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NSW Sports and Recreation

Southern Highlands Regional Shooting Complex

Construction Environmental Management Plan

September 2010

INFRASTRUCTURE | MINING & INDUSTRY | DEFENCE | PROPERTY & BUILDINGS | ENVIRONMENT

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1. Introduction

1.1 Overview

This Construction Environmental Management Plan (CEMP) has been prepared on behalf of NSW Sport and Recreation (the proponent) for implementation during construction of the Southern Highlands Regional Shooting Complex (SHRSC).

The CEMP provides a system and procedures to address and mitigate potential impacts to the environment. The CEMP covers issues with respect to air quality, waste management, ecology, hazards and risks, bushfire, contamination, soil and water, noise and traffic.

The objectives of the CEMP are to:

- Ensure that the clearing and bulk earthworks are done in accordance with existing environmental statutory requirements;
- Ensure that works are done while minimising environmental degradation;
- Ensure that all site personnel comply with the terms and conditions of the CEMP;
- Respond to changes in environmental conditions during construction through monitoring and consultation; and
- Ensure mitigation measures are completed in an appropriate manner.

This document is designed to provide environmental guidance to key personnel involved in the construction of the works. It provides a reference manual for all personnel involved in the construction of the works but it does not replace the need for the Contractor to develop a detailed Environmental Management Plan for the construction works based on their proposed construction methodologies.

This document is to be read in conjunction with the Ecological Management Plan (EMP) and the Soil and Water Management Plan (SWMP) for the proposal.

1.1.1 CEMP Requirements

This management plan addresses particular issues contained within the Minister's Determination for the proposal, as listed in Table 1

Table 1 Minister's Requirements

Requirement	Relevant Section
A vegetation clearing protocol including minimisation of vegetation removal and procedures for the identification of hollow bearing trees on the site and the relocation of any nesting and/or deccing species.	Section 5.2 Also refer to Ecological Management Plan (referenced above) to be read in conjunction with this document.
Any fill to be used on the site to be clean.	Section 5.5

Requirement	Relevant Section
Construction hours to be consistent with Council's standard hours of construction.	Section 5.6
When remediation works are to be undertaken and the methods used.	Refer to Soil and Water Management Plan (referenced above) to be read in conjunction with this document.
Management of construction noise and construction traffic noise to minimise (as far as practical) the impact in the vicinity of the subject site.	Section 5.6

1.2 The Proposal

NSW Sport and Recreation (an agency of Communities NSW) is proposing to construct and operate a regional recreational shooting complex at Hill Top in the NSW Southern Highlands. The construction and operation of the regional shooting complex would allow a number of shooting clubs operating throughout the Southern Highlands, Illawarra and Shoalhaven area to consolidate their operations at the proposed Hill Top venue. This is consistent with the NSW Government's priority to support joint use of the facilities, consolidate ranges threatened by urban encroachment or environmental issues and provide long term security of tenure for shooting clubs.

The Hill Top venue would be known as the Southern Highlands Regional Shooting Complex (SHRSC).

1.2.1 Project Features

The project would involve works to establish a regional recreational shooting complex incorporating the existing Hill Top Rifle Range (which would continue to operate), and include:

- An additional rifle range (500 metres by 100 metres);
- An additional range for rifle and pistol shooting (200 metres by 85 metres);
- A pistol range (50 metres by 140 metres);
- A shotgun range;
- An indoor air range (21 metres by 17 metres by 6.5 metres); and
- Supporting facilities and infrastructure, including:
  - Clubhouse and toilet facilities;
  - Access roads (designed for two wheel vehicle access) connecting to Wattle Ridge Road and between the clubhouse and ranges and informal (unsealed) parking for 160 cars;
  - Diesel generator, solar panels, water supply tanks and septic system; and
  - Ponds to contain water for water quality control and fire fighting purposes.

The Shooting Ranges and support facilities that form part of the proposal would occupy an area of

approximately 16 hectares of land (excluding the existing Hill Top Rifle Range).

The area occupied by the ranges and associated facilities would be cleared as part of the construction. The remainder of the land on the site (approximately 1,000 hectares) would be retained in its existing condition (including the existing Hill Top Rifle Range).

1.3 Site Location and Description

The SHRSC will be located adjacent the existing Hill Top Rifle Range operated by the Southern Highlands Regional Shooting Complex Inc. off Wattle Ridge Road, approximately 5.5 kilometres northwest of the Hill Top village centre in the Wingecarribee local government area (LGA).

The location of the project is shown in Figure 1-1.

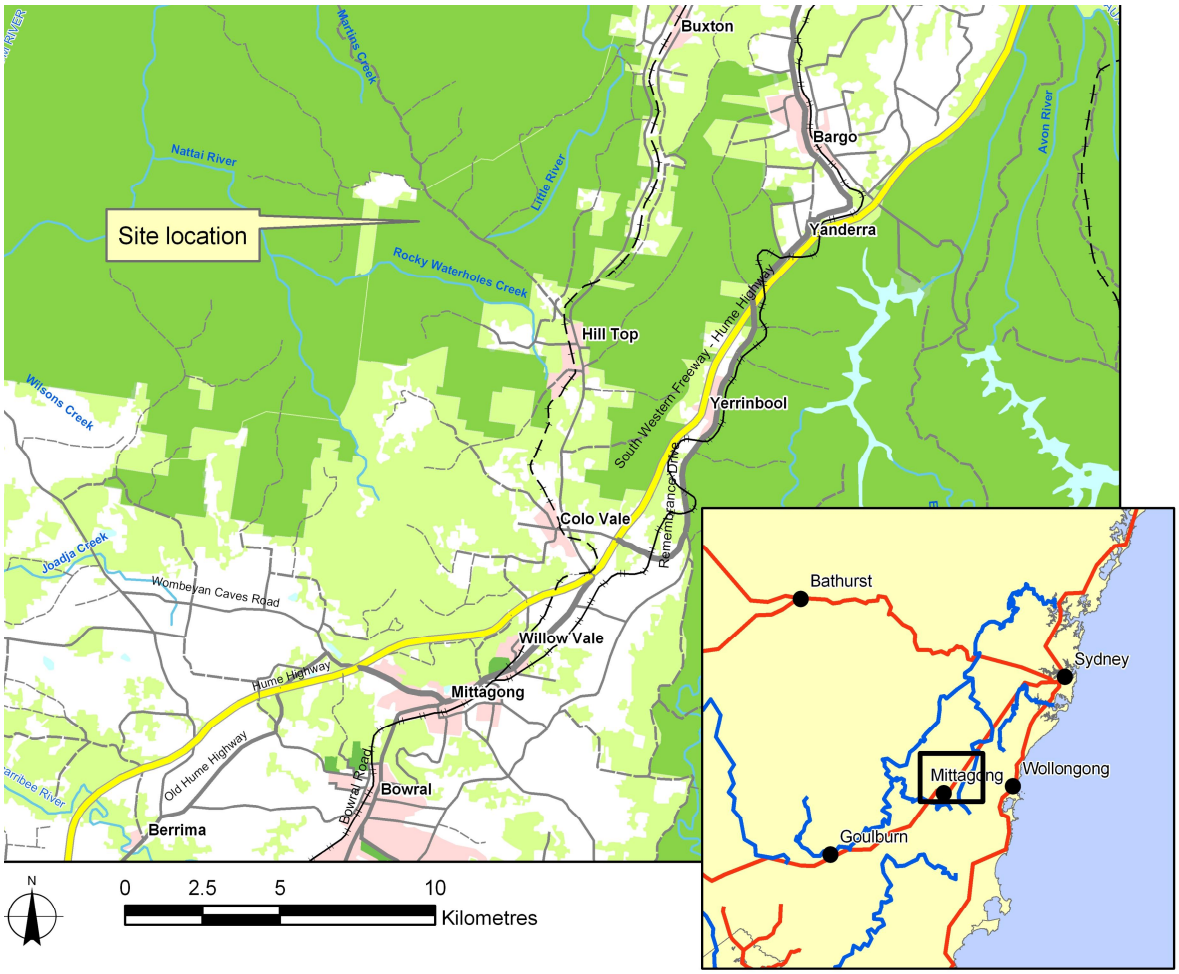

Figure 1-1 Location of the proposal

The site is located in the Wingecarribee Local Government Area (LGA) near the village of Hill Top in the southern highlands of New South Wales, approximately 11 km north of Mittagong. Mittagong is located at the south-western end of the Sydney Basin between the upper reaches of the Nepean River

and other rivers such as the Wollondilly, Nattai, Bargo and Wingecarribee. These rivers flow into the Nepean River further to the north.

The existing range consists of a seven-target rifle range 800 m long, with firing mounds at 100 m intervals. A small clubhouse, toilet facilities and informal car parking are also located on site.

Approximately 1,000 hectares (ha) of land has been excised from the Bargo State Conservation Area by means of *National Parks and Wildlife (Adjustment of Areas) Act 2006.* The area occupied by the range and associated facilities would be cleared as part of the works. The remainder of the land on the site (approximately 984 ha) would be retained in its existing condition as a vegetation buffer zone. This area would act as a safety zone for the proposal.

1.4 Surrounding Land Uses and Sensitive Receptors

The site is bounded by:

- Wattle Ridge – a grazing property/residence which adjoins the site to the northwest (located approximately 2.5 km north of the existing range);
- Bargo State Conversation Area to the southwest;
- A 330 kV cleared electricity easement (Transgrid) to the southeast; and
- Wattle Ridge Road to the northeast.

Bargo State Conservation Area is located further to the southwest, southeast and northeast. Nattai National Park is located further to the northwest, on the opposite side of the Wattle Ridge property. Nattai National Park is accessible from the end of Wattle Ridge Road approximately 3 km away.

Sensitive receptors include Rocky Waterholes Creek, located approximately 1.5 km southwest of the site. The creek is a tributary of the Nattai River. The Nattai River is located approximately 7.5 km southwest of the site.

2. Legislative Requirements

2.1 Relevant Legislation and Guidelines During Construction

Personnel involved in the construction of the project need to be aware of the legislation, related regulations and guidelines outlined in Table 2 that covers key environmental issues including water, noise, air pollution, ecology protection and waste control.

Table 2 Summary of key guidelines

Environmental Aspect	Key legislation
Water	*Protection of the Environment Operations Act, 1997*
	Protection of the Environment Operations (General) Regulations, 1998
	Protection of the Environment Operations (Penalty Notice) Regulations, 1999
	Clean Waters Regulations, 1972
	Environmentally Hazardous Chemicals Act, 1985
	Environmentally Hazardous Chemicals Regulations, 1999
	Dangerous Goods Act, 21975
	Water Management Act, 2000
	Pesticide Act, 1999
	Pesticide Regulations, 1995
	Drinking Water Catchments Regional Environmental Plan No. 1
Noise	*Protection of the Environment Operations Act, 1997*
	Protection of the Environment Operations (General) Regulations, 1998
	Protection of the Environment Operations (Penalty Notice) Regulations, 1999
	Industrial Noise Policy, 2000
	Stationary Noise Source Policy, 1998 (Draft)
	Environment Protection Authority Environmental Noise Control Manual, 1994
Air	*Protection of the Environment Operations Act, 1997*
	Protection of the Environment Operations (General) Regulations, 1998
	Protection of the Environment Operations (Penalty Notice) Regulations, 1999
	Clean Air (Plant and Equipment) Regulation 1997
	National Environmental Protection Measures for Ambient Air Quality (NEPC, 1998)

Environmental Aspect	Key legislation
	Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales (EPA, 2001)
Ecology	*Water Management Act, 2000*
	Threatened Species Conservation Act, 1995
	National Parks and Wildlife Act, 1974
	Native Vegetation Conservation Act, 1997
	Noxious Weeds Act, 1993
Waste	*Protection of the Environment Operations Act, 1997*
	Protection of the Environment Operations (General) Regulations, 1998
	Protection of the Environment Operations (Penalty Notice) Regulations, 1999
	Protection of the Environment Operations (Waste) Regulations, 1996
	Protection of the Environment Operations Amendment (Littering) Act, 1996
	Environmentally Hazardous Chemicals Act, 1985
	Environmentally Hazardous Chemicals Regulations, 1999
Hazardous materials	*Protection of the Environment Operations Act, 1997*
	Protection of the Environment Operations (General) Regulations, 1998
	Protection of the Environment Operations (Penalty Notice) Regulations, 1999
	Protection of the Environment Operations (Waste) Regulations, 1996
	Environmentally Hazardous Chemicals Act, 1985
	Environmentally Hazardous Chemicals Regulations, 1999
	Dangerous Goods Act, 21975
	Pesticide Act, 1999
	Pesticide Regulations, 1995
	Environmental guidelines: Bunding and Spill Management, 1997
	Australian Standards AS1940: *The Storage and Handling of Flammable and Combustible Liquids*, 1993
	Environmental Guidelines: *Assessment, Classification and Management of Liquid and Non-Liquid Waste,* 1999.

3. Roles and Responsibilities

The general roles and responsibilities of the typical parties involved in a construction contract with respect to environmental management are outlined in this Section. These parties include:

- Contractor;
- Superintendent's Representative; and
- Principal.

3.1 Contractor

The roles and responsibilities of the Contractor are as follows:

- Carry out work in accordance with the requirements of this CEMP;
- Make all contractor's staff aware of the requirements of this CEMP and any relevant site specific procedures;
- Ensure staff comply with all relevant Environmental Guidelines;
- Consider and advise on matters specified in the requirements in this plan and comply with such requirements;
- Implement and maintain for the duration of the construction contract, a management system that includes procedures and forms for documenting environmental accidents / incidents, non-conformances and complaints, and procedures for undertaking corrective and/or preventative actions to rectify any accidents / incidents, non-conformance or complaints;
- Keep a register of all environmental accidents / incidents, non-conformances and complaints;
- Provide the Superintendent with a copy of all documented accidents/ incidents, non-conformances and complaints;
- Carry out environmental audits / inspections / monitoring to verify compliance with this CEMP;
- Carry out compliant investigations and report compliant investigation findings to the Superintendent;
- Report all non-conformance to the Superintendent in accordance with the set procedure;
- Correct all non-conformances to the satisfaction of the Superintendent in the timeframe specified by the Superintendent;
- Report on the implementation and effectiveness of corrective actions specified by the Superintendent or implemented to ensure correction of non-compliances;
- Hold a copy of the Conditions of Consent and all licences on site. These shall be made available upon request to authorised agency personnel;
- Identify, obtain and hold on site any other licence, permit, certificate or approval needed to undertake the works; and
- Train field staff so they are able to implement the requirements of the CEMP, particularly in

Erosion and Sediment Control Procedures and Emergency Procedures.

3.2 Superintendent's Representative

The roles and responsibilities of the Superintendent's Representative are as follows:

- Ensure the Contractor is undertaking works in compliance with this CEMP;
- Carry out field inspections to ensure works undertaken comply with this CEMP;
- In the event of a non-conformance with either the requirements of this CEMP or with environmental criteria, the Superintendent's Representative is to ensure corrective actions are implemented satisfactorily and in an appropriate timeframe by the Contractor;
- Direct the Contractor to remedy any environmental incident or accident;
- Inform the Contractor of any complaints received, related to the undertaking of the works and direct the Contractor to investigate the complaint; and
- In the event that a complaint is shown to be legitimate, direct the Contractor to undertake appropriate actions to prevent further complaints.

3.3 Principal

The roles and responsibilities of the Principal are as follows:

- Inform the Contractor of any site specific environmental performance related requirements, including those specified in the Environmental Assessment report and Minister's conditions of approval;
- Inform the Contractor of site specific Emergency Procedures; and
- Induct and train the Contractor so that they are able to meet site specific requirements and follow the necessary procedures.

3.4 All personnel involved in construction

All personnel involved in construction will:

- Carry out work in accordance with the requirements of this CEMP and relevant guidelines and procedures;
- Comply with all permits, approvals and subsequent plans associated with these works; and
- Comply with all relevant legislation and guidelines and standards.

4. Construction methodology and activities

The proposal will be constructed using conventional civil engineering techniques, including:

- Erosion control works consisting of:
  - Sediment ponds to trap any sediment;
  - Diversion drains to direct water around any disturbed areas;
  - Catch drains to intercept potentially polluted water; and
  - Silt fences;
- Trees cleared using excavators and small dozers;
- Provide portable toilet facilities during the construction phase;
- Dozers using ripping tools would undertake the earthworks. Any material to be moved around the site would be moved by articulated truck using tracks that would correspond to future paths around the site;
- Buildings, firing points and targets would be constructed after the earthworks are complete and would include the following:
  - Concrete used for buildings and target footings, would be delivered to site by concrete agitator. The trucks would be cleaned out in a bunded area; and
  - Any material imported to the site would be certified as being clean before being allowed on to the site. The current design of the range indicates that there would be an excess of material equivalent to approximately 1,600m3 and as a result the amount of material to be imported would be minimal. Excess material would be used to flatten batters on the site where possible including the existing 800m range mounds that are showing signs of erosion; and
- The range and clubhouse areas will be sown with grass and vegetated for erosion control.

  The commitment of the proponent at this time is only to construct the 500-metre rifle range, part of 200-metre rifle range and the 50-metre pistol range. The remaining ranges would be constructed in line with the proponent's strategic and funding priorities. The support facilities, including the clubhouse (or part thereof), parking facilities, utility requirements and environmental management measures etc, would be developed concurrently with the 500-metre range.

  It is expected that the construction of the 500-metre rifle range, part of 200-metre rifle range, 50-metre pistol range and associated infrastructure would take approximately 4 months. The full scope of work, if constructed in one stage, would take a period of approximately 6 months to construct.
- Remediation of the existing 800m range stop butt will be required to be undertaken in accordance with the relevant DECC requirements.

5. Environmental Management

This section summarises the environmental risks posed by the construction of the proposal and provides a reference to the control measures that must be implemented to minimise the identified risk. It provides a framework for the Contractor to prepare its detailed Environmental Management Plan specific to construction methodologies adopted.

5.1 General

The Contractor's site sheds (and associated facilities) would be located at the future clubhouse location, in order to provide ready and easy access off Wattle Ridge Road. Appropriate wash down facilities for vehicles entering and exiting the site should be provided, with a procedure put in place for regular maintenance.

An appropriate bunded area for refuelling would be provided for construction vehicles

5.2 Ecological Management

The following measures are recommended to minimise the potential for direct and indirect impacts of the proposal on flora and fauna and their habitat:

- A suitably qualified full-time ecologist to be on-site during tree-felling and vegetation clearance and to inspect hollows where practicable prior to felling trees;
- Engage a suitably qualified herpetologist to undertake a search for eggs in all termite mounds if clearing occurs during the nesting/incubation season of Rosenberg's Goanna (egg depositions occurs from December to February and eggs are incubated until September to October when young goannas dig out of their incubation mounds) within the areas to be cleared. Retrieved eggs are to be removed for continued incubation and translocation. This is to be undertaken in consultation with DECC;
- Engage a suitable qualified ecologist to identify Wombat burrows and advise on suitable precautions to be exercised during vegetation clearance on and around Wombat burrows;
- Undertake compensatory planting of Yellow-bellied Glider food trees adjacent to the ranges at a minimum ratio of 2:1;
- Exercise caution when working near exposed sandstone areas and avoid any disturbance of bush rock on and around exposed sandstone edges to avoid destruction of suitable Broad-headed snake habitat;
- Design and position construction sites so as to minimize vegetation clearance and encroachment into adjacent vegetation by using already disturbed areas;
- Avoid locating vehicles, machinery, equipment and temporary site buildings within the drip line of trees;
- Avoid construction within or close to creeks and watercourses, where practical and possible;
- Fence proposed development areas with appropriate temporary fencing to ensure construction

works do not breach the boundaries and enter the adjacent areas of vegetation;

- Place stockpiles away from vegetated areas;
- Stockpile soil that may contain seed of exotic species away from adjacent vegetation or drainage lines where they could be spread during rainfall events;
- Remove vegetation debris and soil as soon as possible after construction to avoid sedimentation runoff into adjacent drainage lines and creeks to avoid affected plants and new seedlings;
- Exercise caution when undertaking grading of gravel roads to avoid covering vegetation in adjoining habitat with material scraped from the road surface; and
- Construction debris and soil will be removed as soon as possible after construction. Exercise caution when undertaking grading of gravel roads to avoid covering vegetation in adjoining habitat with material scraped from the road surface.

Table 3 below summarises the requirements for Construction Phase Ecological Management as detailed in the project Ecological Management Plan. These requirements are in addition to those identified above.

Table 3 Summary- Ecological Management Actions

Project Phase	Reference in EMP	Mitigation Measure	Timing	Responsibility
Pre-construction Phase				
	Section 6	**Induction –** to familiarise contractors with their obligations for protecting flora and fauna and with relevant flora and fauna management protocols and methods	October 2010	NSWSR Site Manager (advised by Project Ecologists)
	Section 5.2.1	**Identify Disturbance Areas** – identify construction footprints and suitable sites for location of ancillary infrastructure	October 2010	Contractor's Site Manager & Ecologists
	Section 5.2.1	**Install Protective Fencing and signs** – high visibility temporary fencing and signs erected to clearly demarcate construction and works areas from surrounding native vegetation and habitats ('no-go zones'). Installation of signs at property access points to restrict off-road activities and fauna warning signs and speed signs at appropriate locations.	October 2010	Contractor with advice from project ecologists where appropriate

	Sections 5.2.1, 5.3.1, 5.3.4	**Pre-clearance Surveys –** completion of pre-clearance surveys prior to vegetation clearance, in accordance with the *Fauna Habitat Identification Management Procedure*, and including: ◗ **Baseline weed mapping** in accordance with the Weed Management Strategy ◗ **Identification and of hollow-bearing trees and logs** to be cleared in accordance with the Habitat Clearing and Hollow Tree management procedure; ◗ **Identification of Wombat burrows** and installation of one-way wombat gates; ◗ **Inspection of termite mounds** for evidence of nesting by Rosenbergs Goanna and egg retrieval and management in consultation with DECCW; ◗ **Identification of rocky outcrops or ledges** within the construction footprint to be searched for native fauna immediately prior to clearing activities and removal; and ◗ **Identification of Hollow Trees and Yellow-bellied Glider sap-feeding trees** for retention in vicinity of car park and along access roads, where possible ; ◗ **Identification of transportable habitat features** (eg large logs, rocks) to relocate during clearing activities into retained habitats under advice of Project ecologist.	Late September 2010	Project Ecologists engaged by Contractor Qualified herpetologist/ or suitably experienced wildlife specialist
		Closure of unwanted tracks – close unwanted or unused tracks in vicinity of construction area to prevent unauthorised access	Late September/early October 2010	Contractor's Site Manager with direction from Land Manager
	Sections 5.2, and 7.1	**Photographs at Photo Points –** take photos at established photo points and establish and log new photo points in vicinity of new development, as per Conservation Agreement	September 2010	Contractor Ecologists
Construction Phase				
	Section 5.3.2	**Timing –** adhere to the set timing for clearing activities (June to October), clearing not to commence until completion of spring surveys and finalisation and approval of Ecological Management Plan.	September–October 2010	Contractor
	Section 5.3.2	**Operational hours –** construction works to occur during standard operational hours as far as possible to avoid impacts on fauna as a result light and noise. Night works are not permitted.	Throughout construction period	Contractor
	Section 5.3.2	**Maintain Fencing and Signs**– temporary fencing erected to demarcate construction areas and 'no-go zones' to be inspected and repaired as necessary.	Throughout construction period	Contractor

	Section 5.3.2	**Restrict Access –** restrict vehicle movements to access roads and construction areas to prevent mechanical damage to vegetation and soil disturbance in surrounding retained habitat	Throughout construction period	Contractor
	Section 5.3.2	**Enforce speed limits and safe driving practices** to minimise potential for fauna road mortality and disturbance of vegetation from dust generation	Throughout construction period	Contractor
		Install ancillary features – locate temporary construction infrastructure (eg site office), equipment laydown and vehicle/machinery parking areas and stockpile sites within existing clearings or disturbed areas or within the construction footprint away from the drip line of trees as far as possible.	October 2010	Contractor, Site Manager
		Install sediment control features prior to clearing activities – to prevent runoff from exposed soils and stockpiles to minimise the potential for adverse impacts on surrounding and downstream habitats in accordance with the Soil and Water Management Plan and Water Cycle Management Plans.	Early October 2010	Contractor
		Dust suppression – spraying of access tracks and disturbed surfaces to control dust generation and minimise impacts on adjoining vegetation	Throughout construction period, as required	Contractor
	Sections 5.3.2 & 5.3.4, Appendix A	**Implement Habitat Clearing and Hollow Bearing Tree Management Procedure –** the removal of trees with hollows and hollow logs, wombat burrows, rocky outcrops, termite mounds is to be in accordance with this procedure to minimise potential for mortality or harm to fauna. Project Ecologists to be present during vegetation clearing.	September 2010 – April 2011	Contractors/ Project Ecologists
	Sections 5.3.2 & 5.3.4, Appendix A	**Exercise caution around exposed sandstone and bushrock –** care taken to avoid disturbance or destruction of potential broad-headed snake habitat adjoining construction footprints.	Throughout construction period	Contractor
	Sections 5.3.2 & 5.3.4, Appendix A Section 8.1	**Implement Fauna Management and Fauna Handling Management Procedures** – where necessary, animals encountered within construction footprints should be managed in accordance with this procedure. All wildlife handling to be undertaken by wildlife specialists. Document records of animal handling requirements and outcomes for inclusion in contractor monthly field inspection reports and to inform Land Manager's Annual Report to DECCW.	September 2010 – April 2011	Wildlife Specialists Contractor's Site Manager with assistance from Wildlife Specialists
	Section 5.3.2, 5.3.4 & Appendix A	**Reinstatement of Fauna Habitat Features Procedure –** identified transportable habitat features (eg hollow logs and trunks, rocks etc) within construction footprints to be relocated to adjacent habitat in accordance with this procedure.	During vegetation clearing activities	Contractor with advice from Project Ecologists
	Sections 5.3.2 & 5.3.4, Appendix A	**Avoidance of Habitat Features Identified for retention during pre-clearing surveys–** hollow-bearing trees and Yellow-bellied Glider sap-feeding trees to be retained in the car park area and along access roads to be avoided during clearing and grading works, as far as possible.	Throughout construction period	Contractor

		Retention of topsoil and vegetation debris – topsoil removed for construction should be stockpiled for use in rehabilitation/landscaped areas as required. Vegetation debris from clearing activities should be mulched and used for stabilisation of disturbed soils and in proposed rehabilitation/landscaped areas.	During Clearing activities	Contractor
	Section 5.4 & Appendix A	**Weed Control –** adherence to a Weed Management Strategy. Use designated access points to reduce transport of weed material between areas. Workforce personnel to inspect clothing, boots and vehicles/ plant machinery and be clean on entry and exit from site. Manage stockpiles to prevent weed germination. Weekly inspections of construction site and disturbed areas for new occurrences of weeds and weed removal.	Throughout construction period	Contractor
	Section 5.5 & Appendix A	**Implement Biosecurity Procedures –** boot wash down and vehicle spray down stations located at all access points to construction site. Phytoclean (*Phytophthora cinnamomi*), Bleach (Chytrid Fungus). Personnel boots and vehicles/ plan machinery to be clean on entry and clean on exit. Any soil or water brought to the site is to be free of weeds or pathogens.	Throughout construction period	Contractor
		Soil Stockpile Management – locate stockpiles away from vegetated areas or drainage lines to prevent sediment discharge and spread of weeds. Ensure appropriate erosion and sediment controls are in place around soil stockpiles. Manage stockpiles to prevent weed germination in accordance with the Soil and Water Management Plan and Water Cycle Management Plans	Throughout construction period	Contractor
	Appendix A	**Rehabilitation of disturbed areas –** disturbed areas to be progressively stabilised and where appropriate planted with native species endemic to the local area in accordance with Rehabilitation Management Protocol and requirements of Bushfire Management Plan.	Throughout construction period	Contractor
		Waste Management – all chemicals and liquid wastes to be contained within bunded areas to avoid environmental contamination. Rubbish and organic waste to be disposed of regularly and appropriately in accordance with the Soil and Water Management Plan and Water Cycle Management Plans.	September 2010 – April 2011	Contractor in consultation with Project Ecologist
	Section 8.1	**Site Inspections and Reporting -** Undertake daily site inspections and reporting in accordance with CEMP to report on environmental performance, incidents, non-conformance and remedial action to address incidents and non-conformances	Throughout construction period	Contractor Site Manager

5.3 Indigenous Heritage

It is recommended that:

- Where practicable, impact to the identified Aboriginal site Hill 1 be avoided, refer to Figure 5-1;
- If impact to the Aboriginal site Hill 1 cannot be avoided then the artifact to be collected or relocated away from the area of impact; and
- If any Aboriginal artifacts are discovered during construction, all work is to cease in the area and the project manager be notified immediately. The project manager would be responsible for

informing the DECC and the Local Aboriginal Council.

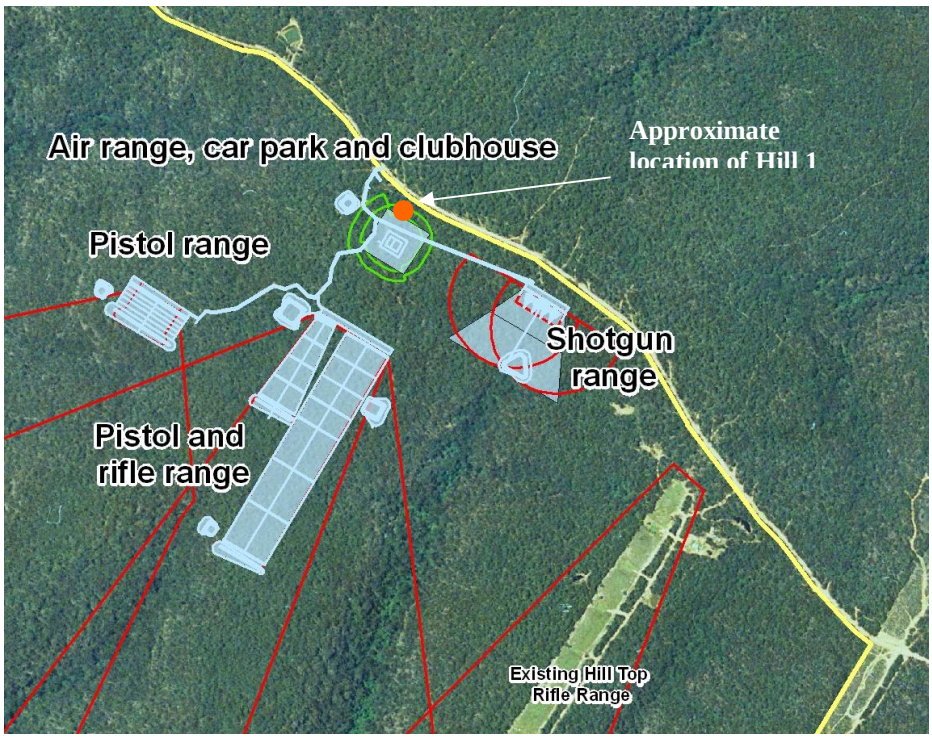

Figure 5-1 Location of Hill 1 (approximate location marked in red)

5.4 Bushfire

The following measures are recommended to limit damage from bushfires:

- Work involving risk of ignition will not be done during periods of total fire ban and very high fire danger;
- Fire suppression equipment will be provided on site;
- Procedures for safe storage and handling of liquid fuels and other flammable materials will be prepared and adopted;
- Emergency bushfire response procedures will be detailed for all site personnel; and
- The local Rural Fire Service Fire Control Centre will be notified of the dates during which construction is to be undertaken and any dates during which “hot works” are to be conducted will be highlighted. This would enable the Rural Fire Service to advise if weather conditions are appropriate or not to carry out the works proposed.

5.5 Soil and Water Contamination

Construction activities have the potential to lead to erosion, sediment transport, siltation and

contamination of offsite waters. Typical activities and sources of potential impacts amongst others include:

- Earthworks undertaken immediately prior to rainfall periods;
- Work areas that have not been stabilised;
- Stripping of topsoil, particularly in advance of construction works;
- Bulk earthworks and construction of pavements;
- Works within drainage paths, including depressions and waterways;
- Stockpiling of excavated materials;
- Storage and transfer of oils, fuels, fertilisers and chemicals; and
- Maintenance of plant and equipment.

Erosion and sedimentation, if uncontrolled, could potentially have the following effects on nearby watercourses:

- Fluctuations in the stream flow characteristics;
- Increased sediment load and organic matter as a result of sediment loads and increased organic matter from construction site runoff, resulting in adverse impacts on benthis fauna;
- Reduction in photosynthetic productivity of water bodies from increasing turbidity;
- Reduction in channel habitat from sediment deposition;
- Scour of stream banks due to high discharge velocities and increased flows;
- Gross pollutants entering receiving creeks; and
- Declining water quality from the influx of man-made substances affecting the aquatic ecology.

Soil and water quality impacts will be managed during construction. The actions to manage these potential impacts are the following:

- Stabilised construction accesses;
- Surveying the edges of the area to be cleared and marking all trees to be retained;
- To minimise the amount of clearing required, the edge of the cleared area would be delineated by either markings or fencing;
- Constructing diversion drains to direct clean water away from disturbed areas. The drains would be sized to convey the 1 in 20 year ARI runoff;
- Construction of silt fences around disturbed areas to stop soil leaving the cleared areas. Cleared vegetation would be used to provide a further filter outside the silt fences;
- Floating earthmoving equipment between work areas to minimise damage to access tracks;
- Providing catch drains to convey water runoff to sediment control ponds. These drains would be stabilised to prevent erosion;
- Prohibiting the movement of stopbutt material or other potentially contaminated material from

the target area into other areas of the site as part of construction; and

- A minimum of 6 sediment control ponds, with a combined storage volume of 6,630m3 will be provided upon commencement of construction.

Fill to be used for earthworks construction is to be suitable virgin excavated natural material (VENM) and any imported fill materials are to be tested accordingly to ensure that it is clean and free of contaminants.

5.6 Noise

It is recognized that higher levels of construction noise, than that potentially emitted from long-term operation of the project, are likely to be tolerated as a result of the relatively short duration of construction works. DECC's *Environmental Noise Control Manual* provides guidelines for assessing the noise impact from construction sites. DECC's general approach to the control of noise from construction sites involves the following:

Noise Levels

For a cumulative period of exposure to construction activity noise of up to 4 weeks, the $L_{A10(5minute)}$ emitted by the works to specific residences should not exceed L_{A90} background level by more than 20dBA.

For a cumulative construction noise exposure period of between 4 weeks and 26 weeks, the emitted $L_{A10(5minute)}$ noise level should not exceed the L_{A90} background level by more than 10 dBA.

For a cumulative construction noise exposure greater than 26 weeks, the emitted $L_{A10(5minute)}$ noise level should not exceed the L_{A90} background level by more than 5 dBA.

A 5dBA penalty must be added to the $L_{A10(5minute)}$ noise level if the noise is substantially tonal or impulsive in character.

Construction Hours

General construction hours are:

- Monday to Friday – 7 am to 5 pm;
- Saturday – 7 am to 1 pm (if inaudible at residential premises) or 8 am to 1 pm (if audible at residential premises); and
- Sundays, public holidays – No work permitted.

In general construction hours should comply with Wingecarribee Shire Council guidelines.

Silencing

The *Environmental Noise Control Manual* recommends that all practical measure should be used to silence excavation and/or construction equipment, particularly in instances where extended hours of operation are required.

When practical, all vehicular movements to and from the construction site will be made only during normal working hours and machines and vehicles would be switched off when not being used rather

than left idling for prolonged periods.

Expected Noise Levels

Typical noise levels produced by construction plan anticipated to be used were sourced from *AS 2436 – 1981 Guide to Noise Control on Construction, Maintenance and Demolition Sites* and from other available database. The sound power levels (L_W) were then distance attenuated from the location of the construction activity.

Received noise at each unattended noise monitoring location (residential receivers at L1, L2 and L3, produced by anticipated activities during the construction of each site of the upgraded facility is shown in Table 5.4 to Table 5.6 for the shortest separation distances, with no noise barriers or acoustic shielding in place and with each plant item operating at full power. The sound pressure levels shown are maximum levels produced when machinery is operated under full load.

It is considered highly unlikely that all mentioned machinery will operate simultaneously at their maximum sound power levels, as machinery generally only operate at their maximum power in brief sequences if at all. The cumulative sum during such occurrences, however, is presented for each receiver.

Table 5.4 Predicted construction noise levels – pistol range

Plant Activity	**L1**	**L2**	**L3**
	Approximate shortest distance of Source to Receiver (km)		
	~5.0	~4.5	~3.2
Crane - L_w 110dB(A)	28	29	32
Backhoe – L_w 108dB(A)	26	27	30
Compressor – L_w 100dB(A)	18	19	22
Concrete Pump – L_w 109dB(A)	27	28	31
Dump Truck – L_w 108dB(A)	26	27	30
Water Tanker - L_w 109dB(A)	27	28	31
Compactor - L_w 110dB(A)	28	29	32
Cumulative prediction	35	36	39
Criteria $L_{A10,\ 15min} \leq L_{A90} + 10$	40	41	40

Table 5.3 Predicted construction noise levels – rifle range

Plant Activity	**L1**	**L2**	**L3**
	Approximate shortest distance of Source to Receiver (km)		

	~5.6	~5.2	~2.7
Crane - L_w 110dB(A)	27	28	33
Backhoe – L_w 108dB(A)	25	26	31
Compressor – L_w 100dB(A)	17	18	23
Concrete Pump – L_w 109dB(A)	26	27	32
Dump Truck – L_w 108dB(A)	25	26	31
Water Tanker - L_w 109dB(A)	26	27	32
Compactor - L_w 110dB(A)	27	28	33
Cumulative prediction	34	35	40
Criteria $L_{A10,\ 15min} \leq L_{A90} + 10$	40	41	40

Table 5.6 Predicted construction noise levels – shotgun range

Plant Activity	**L1**	**L2**	**L3**
	Approximate shortest distance of Source to Receiver (km)		
	~5.6	~5.5	~3.2
Crane - L_w 110dB(A)	27	28	32
Backhoe – L_w 108dB(A)	25	26	30
Compressor – L_w 100dB(A)	17	18	22
Concrete Pump – L_w 109dB(A)	26	27	31
Dump Truck – L_w 108dB(A)	25	26	30
Water Tanker - L_w 109dB(A)	26	27	31
Compactor - L_w 110dB(A)	27	28	32
Cumulative prediction	34	35	39
Criteria $L_{A10,\ 15min} \leq L_{A90} + 10$	40	41	40

The above tables show that, if all mentioned machinery was to be operated simultaneously at their maximum sound power levels, the conservatively predicted cumulative sound level at the various receivers would not exceed construction noise level criteria. Nevertheless, construction equipment may still be heard at times. While construction noise goals are expected to be met, construction noise mitigation methods are still to be provided.

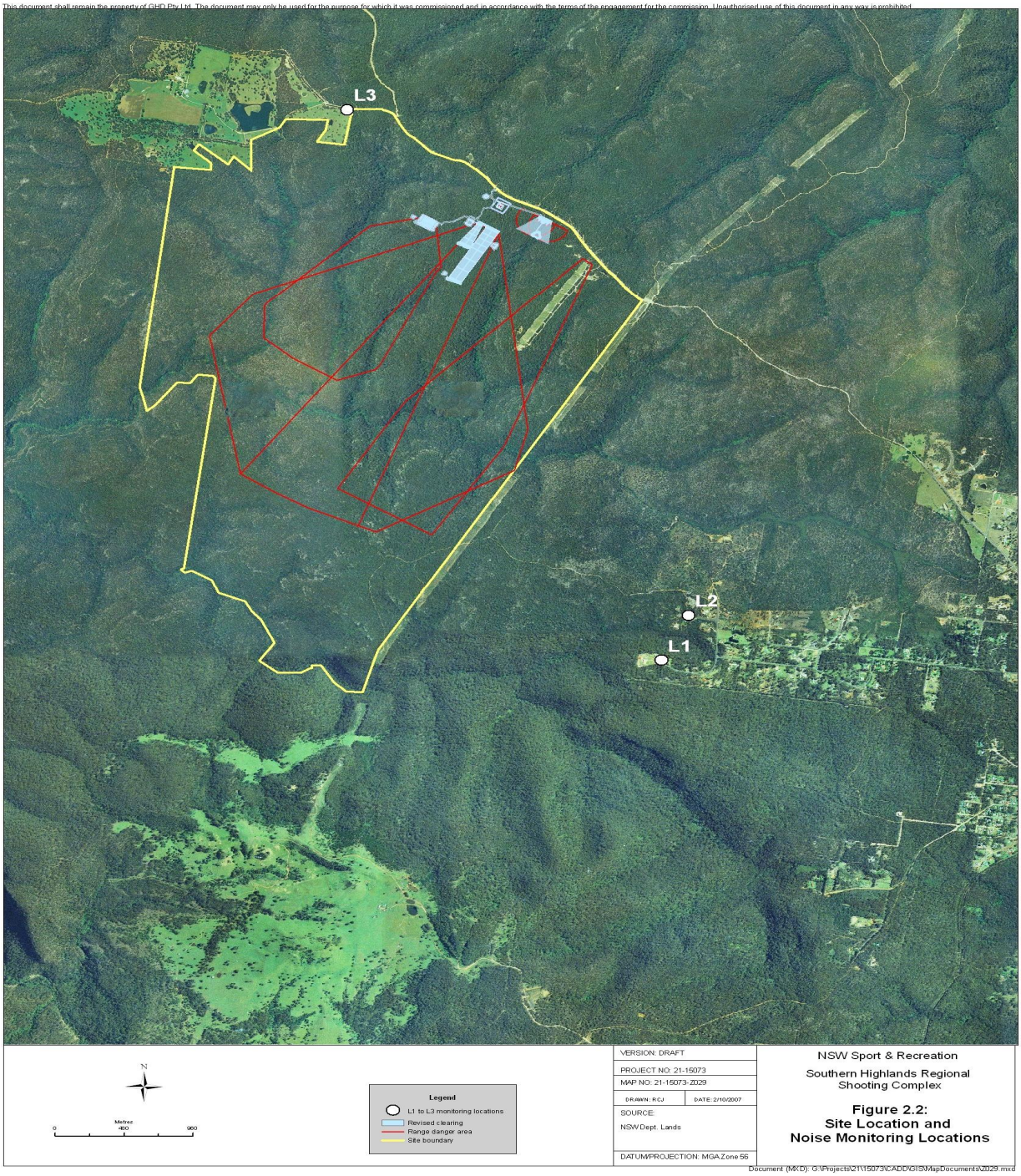

Figure 5-2 Site Location and Noise Monitoring Locations

5.7 Traffic

During the construction period, traffic movements would predominantly be related to the arrival and

departure of construction workers and the delivery of material and equipment. Vehicles would enter and exit the site through Hill Top via Wattle Ridge Road. During the construction period the existing Hill Top Rifle Range would continue to operate normally, and the construction traffic generated is additional to the existing traffic generation of the site.

Traffic Generation to/from Development Site

Traffic generation information has been derived from the construction programming and indicates that a minimum of 2 and a maximum of 15 construction vehicles (heavy and light) would access the site on a daily basis, of those construction vehicles 5 workers would arrive in light vehicles. Therefore based on the maximum scenario it is assumed that the worse case would be 16 construction vehicles per day consisting of 10 heavy and 5 light vehicles per day during construction.

Heavy Vehicle Traffic Generation

Based on the worse case that the heavy vehicle traffic generation during the weekday, peak periods is in the order of 10 trucks per day, comprising 10 in / 10 out. The proportion of these movements occurring during the AM and PM peak periods is conservatively estimated at approximately 25%, with a split between arrivals and departures of 50/50. Therefore, the worse case scenario that truck movements occur during the peak periods, heavy vehicle generation during the AM and PM peak periods is 4 vehicles per hour, 8 vehicles trips per hour, comprising of 4 in and 4 out movements.

Light Vehicle Traffic Generation

During the construction period is it estimated that there would be 10 light vehicles movements per day.

It is likely that the arrival of workers would occur before the AM peak hour and depart before the PM peak hour. Therefore the proportion of these movements occurring during the AM and PM peak periods is conservatively estimated at approximately 20%. Based on this assumption the weekday peak period traffic generation is in the order of 2 additional vehicle trips per hour.

Total Construction Traffic Generation

A summary of the additional traffic movements during the construction period is shown in Table 5.5

Table 5.5 Construction period traffic movements – worse case

Activity	Additional daily traffic (vpd)	Additional AM peak construction traffic (vph)	Additional PM peak construction traffic movements (vph)
Heavy Vehicles	10	4	4
Workers	5	2	2
Total	**15**	**6**	**6**

Construction Traffic routes

It is assumed that construction vehicles would arrive via the Hume Highway through Colo Vale and

travel along Wilson Drive to Hill Top. Wilson Drive provides access to West Street and thence to Wattle Ridge Road. Alternatively, access to Wattle Ridge Road from Wilson Drive is via Coates Road.

Construction traffic between existing and new ranges

Construction traffic movements would be generated between the existing range and the new range over a period of approximately 10 days. This would be undertaken by 2 trucks which would undertake approximately 34 truck movements per day consisting of 17 in / 17 out. The arrival and departure of these trucks to the site have been accommodated for in the total construction traffic generation. The impact of the proposed 34 truck movements per day would be isolated to Wattle Ridge Road between the two range sites.

Construction period road network and intersection performance

Based on the above traffic generation predictions, the surrounding network and intersections would need to accommodate an additional 4 vehicles per hour due to the construction of the proposal. With reference to Austroads – Part 5 Intersections at Grade Fig 6.5 Practical Absorption Capacity this increase can be accommodated within the capacity guidelines. As a result, no impacts on the performance of the existing road network are anticipated.

Road network safety

The proposal would not exacerbate the existing deficiencies in the Hill Top road network but exposure to these safety concerns would be increased.

Construction Measures

This considers on-site traffic and does not include traffic management of construction traffic on public roads. The following measures are recommended:

- Vehicles will have access on Wattle Ridge Road via West Street or Coates Road;
- Limiting heavy vehicle movements within the Hill Top road network to occur outside of the RTA's school zone program hours (8 am – 9.30 am and 2.30 pm – 4 pm);
- Vehicle speed limits will be imposed on construction vehicles and signposts installed to alert drivers to the speed limit;
- Containment fences (plastic mesh or containment table) and safety barriers will be used to provide visible separation to pedestrian and vehicular traffic where required;
- Signs and devices that control traffic will be installed before construction commences;
- Adequate off-road parking will be provided for construction vehicles and construction workforce;
- All trucks on site will have fitted and will maintain reversing lights and alarms; and
- A detailed site traffic management plan will address traffic flow, site parking, road maintenance and material deliveries.

5.8 Air Quality

This seeks to control the emissions generated by the fuel combustion of construction vehicles and the minimisation of dust emissions from wind and traffic sources during construction. Mitigation measures

are:

- Inspection and periodic maintenance of vehicles and construction equipment to ensure that there are no visible and excessive emissions;
- Covering of loads on construction equipment as well as covering of stockpiles;
- Water sprays for dust suppression on unsealed access roadways, aggregate stockpiles and work areas;
- Minimisation of excavation and clearing activities during dry and windy weather conditions;
- Rumble grids and wheel wash facilities will be provided at the construction site to remove dust and mud from vehicles; and
- Soil and vegetation rehabilitation on exposed areas will immediately commence upon completion of construction work.

5.9 Waste Management

This addresses the management of waste during construction:

- All hazardous and industrial waste generated by the construction activities will be classified in accordance with the NSW EPA (1999) Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes and disposed of in an appropriate manner;
- Non-hazardous waste will be segregated at source from hazardous waste and recyclable material;
- Recyclable material will be transferred to a recycling facility by a duly licensed waste carrier;
- Waste will be stored in appropriate bins with food waste bins fitted with secure lids and hazardous waste stored under cover (if and where possible) and away from all concentrated stormwater flows; and
- Any soil contaminated by fuel and oil that cannot be treated on-site, will be treated as Hazardous waste.

5.10 Emergency Procedures

Emergency procedures on site will cover actions to be taken if the following occurs:

- In the event of an oil or other contamination spillage, work will stop in the area of spill and spill response kits will be deployed;
- Collapse of a structure;
- When an explosion or fire occurs, work will stop, flammable / combustible materials are removed from proximity to the fire and the work area evacuated. Emergency services “000” will then be contacted;
- In the event that uncontrolled dust discharge occurs that may impact the health of the workers and nearby residents, work will stop and additional water sprays will be applied to the area of dust generation; and

- When excessive sediment discharge occurs, work will be stopped and additional sediment controls will be installed (gravel inlet filters, sediment fences and stockpile water diversion).

5.11 Water and Waster Water Facilities

During the construction period, toilet and water facilities will available onsite.

Toilet facilities will be provided via portable toilet facilities to be located near the proposed clubhouse. The portable toilets will be regularly disposed and cleaned of in accordance with the manufacturer's requirements.

Tanker water will be supplied to site regularly as required for dust suspension and water supply with top-up water available from the sedimentation dams once constructed.

6. Monitoring and Review

6.1 Environmental Monitoring Program

Programmed monitoring of environmental performance and compliance auditing of environmental management systems will be required for the entire construction phase. This will allow the assessment of the recommended mitigation measures as well as to identify its shortcomings so that corrective actions may be applied.

The following sections detail the environmental monitoring and inspections to be conducted on the Project.

- Daily Environmental Field Inspections
  - The Contractor will perform daily inspections of work areas and construction activities. This will be done to ensure compliance with the CEMP and regulatory conditions. The results of these inspections will be recorded with violations of the CEMP and regulatory standards noted and recommendations for remedial action.
- Weekly Environmental Field Inspections
  - Contractors shall conduct weekly environmental field inspections with the site manager. The results of which will be submitted to the Site Manager for evaluation.
- Monthly Environmental Field Inspections
  - Contractors will also assess their monthly overall environmental performance. The monthly report will consist of a summary of environmental issues and actions during the period.
- Special Inspections
  - Special inspections will be done following these events: significant volume of rainfall, critical sedimentation, high wind and environmental complaints.

6.2 Non-Conformance and Counteractive Action

The Site Manager will issue an Action Item request should a contractor execute substandard work. If the action item is not acted upon within the specified time frame, a formal Project Non-Compliance Notice (NCR) will be issued as well as the appropriate action undertaken to rectify the non-compliance.

6.3 Performance Reporting

Project environmental records will be reviewed to ensure compliance. Documentation will consist of but not be limited to:

- Weekly and monthly environmental field inspection reports by contractors;
- Incident and accident reports and investigations;
- Environmental monitoring report and laboratory analysis and any non compliance; and
- Minutes of meetings.

Project environmental review activities will consist of:

- Environmental matters shall be an agenda item on group meetings;
- Contractors shall report monthly to the site manager about environmental issues and compliance to the CEMP;
- Site manager will inform NSW Sports and Recreation about the project's site environmental situation; and
- If there is a report that has to be submitted under the Environmental Protection Act, any other Act or Regulation, permit or approval, the Site manager will review and approve the report prior to submission.

6.4 CEMP Review

A review of the CEMP is necessary for the continued improvement of the program for environmental management. The review of the CEMP and its sub plans shall take place at appropriate intervals throughout the project's construction. Shown below is a chart for the review of the CEMP.

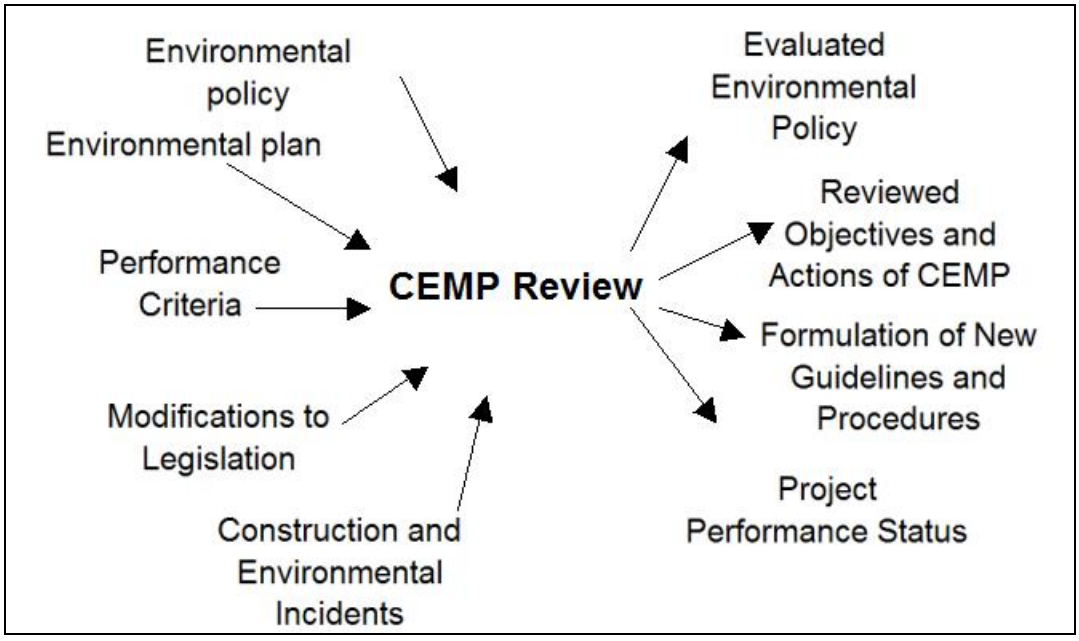

Figure 6-1 Review Flowchart

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