13.1 Aviation Safety

13.1.1 Background and Methodology

The Plume Rise Assessment is contained in **Appendix E** – Air Quality Assessment.

The Civil Aviation Safety Authority (CASA) considers an exhaust plume with a (critical) vertical velocity component of greater than 4.3 m/s to be a potential hazard to aircraft. In areas remote from an aerodrome, CASA require proponents of industrial facilities to notify them if any proposed exhaust plumes are likely to exceed the critical velocity at a height greater than 110 m Above Ground Level (mAGL).

This screening assessment has used the CSIRO's TAPM model to predict a single year of hourly meteorological cases and plume velocity profiles so that potential plume impacts can be identified. The assessment has followed the CASA Advisory Circular *"Guidelines for Conducting Plume Rise Assessments"* (June, 2004) with the exception that a single year has been modelled, and only basic statistics have been presented. Given the small scale of thermal emissions, this approach is considered acceptable.

Emission Parameters

The stack will serve a boiler which will generate steam at a rate of approximately 20 MW, and at a thermal efficiency of approximately 86% (LHV). The use of seawater for cooling purposes means that only a small portion of energy from the power cycle (around 3 MW) is emitted to the air. This means that a relatively small amount of energy is available to contribute to plume buoyancy. Plume buoyancy is the dominant mechanism by which plumes rise through the atmosphere. **Table 13-1** below shows the stack parameters that were modelled for this screening assessment.

Table 13-1 Stack Parameters

Stack Parameter	Value
Approximate Location (MGA94)	760665 mE, 5889863 mN, Zone 55
Base Elevation	39 mAHD
Height	35 mAGL / 74 mAHD
Diameter	1.6 m
Exit Temperature	180°C
Exit Velocity	11.2 m/s

13.1.2 Results

Table 13-2 presents the results from the TAPM modelling, where the critical vertical extent is the height at which the plume depreciates to the critical vertical velocity of 4.3 m/s. As expected, for all hours of the year modelled, plume velocities were predicted to depreciate below 4.3 m/s within metres of the stack top, and well below 110 mAGL.

Table 13-2 Modelling Results

Stack Parameter	Critical Vertical Plume Extent (mAGL)
Maximum	43
Average	38
Minimum	36

The results of the plume rise assessment were supplied to CASA and Airservices Australia. Both confirmed that the Power Plant will not have an impact on the Obstacle Limitation Surfaces for Merimbula Airport, the nearest airport to the site.

Airservices Australia has also confirmed that the Power Plant will not impact on Precision / Non-Precision Navigation Aids, HF / VHF Communications, A-SMGCS, Radar, PRM or Satellite / Links.

13.1.3 Mitigation Measures

No specific mitigation measures are necessary in relation to aviation safety.

13.2 Bushfires

The Project does not require referral to the NSW Rural Fire Service (RFS) under Section 79BA of the EP&A Act as neither residential nor rural-residential developments are proposed.

Whilst there is no formal requirement for consideration of bush fire risk under Part 3A of the EP&A Act, an assessment has been requested by the Director General. The full technical Bush Fire Assessment is provided in **Appendix H**. A summary is presented below.

13.2.1 Methodology

URS has considered the guidelines and requirements of the RFS (2006a, 2006b) for site planning purposes, to determine the potential risk of bush fire to the proposed development and to provide mitigation measures to address any potential risk. Bush fire prone land mapping for Bega Valley Shire was obtained from council and existing bush fire control measures for the current site obtained from SEFE. A site inspection was carried out between 22 and 24 June 2009 during which the surrounding vegetation and existing fire protection measures were assessed.

13.2.2 Assessment of Potential Impacts

The Bega Valley Shire bush fire prone mapping indicates that the site and the surrounding land is mapped as bush fire prone land (categories one and two). The mapped areas correspond to areas of vegetative canopy cover visible in aerial photography and in vegetation mapping of the site.

Asset Protection Zones (APZs) are recommended in the RFS (2006a) document *Planning for Bush Fire Protection* (PBP) as a key measure for the mitigation of bush fire risk. They are an interface between the proposed development and the adjacent bushland. The aim of an APZ is to minimise fuel loads to ensure that radiant heat levels at buildings are below critical limits and to prevent direct flame contact with a building.

The APZ generally comprises two sections: an Inner Protection Zone (IPZ) and Outer Protection Area (OPA). The IPA is located adjacent to the building with the aim of reducing heat intensity at the building surface. It is maintained largely fuel-free and can contain widely spaced trees, with low density understorey vegetation and low fuel loads in the ground layer. Perimeter roads, car parks and cycle ways can be located in the IPA and serve as a 'defendable space' for fire fighting activities and for access to manage the APZ. The OPA is managed as a fuel reduced zone between the IPA and the adjoining bushland and aims to reduce the length of flames, filter embers and suppress a crown fire. The OPA can be maintained as managed bushland, with canopy thinning so there is limited canopy connection into the IPA and a reduced density of understorey vegetation.

The Power Plant will be located within an existing wood chip plant adjacent to bush fire prone land, however the proposed facilities will be surrounded by largely cleared land within the existing plant boundary. Based on existing APZs for the proposed work site the risk to life and property of bush fire attack is rated as low. Providing the existing APZs are maintained, the distance between the Power Plant and the a vegetation hazard varies between 40 – 320 m (average of 208 m). The category of bush fire attack for all boundaries adjacent to existing woodland and the corresponding building standard is 'no requirement', according to Australian Standard AS 3959-1999.

13.2.3 Management

There are currently a number of mitigation measures in place at the SEFE site to minimise the risk of bush fires. These will apply to the proposed development and are listed below:

- Hazardous substances are appropriately stored with signage and fire control measures according to the Dangerous Goods Act and Regulations and the Australian Standards (AS 1940).
- An Emergency Response Plan is in place for the site and all staff are trained to ensure familiarity with the plan and their respective responsibilities.
- An underground fire main provides water for fire fighting.
- A buffer zone between the mill and surrounding vegetation is maintained.
- The site has a Fire Emergency Plan.
- The site has a dedicated fire tender.
- Routine fire training is undertaken for all mill personnel.

The key access and egress issues of relevance to planning for bush fire protection during operation of the Power Plant relate to:

- maintaining existing access for fire fighting vehicles;
- maintaining safe evacuation egress for fire fighting vehicles and staff vehicles; and
- maintaining existing defendable spaces between potential hazards that can accommodate fire fighting vehicles safely and provide a staging place for fire fighting.

The proposed works will be connected to the public road system via existing access to Edrom Road.

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Where practicable, vegetation surrounding the Site and within the APZ would be managed to provide clearly defined on-ground APZ management boundaries, tree canopy separation, a discontinuous shrub layer, vertical separation between vegetation strata, retention of low native groundcovers, and maintenance of fuel loads through mowing / slashing during the spring / early summer months, as necessary.

If landscaping is carried out as part of the proposed development the following is recommended:

- Use of 'fire retardant' species where possible.
- Use of local provenance stock, preferably representative of the vegetation communities recorded adjacent to the site.
- No planting of landscaping trees within 2 m of any building.
- Placement of plantings to ensuring tree canopies do not overhang structures.
- Use of non-combustible mulch where possible.

13.2.4 Mitigation Measures

A summary of the mitigation measures applicable to the proposed works is provided **Table 13-3**.

Table 13-3 Mitigation Measures

Mitigation Measure	Project Stage		
	Pre construction	Construction	Operations
Manage the Power Plant consistent with current bush fire management practices employed on the site.	✓	✓	✓
Ensure that the Power Plant is included in the sites emergency response procedures.	✓	✓	✓
Maintain existing APZs along all boundaries consistent with *Standards for Asset Protection Zones* (RFS 2007).	✓	✓	
Maintain the current water supply to the site and ensure water supply tank(s) contain Storz fittings compatible with RFS hoses.	✓	✓	✓
Where practicable, provide landscaping that includes the following features: • tree canopy separation by at least 2m; • discontinuous shrub layer (clumps or islands of shrubs where possible; not rows); • vertical separation between canopy and shrub layer; • tree canopies not overhanging structures; • no landscaping trees within 2m of any building; • use of non-combustible mulch; and • use of 'fire retardant' species of local provenance.	✓	✓	✓

13.3 Land Contamination

13.3.1 Introduction and Scope

This Section provides a discussion of potential contamination within the immediate area of proposed works. The scope did not include an intrusive assessment. A review of the site history and current operations was considered appropriate for a preliminary assessment due to the limited scope of the proposed works and because the construction of the Power Plant would not result in a change to the existing land use of the incinerator site. The existing environmental management system and EPA licensing of current operations was considered, and pathways for potential contaminants to migrate from the incinerator site were also considered.

The scope of works undertaken by URS involved:

- a search of the contaminated land public record;
- a physical inspection of the site during June 2009; and
- interviews with site personnel concerning past and current site activities.

Contaminated Land Public Record

The contaminated land public record is an online searchable database of:

- actions taken by the EPA under section 15, 17, 19, 21, 23, 26 or 28 of the *Contaminated Land Management Act 1997* (CLM Act);
- actions taken by the EPA under *section 35 or 36 of the Environmentally Hazardous Chemicals Act 1985* (EHC Act); and
- site audit statements provided to the EPA under section 52 of the CLM Act on sites subject to an in-force declaration or order.

No records for the SEFE site were found during the search of this database.

13.3.2 Existing Environment

The existing incinerator is a forced draft incinerator with a single combustion chamber. This structure was constructed in 1972 essentially as a sheet steel teepee-shaped cell with an in-ground ducted primary air system with openings in the top and side for loading waste material and removing ash.

The incinerator has a diameter at the base of 27.5 m and stands 29 m high. The plant's steel frame and steel panel construction sits on concrete foundations (**Plate 13-1**).

SEFE has indicated that the incinerator has disposed of untreated waste wood material generated from saw milling and wood chipping activities since its construction in 1972. Operation of the incinerator typically results in the removal of approximately 10 truckloads of ash over an average year. This ash is disposed of on-site at the quarry area.

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Plate 13-1 View of Burner and Fuel Storage Tank

Diesel is used during the incineration process to initiate combustion. Diesel is stored adjacent to the incinerator in a 28,000 L above ground storage tank (**Plate 13-2**). The tank is seated within a hardstand concrete bund area to contain any spills or leaks. SEFE has indicated that no underground pipe work or associated infrastructure is connected to the tank.

Plate 13-2 View of Fuel Storage Tank in Concrete Bund

There is no visual evidence of contamination indicated by dead or stressed vegetation, no surface indicators of chemical spills and no unexplained patches of bare earth. There is no evidence of leaks or spills from the above ground storage tank. The site is fenced and members of the public are not able to access the site. An EMP and OH&S Plan are in operation at the site for users and visiting maintenance workers.

13.3.3 Proposed works

The proposed Power Plant would be constructed on the site of the incinerator. The incinerator would be dismantled and the concrete foundations removed for levelling and surface preparation. No importation of fill or removal of soil from the area is anticipated. If small quantities of material are required to be removed from the construction footprint, this will be disposed of on-site.

Piles would be driven to support the Power Plant and a new hardstand constructed. All areas across the former incinerator footprint would be covered by hardstand at the completion of construction.

Water pipelines from the facility to the jetty would be above ground, and no significant excavation of the underlying soils would be required for their installation.

The composition of the wood waste to be burnt by the Power Plant would be the same as waste formerly burnt in the incinerator. SEFE propose to use only wood waste generated on their own site supplemented with wood waste generated by sawmilling processes. No fuel would be sought from municipal landfill or other sources in which wood waste could potentially be contaminated.

The diesel tank would not require removal as part of construction works. The tank would continue to be utilised to store fuel for use during start-up of the Power Plant.

SEFE proposes to recycle bottom ash and coarse fly ash to soils (293 tpa) via land application with the fine fly ash fraction being collected separately and disposed of to landfill within SEFE's mill site (around 32 tpa) SEFE is currently consulting with DECCW on the conditions under which land disposal of ash would be permitted.

13.3.4 Conclusion

As outlined above, the proposed scope of works are relatively small in scale. Previous activities carried out at this location involved the incineration of clean wood waste material since 1972. The proposed works largely represent a continuation of existing activities.

Dismantling the burner and constructing the Power Plant would not disturb underlying soils beyond the existing incinerator footprint. It is not anticipated that material from beneath the burner would require removal. SEFE has indicated that material from the area would be disposed of on-site if excavation and removal of some material is deemed necessary. Considering this, the proposed works would not be expected to facilitate the migration of any potential in-situ contaminants, should they exist.

Following construction, the Power Plant building curtilage would be covered by hardstand to the extent of the original burner footprint. Covering all exposed areas of the incinerator footprint with hardstand reduces the potential exposure of contamination to the surrounding environment, should it exist.

13.3.5 Mitigation Measures

Table 13-4 Mitigation Measures

Mitigation Measure	Project Stage		
	Pre construction	Construction	Operations
Sediment, dust and run-off would be managed during construction.		✓	
Ash disposed of on-site will go direct to landfill and will not be stockpiled.			✓