported to the EPA through the Waste and Resource Reporting Portal (WARRP). Two certified weighbridges are proposed as part of the application.

A Waste Characterisation Methodology will be prepared to help inform an application for specific Resource Recovery Order and Exemption (RROE). RROE are being sought for the wood derived waste to be used as an eligible waste fuel. The NSW EPA will be consulted to ensure that the methodology for sampling, testing and monitoring of the eligible waste fuels are sufficient to inform a detailed specific RROE application.

A waste management plan would be developed for the proposed development and included in the EIS.

3.3.7. Water Management Act 2000

The object of the *Water Management Act 2000* is the sustainable and integrated management of the state's water for the benefit of both present and future generations. The *Water Management Act 2000* recognises the need to allocate and provide water for the environmental health of our rivers and groundwater systems, while also providing licence holders with more secure access to water and greater opportunities to trade water through the separation of water licences from land.

The proposed development will use water during the processing of biomass for stack cooling and for steam generation. An assessment of water requirements against the relevant water sharing plan and availability and access to water from the relevant water source(s) will be prepared to accompany the EIS.

3.3.8. Coal Mine Subsidence Compensation Act 2017

The Site is located within the Patrick Plains Mine Subsidence District (MSD). The MSDs administered by Subsidence Advisory NSW under the *Coal Mine Subsidence Compensation Act 2017* to help protect homes and other structures from potential mine subsidence damage.

Districts are proclaimed in areas where there are potential subsidence risks from underground coal mining that has occurred or may take place in the future.

Subsidence Advisory NSW regulates building and subdivision works within districts to ensure structures are built to an appropriate standard that reduces the risk of damage should subsidence occur.

Section 91 of the *Environmental Planning and Assessment Act 1979* specifies that all development within a MSD (excluding exempt development) is considered 'integrated development', therefore approval from Subsidence Advisory NSW is required.

The project will need to reference the *Development Guideline 2 – Potential subsidence risk non-active workings (Subsidence Advisory NSW, May 2018)*. Compliance with this guideline is a requirement for persons planning to develop property within a mine subsidence district that has been assigned Guideline 2.

Following construction, a certifier must be engaged to certify that an improvement has been constructed in accordance with Guideline 2. A copy of this certification must be provided to Subsidence Advisory NSW.

3.4. Environmental Planning Instruments and Policies

3.4.1. State Environmental Planning Policy (Infrastructure) 2007

The aim of the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP) is to facilitate the effective delivery of infrastructure across NSW by improving regulatory certainty and efficiency through a consistent planning regime for infrastructure and the provision of services, and by providing greater flexibility in the location of infrastructure and service facilities.

Other key aims of the Infrastructure SEPP are to allow for the efficient development, redevelopment or disposal of surplus government owned land, and identify the environmental assessment category into which different types of infrastructure and services development fall (including identifying certain development of minimal environmental impact as exempt development). The Infrastructure SEPP also seeks to help proponents identify matters to be considered in the assessment of development adjacent to particular types of infrastructure development and providing for consultation with relevant public authorities about certain development during the assessment process or prior to development commencing.

Division 4, Section 34(1) of *State Environmental Planning Policy (Infrastructure) 2007* sets out that ‘Electricity generating works’ are permissible in RU1 Primary Production zones, as:

- Under Section 33 of *State Environmental Planning Policy (Infrastructure) 2007*, RU1 Primary Production is a ‘prescribed rural, industrial or special use zone’ for ‘Electricity generating works or solar energy systems’.
- Under Section 34(1)(b) of *State Environmental Planning Policy (Infrastructure) 2007*, ‘Electricity generating works or solar energy systems’ are permissible in a ‘prescribed rural, industrial or special use zone’.

In addition, Section 34(3) states that ‘*Development for the purpose of, or resulting in, a change of fuel source of an existing coal or gas fired generating works by a proportion of more than 5 per cent in any 12 month period may only be carried out with consent.*’

‘Electricity generating works’ defined under the Standard Instrument include a building or place used for the purpose of making or generating electricity. Therefore, the proposed development is permissible with consent in RU1 zoning under Section 33 and 34 of the *State Environmental Planning Policy (Infrastructure) 2007*.

3.4.2. State Environmental Planning Policy (State and Regional Development) 2011

The aims of the *State Environmental Planning Policy (State and Regional Development) 2011* (State and Regional Development SEPP) are:

- (a) To identify development that is State Significant Development.
- (b) To identify development that is State Significant Infrastructure and critical State Significant Infrastructure.
- (c) To identify development that is regionally significant development.

Under Part 2, Clause 8 of the State and Regional Development SEPP, development is declared to be State Significant Development (SSD) if the development is specified in Schedule 1 or 2. A development is declared a Regionally Significant Development if the development is specified in Schedule 7. Schedules 2 through 5 do not apply to the proposed development.

The following Clauses under Schedule 1 have been assessed:

Under Clause 20(3) of Schedule 1, “Development for the purpose of electricity generating works or heat or their co-generation (using any energy source, including... biofuel...) that has a capital investment value of more than \$30 million” is considered SSD.

The Capital Investment Value (CIV) of works excludes the cost of the constructing and commissioning works approved by a previous development consent. The CIV of the proposed application is under \$30 million. Therefore Clause 20(3) does not apply.

Under Clause 23(4) of Schedule 1, “Development for the purpose of waste incineration that handles more than 1,000 tonnes per year of waste” is considered SSD.

Development for the purpose of waste incineration would be for the purpose of disposing of waste by incinerating it. The proposed application is not for the purpose of “waste incineration” (disposal) but for “electricity generating works”. Ancillary uses which are subservient to the dominant use are not considered separate independent uses. Therefore Clause 23(4) does not apply.

The following Clauses under Schedule 7 have been assessed:

Clause 5 provides that a project is Regionally Significant Development if it is “*Private infrastructure and community facilities over \$5 million*” for the purposes of “*electricity generating works.*” The CIV of the proposed application is under \$5 million. Therefore Clause 5 does not apply.

Clause 7 (Particular designated development) of Schedule 7 provides that a project is Regionally Significant Development if it is “*development for the purposes of...waste management facilities or works, which meet the requirements for designated development under clause 32 of Schedule 3 to the Environmental Planning and Assessment Regulation 2000.*”

Clause 32 (Waste management facilities or works) of the *Environmental Planning and Assessment Regulation 2000* does not apply to “*development comprising or involving waste management facilities or works specifically referred to elsewhere in this Schedule*” as stated in Clause 32(2b). The primary purpose of the proposed development is ‘*electricity generating works.*’ The proposed project is considered a Designated Development (DD) under Clause 18(1c) of Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* as it involves “*Electricity generating stations, including associated water storage, ash or waste management facilities, that supply or are capable of supplying – more than 30 megawatts of electrical power*” from bio-material. Therefore Clause 7 of Schedule 7 of the *State Environmental Planning Policy (State and Regional Development) 2011* does not apply.

The project does not trigger relevant SSD requirements and is not considered a Regionally Significant Development.

3.4.3. State Environmental Planning Policy No. 55: Remediation of Land

Under *State Environmental Planning Policy, No. 55: Remediation of Land (SEPP 55)*, applicants for consent must carry out a preliminary site investigation for any development consent sought on land previously used for activities that may cause contamination.

Specifically, Clause 7 of SEPP 55 requires the approval authority to have regard to certain matters before granting approval. These matters include:

- Whether the land is contaminated.
- Whether the land is, or would be, suitable for the purpose for which development is to be carried out.
- If remediation is required for the land to be suitable for the proposed purpose, whether the land will be remediated before the land is used for that purpose.

SEPP 55 also imposes obligations to carry out any remediation work in accordance with relevant guidelines, developed under the *Contaminated Lands Management Act 1995* and to notify the relevant council of certain matters in relation to any remediation work.

The proposal seeks to modify the current site layout and install mobile conveyor equipment with minor ground disturbance for weighbridge installation. A SEPP 55 preliminary site assessment is not expected to be required for the application.

3.4.4. State Environmental Planning Policy No 33: Hazardous and Offensive Development

State Environmental Planning Policy No 33: Hazardous and Offensive Development (SEPP 33) outlines the requirements for a Preliminary Hazard Analysis screening test, required to be undertaken for hazardous and potentially hazardous industries.

A potentially hazardous industry is defined within SEPP 33 as a development for the purpose of any industry which, if the development were to operate without employing any measures to reduce or minimise its impact, would pose a significant risk to human health, life or property, or to the biophysical environment.

Part 3 of SEPP 33 applies to:

- a) *development for the purposes of a potentially hazardous industry, and*
- b) *development for the purposes of a potentially offensive industry, and*
- c) *development notified, for the purposes of this Part, by the Director in the Gazette as being a potentially hazardous or potentially offensive development.*

Development that is potentially hazardous and/or offensive is permissible under SEPP 33 if the facility is capable of securing an Environment Protection Licence (EPL) from the NSW Environment Protection Authority.

The proposed development will need to be assessed as during the development application stage to determine if the operations are “potentially hazardous” or “potentially offensive” as per the definitions in Part 1 of SEPP 33. A preliminary hazard analysis (PHA) will be prepared as part of the EIS for the development application.

3.4.5. State Environment Planning Policy No. 64 – Advertising and Signage

The aim of State Environmental Planning Policy No 64 – Advertising and Signage (SEPP 64) is to ensure that signage is compatible with the desired amenity and visual character of an area, provides effective communication in suitable locations and is of a high-quality finish and design. This Policy does not regulate the content of signage and does not require consent for a change in the content of signage.

Part 2 of SEPP 64 details the requirements that a consent authority must be satisfied with prior to granting development consent:

A consent authority must not grant development consent to an application to display signage unless the consent authority is satisfied:

- a) that the signage is consistent with the objectives of this Policy as set out in clause 3 (1) (a), and
- b) that the signage the subject of the application satisfies the assessment criteria specified in Schedule 1. Part 3 (9) of SEPP 64 details advertisements to which this Part applies and states:
 - a. This Part applies to all signage to which this Policy applies, other than the following:
 - i. business identification signs,

- ii. building identification signs,
- iii. signage that, or the display of which, is exempt development under an environmental planning instrument that applies to it,
- iv. signage on vehicles

Signage is proposed to be installed as part of the development application to identify the facility. The proposed signage will be defined as a ‘business identification sign’ and therefore SEPP 64 is not applicable.

3.5. Singleton Local Environmental Plan 2013

The following section provides the local planning and legislative framework for the proposed development. The purpose of this section is to outline the approval process and identify the applicable local planning controls that relate to the Singleton Local Environmental Plan 2011 (Singleton LEP).

3.5.1. Zone Objectives

The objectives of RU1 Primary Production are to:

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base;
- To encourage diversity in primary industry enterprises and systems appropriate for the area;
- To minimise the fragmentation and alienation of resource lands; and
- To minimise conflict between land uses within this zone and land uses within adjoining zones.

3.5.2. Land Use Permissibility

The development is located on land zoned as RU1 Primary Production under the Singleton Local Environmental Plan 2013.

Under the dictionary of the Singleton LEP, ‘*Electricity generating works*’ is defined as ‘*a building or place used for the purpose of making or generating electricity.*’

Whilst the LEP prohibits development that may be classified as a ‘Electricity generating works’, this development is considered permissible with consent in RU1 zoning under Division 4 of the *State Environmental Planning Policy (Infrastructure)* 2007.

3.6. Singleton Development Control Plan 2014

The objectives of the *Singleton Development Control Plan 2014* are to:

- To provide clear and concise guidance on Council’s minimum requirements for building, subdivision and land development,
- To provide detailed criteria to assist Council in assessing development applications as required by the provisions of the *Environmental Planning and Assessment Act 1979*,
- To achieve high quality design outcomes,
- To protect and conserve the environmental and cultural heritage of Singleton, and
- To provide for the orderly and economic use and development of land in Singleton.

The development is required to demonstrate compliance the *Singleton Development Control Plan 2014*. Relevant sections and provisions are described in Table 3.1. The EIS would address the relevant elements of the Singleton DCP.

Table 3.1. Relevant provisions of the Singleton Development Control Plan 2014.

Section or Chapter	Description of Relevant Provisions	How the DCP element will be addressed
2.4	Stormwater drainage system. The development must ensure stormwater is disposed of suitably and does not contribute to adverse downstream impacts or overload the public stormwater drainage system.	Analysis and update, if required, to the existing storm drain capture, treatment, and reuse system per this DCP section.
2.28	Design of car parking areas, loading docks and vehicle manoeuvring areas. Design must ensure suitably designed vehicle manoeuvring areas. Onsite parking spaces must meet the requirements in Schedule 1.	Traffic, parking and swept path analysis to be included in the EIS.
2.29	Waste storage and collection areas. The development must minimise adverse environmental impacts and ensure the suitable management and storage of waste onsite.	Receival, storage and management of biomass waste and management of on-site generated waste will be included in a Waste Management Plan in the EIS.
4.1	Operational details. The land use should not generate any significant adverse impacts as a result of: (a) hours of operation, (b) employee numbers, (c) customer or patron numbers, (d) waste management, (e) traffic generation, (f) chemical use or storage, and (g) emissions.	Operational details will be provided in the EIS and include any potential impacts and associated mitigation measures proposed for the project.
4.3	Site planning. The development must consider whether the site is suitable for the development taking into account the following: (a) road layout and design, and (b) lot size, shape and dimensions, and (c) access, and (d) drainage requirements, and (e) utilities and services, and (f) sewage disposal, and (g) natural hazards, and (h) character of the locality, and (i) heritage and archaeological conservation, and (j) tree preservation, and (k) soils.	These details will be provided in the EIS for the proposal. An assessment of the suitability of the site for the proposal will be provided, including any potential impacts to neighbouring properties, the community and environmental and heritage values. Existing and proposed utilities will be assessed.

3.7. Relevant Policies and Guidelines

3.7.1. NSW Energy from Waste Policy Statement

The *NSW Energy from Waste Policy Statement 2015* identifies the relevant policy framework and principal criteria that apply to facilities in NSW that propose to thermally treat waste or waste-derived fuels for the recovery of energy, and in doing so, providing regulatory clarity to industry and the community. In accordance with Schedule 1 of the POEO Act 1997, thermal treatment means the processing of waste by burning, incineration, thermal oxidation, gasification, pyrolysis, plasma or other thermal treatment processes.

Under the NSW Energy from Waste Policy Statement, the project is not defined as an ‘energy recovery facility’ because it will combust an ‘Eligible Waste Fuel’.

The policy refers to the *Eligible Waste Fuels Guidelines* 2016 for details on how to apply for a resource recovery order and exemption for the use of an eligible waste fuel.

A combined Eligible Waste Fuel and RRO/RRE application will be submitted for the wood derived from waste in accordance with the Eligible Waste Fuel Guidelines (Part 4).

3.7.2. Eligible Waste Fuels Guidelines

As per the Eligible Waste Fuel Guidelines, wood and biomass derived waste to be combusted by the Redbank Power Station to produce electricity will be sourced from waste generated that meets the definition of an EPA approved eligible waste fuel as defined in Section 3 of the policy:

- Biomass from agriculture;
- Forestry and sawmilling residues; and
- Uncontaminated wood waste.

3.7.3. The ash from burning biomass order 2014

The ash from burning biomass order 2014 applies to ash, meaning the waste generated by burning biomass from agriculture, forestry and sawmilling residues, uncontaminated wood waste and/or organic residues from virgin paper pulp activities.

Verdant Earth Technologies Limited would aim to supply ash from the Redbank Power Station for agricultural application to land in accordance with the testing and reporting requirements of the order.

3.8. Fire and Rescue NSW – Fire Safety Guidelines

Fire & Rescue NSW (FRNSW) published guidelines to provide guidance on fire safety in waste facilities that receive combustible waste material, including provisions for fire safety and safe fire brigade intervention to protect life, property and the environment.

The guidelines detail the requirements of FRNSW for waste facilities including:

- Consideration of fire safety including site selection, planning, design, assessment and operation;
- Fire safety systems to be adequate to special hazards identified within a waste facility and which also meet the operational needs of firefighters;
- Safe storage and stockpiling of combustible waste material based on expected combustibility and maximum pile size; and
- Workplace fire safety and fire safety planning, including procedures for the event of fire or emergency incident.

The guidelines apply to the proposed development as it would be a facility receiving, storing and processing potentially combustible waste. Fire safety will be assessed for adequacy in the Environmental Impact Statement accompanying the development application and include consultation with FRNSW.

3.9. Approvals and Licences Required

The development is considered to be a Designated Development (DD) project under *Environmental Planning and Assessment Regulation 2000*.

For a DD, an EIS will be required and third parties must be notified and can appeal against a decision to grant consent. Developments are DD due to their size, economic value or potential impacts they could have. A development can be

categorised as ‘designated development’ if the type of development activity is listed in Schedule 3 of the *Environmental Planning and Assessment Regulation 2000*.

The proposed development type is included under Clause 18(1c) of Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* as it involves an electricity generating station supplying or capable of supplying “more than 30 megawatts of electrical power” from bio-material.

If a development application is categorised as DD, the application:

- Must be accompanied by an environmental impact statement (EIS); and
- Will require public notification for a minimum 28 days.

The proposed development requires an Environment Protection Licence (EPL) from the NSW Environment Protection Authority as ‘electricity generation’ project and as an ‘energy recovery from general waste’ under Clauses 17 and 18, respectively, of Schedule 1 of the *Protection of the Environment Operations Act 1997*.

The project will also require a specific resource recovery exemption and order (specific RROE) from the EPA for use of biomass at the power plant.

4. Project Justification

4.1. Strategic Drivers

4.1.1. NSW Waste and Sustainable Materials Strategy 2041

This strategy updates NSW's previous strategy: the *Waste Avoidance and Resource Recovery Strategy 2014–2021*.

NSW Waste and Sustainable Materials Strategy 2041: Stage 1 – 2021-2027 outlines the actions NSW will take over the next six years – the first phase of the strategy – to deliver on a set of long-term objectives. The strategy is by \$356 million in funding to help deliver priority programs and policy reforms, including:

- Phasing out problematic single-use plastic items;
- Financial incentives for manufacturers and producers to design out problematic plastics;
- Having government agencies preference recycled content and invest in research and pilots for recycling innovation;
- Introducing tighter environmental controls for energy from waste in NSW, with further consideration of planning and infrastructure needs underway;
- Mandating the source separation of food and garden organics for households and selected businesses; and
- Incentivising biogas generation from waste materials.

Specific targets focus on the environmental benefits and economic opportunities in how we manage our waste, and includes the following:

- Reduce total waste generated by 10% per person by 2030;
- Have an 80% average recovery rate from all waste streams by 2030;
- Significantly increase the use of recycled content by governments and industry;
- Phase out problematic and unnecessary plastics by 2025;
- Halve the amount of organic waste sent to landfill by 2030;
- Reduce litter by 60% by 2030 and plastics litter by 30% by 2025; and
- Triple the plastics recycling rate by 2030.

To complement this strategy, NSW also released the following documents:

- *NSW Plastics Action Plan*, which sets out how we will phase out problematic plastics, tackle litter from plastic items like cigarette butts, and support innovation and research;
- *NSW Waste and Sustainable Materials Strategy: A guide to future infrastructure needs*, which sets out the investment pathway required for NSW to meet future demand for residual waste management and recycling.

The proposed development will assist in creating additional markets for uncontaminated wood and timber from the urban waste stream, and help deliver targets in this strategy.

4.1.2. NSW Government's Net Zero Plan Stage 1: 2020 – 2030

The *Net Zero Plan Stage 1: 2020-2030* is the foundation for NSW's action on climate change and goal to reach net zero emissions by 2050. It outlines the NSW Government's plan to grow the economy, create jobs and reduce emissions over the next decade.

The plan aims to enhance the prosperity and quality of life of the people of NSW, while helping the state to deliver a 35% cut in emissions by 2030 compared to 2005 levels. The plan will support a range of initiatives targeting electricity

and energy efficiency, electric vehicles, hydrogen, primary industries, coal innovation, organic waste and carbon financing.

As part of the plan, the NSW Government has set as their top priority is to drive the uptake on proven emissions reduction technologies that grow the economy, create new jobs or reduce the cost of living. The NSW Government's first priority is to provide a pathway to deploy those technologies at scale over the next decade. To do this, the NSW Government will remove unnecessary barriers to entry for those technologies and make co-investments to address the high upfront capital costs that may stand in the way of their take-up.

Furthermore, the NSW Government has set a target of net zero emissions from organic waste by 2030. To deliver on this goal, the NSW Government will establish world-leading landfill diversion policies to apply to the waste industry. It will:

- Facilitate the development of 'waste to energy' facilities in locations that have strong community support, provided those facilities meet strict environmental standards; and
- Update regulatory settings to ensure residual emissions from the organic waste industry are offset.

These policies strongly support the re-purposing of existing energy generation infrastructure to create low emissions green power for residents of NSW. The proposed project will deliver green baseload power to the electricity grid and will be the first major project of its type in NSW to help drive progress towards the NSW Government's goal of net zero greenhouse gas emissions by 2050.

4.1.3. The National Waste Policy 2018 Strategy

The 2018 National Waste Policy provides a framework for collective action by businesses, governments, communities and individuals until 2030. The 2018 National Waste Policy focuses on waste avoidance, improved material recovery and use of recovered materials.

Strategy 7 of the policy aims to increase industry capacity through identifying and addressing opportunities across municipal solid waste, commercial and industrial waste, and construction and demolition waste streams for improved collection, recycling and energy recovery, to deliver ongoing improvements in diversion from landfill, improved quality of recycled content and use of the waste hierarchy.

4.2. Addressing Electricity Shortfalls

The Redbank Power Station can provide green baseload 'dispatchable' power 24 hours a day, seven days a week, unlike many other alternative renewables. The reliability of the electricity grid is a matter of public importance to NSW. With increasing installation of variable renewable energy resources such as wind and solar power plants the requirement for dispatchable electricity is becoming more critical to maintaining stability and supply.

Liddell power station produces around 8,000 GWh of electricity or enough power for approximately one million average Australian family homes. Production from the Liddell power station meets approximately 35% of the electricity needs of New South Wales. Given the upcoming closure of the 1,800 MW Liddell Power Station in April 2023, additional baseload power capacity is crucial to maintain stability in the energy market. Using biomass to fuel the Redbank Power Station would reduce the risks of supply interruptions during peak summer periods and assist in maintaining stable prices.

When the Northern Power Station in South Australian and Hazelwood power station in Victoria closed in 2016/2017, energy prices spiked and rolling blackouts occurred throughout South Australia and Victoria.

The Redbank Power Station would be Australia's third largest 100% green baseload power generator with net zero CO₂ emissions.

4.3. Sustainability

4.3.1. Environmental

In 2017, the NSW Department of Primary Industries (2017) prepared a report to look at forestry residues on the North Coast of NSW and the potential for their use in energy generation. The study concluded that from a climate perspective, using biomass that would have otherwise been left in the forest to burn and/or decay for bioenergy generation results in positive outcomes, especially if biomass is used to produce electricity displacing the use of coal. This is true even when the carbon dioxide emissions from burning the biomass to generate energy are included in the calculations. In practice, the CO₂ released will be reabsorbed by the growing trees in a sustainable harvest system, negating the impact of such emissions.¹

4.3.2. Economic

Conversion of the Redbank Power Station to a waste biomass to energy facility is estimated to create between 200-300 construction jobs and 50 permanent jobs following recommissioning. When fully operational the power plant would produce a million megawatt hours of electricity per year, equivalent to supplying around 200,000 homes.

It is also estimated that there would be a significant flow on effect from the project, including approximately 800-900 direct and indirect jobs into the regional and state economy from the fuel supply requirements.

4.3.3. Social

The project will also deliver educational and demonstration opportunities for the promotion of green electricity generation and sustainable waste management practices. Much of the residual forestry and agricultural wastes processed by the power station will be diverted from landfill. On the north coast alone, residues from agricultural crops (45,000 -78,000 tonnes/year) are currently disposed of in landfills (approximately 700, 000 tonnes/year). The Redbank Power Station sits in a region of NSW that includes a substantial forest estate, and a large number of sawmill and wood processing facilities within a 300-400km radius of the site.

Significant quantities of biomass can be sourced from industrial wood based waste, end-of-life timber products, sawmill and wood processing residues and low quality forest resources not suitable for timber product manufacturing. This project can provide additional opportunities for synergies with the sustainable forestry and agricultural industry.

¹ NSW Department of Primary Industries (2017). North Coast Residues: A project undertaken as part of the 2023 North Coast Forestry Project

5. Baseline Conditions

5.1. Site Description

The Site is located at 112 Long Point Road West, Warkworth (Lot 450 DP1119428) along the southern alignment of Long Point Road. South of the Site is bound by a railway easement and the Golden Highway. The lot itself is about 18 hectares, and the existing Redbank Power Station comprises approximately 10 hectares on the east side of the lot.

The site currently contains power station infrastructure:

- Multiple buildings including offices, warehouses and turbine hall;
- Road access and carparks;
- Stockpile area and conveyor belts;
- Sediment basin, detention basin and wastewater storage basin; and
- Power generation infrastructure (Boiler, cooling tower, stack and turbo generator).

5.2. Adjoining Premises and Sensitive Receivers

The Site is relatively flat with a northeasterly aspect. Average gradients of the site are in the order of 1-2%. The immediate surrounding landscapes are uncleared bushland, but the region is mainly cleared for grazing purposes, with native pastures. There are multiple large open cut coal mines within 10km of the site.

The nearest dwellings appear to be over 1km distance toward the east. Warkworth is about 4.5km to the northwest, and Mount Thorley sits about 5km to the south.

5.3. Easements, Licences or Covenants

No easements or covenants are currently known to impact the subject site. Further investigations will be done in consultation with Singleton Council as part of the Environmental Impact Statement process. The lot is currently partially developed and has a consent and associated EPL to operate the power plant fueled by coal washery tailings for electricity generation.

5.4. Air Quality

The use of biomass as a fuel will result in a positive change to the air quality impacts associated with Redbank Power Station. The most significant source of operational air emissions for the power station will be through biomass combustion products and emissions from the main stack. An initial assessment of the proposed development identified that approximately 112 tonnes of biomass would be burned per hour, assuming a nominal fuel moisture content of 25%. For the majority of the nominated pollutants there will likely be a positive impact in regard to reduced concentrations by using biomass compared with coal. The data also indicates that the proposed use of biomass would result in a reduction in greenhouse gas emissions of approximately 98% compared to the currently approved fuel (coal tailings).

As such an air quality assessment will be undertaken for the development EIS to assess air quality impacts from the proposed fuel sources. Other potential air quality impacts that will be assessed include dust from the management of biomass receipt and storage. This includes a comparison of both the stack emissions and the greenhouse gases to assess predicted emissions against current air quality requirements.

5.5. Geology and Soils

The site is shown as mapped within the Branxton Soil Landscape. The main soils are Yellow Podzolic Soils on midslopes with Red Podzolic Soils on crests. Yellow Soloths occur on lower slopes and in drainage lines. Alluvial Soils occur in some creeks with Siliceous Sands on flats within large valleys. Some acid topsoil problems are encountered in the area.

Tunnel and gully erosion in the Yellow Soloths due to their high dispersibility. Little erosion is associated with the Alluvial Soils and Siliceous Sands. There are some salt scalds in the Yellow Soloths.

In terms of geology, the area consists of the Farley Formation, Rutherford Formation, Mulbring Siltstone, Muree Sandstone, Branxton Formation and Singleton Coal Measures.

Very little soil disturbance is expected for the project. Potential soil and geology impacts will be considered further in the EIS.

5.6. Biodiversity

The site of the power station itself has been previously cleared and disturbed. The western part of the lot contains bushland and Sandy Hollow Creek, which enters the Hunter River about 2.3km to the east. A small first order waterway that is mapped as discharging to Sandy Hollow Creek on the lot was diverted during the original construction of the power plant. Sandy Hollow Creek is mapped as High Value Biodiversity land.

While the proposed development site is on the cleared portion of the lot, a biodiversity assessment will be undertaken during the EIS to consider any potential impacts on fauna in this nearby riparian area of high ecological value.

5.7. Surface Water and Stormwater

The site previously contained a watercourse however the channel was diverted around the site as part of the original construction works. An external catchment also affects the southern end of the site. A large diversion bund is situated adjacent to the stockpile area, which conveys flows from this external catchment to the aforementioned watercourse. Council's online mapping was consulted in regards to flooding information and the site exists outside any flood affected areas.

The proposed biomass fuel conversion of the power station will not result in the creation of any additional impervious areas or alter the current hydraulic characteristics of the site. Therefore, it is unlikely that augmentation of the current site drainage network is necessary as part of the conversion.

The existing detention basin is 6 megalitres (ML) in volume with a permanent pool volume of approximately 3 ML resulting in a remaining 3 ML of OSD volume. Combined with a daily reuse of 0.330 ML, the OSD would be considered oversized for the site and overflow from the OSD basin only occurs in extreme rainfall events. Figure 5.1 shows a photo of the existing stormwater detention basin near the fuel storage area.

Overflow from the sediment basin is conveyed to the large detention basin along with the remaining runoff from the majority of the site via open concrete channel.

The detention basin is the source of water for the operation of the power plant which draws from the basin. The water is recirculated back into the basin after losses via steam through the exhaust stacks. The permanent water level of the basin is approximately 3ML and is supplemented with water from the Hunter River, which is pumped into the basin.

The quality of stormwater discharging from the subject site is expected to remain unchanged as a result of the proposed biomass fuel conversion. The existing treatment train and in particular the size of the detention and

retention ponds captures and reuses most of the run-off from the Site. As a result, very little stormwater is discharged from the site.

Soil and water would be assessed as part of the EIS, including an assessment of the adequacy of the stormwater management infrastructure, water balance, and analysis of water access and adequate water supply for the Site and operations. An assessment of releases to the Hunter River in accordance with the Hunter River Salinity Trading Scheme would also be prepared.

Figure 5.1. View of the existing stormwater detention pond.



5.8. Groundwater

The site is not located in an area of groundwater vulnerability according to the *Singleton Local Environmental Plan 2013*. Groundwater interception from the development is not likely. Further investigations in relation to groundwater will be undertaken as part of the Environmental Impact Statement.

5.9. Traffic

It is estimated that 140 movements (70 trips) per day would be needed to haul the required biomass. It is proposed that biomass would be transported via road primarily using B-Double trucks across the day (12 hour shift). This

assumes a consistent 50/50 split travelling to/from the site from the northerly and southerly directions. As biomass fuel arrangements will be managed by the site operator, the arrival of vehicles will be scheduled to avoid queueing.

The Golden Highway (Jerrys Plain Road)/Long Point Road intersection was upgraded as part of the construction of the Redbank Power Station. A preliminary assessment prepared by Ason Group for Hunter Energy concluded that the intersection is predicted to continue to operate at a good level of service and with spare capacity.

In addition, the broader Power Station would recommence operations in line with existing approvals; from a traffic and transport perspective, this includes:

- The employment of up to 50 operational and maintenance staff;
- Primary shifts for staff being Monday to Friday between 6:00am – 6:00pm.

The key roads providing access for the Site and for the haulage routes heading north and south are detailed below:

- Golden Highway (Jerry Plains Road): A State Highway (SH 27), the Golden Highway generally runs in a north-west to south-east to direction between the Castlereagh Highway at Craboon and Putty Road at Singleton, respectively. It generally provides two traffic lanes for two-way traffic, and at-grade and grade-separated intersections appropriate to through and turning traffic demands along different parts of the route. In the vicinity of the Site, the Golden Highway has a posted speed limit of 100km/h.
- Long Point Road West: A collector road, Long Point Road West generally run in an east-west direction between Gouldsville Road and the Golden Highway, respectively. It provides two sealed traffic lanes for two-way traffic, and has a posted speed limit of 100km/h.

Preliminary traffic modelling of a conservative development scenario of up to 20 heavy vehicle trips per hour during the peak periods, as well as staff trips occurring in those same peak hours, concluded the Proposal would have no significant impact on the operation of the Golden Highway/ Long Point Road West intersection, nor on capacity limits or existing geometry requirements.

A traffic impact assessment would be included with the EIS.

5.10. Aboriginal Heritage

The site has been previously disturbed during the construction and operation of the existing Redbank Power Plant. Consequently, the potential impacts on Aboriginal cultural heritage of high value in the area is likely to be low. An Aboriginal Heritage Information Management System search undertaken in June 2021 shows that at least 10 Aboriginal sites are located on the lot.

Therefore, there is the potential for Aboriginal objects to be present within the proposed area, even if they are in a disturbed context resulting from past land-use activities. The EIS will address this in more detail.

5.11. Hazards and Risks

The site is located within a bushfire hazard zone and therefor bushfire risks will need to be assessed and addressed in the EIS.

Handling biomass also creates a potential dust and explosion hazard. The main dust explosion hazard areas are listed as follows:

- Delivery Area;
- Fuel Stockpile;
- Boiler storage silos;

- Conveyors;
- Transfer chutes; and
- Fuel feeder area.

Dust has the potential to be dispersed into the air during unloading from the trucks and at various transfer points, while silos, conveyor covers and the hopper provide the containment. In addition to the sources of ignition considered for fire, there are now additional sources to be considered. All electrical equipment must be suitable for the hazardous classification area in which it is installed.

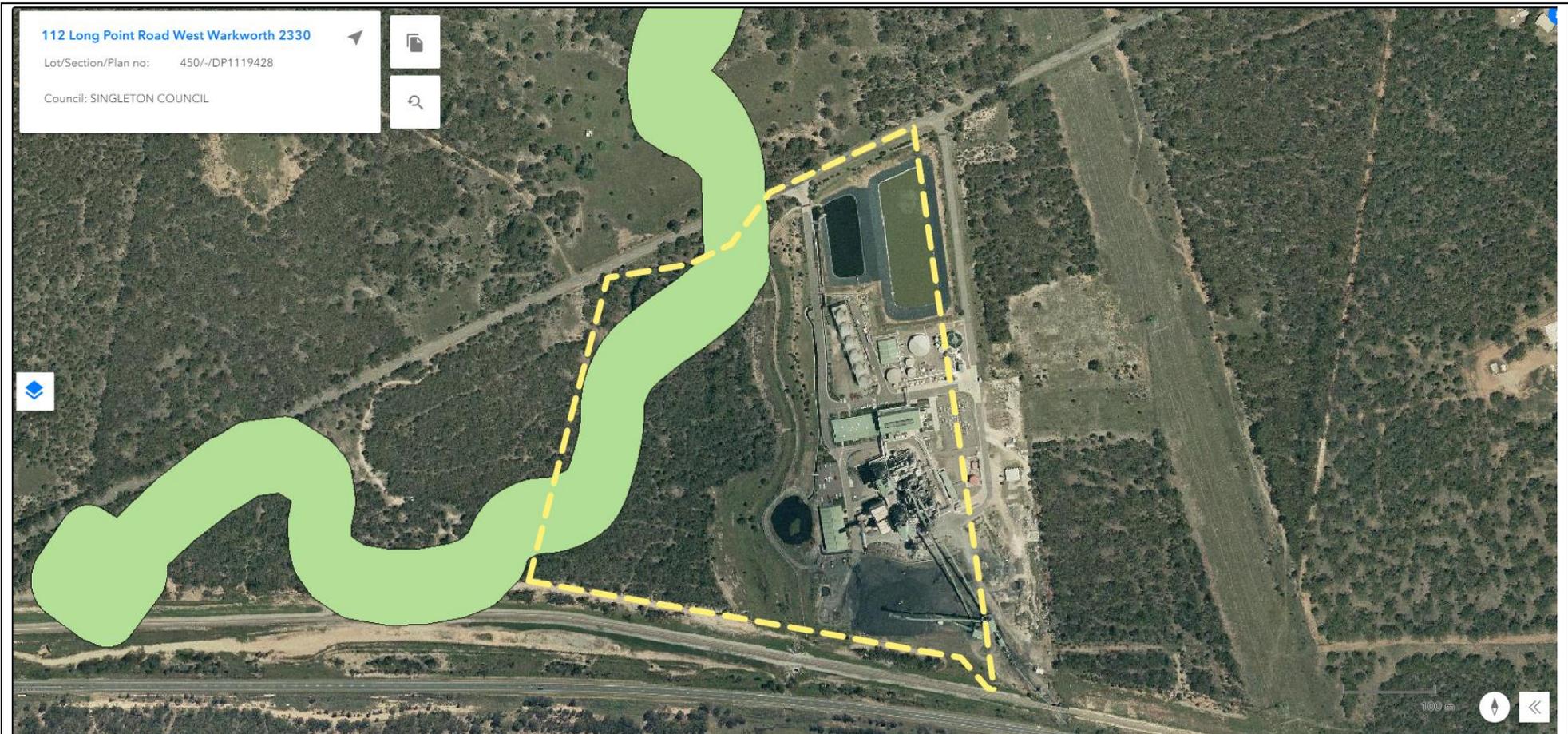
Dust suppression and fire detection is to be installed and interlocked to the existing system to ensure the safe operation of the plant

A bushfire assessment, preliminary hazard assessment, dust hazard analysis, and fire safety study would be prepared for the proposed development and accompany the EIS.

5.12. Social/Cultural Environment

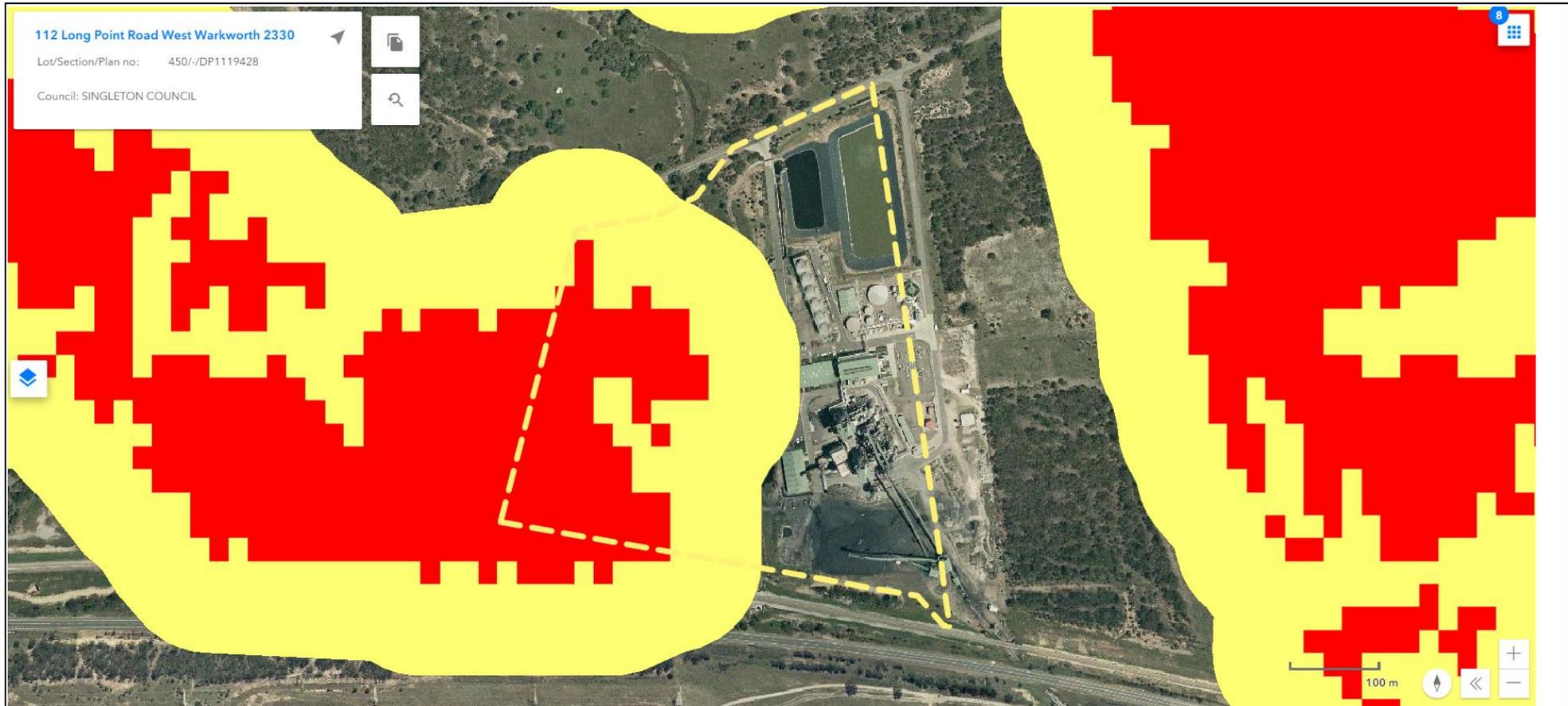
There are no expected changes to the impact of the development on the social and cultural environment. The EIS will address this in more detail.

Figure 5.2. Riparian lands and watercourses near the site.



Date	Revision	Drawn By	Site description	Jackson Environment and Planning Pty Ltd Strategy Infrastructure Compliance Procurement A: Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060 E: admin@jacksonenvironment.com.au T: 02 8056 1849 W: http://www.jacksonenvironment.com.au	 JACKSON ENVIRONMENT AND PLANNING STRATEGY INFRASTRUCTURE COMPLIANCE PROCUREMENT	Client	Verdant Earth Technologies Limited
4/06/21	Revision A	E. Larson	112 Long Point Road West, Warkworth (Lot 450 DP1119428)			Project	Redbank Power Station
						Title	Riparian Lands and Watercourses
						Scale	Per image
						Source	NSW Planning Portal

Figure 5.3. Bushfire hazard mapping for the site. Red is Vegetation Category 1. Yellow is Vegetation Buffer. Lot boundary is dotted yellow.



Date	Revision	Drawn By	Site description	Jackson Environment and Planning Pty Ltd	Client	Verdant Earth Technologies Limited
4/06/21	Revision A	E. Larson	112 Long Point Road West, Warkworth (Lot 450 DP1119428)	Strategy Infrastructure Compliance Procurement A: Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060 E: admin@jacksonenvironment.com.au T: 02 8056 1849 W: http://www.jacksonenvironment.com.au	Project	Redbank Power Station
					Title	Bushfire hazard
					Scale	Per image
					Source	NSW Planning Portal

6. Matters and Impacts

The following table outlines the matters and impacts relevant to the proposed facility, along with the type of assessment that would be undertaken as part of an Environmental Impact Statement.

Table 6.1. Relevant matters and impacts for consideration in the EIS phase of the project.

	Matters	Level of impact expected	Description of impact	Requires assessment in EIS?	Type of assessment
Amenity	Acoustic	Medium	Noise from increased truck movements through haul transport areas, and potential changes in plant/equipment noise during operations, requires assessment.	Yes	Noise and Vibration Study
	Visual	Medium	No major changes to existing facility is proposed. Night time works may change lighting requirements.	Yes	Lighting Assessment
	Odour	Medium	Operations to include burning of wood waste.	Yes	Air Quality Impact Assessment
	Microclimate	None	No microclimate impacts expected.	No	None
Access	Access to property	Low	General access and disabled access to be provided. Additional access for B-Doubles proposed.	Yes	Engineering Plans and Swept Path Analysis
	Access to services	Low	No significant impacts on existing water and telecommunication services. Existing sewer and power connection within the will include further investigation.	Yes	Preliminary Engineering Design and Water Balance
	Road and rail network	Medium	Additional traffic generation moderate and within capacity of existing road network.	Yes	Traffic Impact Assessment
	Parking	Low	Sufficient on-site parking to be provided, including visitor parking per DCP.	Yes	Traffic Impact Assessment
Built environment	Public domain	Low	No public domain impacts expected.	No	None
	Public infrastructure	Medium	Potential for additional impacts on road infrastructure will be assessed.	Yes	Traffic Impact Assessment
Heritage	Natural	Low	No known impacts on natural heritage. Heritage will be assessed in the EIS.	Yes	None
	Cultural	Low	No known impacts on European or other cultural heritage.	No	None

	Matters	Level of impact expected	Description of impact	Requires assessment in EIS?	Type of assessment
	Aboriginal cultural	Medium	Project primarily limited to existing disturbed areas. Whilst Aboriginal cultural heritage artefacts are known to occur within the lot where the facility is located, no disturbance of the site is proposed, so impacts are not expected from the proposed development.	No	None
	Built	None	No impacts on heritage listed buildings or infrastructure expected.	No	None
Social	Health	Medium	Operations will minimise impacts on air pollution, water pollution and contamination.	Yes	Air Quality Impact Assessment Preliminary Site Investigation
	Safety	Low	There are potential risks associated with storing and burning biomass, including dust explosion risks. Fire and emergency procedures and systems to be implemented.	Yes	Fire safety study Preliminary Hazard Assessment
	Community services and facilities	Low	No expected impact on access to healthcare, education or other community services and facilities.	No	Community Consultation
	Social cohesion	None	No expected impact on the willingness of members of society to work together.	No	Community Consultation
Economic	Natural resource use	Low	Negligible impact on minerals, forestry and agricultural resources.	No	None
	Livelihood	None	Economic benefits to the Singleton/Hunter community.	Yes	Economic Analysis
	Opportunity cost	Low	Limited impacts on markets or customer access to other businesses expected.	Yes	Community Consultation
Air	Particulate matter	Medium	Potential impacts of stack emissions, dust and particulates.	Yes	Air Quality Impact Assessment
	Gases	Medium	Potential impacts of stack emissions, dust, gases and particulates.	Yes	Air Quality Impact Assessment
	Atmospheric emissions	Medium	Some greenhouse gas emissions from motor vehicles and operation of boilers.	Yes	Air Quality Impact Assessment
Biodiversity	Native vegetation	Low	Additional clearing is not proposed, however other potential impacts to flora/fauna to be assessed.	Yes	Biodiversity Assessment
	Native fauna	Medium	Biodiversity Assessment to be undertaken.	Yes	Biodiversity Assessment

	Matters	Level of impact expected	Description of impact	Requires assessment in EIS?	Type of assessment
Land	Stability / structure	Low	Minor amount of soil disturbance from installation of weighbridges only.	No	None
	Soil chemistry	Low	Minor amount of soil disturbance from installation of weighbridges only.	No	None
	Land capability	Low	Negligible impact expected on capacity of land.	No	None
	Topography	Low	Some minor excavation required, but minimal negative impacts on site topography or waterways.	Yes	Survey
Water	Water quality	Low	Existing surface stormwater runoff will be assessed for adequacy. Impacted water is captured by existing stormwater drainage, treatment and recirculation system.	Yes	Stormwater Management Investigation
	Water availability	Low	Assessment of water use, balance, licensing and availability for the proposed development.	Yes	Water Balance
	Hydrological flows	Low	Existing stormwater collection and management system is in place at the facility. This will be assessed for adequacy.	Yes	Stormwater Management Investigation
Risks	Coastal hazards	None	No coastal hazards associated with project	No	None
	Flood waters	Low	Site is not located in a flood risk zone and all development will be above the Probably Maximum Flood level of 4 m AHD	No	None
	Bushfire	Medium	Site is located in a bushfire prone zone.	Yes	Bushfire Study and Preliminary Hazard Analysis
	Undermining	None	No undermining associated with project.	No	None
	Steep slopes	None	No steep slopes associated with project.	No	None

7. Stakeholder and Community Consultation

Stakeholder and community consultation will be performed to ensure the proposed development is executed in a manner that protects both the environment and human health and provides value in the shape of an important recycling facility for the community.

Key stakeholders identified include:

- Local residents;
- Local businesses;
- Government agencies;
- Singleton Council; and
- Environment groups.

As part of the development approval process and the preparation of an EIS, the Proponent would seek to consult with the relevant government agencies and stakeholders, including:

- NSW Department of Planning, Industry and Environment;
- NSW Environment Protection Authority;
- Water NSW; and
- NSW Roads and Maritime Services.

2.1 Stakeholder consultation strategy

Consultation will be based on the strategy shown below in Table 5.2, in accordance with the DCP and statutory requirements, including the requirements for pre-lodgement community consultation associated with this “community significant development”. The primary focus of the stakeholder consultation strategy is to consult with all relevant stakeholders to ensure that the proposed development is conducted to meet all community and regulatory concerns.

Table 5.2. Stakeholder consultation strategy.

Organisation or Group	Reason for Involvement	Description of their Interest	Type of Engagement	Is this an Existing Relationship	Tools
Singleton Council Planning Department	EIS consultation, compliance with LEP and DCPs	Statutory	Involve, Consult	Yes	EIS and specialist reports
Singleton Council Mayor and Councillors	Political, organisational	Policy and community support	Empower	Yes	Reports, briefings
NSW EPA	Administration of the POEO Act	Statutory	Consult	Yes	Development assessment and licensing
NSW Department of Planning, Industry and Environment	Administration of the <i>Environmental Planning & Assessment Act 1979</i> (as amended); <i>Environmental Planning and</i>	Statutory	Consult	Yes	Designated development / SEARs

Organisation or Group	Reason for Involvement	Description of their Interest	Type of Engagement	Is this an Existing Relationship	Tools
	<i>Assessment Regulation 2000</i>				
NSW Water	<i>Water Management Act 2000</i>	Statutory	Consult	Yes	Development assessment and licensing
Businesses in the area of the development	Local business interest	Potential to be impacted by the development	Consult	Yes	Facilitated community meeting, direct mail, notification on social media an in local newspaper, interviews, public exhibition of EIS
Local Residents and Environment Groups	Local community interest, support for sustainable energy development	Potential to be impacted by the development	Consult	No	Facilitated community meeting, direct mail, notification on social media an in local newspaper, interviews, public exhibition of EIS

8. Capital Investment Value

The capital investment value if the project is expected to be less than \$5M.

9. Conclusion

This scoping report has been prepared for a proposed development at the Redbank Power Station located at 112 Long Point Road West, Warkworth (Lot 450 DP 1119428).

The Redbank Power Station was originally commissioned in July 2001 as an electricity generating facility. It was designed to operate on low value fuels and operated on beneficiated dewatered coal tailings (BDT) to create electricity. The tailings were transferred by conveyor from the Warkworth mine. The power station has been in care and maintenance since October 2014. Verdant Earth Technologies Limited has acquired Redbank and is planning to restart the plant. It is seeking a new approval to add the ability to use 100% biomass as a fuel for its operations and to remove Condition 22 on the existing consent regarding expiry (DA183/93).

Restarting of the Redbank Power Station to operate as an electricity generation facility on waste biomass would create between 200-300 construction jobs and 50 permanent jobs following recommissioning. It will also create or support a large number of direct and indirect jobs in the fuel supply line over the plants life. When fully operational the power plant would produce into the grid approximately 1 million megawatt hours of baseload electricity per year, equivalent to supplying around 200,000 homes. The project will also drive significant progress towards the NSW Government's *Net Zero Plan Stage 1: 2020-2030*, being the foundation for NSW's action on climate change and goal to reach net zero emissions by 2050. The conversion of Redbank Power Station to operate on waste biomass fuel will result in the first major green baseload power station for the country.

The biomass fuel sources proposed to be used at Redbank Power Station will be '*eligible waste fuels*' as defined by the NSW Environment Protection Authority's (EPA's) *Energy from Waste Policy Statement*. These include existing forestry and sawmill residues and uncontaminated wood waste that is generated in primary and secondary manufacturing processes. Biomass would be sourced from the waste products of existing industry. The project does not propose harvesting trees solely for fuel.

The existing plant consists of two fluidised bed combustion steam generator units of FiCirc® design and a single 151MW steam turbine, and the associated balance of plant equipment. The technology is characterised by a deep fluidised bed, configured to provide a high degree of bed fines recirculation to enhance the gas to solids contact. The result is a highly efficient combustion system producing low NO_x, SO_x, carbon monoxide and particulate emissions due to the ability to control the combustion chamber temperatures and the addition of sorbent material if required. This style of unit has demonstrated excellent performance and emissions profiles with a wide range of fuels including coal, petroleum coke, and biomass. Minor adjustments to the existing plant and equipment will be needed, along with a set of mobile conveyors, to allow the use and storage of biomass in place of coal at the facility. The facility will potentially accept up to 900,000 tonnes per year of biomass as fuel for conversion into electricity.

The facility is located on land zoned RU1 under the *Singleton Local Environmental Plan 2013*. The proposed development is permissible as a '*electricity generating works*' with consent in RU1 zoning under Division 4 of the *State Environmental Planning Policy (Infrastructure) 2007*.

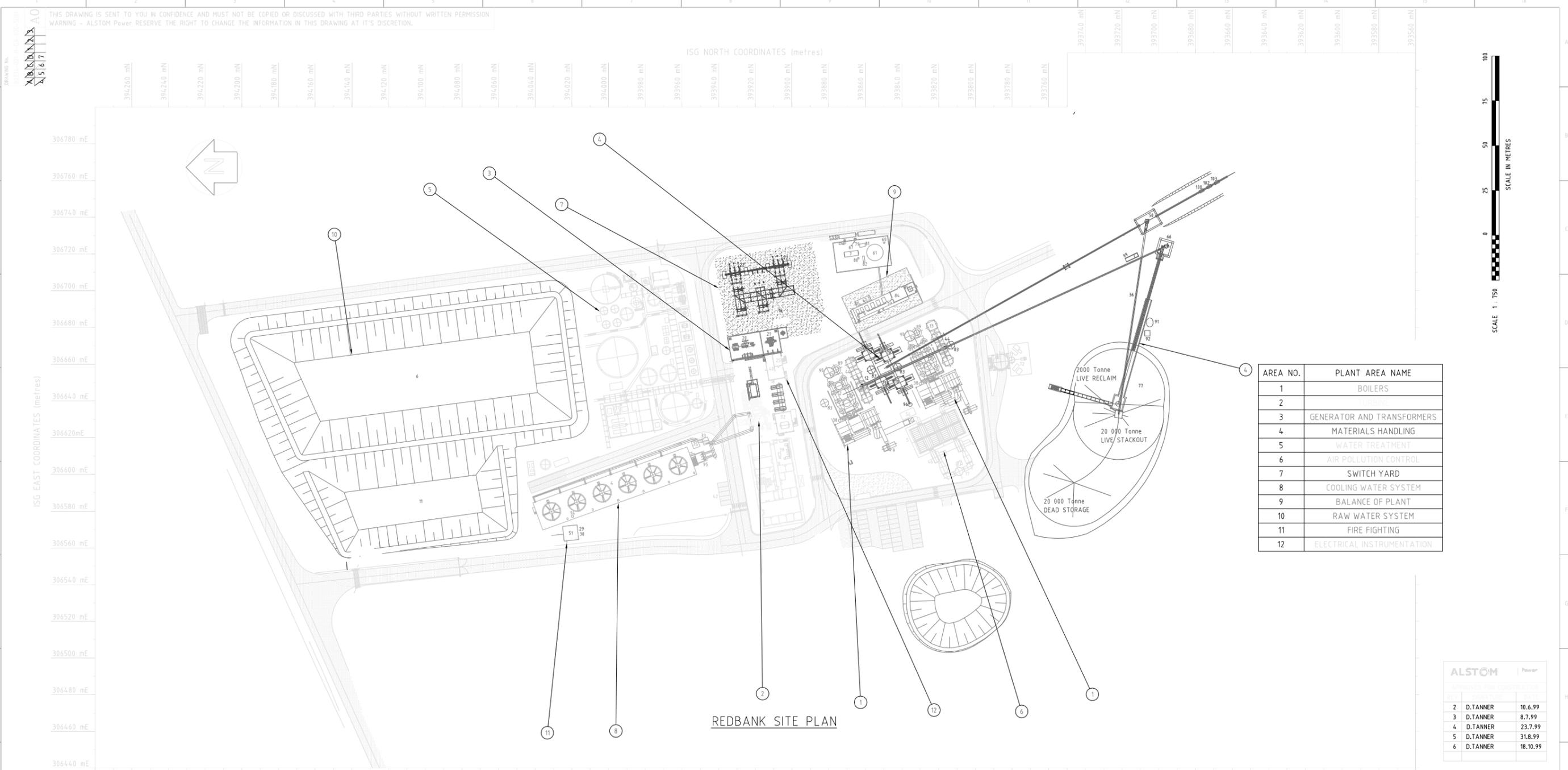
The proposed project is considered a Designated Development (DD) under Clause 18(1c) of Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* as it involves an electricity generating station supplying or capable of supplying "*more than 30 megawatts of electrical power*" from bio-material. Therefore, the project requires assessment under Part 4 of the *Environmental Planning and Assessment Act 1979* and the consent authority for the development will be the Singleton Council. An Environmental Impact Statement (EIS) will need to accompany the development application. A licence from the NSW EPA under Schedule 1 of the *Protection of the Environment Operations Act 1997* will be required.

As part of this assessment, we have also considered the strategic drivers, including the State and Local Planning Policies. The preliminary environmental assessment has also considered the sustainability benefits of the project, including the environmental, economic and social benefits.

This preliminary environmental assessment has found that consideration will need to be given as a priority to additional traffic generation on the regional network, air quality due to emissions from combustion of biomass, Aboriginal cultural heritage, bushfire risks and hazards from storage and management of biomass, and stormwater collection and management. Impacts are expected to be minimised by maintaining best practice operations and strict infrastructure process controls.

These factors and other issues raised by the Singleton Council and other regulatory authorities should be considered in the EIS to ensure that the proposed upgrades are carried out to protect human health and the environment, while supporting the development of important electricity generating infrastructure for the region.

Appendix A Existing Facility Layout



AREA NO.	PLANT AREA NAME
1	BOILERS
2	GENERATOR AND TRANSFORMERS
3	MATERIALS HANDLING
4	WATER TREATMENT
5	AIR POLLUTION CONTROL
6	SWITCH YARD
7	COOLING WATER SYSTEM
8	BALANCE OF PLANT
9	RAW WATER SYSTEM
10	FIRE FIGHTING
11	ELECTRICAL INSTRUMENTATION
12	

ALSTOM Power			
APPROVED FOR CONSTRUCTION			
REV	DESCRIPTION	DATE	BY
2	D.TANNER	10.6.99	
3	D.TANNER	8.7.99	
4	D.TANNER	23.7.99	
5	D.TANNER	31.8.99	
6	D.TANNER	18.10.99	

EQUIPMENT LIST:

1. BOILER NUMBER ONE
2. BOILER NUMBER TWO
3. STEAM TURBINE & GENERATOR SET
4. COOLING TOWER
5. FABRIC FILTER
6. WASTE WATER HOLDING POND - 60 MEGA LITRE CAPACITY
7. DIESEL OIL STORAGE TANK - 40,000 LITRE CAPACITY
8. BACKUP FUEL (COAL) STORAGE AREA - 40,000 TONNES
9. F.D. FAN
10. EMERGENCY ASH STORAGE SILO
11. RAW WATER HOLDING POND - 6 MEGA LITRE CAPACITY
12. BACKUP FUEL (COAL) STORAGE SILO
13. SAND INERT MATERIAL STORAGE SILO
14. LIMESTONE STORAGE SILO
15. COOLING WATER PIPEWORK - UNDERGROUND
16. SWITCHYARD
17. STACK
18. AUXILIARY BAY - BOILER FEED PUMPS/ FEEDWATER HEATERS/DEAERATOR
19. BDT FUEL STORAGE SILO & TRANSFER PUMPS
20. 15.7 kV/132 kV MAIN TRANSFORMER
21. 6.6 kV/132 kV AUXILIARY TRANSFORMER
22. TRANSMISSION LANDING TOWER
23. FABRIC FILTER/ASH HANDLING MCC ROOM/TRANSFORMER
24. BOILER TRANSFORMER
25. BATTERY ROOM

26. SEWAGE TRANSFER PIT AND PUMPS
27. LPG STORAGE AREA
28. ROAD BRIDGE
29. FIRE WATER PUMP
30. DIESEL FIRE WATER PUMP
31. RIVER WATER PUMPS (NOT SHOWN)
32. FIRST FLUSH OVERFLOW TO CREEK
33. COOLING WATER FILTER STATION
34. BDT FUEL CONVEYOR
35. BACKUP FUEL (COAL) CONVEYOR
36. BACKUP FUEL (COAL) STACK OUT CONVEYOR
37. SITE CONSTRUCTION HUTS AND LAYDOWN AREA
38. BOILER BLOWDOWN TANK
39. STATION CONTROL ROOM
40. SWITCHGEAR ROOM
41. WAREHOUSE/MAINTENANCE BUILDING
42. CAR PARK
43. BED SAND/LIMESTONE - INGROUND RECEIVAL HOPPER
44. AUXILIARY COOLING WATER TANK (UNDER COAL SILOS)
45. EARTHEN BERM STORMWATER WALL
46. I.D. FAN
47. FUTURE GAS TURBINE
48. SEDIMENTATION/OILY WATER SEPARATORS
49. WATER PIPE LINES TO/FROM HUNTER RIVER
50. BACKUP FUEL (COAL) TRANSFER HOUSE
51. FIRE TURN-OUT POINT

52. CONDENSATE TANK RACK ROOM (UNDER) RACK ROOM
53. INSTRUMENT SHOP
54. FACILITY ADMINISTRATION BUILDING
55. AIR COMPRESSOR HOUSE
56. BOILER MCC ROOM A/B
57. OVERLAND FUEL BACKUP (COAL) CONVEYOR TRANSFER STATION
58. EXISTING 66 kV TRANSMISSION LINE
59. CHEMICAL LABORATORY
60. FUTURE FUEL FORWARDING PUMP
61. FUEL OIL STORAGE TANK - 380,000 LITRE CAPACITY
62. 11 kV/0.433 kV TURBINE HALL SUPPLY TRANSFORMER
63. PRIMARY CONTAINMENT BACKUP FUEL (COAL) STORAGE DAM
64. OVERLAND FUEL CONVEYOR (BY OTHERS)
65. PERIMETER FENCE
66. CRUSHER HOUSE
67. MOBILE EQUIPMENT FUEL STATION
68. EMERGENCY GENERATOR
69. CHEMICAL FEED STATION
70. NITROGEN STORAGE AREA
71. ASH SLURRY MIX TANK
72. ASH SLURRY DISPOSAL PUMP
73. FUTURE EARTHING AREA
74. LIMESTONE STOCKPILE (56 CUBIC METRES)
75. AUXILIARY COOLING WATER HEAT EXCHANGERS
76. BACKUP FUEL RECLAIM CONVEYOR
77. BACKUP FUEL RECLAIM FEEDER

78. ABORIGINAL HERITAGE SITE
79. DIESEL OIL TRANSFER PUMPS
80. DIESEL OIL PUMPS
81. FUEL OIL TRANSFER PUMPS
82. FUEL OIL PUMPS
83. BDT AGITATOR TANK & INJECTOR PUMPS
84. COMPRESSOR HOUSE MCC
85. 6.6 kV/0.433 kV COMPRESSOR HOUSE TRANSFORMER
86. 11 kV/0.433 kV TRANSFORMER (ENERGY AUST.)
87. STACK EMISSION MONITORING - CEMS SHED
88. BOILER SO₂ & O₂ MONITORING SHED.
89. ASH COOLER
90. BED MATERIALS SILO
91. COAL DUST WATER SPRINKLER TANK
92. COAL DUST SPRINKLER PUMP SHED
93. SLURRY LINE FROM ASH/DUST PLANT TO WALKWORTH MINE
94. SERVICE WATER HEADER TANK TO FIREWATER PUMPS
95. AUXILIARY COOLING WATER PUMPS
96. BDT AIR RECEIVER
97. FABRIC FILTER AIR RECEIVER
98. FIRST AID ROOM
99. INLET PIT SILT ARRESTOR
100. COAL SAMPLER
101. BACKUP FUEL (COAL) STOCKPILE SPRAY PUMPS
102. COAL SCANNER
103. COAL OVER MAGNET

WATER TREATMENT PLANT EQUIPMENT LIST

- A1 RAW WATER FEED PUMPS
- A2 Ø 16m RAW WATER CLARIFIER
- A3 SLUDGE THICKENER
- A4 ELEVATED DEWATERING FACILITY
- A5 4xØ4m GRAVITY FILTERS
- A6 2000 cu.m TREATED WATER/FIREWATER TANK
- A7 COOLING WATER MAKEUP PUMPS
- A8 SERVICE WATER PUMPS
- A9 NOT USED
- A10 NOT USED
- A11 RO FEED PUMPS
- A12 RO CARTRIDGE FILTER SKID
- A13 WATER TREATMENT RO TRAIN 1 AND 2
- A14 WASTE WATER TREATMENT RO UNIT
- A15 MIXED BED POLISHER SKID
- A16 PRESSURE FILTER AIR BLOWERS
- A17 NEUTRALISATION PIT AND PUMPS
- A18 SLUDGE HOLDING TANK
- A19 BACKWASH COLLECTION PIT
- A20 300 cu.m DEMIN WATER TANK
- A21 MIXED BED REGEN. WATER PUMPS
- A22 DEMIN. WATER TRANSFER PUMPS
- A23 ANTISCALANT DOSING SKID
- A24 SODIUM BISULPHITE DOSING SKID

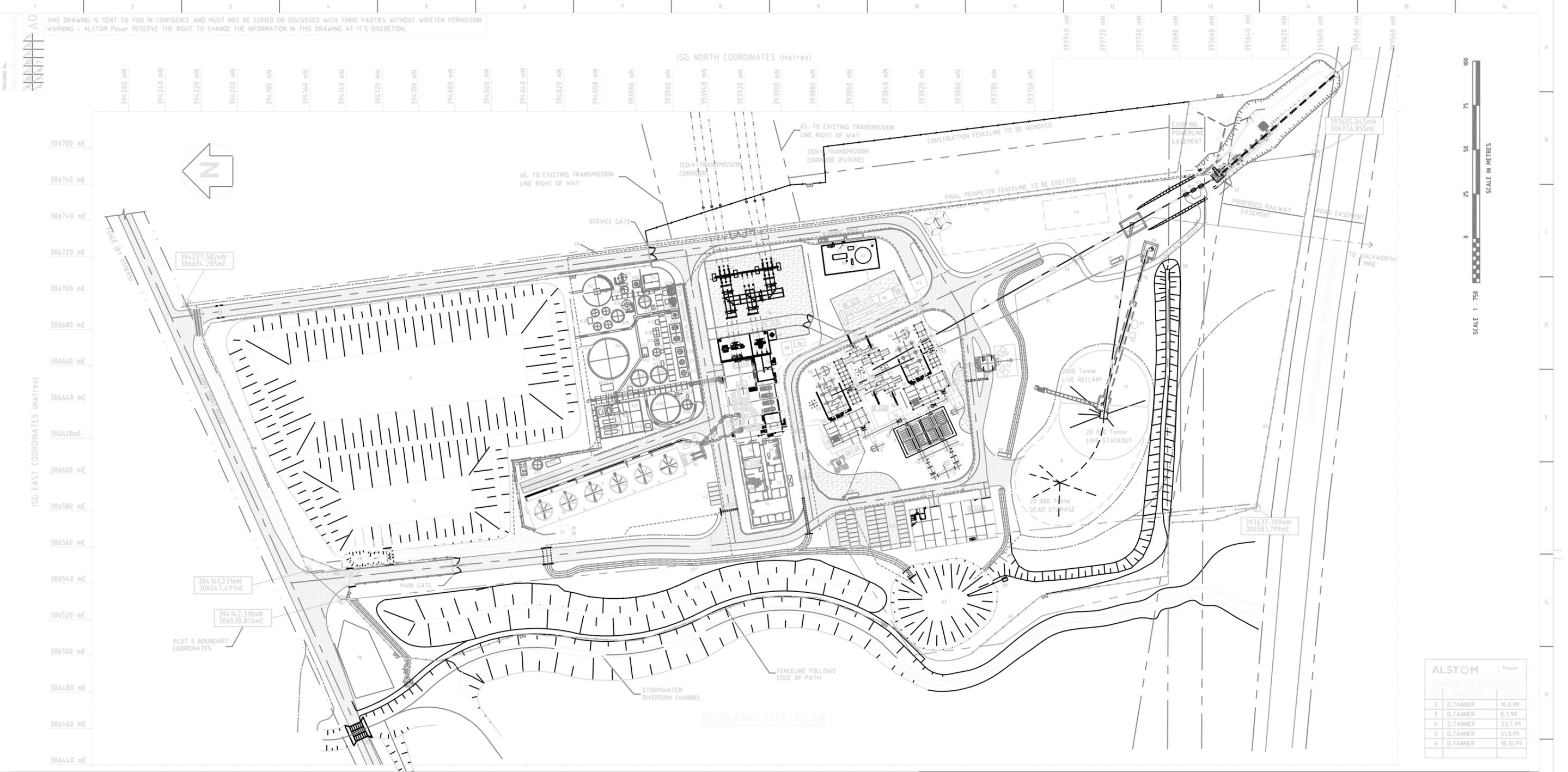
- A25 CAUSTIC BULK STORAGE TANK AND DOSING PUMPS
- A26 SULPHURIC ACID BULK STORAGE TANK & DOSING PUMPS
- A27 SODIUM HYPOCHLORITE DOSING SYSTEM
- A28 FERRIC CHLORIDE DOSING SYSTEM
- A29 LIME SILO & MIXING TANKS/PUMPS
- A30 WASTE WATER DISCHARGE PUMPS
- A31 SODA ASH SILO & MIXING TANKS/PUMPS
- A32 1000 cu.m COOLING TOWER BLOWDOWN TANK
- A33 WASTE WATER CLARIFIER FEED PUMPS
- A34 Ø5.4m WASTE WATER CLARIFIER
- A35 100 cu.m SOFTENED WATER TANK
- A36 SAND FILTERS FEED/BACKWASH PUMPS
- A37 NEUTRALISATION TANK TRANSFER PUMPS
- A38 PRESSURE SAND FILTER SKID
- A39 GRAVITY FILTERS AIR BLOWERS
- A40 300 cu.m HIGH PURITY WATER TANK
- A41 BDT RINSE PUMPS
- A42 MIXED BED FEED PUMPS
- A43 MAGNESIUM OXIDE DOSING SYSTEM
- A44 CIP SKID
- A45 PACKAGE SEWAGE TREATMENT PLANT
- A46 TRANSFORMER
- A47 OPERATOR OFFICE - LABORATORY
- A48 SWITCHROOM
- A49 HYDROCHLORIC ACID STORAGE TANK & PUMP
- A50 POTABLE WATER TANK
- A51 POTABLE WATER PUMP SYSTEM
- A52 BACKWASH AND DRAINAGE PIT
- A53 IRRIGATION WATER TANK
- A54 AIR RECEIVERS
- A55 FILTER PRESS CLEANING TANK & PUMP

LEGEND :

	CONCRETE/ASPHALT HARDSTAND		SURFACE DRAINAGE
	COMPACTED GRAVEL HARDSTAND		BOUNDARY FENCE

		SCALE: 1 : 750 U.O.N. DATE: 15.04.99 DRAWN: PAUL FURNIVAL CHECKED: G.JENNER APPROVED: D.TANNER DESIGN ENG: G.JENNER	CLIENT: REDBANK CONSTRUCTION PTY. LTD. PROJECT: REDBANK POWER PROJECT TITLE: 00 PLANT SYSTEMS 128 MW POWER PLANT POWER PLANT ARRANGEMENT	DRAWING NO: 151617
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REDBANK SITE PLAN

ALSTOM Power		
APPROVED FOR CONSTRUCTION		
REV	SIGNATURE	DATE
2	D.TANNER	10.6.99
3	D.TANNER	8.7.99
4	D.TANNER	23.7.99
5	D.TANNER	31.8.99
6	D.TANNER	18.10.99

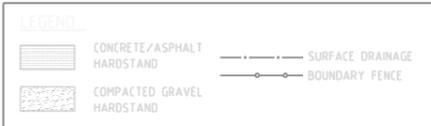
- EQUIPMENT LIST**
1. BOILER NUMBER ONE
 2. BOILER NUMBER TWO
 3. STEAM TURBINE & GENERATOR SET
 4. COOLING TOWER
 5. FABRIC FILTER
 6. WASTE WATER HOLDING POND - 60 MEGA LITRE CAPACITY
 7. DIESEL OIL STORAGE TANK - 40,000 LITRE CAPACITY
 8. BACKUP FUEL (COAL) STORAGE AREA - 40,000 TONNES
 9. F.D. FAN
 10. EMERGENCY ASH STORAGE SILO
 11. RAW WATER HOLDING POND - 6 MEGA LITRE CAPACITY
 12. BACKUP FUEL (COAL) STORAGE SILO
 13. SAND INERT MATERIAL STORAGE SILO
 14. LIMESTONE STORAGE SILO
 15. COOLING WATER PIPEWORK - UNDERGROUND
 16. SWITCHYARD
 17. STACK
 18. AUXILIARY BAY - BOILER FEED PUMPS/ FEEDWATER HEATERS/DEAERATOR
 19. BDT FUEL STORAGE SILO & TRANSFER PUMPS
 20. 15.7 kV/132 kV MAIN TRANSFORMER
 21. 6.6 kV/132 kV AUXILIARY TRANSFORMER
 22. TRANSMISSION LANDING TOWER
 23. FABRIC FILTER/ASH HANDLING MCC ROOM/TRANSFORMER
 24. BOILER TRANSFORMER
 25. BATTERY ROOM

26. SEWAGE TRANSFER PIT AND PUMPS
27. LPG STORAGE AREA
28. ROAD BRIDGE
29. FIRE WATER PUMP
30. DIESEL FIRE WATER PUMP
31. RIVER WATER PUMPS (NOT SHOWN)
32. FIRST FLUSH OVERFLOW TO CREEK
33. COOLING WATER FILTER STATION
34. BDT FUEL CONVEYOR
35. BACKUP FUEL (COAL) CONVEYOR
36. BACKUP FUEL (COAL) STACK OUT CONVEYOR
37. SITE CONSTRUCTION HUTS AND LAYDOWN AREA
38. BOILER BLOWDOWN TANK
39. STATION CONTROL ROOM
40. SWITCHGEAR ROOM
41. WAREHOUSE/MAINTENANCE BUILDING
42. CAR PARK
43. BED SAND/LIMESTONE - INGROUND RECEIVAL HOPPER
44. AUXILIARY COOLING WATER TANK (UNDER COAL SILOS)
45. EARTHEN BERM STORMWATER WALL
46. I.D. FAN
47. FUTURE GAS TURBINE
48. SEDIMENTATION/OILY WATER SEPARATORS
49. WATER PIPE LINES TO/FROM HUNTER RIVER
50. BACKUP FUEL (COAL) TRANSFER HOUSE
51. FIRE TURN-OUT POINT

52. CONDENSATE TANK RACK ROOM (UNDER) RACK ROOM
53. INSTRUMENT SHOP
54. FACILITY ADMINISTRATION BUILDING
55. AIR COMPRESSOR HOUSE
56. BOILER MCC ROOM A/B
57. OVERLAND FUEL BACKUP (COAL) CONVEYOR TRANSFER STATION
58. EXISTING 66 kV TRANSMISSION LINE
59. CHEMICAL LABORATORY
60. FUTURE FUEL FORWARDING PUMP
61. FUEL OIL STORAGE TANK - 380,000 LITRE CAPACITY
62. 11 kV/0.433 kV TURBINE HALL SUPPLY TRANSFORMER
63. PRIMARY CONTAINMENT BACKUP FUEL (COAL) STORAGE DAM
64. OVERLAND FUEL CONVEYOR (BY OTHERS)
65. PERMETER FENCE
66. CRUSHER HOUSE
67. MOBILE EQUIPMENT FUEL STATION
68. EMERGENCY GENERATOR
69. CHEMICAL FEED STATION
70. NITROGEN STORAGE AREA
71. ASH SLURRY MIX TANK
72. ASH SLURRY DISPOSAL PUMP
73. FUTURE EARTHING AREA
74. LIMESTONE STOCKPILE (56 CUBIC METRES)
75. AUXILIARY COOLING WATER HEAT EXCHANGERS
76. BACKUP FUEL RECLAIM CONVEYOR
77. FIRE TURN-OUT POINT

- WATER TREATMENT PLANT EQUIPMENT LIST**
- A1 RAW WATER FEED PUMPS
 - A2 Ø 16m RAW WATER CLARIFIER
 - A3 SLUDGE THICKENER
 - A4 ELEVATED DEWATERING FACILITY
 - A5 4xØ4m GRAVITY FILTERS
 - A6 2000 cu.m TREATED WATER/FIREWATER TANK
 - A7 COOLING WATER MAKEUP PUMPS
 - A8 SERVICE WATER PUMPS
 - A9 NOT USED
 - A10 NOT USED
 - A11 RO FEED PUMPS
 - A12 RO CARTRIDGE FILTER SKID
 - A13 WATER TREATMENT RO TRAIN 1 AND 2
 - A14 WASTE WATER TREATMENT RO UNIT
 - A15 MIXED BED POLISHER SKID
 - A16 PRESSURE FILTER AIR BLOWERS
 - A17 NEUTRALISATION PIT AND PUMPS
 - A18 SLUDGE HOLDING TANK
 - A19 BACKWASH COLLECTION PIT
 - A20 300 cu.m DEMIN WATER TANK
 - A21 MIXED BED REGEN. WATER PUMPS
 - A22 DEMIN. WATER TRANSFER PUMPS
 - A23 ANTISCALANT DOSING SKID
 - A24 SODIUM BISULPHITE DOSING SKID

- A25 CAUSTIC BULK STORAGE TANK AND DOSING PUMPS
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- A55 FILTER PRESS CLEANING TANK & PUMP



REV	DATE	DESCRIPTION	CHK	APP	REV	DATE	DESCRIPTION	CHK	APP
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3	10/06/99	ISSUE FOR PERMIT	SL	SL	3	10/06/99	ISSUE FOR PERMIT	SL	SL
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REDBANK CONSTRUCTION PTY. LTD.
REDBANK POWER PROJECT

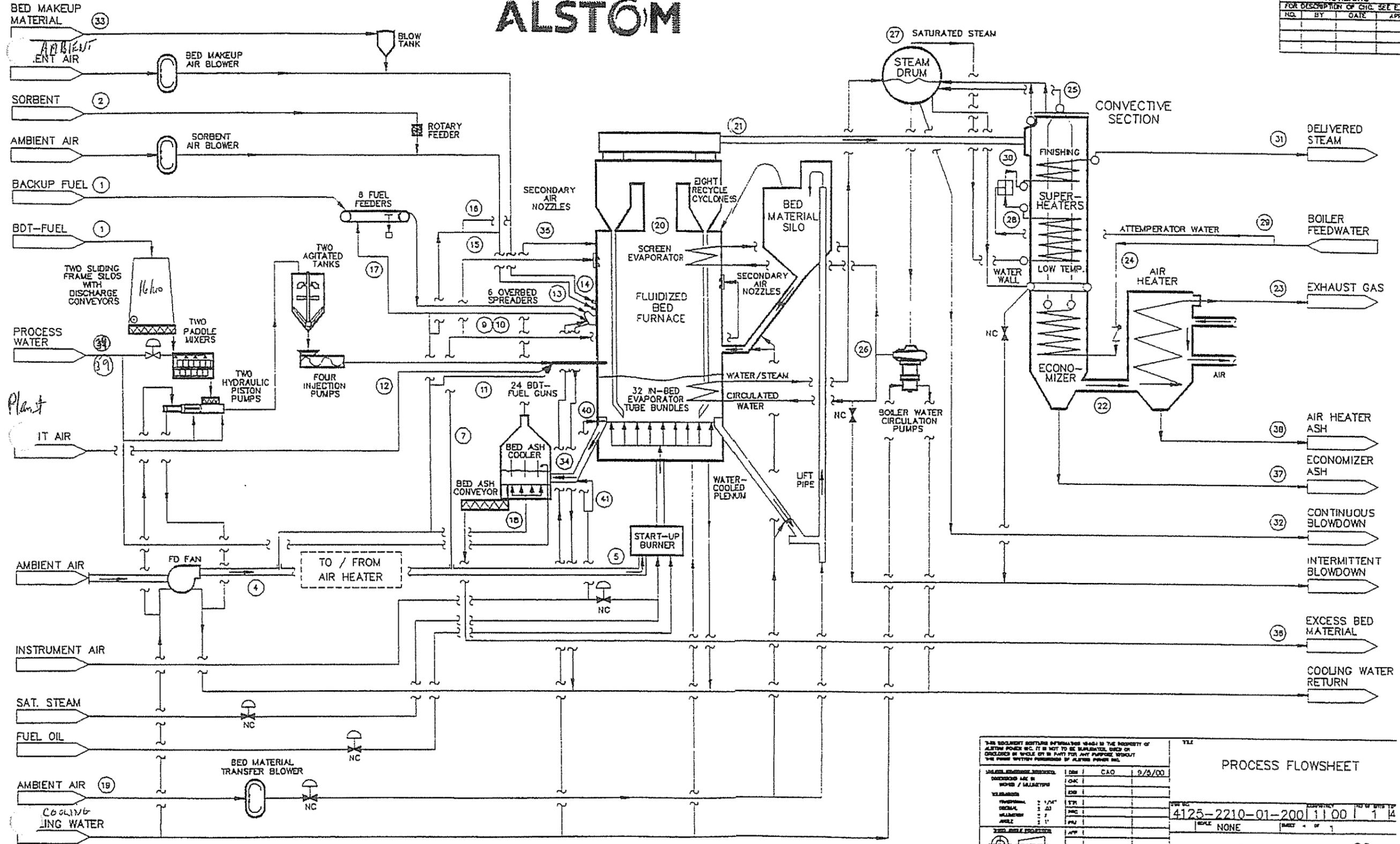
99 PLANT SYSTEMS
128 MW POWER PLANT
POWER PLANT ARRANGEMENT

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Appendix B Fluidised Bed Technology Process Flow

ALSTOM

REVISIONS			
FOR DESCRIPTION OF CHG. SEE E.			
NO.	BY	DATE	APP.



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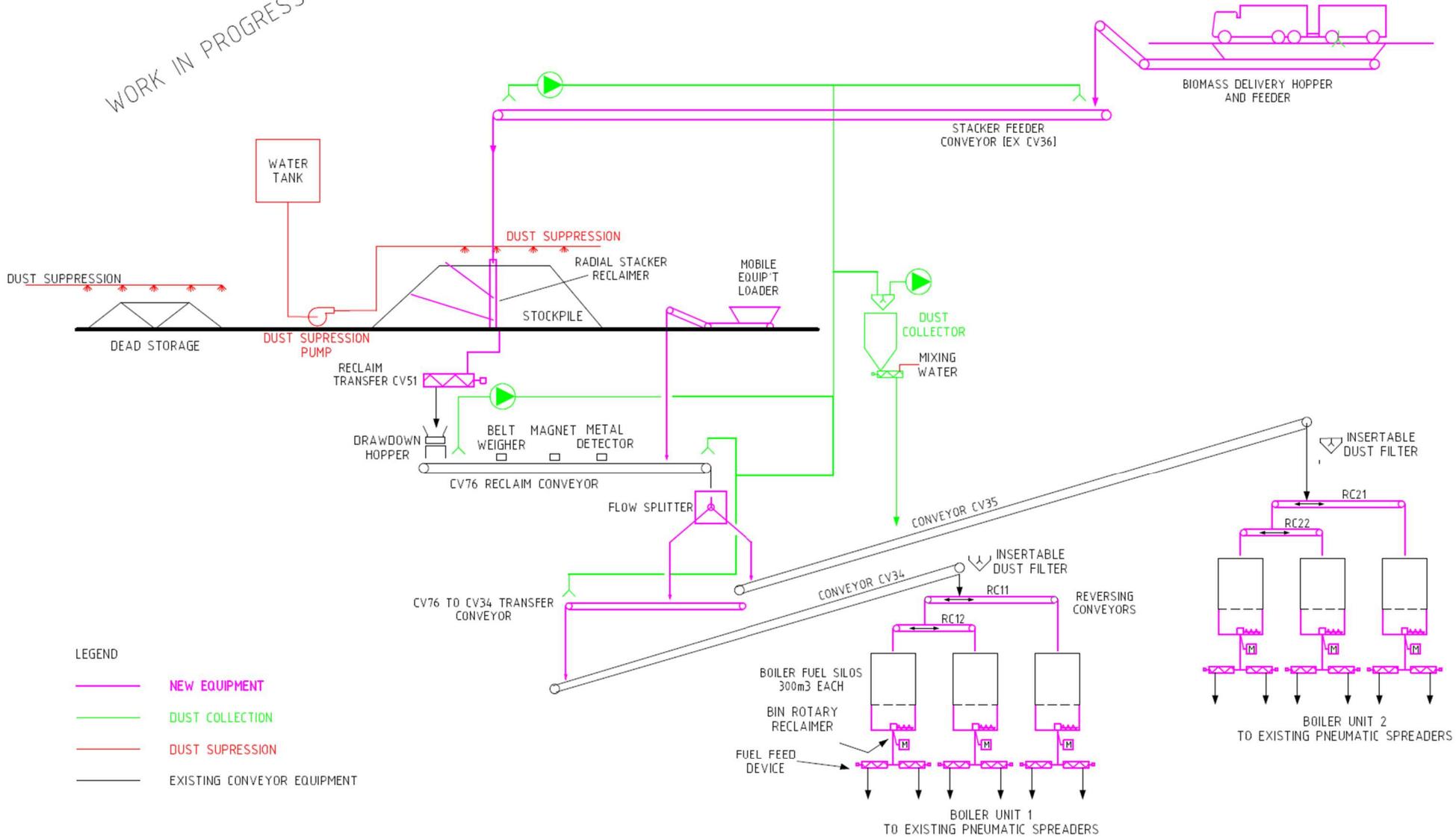
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 FRACTIONS: 1/16"
 TOLERANCES: .005"
 SURFACE FINISH: NONE
 SHEET: 1 OF 1

PROJECT NO: 4125-2210-01-200
 DRAWING NO: 1100
 SHEET NO: 1 OF 1

ALSTOM Power 60
 Son Mado, Coruña

Appendix C Proposed Changes to Plant

WORK IN PROGRESS



- LEGEND**
- NEW EQUIPMENT
 - DUST COLLECTION
 - DUST SUPPRESSION
 - EXISTING CONVEYOR EQUIPMENT

NOTES		REVISIONS				
REV	DRN	DATE	DESCRIPTION	APP		



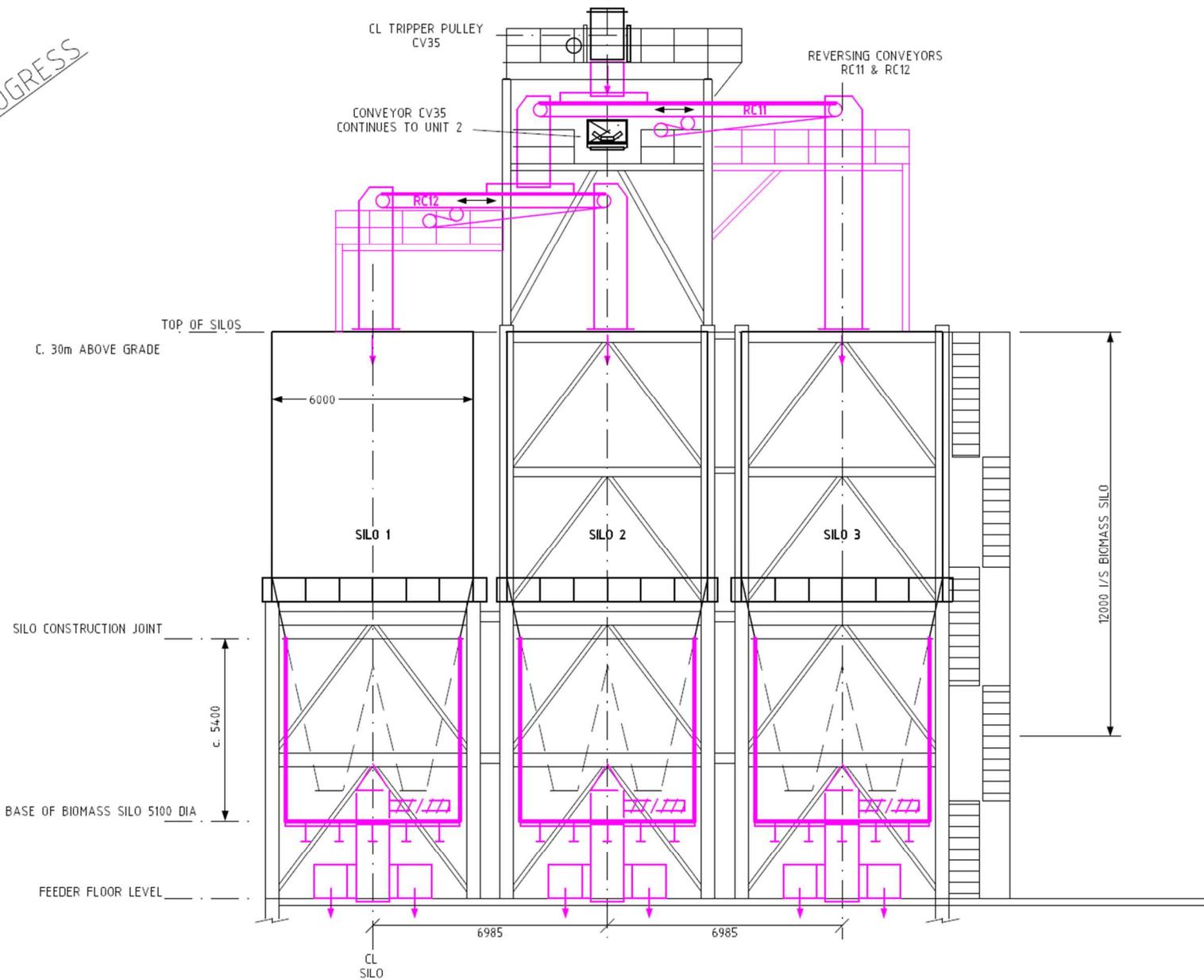
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NOT TO SCALE		
DRN	SIGNATURE	DATE
	DT	17.08.2020

CLIENT	
HUNTER ENERGY FOR REDBANK PS	
TITLE	BIOMASS HANDLING PLANT PROCESS FLOW DIAGRAM

DRAWING No.	
C12156-PFD-001	
REVISION	A
A3	
Boiler & Power Plant Services Pty Ltd	

IN PROGRESS



NOTES		REVISIONS				
REV	DRN	DATE	DESCRIPTION	APP		

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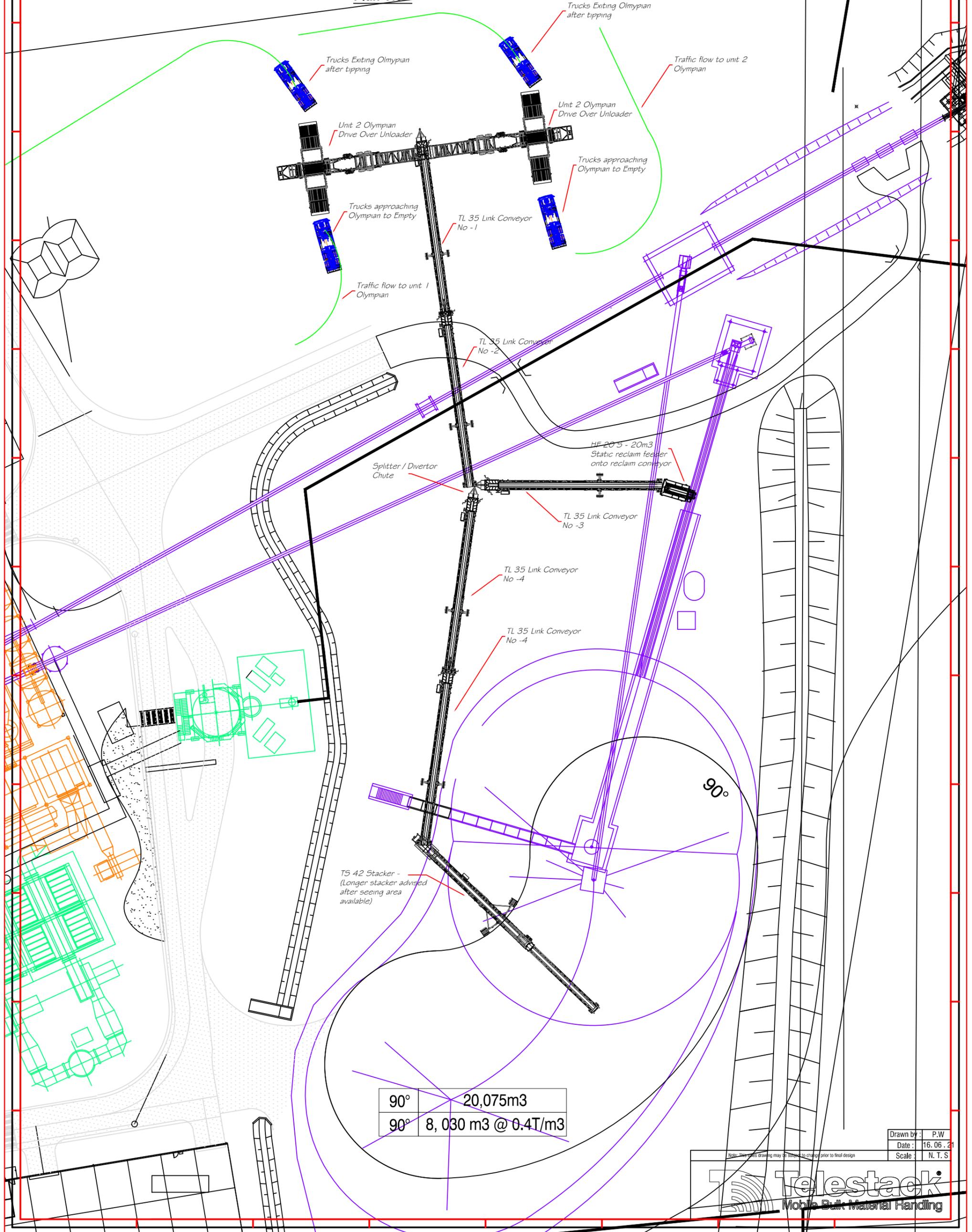
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DRN.	SIGNATURE	DATE
	DT	19.08.2020
REVIEW		
APP.		

CLIENT	HUNTER ENERGY
TITLE	REDBANK POWER STATION BIOMASS HANDLING STUDY SILO AREA MODIFICATIONS

DRAWING No.	C12156-021
REVISION	A
	A3
<i>Boiler & Power Plant Services Pty Ltd</i>	

Appendix D Proposed Biomass Fuel Handling Layout

Hunter Energy - Proposed Layout for Woodchip Handling at Power Plant , NSW - Australia
2 x Olympian 1800, 5 x TL 35 Links, Splitter chute , HF 20 S Reclaim Feeder and 1 x TS 42 Radial Telescopic Stacker
200 tph Capacity of Woodchips at 0.4T/m3 Density
Plan View



90°	20,075m3
90°	8, 030 m3 @ 0.4T/m3

Drawn by : P.W
 Date : 16.06.21
 Scale : N. T. S