

ENVIRONMENTAL AUDIT

WEST NOWRA RECYCLING AND WASTE FACILITY STAGES 1 - 3



**REPORT PREPARED FOR
ENVIRONMENT & NATURAL RESOURCE SOLUTIONS
ON BEHALF OF THE WASTE SERVICES UNIT, SHOALHAVEN CITY COUNCIL**

**25 JULY 2019
VERSION B – FINAL**

**120 FLATROCK ROAD
MUNDAMIA NSW 2540**

**Lot 436 DP 808415; Lot 437 DP 808415; Lot 1 DP 847203; Lot 1 DP 870268;
and Lot 1 DP 1018193, Yalwal Road, Nowra, New South Wales**

DOCUMENT CONTROL REGISTER

Project	Version	Description	Prepared By	Report To	Date	Comments
HG-R7011	A	Draft	A. Hagenbach	ENRS	16 July 2019	1 st Draft
HG-R7011	B	Final	A. Hagenbach	ENRS	25 July 2019	Final

Role	Personnel
Principal Auditor/Author	A. Hagenbach (The HG Institute)
Review	R. Last (ENRS)
Client Review	G. Bianco (Waste Services Unit, SCC)

DISCLAIMER AND INDEMNITY

This environmental audit report (the report) has been prepared by The Hydro-Geologie (HG) Institute for the sole benefit of, and is confidential to, Environment & Natural Resource Solutions (ENRS), on behalf of the Waste Services Unit Shoalhaven City Council (SCC), for the West Nowra Recycling and Waste Facility Stages 1 to 3 to conduct an environmental audit for the 5-year period between 24 May 2014 to 24 May 2019 in accordance with Condition 21 of Development Application (DA) No. 90/3061 (dated 24 May 1991) (as amended). The report was prepared in accordance with the contracted scope of works, and subject to the applicable budgeted cost, timing and other constraints (e.g. accessibility and weather conditions).

The report should not be used or relied upon for any other purpose without The HG Institute's prior written consent. The content of the report represents the professional opinion of an experienced environmental consultant. The HG Institute does not provide legal advice and if required the advice of legal professionals should be sought by ENRS and/or SCC. Neither The HG Institute, nor any officer or employee of The HG Institute, accepts responsibility or liability in any way whatsoever for the use or reliance of this report for any other purpose than that for which it has been prepared, nor any use or reliance on this report by any third party or parties.

The information on which this report is based has been provided by the Waste Services Unit SCC and ENRS, and other relevant third parties. The HG Institute: has presumed the accuracy of this information; has not verified the accuracy or reliability of this information; has not made any independent investigations or enquiries in respect of those matters of which it has no actual knowledge at the time of providing this report (other than as expressly stated within the report); and makes no warranty or guarantee, expressed or implied, as to the accuracy or reliability of this information.

If further information becomes available, or information provided is confirmed as being incomplete, inaccurate and/or unreliable, The HG Institute reserves its right to amend this report. Under no circumstances shall The HG Institute be liable for direct, indirect or consequential losses, costs, expenses and damages of any kind whatsoever in connection with such information.

The report is and remains the property of The HG Institute, and may only be used for the purpose for which it was commissioned in accordance with the General Conditions of Engagement.

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	-

EXECUTIVE SUMMARY

The Hydro-Geologie (HG) Institute was engaged by Environment and Natural Resource Solutions (ENRS), on behalf of the Waste Services Unit Shoalhaven City Council (SCC), to conduct an environmental audit in general accordance with Condition 21 of Development Application (DA) No. 90/3061 (dated 24 May 1991) for the West Nowra Recycling and Waste Facility Stages 1 to 3, located at Flatrock Road, Mundamia, New South Wales (NSW).

For the purposes of defining the scope for this environmental audit, SCC confirmed that all conditions of consent relate to the following key approval documentation for the West Nowra Recycling and Waste Facility Stages 1 to 3:

- Development Consent – Extension of Waste Depot (DA No. 90/3061) – endorsed 24 May 1991;
- Amendment of Development Consent – Extension of Waste Depot (DA No. 90/3061) – 14 December 1994;
- Amendment of Development Consent – Extension of Waste Depot (DA No. 90/3061) – 17 September 1996; and
- Environment Protection Licence (EPL) No. 5877 – 23 November 2018.

The scope of the environmental audit relates to the five-year period of the existing landfill operations between 24 May 2014 and 24 May 2019 at the premises as defined in the approved plan(s) under DA No.90/3061 and EPL No. 5877 applying to the following lands: Lot 436 DP 808415; Lot 437 DP 808415; Lot 1 DP 847203; Lot 1 DP 870268; and Lot 1 DP 1018193, Yalwal Road, Nowra, NSW.

The environmental audit process was undertaken by The HG Institute in accordance with the brief for the environmental audit program outlined in the ENRS proposal to the Waste Services Unit SCC (dated 3 June 2019), and included a physical site inspection and interviews with Waste Services Unit SCC site personnel on Thursday, 27 June 2019.

At the time of the site inspection, landfilling activities at the premises were in operation and contained within the approved extents of the development footprint.

Detailed review of the requirements of the key approval documentation identified several aspects to be considered to maintain acceptable standards at the West Nowra Recycling and Waste Facility Stages 1 to 3 to ensure satisfactory compliance. Each of these aspects, and corresponding recommendations are provided in **Table ES-1**.

However, it should be recognised that since the original Development Application (DA No. 90/3061) was endorsed, and amended, more than 20 years ago, the relevant environmental management plans, monitoring and reporting practices and standards at the West Nowra Recycling and Waste Facility Stages 1 to 3 have significantly evolved and been streamlined to reflect the introduction of, and changes to, NSW Government policy, legislation, departments, guidelines and licence conditions, as well as improved landfilling operations, implementation of best practices, and innovative and alternative landfilling/recycling practices.

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	ES-1

Table ES-1 Opportunities for Improvement and Recommendations

Condition	Aspect	Recommendation
DA No. 90/3061 – Condition 5	Maintain Acceptable Standards – Properly Monitor the Impact of Development	SCC should review and, where considered necessary, revise the conditions of DA No. 90/3061 (as amended) to reflect the relevant outcomes of this environmental audit, when assessing and reconsidering Condition 5. <i>[NB: SCC has sought an extension to the approved use period from 29 years to 49 years which is currently the subject of assessment / reconsideration]</i>
DA No. 90/3061 – Conditions 6 to 9	Maintain Acceptable Standards – Environmental Protection	SCC should review and, where considered necessary, revise the Landfill Environmental Management Plan (LEMP) to reflect the requirements of DA No. 90/3061 Conditions 6 to 9 (as amended). Relevant guidelines, standards and policies should be referred to where applicable.
DA No. 90/3061 – Conditions 7(a) & 20	Maintain Acceptable Standards – Dam Sizing & Monitoring	SCC should consider engaging a suitably qualified professional to confirm the sizing / catchment of the existing leachate dam and sediment pond are appropriately designed considering the as-built Stage 1-3 drainage layout, design recurrence interval, duration and freeboard requirements (in accordance with the EPA's <i>Environmental Guidelines: Solid Waste Landfills</i> [2016], if applicable). The LEMP should then be reviewed and, if considered necessary, updated accordingly to include a monitoring program and reference to the Department of Environment and Conservation NSW <i>Managing Urban Stormwater: Soils and Construction Volume 2B Waste Landfills</i> (2008a).
DA No. 90/3061 – Conditions 7(d)-(k) & 22	Maintain Acceptable Standards – Solid Waste Landfills	If the opportunity presents as described above for DA No. 90/3061 Condition 5, SCC should review and, where considered necessary, revise the conditions of DA No. 90/3061 (as amended) to reflect the contemporary requirements of the EPA's <i>Environmental Guidelines: Solid Waste Landfills</i> (2016).
DA No. 90/3061 – Condition 8(a) & Dot Point	Maintain Acceptable Standards – Groundwater Monitoring and Leachate System Improvement Works	SCC should review the current environmental monitoring regime at the premises in line with the recent EPA requests, and continue the groundwater investigations to acquire sufficient information to inform a Remediation Action Plan for the former unlined Stage 1 landfill area. More specifically, and in line with the recommendations for EPL Condition R1.8 below, the groundwater monitoring network should be reviewed, and if necessary revised to reflect the relevant requirements of Section 4.4 of the EPA's <i>Environmental Guidelines: Solid Waste Landfills</i> (2016) and reconsider past DLWC recommendations for monitoring parameters.
DA No. 90/3061 – Condition 18	Maintain Acceptable Standards – Vehicle Access	SCC should review the LEMP and, if considered necessary, update to include reference to the EPA's <i>Managing Urban Stormwater: Soils and Construction Volume 2C Unsealed Roads</i> (2008b) as referred in accordance with the EPA's <i>Environmental Guidelines: Solid Waste Landfills</i> (2016).
DA No. 90/3061 – Condition 21	Maintain Acceptable Standards – Environmental Performance	SCC should consider increasing the frequency of environmental audits to align with the contemporary DPE guideline <i>Independent Audit Post Approval Requirements June 2018</i> of intervals no greater than three (3) years to maintain acceptable standards and to ensure satisfactory compliance.
DA No. 90/3061 – Conditions 24-25 / Standard Condition 9	Maintain Acceptable Standards – Revegetation & Rehabilitation	SCC should review and, if considered necessary, revise the Landscape Management Plan (as part of the LEMP) to reflect the requirements of the approved revegetation plan (for the Sandy Creek buffer), the approved rehabilitation and revegetation plan (for landfill areas) and recognise the habitat corridors under the Shoalhaven LEP 2014.
DA No. 90/3061 – Condition [c]	Extension Modification – Consultation	SCC should consider consulting with the relevant Illawarra Council(s) (e.g. Wingecarribee, Wollongong, Shellharbour, Kiama) in relation to currently proposed extension augmentation (i.e. DA No. 90/3061 Condition 5).

Table ES-1 (Cont.) Opportunities for Improvement and Recommendations

Condition	Aspect	Recommendation
DA No. 90/3061 – Standard Condition 1	Maintain Acceptable Standards – Development Generally	SCC should review and confirm that the development complies with the requirements of the Shoalhaven LEP 2014, and all applicable codes, plans and designs duly adopted by SCC.
EPL No. 5877 – Condition L2.4	Concentration Limits – Overflow Events	SCC should ensure that that comparisons are made in future Annual Returns against the limit conditions prescribed in Condition L2.4 if overflow events are to occur.
EPL No. 5877 – Condition R1.7	Maintain Acceptable Standards – Water Quality Analysis and Interpretation	The next Annual Report for the West Nowra Recycling and Waste Facility Stages 1 to 3, for data collected during the audit scope period after the last Annual Report (i.e. from 30 October 2018 to 24 May 2019), should reflect any new information published in the revised Australian and New Zealand Guidelines for Fresh & Marine Water Quality (2018) if available when analysing and interpreting the monitoring data. Provision of future Annual Reports to NSW Department of Industry – Water should also be considered.
EPL No. 5877 – Condition R1.8 (& P1.3)	Opportunities for Improvement – Detailed Recommendations	The detailed recommendations included in the Annual Environmental Monitoring Results reports, included as an attachment to each Annual Report, should be carried forward in the Annual Report with SCC accountabilities and timeframes for implementation to improve the environmental performance at the premises.
EPL No. 5877 – Condition R4.1	Reporting Conditions – Fires	SCC should review and, where considered necessary, update the Site Emergency Procedure Manual to reflect the reporting requirements of Condition R4.1 in EPL No. 5877 in relation to fires occurring at the premises.
EPL No. 5877 – Condition M2.2 & M2.4	Monitoring & Recording Conditions – Gas Test Methods	The Annual Environmental Monitoring Results Reports and Landfill Surface Gas Emission Monitoring Reports should clarify that testing is conducted in accordance with Benchmark Technique Number 18 of the Environmental Guidelines: Solid Waste Landfills (1996). Results reported should also be converted from ppm to percent by volume to allow direct comparison with the corresponding threshold of 1.25% methane (v/v) prescribed in the guidelines.
EPL No. 5877 – Condition M3.1 & M3.2	Monitoring & Recording Conditions – Approved Methods	The Annual Environmental Monitoring Results Reports and Landfill Surface Gas Emission Monitoring Reports should clarify that testing is conducted in accordance with the Approved Methods Publications, unless another method has been approved by the EPA in writing.
EPL No. 5877 – Condition M4.2	Monitoring & Recording Conditions – Complaints	Complaint response procedures at the West Nowra Recycling and Waste Facility should be documented in the LEMP to reflect all the details required by EPL Condition M4.2, if and when a complaint is received.
EPL No. 5877 – Condition M5.2	Monitoring & Recording Conditions – Complaints	SCC should consider specifying on the SCC website and/or notify the public by other means that the general enquiries telephone number (02 4429 3111) is a complaints line.
EPL No. 5877 – Condition M6.1	Monitoring & Recording Conditions – Irrigation	SCC should review the monitoring records of application of leachate to the licenced utilisation (irrigation) area for the 2016-17 & 2017-18 period and amend future reporting of activities in the next Annual Report.
EPL No. 5877 – Condition M7.1	Monitoring & Recording Conditions – Remaining Capacity	SCC should confirm the remaining disposal capacity, subject to clarification of the (approved) total design/holding capacity for Stages 1-3 as defined in Condition 3 of DA No. 90/3061, and any inconsistency rectified for future reporting.

The environmental management systems in place for the West Nowra Recycling and Waste Facility Stages 1 to 3 include assessments of activities and operations to identify the aspects that have a potential to cause environmental impacts and implement operational controls through implementation of an operational maintenance program, including preventative maintenance as required. Relevantly, the environmental audit findings at the West Nowra Recycling and Waste Facility Stage 1 to 3 conclude for the 5-year audit scope period (24 May 2014 to 24 May 2019):

- no reportable complaints were received;
- one (1) reportable incident (a dam overflow event) occurred following a 316.6 mm rainfall event between 4-7 June 2016, which triggered overflow event notification, monitoring and reporting;
- no penalty notices;
- no prosecutions or civil proceedings; and
- no enforceable undertakings.

Consultation was also undertaken with the NSW Environment Protection Authority (EPA) during the environmental audit as a key agency with a role in regulating the existing development. The EPA confirmed (18 June 2019) that there are no significant outstanding matters that are not represented on the *Protection of the Environment Operations Act 1997* Public Register and have recently requested SCC review the current environmental monitoring regime at the premises.

Relevantly, it is noted that although it is reported in the 2017-18 Annual Report that initial results indicate that existing leachate management infrastructure is fit for purpose, a potential for groundwater contamination was identified below the depth of the current monitoring network, to the west of the former unlined Stage 1 landfill area and that:

“A remediation action plan will be prepared for EPA, outlining any proposed management strategies to mitigate potential risks and remediate any contaminated groundwater within the former unlined Stage 1 landfill area.”

At the end of the audit scope period (24 May 2019), it is understood that the Waste Services Unit SCC is still investigating to acquire sufficient information to inform a Remediation Action Plan.

Nevertheless, based on the annual review of environmental monitoring results at each surface water, leachate and groundwater monitoring point required by EPL No. 5877 during the audit scope period, ENRS (2014; 2015; 2016; 2017; and 2018) has concluded that there is unlikely to be any significant off-site impacts from site operations at the West Nowra Recycling and Waste Facility Stages 1 to 3.

Similarly, the ALS Environmental landfill surface gas monitoring results reports (2014b; 2015a; 2015b; 2016a; 2016b; 2017a; 2017b; 2018a; 2018b; and 2019) have consistently recorded methane concentrations below the prescribed EPL concentration limits.

Based on the review of available documented information for the 5-year audit scope period (i.e. 24 May 2014 to 24 May 2019), site inspection and interviews, the existing environmental management (and response) practices implemented as part of the currently approved landfill operations at West Nowra Recycling and Waste Facility Stage 1 to 3 are carried out in a competent manner and are generally compliant. Some administrative non-compliance and/or low risk level non-compliance resulting as a consequence of the evolution and streamlining of contemporary requirements which are not currently reflected in DA No. 90/3061 are detailed in this environmental audit report.

Importantly, it is also noted that the SCC has introduced and implemented industry best practices for landfilling and resource recovery at the premises and therefore the Stage 1 to 3 landfill life expectancy has been extended by several years. With the potential staged integration with the neighbouring West Nowra Resource Recovery Facility (SSD 15_7015) and the proposed landfill extension at Stage 4 (SSD 15_7187) it could further extend an additional 20 years (combined)¹. Thus, independent environmental audits should be carried out at intervals no greater than three (3) years to align with contemporary NSW Department of Planning and Environment (DPE) guideline requirements to maintain acceptable standards and to ensure satisfactory compliance.

It is also understood that the NSW DPE (correspondence dated 22 September 2017) has indicated a preference for the West Nowra Recycling and Waste Facility to operate under a single, modern planning approval and to consider surrendering all existing planning approvals for the facility (i.e. DA No. 90/3061 [as amended]). Given the relative number of “not verified” compliance status conditions identified during this environmental audit, and recognising that a modification of DA No. 90/3061 [as amended] is currently the subject of assessment by SCC, it is recommended that a response to this environmental audit be prepared in advance of considering the option to surrender all existing development consents (particularly if amendments are made by SCC in accordance with Condition 5 of DA No. 90/3061).

¹ The Waste Services Unit SSC has separately sought (Application DS19/1237 received by SCC 3 June 2019) to modify (by Section 96 Amendment) Condition 5 of DA No. 90/3061 to increase the approved use period from 29 years to 49 years (i.e. to 24 May 2040).

TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	BACKGROUND	1
1.2	AUDIT ENGAGEMENT AND TEAM	1
1.3	AUDIT OBJECTIVES, SCOPE AND PERIOD	2
1.4	AUDIT REPORT STRUCTURE	5
2.0	AUDIT METHODOLOGY	7
2.1	PRINCIPAL AUDITOR SELECTION – SUITABLY QUALIFIED PROFESSIONAL	7
2.2	COMPLIANCE EVALUATION AND STATUS DESCRIPTORS	7
2.3	DESKTOP REVIEW AND PRELIMINARY PLANNING ACTIVITIES	8
2.4	PHYSICAL SITE INSPECTION AND SITE INTERVIEWS	8
2.5	CONSULTATION WITH KEY STAKEHOLDERS	9
3.0	AUDIT FINDINGS	11
3.1	APPROVAL DOCUMENTATION LIST	11
3.2	COMPLIANCE PERFORMANCE	16
3.3	SUMMARY OF STAKEHOLDER NOTICES, ORDERS OR PROSECUTIONS	19
3.4	POST-APPROVAL/CURRENT DOCUMENTATION LIST	19
3.5	ENVIRONMENTAL PERFORMANCE (AND MANAGEMENT CONTROLS)	20
3.6	COMPLAINTS	30
3.7	INCIDENTS	31
3.8	SITE INSPECTION AND SITE INTERVIEWS	32
3.9	PREVIOUS ENVIRONMENTAL AUDIT RECOMMENDATIONS	32
3.10	IMPROVEMENT OPPORTUNITIES PREVIOUSLY IDENTIFIED	33
4.0	RECOMMENDATIONS	37
4.1	NON-COMPLIANCES	39
4.2	NOT VERIFIED	40
4.3	OPPORTUNITIES FOR IMPROVEMENT	41
5.0	CONCLUSION	42
6.0	REFERENCES	43
7.0	ABBREVIATIONS AND ACRONYMS	48

LIST OF TABLES

Table 1-1	Conditions and Requirements Beyond this Audit Scope (Greater Than Five Years)
Table 2-1	Status Descriptors and Criteria for Assessing Compliance
Table 2-2	Risk Level Categories for Non-Compliant Status
Table 3-1	DA Tracking Search Results [24 May 2014 – 24 May 2019]
Table 3-2	Summary of Regulatory Compliance [24 May 2014 – 24 May 2019]
Table 3-3	Other Compliance Reporting [24 May 2014 – 24 May 2019]
Table 3-4	Summary of Complaints
Table 3-5	Summary of Incidents and Accidents
Table 3-6	Detailed Recommendations for Improvement Opportunities
Table 4-1	Recommendations of this Environmental Audit and Opportunities for Improvement

LIST OF TABLES (ATTACHMENT 1)

Table A1-1	Conditions of DA No. 90/3061 [24 May 1991] including Amendments [14 December 1994 and 17 September 1996]
Table A1-2	Standard Conditions – Condition 1 of Development Consent DA No. 90/3061 [24 May 1991]
Table A1-3	Recommendations 1-3 from the Department of Land and Water Conservation (Hydrogeology Section) [Correspondence dated 26 August 1996]
Table A1-4	Conditions of Environment Protection Licence (EPL) No. 5877 [23 November 2018]

LIST OF CHARTS

Chart 3-1	Compliance Status – Environmental Audit Statistical Summary
-----------	---

LIST OF SCHEMATIC AND FIGURES (ATTACHMENT 2)

Schematic A	Environmental Management Documentation Evolution/Streamlining Summary
Figure 1	Original West Nowra Recycling and Waste Facility Design [Source: Figure No.3 in SEE SK&P (1990)]
Figure 2	Original West Nowra Recycling and Waste Facility Design [Soil & Water Management Plan]
Figure 3	West Nowra Recycling and Waste Facility [Source: Figure 2 in Locale Consulting Pty Ltd, 2015]
Figure 4	Volumetric Survey – Stages 1, 2 & 3 Period Ending December 2018
Figure 5	Land Zoning [Source: Shoalhaven Local Environmental Plan 2014]
Figure 6	Plan Showing Gas Generator and Gas Flare Excluded from Premises to which EPL No. 5877 Applies [Plan Reference No. 2824_182]
Figure 7	Plan Showing Deposited Waste at Premises as Reference for Distance to Gas Accumulation Monitoring in Buildings [Plan Reference No. 2824_16]
Figure 8	Plan Showing 'Wet Weather Tipping Areas' [Plan Reference No. 2824_252]
Figure 9	Plan Showing 'Bore Locations' [Plan Reference No. 2824_233A dated 22/01/14]
Figure 10	Site Layout & Bore Monitoring Plan [Source: ENRS, 2018]

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	ii

LIST OF PLATES (ATTACHMENT 5)

Plate 1	Site Entry [Operating Hours / Contact Number / Emergency Assembly Point]
Plate 2	Site Entry [Gate Lock / Security Fence]
Plate 3	Site Entry Sign [Speed Restrictions]
Plate 4	Water Tanks [Fire-Fighting Capacity]
Plate 5	Gas Generator
Plate 6	Gas Flare
Plate 7	Weighbridge Cover & Prohibition Sign
Plate 8	Tyre Stockpile
Plate 9	Litter Control at Boundary Fence (1)
Plate 10	Litter Control at Boundary Fence (2)
Plate 11	Litter Control Portable Fencing
Plate 12	Litter Control Automatic Tarp Deployment System
Plate 13	Green Waste Stockpile
Plate 14	Timber Wood Stockpile
Plate 15	Vehicle Washdown Area (1)
Plate 16	Vehicle Washdown Area (2)
Plate 17	Stormwater Drain Top of Batter (1)
Plate 18	Stormwater Drain Top of Batter (2)
Plate 19	Drop Down Drain
Plate 20	Stormwater Drain Outlet (Below Drop Down Drain)
Plate 21	Irrigation (Utilisation) Area with Stormwater Drain in Foreground
Plate 22	Stage 1 North Batter Rehabilitation (1)
Plate 23	Stage 1 North Batter Rehabilitation (2)
Plate 24	First Flush Dam
Plate 25	Leachate Dam
Plate 26	Sedimentation Dam
Plate 27	Active Landfill Cell Area
Plate 28	Future Landfill Cell Preparation
Plate 29	Western Boundary Vegetation

LIST OF ATTACHMENTS AND ENCLOSURE

Attachment 1	Environmental Audit Tables
Attachment 2	Schematic and Figures
Attachment 3	Consultation Records
Attachment 4	Suitably Qualified Professional Details
Attachment 5	Site Inspection Photographs [27 June 2019]
Attachment 6	Independent Audit Declaration
Enclosure 1	Section 3.3 (Description of Proposal) and Section 3.4 (Proposed Operational Safeguards) [Excerpts from SEE (SK&P, June 1990)]

1.0 INTRODUCTION

1.1 BACKGROUND

The existing West Nowra Recycling and Waste Facility (including Stages 1 to 3) is located at 120 Flatrock Road, Mundamia, New South Wales (NSW) and is operated by the Shoalhaven City Council (SCC). Disposal of waste at the facility originally commenced in 1975, and has been in operation for more than 40 years.

Development Application (DA) No. 90/3061 for Stages 1 to 3 of the West Nowra Recycling and Waste Facility was originally endorsed on 24 May 1991. Landfilling (waste disposal) operations have been completed for Stages 1 and 2, and are currently being conducted for Stage 3. The premises are currently licensed (Environment Protection Licence [EPL] No. 5877) as a general solid waste (putrescible and non-putrescible) waste facility and is authorised to carry out the following scheduled activities:

- waste disposal (application to land);
- waste storage (other types of waste);
- composting; and
- waste processing (non-thermal treatment of general waste).

EPL No. 5877 applies to the following land, lots and deposited plans (DPs) at the West Nowra Recycling and Waste Facility: Lot 436 DP 808415; Lot 437 DP 808415; Lot 1 DP 847203; Lot 1 DP 870268; and Lot 1 DP 1018193, Yalwal Road, Nowra, NSW. The applicable lots and DPs are zoned as SP2 Special Infrastructure under the *Shoalhaven Local Environmental Plan 2014*. It is noted that under the former *Shoalhaven Local Environmental Plan 1985*, only Lot 1 DP 847203 was designated as 'special uses zone' for the waste depot.

1.2 AUDIT ENGAGEMENT AND TEAM

The Hydro-Geologie (HG) Institute was engaged by Environment & Natural Resource Solutions (ENRS), on behalf of the Waste Services Unit, Shoalhaven City Council (SCC), to conduct an environmental audit in general accordance with Condition 21 of DA No. 90/3061 (dated 24 May 1991) (as amended) for the West Nowra Recycling and Waste Facility Stages 1 to 3, located at Flatrock Road, Mundamia, NSW.

In accordance with Condition 21 of DA No. 90/3061, the audit was led by a suitably qualified professional and further details are provided in **Section 2.1**.

1.3 AUDIT OBJECTIVES, SCOPE AND PERIOD

The objective is to carry out the environmental audit in accordance with Condition 21 of DA No. 90/3061 for the West Nowra Recycling and Waste Facility Stages 1 to 3, which states:

21. To ensure satisfactory compliance with all conditions of consent and maintain acceptable standards an environmental audit shall be undertaken by a suitably qualified professional every five (5) years.

For the purposes of defining the scope for this environmental audit, SCC confirmed that all conditions of consent relate to the following key approval documentation for the West Nowra Recycling and Waste Facility Stages 1 to 3:

- Development Consent – Extension of Waste Depot (DA No. 90/3061) – endorsed 24 May 1991;
- Amendment of Development Consent – Extension of Waste Depot (DA No. 90/3061) – 14 December 1994;
- Amendment of Development Consent – Extension of Waste Depot (DA No. 90/3061) – 17 September 1996; and
- Environment Protection Licence (EPL) No. 5877 – 23 November 2018.

In accordance with Condition 21 of DA No. 90/3061 the scope of the environmental audit relates to the five-year period of the existing landfill operations between 24 May 2014 and 24 May 2019 at the premises as defined in the approved plan(s) under DA No. 90/3061 and EPL No. 5877 applying to the following lands: Lot 436 DP 808415; Lot 437 DP 808415; Lot 1 DP 847203; Lot 1 DP 870268; and Lot 1 DP 1018193, Yalwal Road, Nowra, NSW.

During the preliminary planning activities to scope the environmental audit, it was recognised that since DA No. 90/3061 was originally endorsed, and amended, more than 20 years ago, the relevant environmental management plans, monitoring and reporting practices and standards at the West Nowra Recycling and Waste Facility Stages 1 to 3 have significantly evolved and been streamlined to reflect the introduction of, and changes to, NSW Government policy, legislation, departments², guidelines and licence conditions, as well as improved landfilling operations, implementation of best practices, and innovative and alternative landfilling/recycling practices.

² For example, in 1991, the Soil Conservation Service (SCS) were abolished and functions incorporated with the Land Titles Office and the Valuer General's Department under the Department of Conservation and Land Management (CaLM). The State Pollution Control Commission (SPCC) was abolished by the *Protection of the Environment Administration Act, 1991* (Act No. 60, 1991) and the Environment Protection Authority (EPA) was established from 1 March 1992 (6) to carry on an enlarged role in relation to the environment. In 1995, CaLM was succeeded by the Department of Land and Water Conservation (DLWC). In 2003, DLWC was brought together with Planning NSW and the Infrastructure Coordination Unit of the Premier's Department to create the Department of Infrastructure, Planning and Natural Resources (DIPNR), which two years later was abolished and the separate Department of Natural Resources (DNR) was formed. The SCS business unit was however incorporated into the Department of Lands. Two years on and the DNR was abolished and functions transferred to the Office of Environment and Heritage (OEHL) and NSW Office of Water (NOW) as part of the Department of Primary Industries. In 2009, the Department of Lands was abolished and the SCS became a division of Land and Property Management Authority. In 2011, both were amalgamated into the Department of Industry and Investment and then in 2017 known as Department of Industry (DoI). DoI – Water is now responsible for surface and groundwater management including ensuring water security for NSW and SCS aligned with the Local Land Services. Water NSW was responsible for most water compliance functions from 2016 to 2018, however this was later transferred to the independent Natural Resource Access Regulator (NRAR) from 30 April 2018. In July 2019, the OEHL will be dissolved as part of the new Department of Planning, Industry and Environment (DPIE).

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	2

For the purposes of providing context, a summary of the evolution of the environmental management documentation for Stages 1 to 3 of the West Nowra Recycling and Waste Facility is shown on **Schematic A** in **Attachment 2**.

A summary of the chronological changes in relevant guidelines and policies is provided in **Section 3.1.4**.

Consequently, the following conditions and requirements of DA No. 90/3061 in **Table 1-1** were not considered any further in the evaluation of compliance on the basis of pre-dating and, in many cases, being well beyond the 5-year period of the audit scope. Similarly, where the original approval documentation or correspondence was unable to be provided by the SCC, the environmental audit has indicated that the compliance status is “Not Verified” and recommend that specific consideration be made in a future environmental audit and/or future modification of DA No. 90/3061. The compliance evaluation approach and assessment criteria are discussed further in **Section 2.2**.

Table 1-1 Conditions and Requirements Beyond this Audit Scope (Greater Than Five Years)

Condition	Time-Based Condition Requirement	Beyond this Audit Scope* [24 May 2014-24 May 2019]
DA No. 90/3061 – Condition 2	Alteration to plan(s) submitted with DA No. 90/3061 <i>‘... prior to submission of the building application.’</i>	Yes – Pre-dates.
DA No. 90/3061 – Condition 4	Specific Details of Works for Stages 2 and 3 <i>‘... prior to works and rehabilitation commencing.’</i>	Yes – Pre-dates.
DA No. 90/3061 – Condition 6	Soil and Water Management Plan <i>‘... prior to release of the building application.’</i>	Yes – Pre-dates.
DA No. 90/3061 – Condition 7(a)	Sediment and Erosion Plan <i>‘... submitted with the Building Application...’</i>	Yes – Pre-dates.
DA No. 90/3061 – Condition 7(b)	Leachate Treatment/Disposal Plan <i>‘... prior to works commencing...’</i>	Yes – Pre-dates. [Prior to Cell 3E/2]
DA No. 90/3061 – Condition 7(c)	Strategy Plan <i>‘... prior to release of the building approval...’</i>	Yes – Pre-dates. ^a
DA No. 90/3061 – Condition 7(h)	Portable Fencing Details <i>‘... prior to release of the building application.’</i>	Yes – Pre-dates.
DA No. 90/3061 – Condition 10	Landscape and Rehabilitation Plan <i>‘... prior to release of the building approval...’</i>	Yes – Pre-dates.
DA No. 90/3061 – Condition 11	Landscape Plan (Track to Sandy Creek) <i>‘... prior to release of the building approval for Stage 1 works.’</i>	Yes – Pre-dates.
DA No. 90/3061 – Condition 12	Landscape Bond and Completion/ Maintenance Agreement <i>‘... submitted with the building application.’</i>	Yes – Pre-dates.
DA No. 90/3061 – Condition 19	Detailed Design of Access Roads for Stages 2 & 3 <i>‘... prior to works of such stages commencing.’</i>	Yes – Pre-dates.
DA No. 90/3061 – Condition 24	Revegetation Plan (for vegetation buffer to Sandy Creek) <i>‘... submitted within 6 months from the date of the amended consent.’</i>	Yes – Pre-dates. [i.e. 17 March 1997] ^b

Table 1-1 (Cont.) Conditions and Requirements Beyond this Audit Scope (Greater Than Five Years)

Condition	Time-Based Condition Requirement	Beyond this Audit Scope* [24 May 2014-24 May 2019]
DA No. 90/3061 – Condition 25	Rehabilitation and Revegetation Plan (for landfill areas) <i>'... submitted within 12 months from the date of the amended consent.'</i>	Yes – Pre-dates. [i.e. 17 September 1997] ^c
DA No. 90/3061 – Note 1	Not Substantially Commenced <i>... within a period of two years from the granting of this approval.'</i>	Yes – Pre-dates.
DA No. 90/3061 – Note 2	Environmental Planning Instrument (new) <i>'... within one year of the granting of this consent.'</i>	Yes – Pre-dates.
DA No. 90/3061 – Note 3	Building Application [for Construction] <i>'... must be submitted before the expiry of the two year period for which the consent is valid'</i>	Yes – Pre-dates.
DA No. 90/3061 – Note 4	Right of Appeal <i>'... within twelve (12) months after receipt of this notice.'</i>	Yes – Pre-dates.
DA No. 90/3061 – Condition [a] / Standard Condition 2	Building application approval <i>'... prior to works proceeding.'</i>	Yes – Pre-dates.
DA No. 90/3061 – Standard Condition 5	Restrictive Covenants and Instruments <i>'...before commencing any work.'</i>	Yes – Pre-dates.
DA No. 90/3061 – Standard Condition 6(e)	Car Parking <i>'... subject to approval with the application'</i>	Yes – Pre-dates.
DA No. 90/3061 – Standard Condition 7(b)	Site and Engineering Works <i>'...prior to approval being given.'</i>	Yes – Pre-dates.
DA No. 90/3061 – Standard Condition 10	Signs and Advertising <i>'...before being erected or fixed or placed in position.'</i>	Yes – Pre-dates.
DA No. 90/3061 – Standard Condition 11	Nominated Specific User <i>'...before the use commences.'</i>	Yes – Pre-dates.

* Scope discussed and agreed with Waste Services Unit SCC during site meeting on 27 June 2019.

^a Condition 7(c) however states: *'This strategy plan shall be clearly displayed for the information of all staff.'* Therefore, its display has been considered in this environmental audit.

^b Condition 24 however states: *'... and revegetation of this area shall be carried out in accordance with the approved plan.'* Therefore, its implementation has been considered in this environmental audit.

^c Condition 25 however states: *'Rehabilitation and revegetation of the landfill areas shall be carried out in accordance with the approved plan.'* Therefore, its implementation has been considered in this environmental audit.

As recognised above, given the evolution and streamlining of requirements to reflect the introduction of, and changes to, NSW Government policy, legislation, departments, guidelines and licence conditions, as well as improved landfilling operations, implementation of best practices, and innovative and alternative landfilling/recycling practices, over the past 20 years and more, the audit scope has not completed an assessment of strict compliance for the period 24 May 2014 to 24 May 2019 against the recommendations of the *Proposed Extensions to West Nowra Waste Depot Statement of Environmental Effects* (SEE), prepared by Sinclair Knight and Partners, dated June 1990 (i.e. Condition 22 of DA No. 90/3061), primarily on the basis that strict compliance cannot be achieved as requirements and landfill design parameters have been superseded by the contemporary requirements of the EPA's *Environmental Guidelines: Solid Waste Landfills* (EPA, 2016).

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	4

For completeness and transparency, a copy of relevant excerpts from two relevant chapters in the SEE (Sinclair Knight and Partners, 1990): Description of the Proposal (SEE Section 3.3); and Proposed Operational Safeguards (SEE Section 3.4); is provided in **Enclosure 1**.

Finally, it is also noted that the current post-approval documentation (including management plans and sub-plans) (**Section 3.4**), in meeting relevant approval requirements, has been considered when assessing environmental performance and management controls (**Section 3.5**), and recognises each has either been:

- prepared by suitably qualified and/or independent professional(s);
- required to be developed in consultation with relevant stakeholders and/or certified; and/or
- subsequently approved by an approval authority (or nominated suitably qualified person).

Nevertheless, review and improvement opportunities for the current management plans and sub-plans have been recommended as part of this environmental audit scope (**Section 4.0**).

1.4 AUDIT REPORT STRUCTURE

Although the objective of this environmental audit is to meet requirement of Condition 21 of DA No. 90/3061, the audit process and methodology described in the following sections has been generally guided by (where relevant) the contemporary NSW Department of Planning and Environment (DPE) guidelines for independent audits (NSW Government, 2015; DPE, 2018) and the report structure as follows:

- Section 1: **Introduction** - Provides background to the development, introduces the audit team, and defines the audit objectives, scope development and period.
- Section 2: **Audit Methodology** - Describes the audit methodology including the auditor selection (as a suitably qualified professional), compliance evaluation approach, desktop review and preliminary planning activities, details of the physical site inspection and interviews and consultation with key stakeholders.
- Section 3: **Audit Findings** – Provides a comprehensive assessment of the audit findings, supported by environmental audit tables provided in **Attachment 1**, including compliance and environmental performance evaluation.
- Section 4: **Recommendations** – Presents the results of the environmental audit including the recommendations where non-compliant and/or not verified status was identified, including opportunities for improvement.
- Section 5: **Conclusion** – Provides concluding remarks.
- Section 6: **References** – Lists the documents referenced in this report.
- Section 7: **Abbreviations and Acronyms** – Lists the abbreviations and acronyms used in this report.

The full list of attachments and enclosure in support of this environmental audit report is as follows:

- Attachment 1: Environmental Audit Tables
- Attachment 2: Schematic and Figures
- Attachment 3: Consultation Records
- Attachment 4: Suitably Qualified Professional Details
- Attachment 5: Site Inspection Photographs
- Attachment 6: Independent Audit Declaration Form
- Enclosure 1: Section 3.3 (Description of Proposal) and Section 3.4 (Proposed Operational Safeguards) [Excerpts from SEE (SK&P, June 1990)]

2.0 AUDIT METHODOLOGY

2.1 PRINCIPAL AUDITOR SELECTION – SUITABLY QUALIFIED PROFESSIONAL

ENRS engaged Mr Aaron Hagenbach (of The HG Institute), on behalf of the Waste Services Unit SCC, as the principal auditor to lead and carry out the environmental audit. Details are provided in **Attachment 4** demonstrating relevant competence, Principal Auditor certification and experience, and includes a statement of independence.

An independent audit declaration form³ issued at the completion of the environmental audit, is included in **Attachment 6**.

2.2 COMPLIANCE EVALUATION AND STATUS DESCRIPTORS

Compliance Assessment Criteria

The environmental audit has been carried out using the compliance assessment criteria (including status descriptors) in **Table 2-1**. The compliance assessment criteria, and risks level categories to be applied if a non-compliant status was identified (**Table 2-2**), were discussed and agreed during the opening meeting with the Waste Services Unit SCC and ENRS on 27 June 2019.

Table 2-1 Status Descriptors and Criteria for Assessing Compliance

Status Descriptor	Assessment Criteria
Noted	A heading, statement or fact, where no assessment of compliance can be made.
Not Triggered	A requirement/condition beyond the defined scope of the environmental audit and is therefore not applicable and no further assessment of compliance is made.
Compliant	Sufficient verifiable evidence has been collected to demonstrate that the intent and all elements of the requirement/condition have been complied with, within the defined scope of the environmental audit.
Not Verified	Where sufficient verifiable evidence is absent or unable to be collected to demonstrate that the intent and all elements of the requirement/condition have been complied with, within the defined scope of the environmental audit, and where there is nothing contrary to suggest that the operation is non-compliant. In such a situation, other means (i.e. personal communication, visual inspection, etc.) to verify that the requirement/condition has been met is made.
Non-Compliant	The intent, or one or more specific elements, of the requirement/condition have not been complied with, within the defined scope of the environmental audit.

³ The Independent Audit Declaration Form has been included with this environmental audit, without amendment, to that in the *Independent Audit Post Approval Requirements* (DPE, 2018). However, it is noted that the objective of the environmental audit is to meet the requirement of Condition 21 of DA No. 90/3061 and, as expressly stated within this report, has been generally guided by (where relevant) the contemporary NSW Department of Planning and Environment (DPE) guidelines for independent audits (NSW Government, 2015; DPE, 2018).

Table 2-2 Risk Level Categories for Non-Compliant Status

Risk Level	Description*
Administrative Non-Compliance	Where the non-compliant status does not result in material harm to the environment and does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions).
Low	Where the non-compliant status has the: • potential for moderate environmental consequences, but is unlikely to occur; or • potential for low environmental consequences but is likely to occur.
Medium	Where the non-compliant status has the: • potential for serious environmental consequences, but is unlikely to occur; or • potential for moderate environmental consequences but is likely to occur.
High	Where the non-compliant status has the potential for significant environmental consequences, regardless of the likelihood of occurrence.

* For the purposes of this environmental audit, qualitative measures used for defining the level of environmental consequences were as follows:

- Low (e.g. minor impact on environmental values of an area);
- Moderate (e.g. localised and considerable impact on environmental values of an area);
- Serious (e.g. widespread and considerable impact on environmental values of an area); or
- Significant (e.g. widespread substantial impact on environmental values of an area).

2.3 DESKTOP REVIEW AND PRELIMINARY PLANNING ACTIVITIES

The desktop review comprised collation and review of relevant documentation provided by SCC and ENRS, including post-approval documentation (**Section 3.4**), or otherwise available to the public (e.g. NSW Government websites and registers). A comprehensive list of references considered during the conduct of this environmental audit is included in **Section 6.0**. The documents requested and received are noted in the environmental audit tables (**Attachment 1**).

2.4 PHYSICAL SITE INSPECTION AND SITE INTERVIEWS

The site inspection and interviews were conducted on Thursday, 27 June 2019 with the following key representatives of the Waste Services Unit SCC for the West Nowra Recycling and Waste Facility Stages 1 to 3:

- Mr Giordano Bianco – Environmental Projects Engineer (site inspection and interviews); and
- Mr David Hojem – Waste Services Manager (interview).

The physical site inspection involved a drive-through of the premises at the West Nowra Recycling and Waste Facility, with inspection on-foot at select accessible areas.

Photographs taken during the site inspection on 27 June 2019 are provided in **Attachment 5**.

2.5 CONSULTATION WITH KEY STAKEHOLDERS

Consultation was undertaken during the environmental audit with the Waste Services Unit SSC and the NSW EPA to help inform the scope of the environmental audit and seek feedback on environmental performance at the West Nowra Recycling and Waste Facility Stages 1 to 3.

A community consultative committee (CCC) is not required for the West Nowra Recycling and Waste Facility Stages 1 to 3, therefore no such consultation was undertaken.

Waste Services Unit Shoalhaven City Council (SCC)

During the course of the environmental audit, the representatives of the Waste Services Unit SCC were regularly consulted following the initial information request (including provision of checklists) to seek, confirm and obtain the relevant approval documentation for review.

Representatives of the Waste Services Unit SCC accompanied the principal auditor during the site inspection of the West Nowra Recycling and Waste Facility Stages 1 to 3 on Thursday, 27 June 2019 and attended the site interviews.

Environment Protection Authority

Consultation was undertaken with the NSW Environment Protection Authority (EPA) on 17 June 2019, in advance of the site inspection as a key agency with a role in regulating the scheduled activities at the premises. The EPA confirmed (18 June 2019) that there are no significant outstanding matters that are not represented on the *Protection of the Environment Operations Act 1997* Public Register and have recently requested SCC review the current environmental monitoring regime at the premises. A copy of the correspondence on file is provided in **Attachment 3**.

The EPA was also aware of the separate State Significant Development (SSD) application for the adjacent Stage 4 Landfill Extension (SSD 15_7187) and approved staged development of the adjacent West Nowra Resource Recovery Facility (SSD 15_7015), both of which were beyond the scope of this environmental audit. The approximate locations of the SSD applications are shown in **Attachment 2 – Figure 3**.

National Parks and Wildlife Service (NPWS)

NPWS has an office and workshop facility at 104 Flatrock Road, Mundamia and is one of the nearest receivers (commercial office) to the West Nowra Recycling and Waste Facility Stages 1 to 3.

Whilst consultation was not undertaken during the course of this environmental audit with NPWS, it is noted that submissions have been made by NPWS in relation to adjacent developments (i.e. West Nowra Resource Recovery Facility) which were reviewed during the environmental audit and relevant issues raised specifically relating to the existing West Nowra Recycling and Waste Facility Stages 1 to 3 are discussed in **Section 3.6**.

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	9

Department of Planning and Environment (DPE)

A copy of correspondence received from the DPE (now the Department of Planning, Industry and Environment [DPIE]) dated 22 September 2017, including the amended Secretary's Environmental Assessment Requirements for the Extension to Existing Landfill – West Nowra Recycling and Waste Facility (SSD 15_7187), was reviewed and considered where relevant in this environmental audit.

Notably, as described in **Section 1.4**, the audit process and methodology has been generally guided by (where relevant) the contemporary DPE guidelines for independent audits, including:

- *Independent Audit Guideline - Post-Approval Requirements of State Significant Developments* (NSW Government, 2015); and
- *Independent Audit - Post Approval Requirements* (DPE, 2018).

2.5.1 Prior Records of Consultation

During the review of documentation for the environmental audit, prior records of consultation with the EPA, Department of Conservation and Land Management (CaLM) and Department of Land and Water Conservation (DLWC) were made available by the SCC and are also provided in **Attachment 3**.

3.0 AUDIT FINDINGS

3.1 APPROVAL DOCUMENTATION LIST

3.1.1 Environmental Planning and Assessment Act, 1979

The Development Consent – Extension of Waste Depot (DA No. 90/3061), endorsed 24 May 1991, is the key planning approval document for the West Nowra Recycling and Waste Facility Stages 1 to 3. DA No. 90/3061 has been amended on two occasions: 14 December 1994; and 17 September 1996.

The 14 December 1994 Amendment to DA No. 90/3061, resulted in changes to the following conditions in DA No. 90/3061:

- General
 - *Condition 3*
- Environmental Protection
 - *Condition 7(m)*
 - *Condition 8(a)*
- Landscaping
 - *Condition 10(d)(i)-(iii)*

The subsequent 17 September 1996 Amendment to DA No. 90/3061, resulted in changes to the following conditions in DA No. 90/3061:

- Amenity of Surrounding Areas
 - *Condition 15*
- Conditions of City Health Surveyor
 - *Condition 24*
 - *Condition 25*
- Advice to Applicant
 - *New Dot Point*

The current conditions of DA No. 90/3061 (as amended above) are provided in **Attachment 1**.

SCC has recently made an application to modify DA No. 90/3061. The Waste Services Unit SSC has separately sought (Application DS19/1237 received by SCC on 3 June 2019) to modify (by Section 96 Amendment) Condition 5 of DA No. 90/3061 to increase the approved use period from 29 years to 49 years (i.e. to 24 May 2040).

A search of the SCC DA Tracking system (i.e. for building and other works) was also conducted for each lot and DP at the premises and the results presented in **Table 3-1**.

Table 3-1 DA Tracking Search Results [24 May 2014 – 24 May 2019]

DA	Description	Submitted	Approved	Lapse Date
Lot 436 DP 808415				
DA 16/1432	Waste Transfer Station (Shed, Recycling Bays, Access and Drainage Works)	14-04-16	16-09-16	16-09-21
Lot 1 DP 847203				
RA 14/1003	Commercial Additions – Resource Recovery Park	13-08-14	Withdrawn	
Lot 1 DP 1018193				
RA 14/1003	Commercial Additions – Resource Recovery Park	13-08-14	Withdrawn	
DA 16/1511	Cover over Weighbridge Office	26-04-16	14-07-16	14-07-21
DS 16/1478	Cover over Weighbridge Office	2-11-16	18-11-16	14-07-21
DA 19/1412	New Shed and Shed Extension	30-04-19	Not Determined	

Construction and occupation certificates were issued during the audit scope period as follows:

- **21 July 2016:** CC16/1485 (Cover over Existing Weighbridge Office – Construction Certificate)
- **27 March 2017:** CC16/2443 (Waste Transfer Station – Construction Certificate)
- **5 April 2017:** OC17/1344 (Cover over Existing Weighbridge Office – Final Occupation Certificate)
- **22 November 2017:** OC17/2265 (Waste Transfer Station – Interim Occupation Certificate)

3.1.2 Environmental Planning Instruments

Illawarra-Shoalhaven Regional Plan 2015

The *Illawarra-Shoalhaven Regional Plan 2015* applies to the local government areas of Kiama, Shellharbour, Shoalhaven and Wollongong. The *Illawarra-Shoalhaven Regional Plan 2015* provides the strategic policy, planning and decision-making framework to guide the region to sustainable growth over the next 20 years (DPE, 2015).

Shoalhaven Local Environmental Plan 2014

The *Shoalhaven Local Environmental Plan 2014* provides the local environmental planning provisions for land in Shoalhaven with the following aims:

- (a) to encourage the proper management, development and conservation of natural and man-made resources,
- (b) to facilitate the social and economic wellbeing of the community,
- (c) to ensure that suitable land for beneficial and appropriate uses is made available as required,
- (d) to manage appropriate and essential public services, infrastructure and amenities for Shoalhaven,
- (e) to minimise the risk of harm to the community through the appropriate management of development and land use.

The relevant Lots and DPs at the West Nowra Recycling and Waste Facility Stages 1 to 3 are zoned as SP2 Special Infrastructure under the *Shoalhaven Local Environmental Plan 2014*. It is noted that under the former *Shoalhaven Local Environmental Plan 1985*, only Lot 1 DP 847203 was designated as 'special uses zone' for the original waste depot.

Relevant to the corridor of land east of the premises (**Attachment 2 – Figure 5**), Clause 7.21 (Development on land in the vicinity of the Western Bypass Corridor) of the *Shoalhaven Local Environmental Plan 2014 – Services Corridor* (Lot 7319 DP 1165060) states:

- (1) *The objectives of this clause are as follows:*
- (a) *to minimise any visual or acoustic impacts on development proposed in the vicinity of the land to which this clause applies,*
 - (b) *to ensure that development proposed in the vicinity of that land will not compromise, restrict or otherwise prevent the future use of that land as a road*

This Clause is specifically discussed in this environmental audit when considering the Advice to the Applicants of the City Planner – d in DA No. 90/3061 (**Attachment 1**).

3.1.3 Protection of the Environment Operations Act, 1997

The West Nowra Recycling and Waste Facility Stages 1 to 3 is a licenced general solid waste (putrescible and non-putrescible) landfill facility under the *Protection of the Environment Operations Act, 1997*. Prior to the introduction of the *Protection of the Environment Operations Act, 1997*, the West Nowra Waste Depot was the subject of Licence 3559 issued under the *Pollution Control Act, 1970*. Environment Protection Licence (EPL) No. 5877 is currently the key regulatory licence for the operation of the West Nowra Recycling and Waste Facility Stages 1 to 3.

EPL No. 5877 was varied on seven (7) occasions during the 5-year environmental audit period:

- **28 August 2015** *(to allow for disposal of waste in cells 3D-2 and 3E-1, and wet weather tipping areas, following submission of Construction Quality Assurance Report and test results; the variation also reflected updates to the groundwater monitoring network and completion of a prior Pollution Reduction Program - Nappy Composting Trial);*
- **29 September 2015** *(to permit the construction of a Cathode Ray Tube [CRT] Glass Waste Mono-cell, following submission of Construction Quality Assurance Plan);*
- **23 November 2015** *(to allow for the disposal of CRT Glass Waste in the CRT Glass Waste Cell, in accordance with a Specific Immobilisation Approval, following submission of Construction Quality Assurance Certification Report);*
- **11 January 2016** *(to reflect the last load of CRT Glass Waste had been received to the CRT Glass Waste Cell, and relevant updates to remove conditions);*
- **28 September 2016** *(to reflect that the QA/QC documentation for the capped CRT Glass Waste Cell had been submitted and designs for waste cell 3E-2 had been provided);*
- **7 December 2017** *(to permit the use of an Automated Tarp Deployment System [ATDS] as an alternative form of daily cover); and*

- **23 November 2018** (to allow for disposal of waste in cells 3E-2 following submission of Construction Quality Assurance Report and reflect that designs for waste cell 3F had been provided).

3.1.4 Guidelines, Standards and Policy

A list of potentially relevant guidelines, standards and policies are provided below, in chronological order, to identify some of the key changes and updates made prior to and during the audit scope period which while not specifically identified in DA No. 90/3061 or EPL No. 5877 may be applicable to the West Nowra Recycling and Waste Facility Stages 1 to 3. Relevant planning-related legislation and instruments introduced have also been included.

- **1996:** *Environmental Guidelines: Solid Waste Landfills* (EPA, 1996). [refer 2016 update below]
Guidelines for the Laboratory Analysis of Contaminated Materials (ANZECC, 1996).
- **1997:** *Protection of the Environment Operations Act, 1997.*
Contaminated Land Management Act, 1997.
Guidelines for the Assessment and Management of Groundwater Contamination (DEC, 1997). [refer 2007 update below]
AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting.
- **1998:** *Acid Sulfate Soils Assessment Guidelines* (ASSMAC, 1998).
- **1999:** *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes* (EPA, 1999).
Managing Land Contamination Planning Guidelines SEPP 55-Remediation of Land (DUAP & EPA, 1998).
National Environment Protection (Assessment of Site Contamination) Measure 1999 [refer 2013 update below]
- **2000:** *Environmental Guidelines: Use and Disposal of Biosolids Products* (EPA, 2000b).
Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC & ARMCANZ, 2000). [Refer 2018 update below]
NSW Industrial Noise Policy (2000) (EPA, 2000a). [Refer 2017 update below]
- **2001:** *State Environmental Planning Policy No. 64-Advertising and Signage.*
- **2003:** *AS 4454-2003 Composts, Soil Conditioners and Mulches.*
Contaminated Sites: Guidelines on Significant Risk of Harm from Contaminated Land and the Duty to Report (EPA, 2003). [refer 2015 update below]
- **2004:** *Environmental Guidelines: Composting and Related Organics Processing Facilities* (DEC, 2004b).
ISO 14001:2004 Environmental Management Systems – Requirements with Guidance for Use. [refer 2015 update below]
Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales (DEC, 2004a).
Environmental Guidelines: Use of Effluent by Irrigation (DEC, 2004c).
- **2006:** *Handbook: Environmental Risk Management – Principles and Process.* Third edition 2006.
Technical Framework: Assessment and Management of Odour from Stationary Sources in NSW (DEC, 2006a).
Technical Notes: Assessment and Management of Odour from Stationary Sources in NSW (DEC, 2006b).

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	14

- **2007:** *Guidelines for Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DEC, 2007a).
Guidelines for the Assessment and Management of Groundwater Contamination (DEC, 2007b).
National Greenhouse and Energy Reporting Act, 2007.
- **2008:** *Managing Urban Stormwater: Soils and Construction, Volume 2B – Waste Landfills* (Landcom, 2008a).
Managing Urban Stormwater: Soils and Construction, Volume 2C – Unsealed Roads (Landcom, 2008b).
- **2009:** *Waste Classification Guidelines Part 1: Classifying Waste* (DECCW, 2009). [refer 2014 update below]
Contaminated Sites: Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (DEC, 2009).
- **2010:** *Protection of the Environment Operations (Clean Air) Regulation 2010.*
- **2011:** *Guidelines for Consultants Reporting on Contaminated Sites* (OEH, 2011).
Australian Drinking Water Guidelines (NHMRC, 2011).
Hazardous and Offensive Development Application Guidelines Applying SEPP 33 (DoP, 2011).
NSW Road Noise Policy (DECCW, 2011).
Work Health and Safety Act 2011.
- **2012:** *Environmental Guidelines: Preparation of Pollution Incident Response Management Plans* (State of NSW and EPA, 2012).
- **2013:** *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013.*
NSW Aquifer Interference Policy (DPI-Water, 2012).
- **2014:** *NSW Waste Avoidance and Resource Recovery Strategy 2014-21* (EPA, 2014).
Waste Classification Guidelines Part 1: Classifying Waste (State of NSW and EPA, 2014).
Shoalhaven Local Environmental Plan 2014.
AS/NZS ISO 19011:2014 Guidelines for Auditing Management Systems.
- **2015:** *ISO 14001:2015 Environmental Management Systems – Requirements with Guidance for Use.*
Independent Audit Guideline - Post-Approval Requirements of State Significant Developments (NSW Government, 2015). [refer 2018 DPE update below]
Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (EPA, 2015).
Illawarra-Shoalhaven Regional Plan 2015 (DPE, 2015).
Recycled Water Guidance Document: Recycled Water Management Systems (DPI-Water, 2015).
- **2016:** *Environmental Guidelines: Solid Waste Landfills* (EPA, 2016).
- **2017:** *Noise Policy for Industry* (EPA, 2017).
National Greenhouse and Energy Reporting Scheme Measurement – Technical Guidelines for the Estimation of Emissions by Facilities in Australia (DEE, 2017).
Work Health and Safety Regulation 2017.
- **2018:** *Australian & New Zealand Guidelines for Fresh & Marine Water Quality* (ANZG) (2018).
Independent Audit - Post Approval Requirements (DPE, 2018).

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	15

3.2 COMPLIANCE PERFORMANCE

Based on the evaluation of compliance in **Attachment 1**, a statistical summary of the compliance status for the audit scope period at the West Nowra Recycling and Waste Facility Stages 1 to 3 is provided in **Table 3-2** and shown graphically in **Chart 3-1**.

Table 3-2 Summary of Regulatory Compliance [24 May 2014 – 24 May 2019]

Approval	Noted	Not Triggered	Compliant	Not Verified	Non-Compliant			
					ANC	Low	Medium	High
DA No. 90/3061	2	38	13	6	0	7	0	0
EPL No. 5877	32	19	41	7	1	5	0	0

ANC = Administrative Non-Compliance

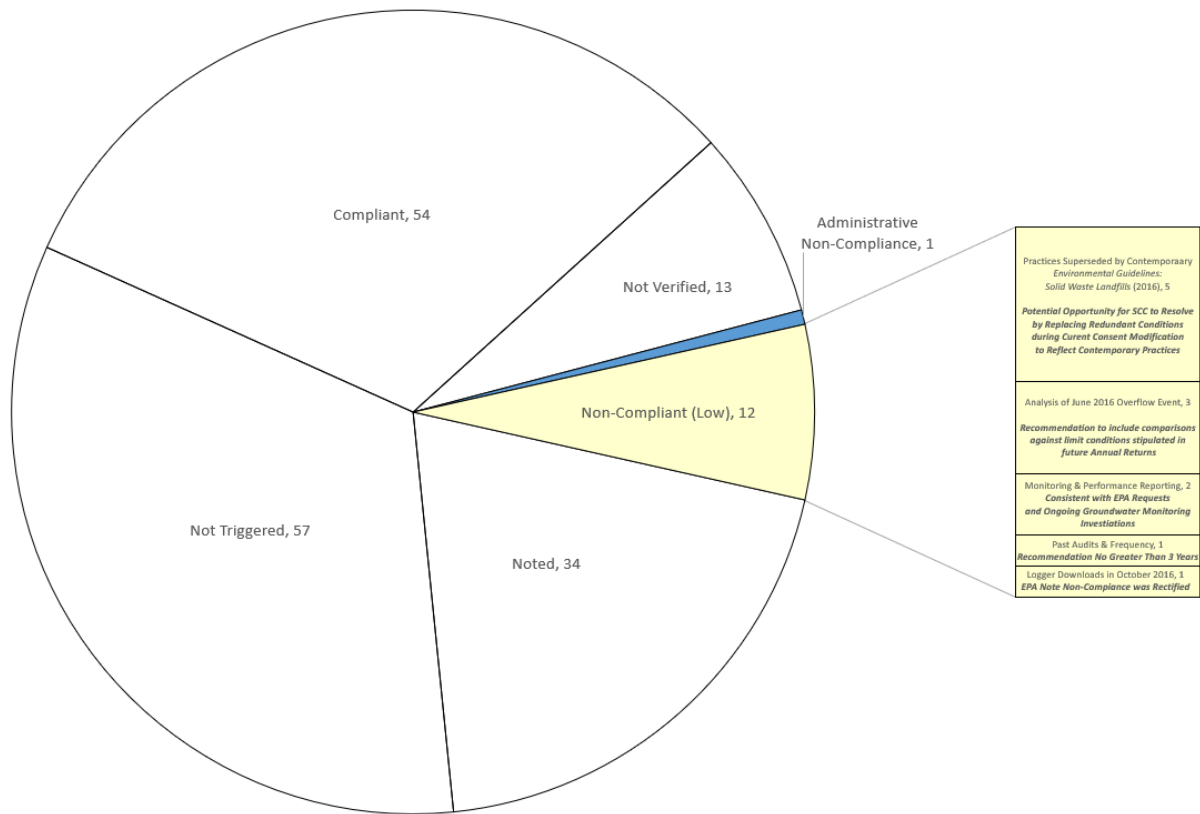


Chart 3-1 Compliance Status – Environmental Audit Statistical Summary

An analysis of the environmental audit findings has been completed and the following conclusions made in relation to compliance performance for the audit scope period:

- There were no “Non-Compliant (Medium)” or “Non-Compliant (High)” outcomes.

- Approximately 60% of the DA No. 90/3061 conditions (including the Standard Conditions) were 'Not Triggered' on the basis of the requirements pre-dating and, in many cases, being well beyond the 5-year period of the audit scope (i.e. relating to the initial commencement of development in the 1990s).
- 5 of the 12 'Non-Compliant (Low)' outcomes are a direct consequence of DA No. 90/3061 conditions which do not reflect contemporary practices approved by the EPA or as outlined in *Environmental Guidelines: Solid Waste Landfills* (EPA, 2016).
- In contrast, approximately 70% of the EPL No. 5877 conditions were either 'Compliant' or 'Noted', reflecting that the EPL is currently the key regulatory licence for the operation of the West Nowra Recycling and Waste Facility Stages 1 to 3.
- 3 of the 12 'Non-Compliant (Low)' outcomes relate to the analysis and reporting of the June 2016 overflow event in the Annual Return, however it is noted that relevant comparisons and discussion was included in a separate letter report by ENRS (2016).
- 2 of the 12 'Non-Compliant (Low)' outcomes are relevant to the current review of environmental monitoring requested by the EPA and ongoing groundwater investigations.
- Previous environmental audits required by Condition 21 of DA No. 90/3061 were not available, therefore it is recommended future environmental audits be carried out at intervals no greater than three (3) years to align with contemporary DPE (2018) guideline requirements.
- Each of the Annual Returns for EPL No. 5877 concluded in Part C Statement of Compliance – Licence Conditions that all conditions of the licence were complied with (including monitoring and reporting requirements), with the exception of two (2) non-compliances for monitoring at Points 25 and 27 which occurred in October 2016. These reported non-compliances relate to the logger downloads (**Chart 3-1**) which the EPA subsequently confirmed had been rectified and appropriate action was taken.
- The one (1) administrative non-compliance relates to the notification requirements for the telephone complaints line as prescribed in EPL No. 5877, however it is noted that a general enquiries telephone line (02 4429 3111) has been maintained during business hours that provides the opportunity to members of the public to make a complaint (**Section 3.6**).

Comparisons and reporting of compliance with relevant criteria are provided separately in the Annual Reports (including annual environmental monitoring results and landfill surface gas emission monitoring reports) (ENRS, 2014b; 2015; 2016a; 2016b; 2017; 2018; and ALS Environmental, 2014b; 2015a; 2015b; 2016a; 2016b; 2017a; 2017b; 2018a; 2018b; 2019). Relevant statements for compliance performance during the audit scope period as presented in these reports are summarised in **Table 3-3**.

During the course of the environmental audit it was recognised that while some requirements were unable to be verified and many "Not Triggered" outcomes were made (i.e. beyond the 5-year period of the audit scope), a number of relevant improvement opportunities were identified and have been included in **Section 4.0**.

Table 3-3 Other Compliance Reporting [24 May 2014 – 24 May 2019]

Document	Aspect	Statements / Notes
Annual Environmental Monitoring Report (ENRS, 2014b; 2015; 2016a; 2016b; 2017; 2018)	Water Quality Data (QA/QC)	• QA/QC indicators either all complied with the required standards, or showed variations that would have no significant effect on the quality of the data of the conclusions of the environmental assessments. • Certificates of Analysis are provided with each ALS report, including sample container / preservation compliance. • <i>ENRS recommend sampling include rinsate samples and field duplicates at the standard rate of 1 in 10, or field QA/QC is conducted in accordance with ALS procedures.</i> • <i>ENRS recommend groundwater bores should be purged prior to sampling by removing at least three (3) well volumes or low flow parameter stabilisation methods applied with completed field sheets to document pumping volumes and field parameters.</i>
	Groundwater Sampling and Parameters	• The SCC audit/review of the 2013-14, 2014-15 and 2016-17 monitoring results did not identify any EPL non-compliances. • The SCC audit/review of the 2017-18 monitoring results identified four (4) potential non-compliances for not reporting Total Phenols concentrations at boreholes BH2, BH10, BH18 and BH21. • However, it was duly noted that insufficient sample was available in the bore to conduct the full suite of analysis and that the EPA does not consider a dry sampling event to be a non-compliance, however where annual samples are dry the point should be re-scheduled or sampled during the next regular sampling. • Relevantly, Total Phenols at the boreholes had previously been reported below the limit of the detection for Total Phenols, as were all other boreholes during the 2017-18 sampling period. • <i>ENRS recommend that consideration be given to advancing borehole depths to ensure penetration of the groundwater saturated zone to obtain sufficient sample and ensure compliance with Section 4.4 of the Environmental Guidelines: Solid Waste Landfills which require:</i> <i>If the waste mass is above the groundwater level, the screened section of the well should extend through the upper 5 to 10 metres of the saturated aquifer, or into at least the first water-bearing zone in the case of fractured aquifers.</i> • <i>ENRS recommend that 4-chlorophenol be removed from the list of required analytes in the EPL as it is no longer part of the available laboratory suite for individual reporting, but continues to be reported within the results for Total Phenols.</i>
	Leachate Monitoring Data	• The SCC audit/review of the 2015-16 monitoring results identified the two non-compliances at Points 25 and 27 which occurred in October 2016 (logger data unable to be recovered) and the EPA subsequently confirmed had been rectified and appropriate action was taken (as discussed separately above).
	Methane Gas Monitoring	• Methane gas emission monitoring at the landfill demonstrated all concentrations were below EPA licence limits. • Methane gas concentrations in buildings located within a distance of 250 m of the site were below the EPA licence limits.

3.3 SUMMARY OF STAKEHOLDER NOTICES, ORDERS OR PROSECUTIONS

Based on the search of the *Protection of the Environment Operations Act 1997* Public Register, there have been no orders or prosecutions in the past 5 years (within the scope of this audit) associated with EPL No. 5877 and the scheduled activities undertaken at the West Nowra Recycling and Waste Facility Stages 1 to 3. The EPA confirmed during consultation (18 June 2019) (**Attachment 3**) that there are no significant outstanding matters that are not represented on the *Protection of the Environment Operations Act 1997* Public Register.

Thus, there were no records of penalty notices, enforceable undertakings or civil proceedings identified during the audit scope period.

3.4 POST-APPROVAL/CURRENT DOCUMENTATION LIST

The HG Institute provided a comprehensive checklist of post-approval documentation requirements as prescribed in DA No. 90/3061 (as amended) and EPL No. 5877 to the Waste Services Unit SCC during preliminary planning activities for the environmental audit. In accordance with the audit scope, the Waste Services Unit SCC provided the following post-approval documentation for consideration which was relevant to the current activities:

- Landfill Environmental Management Plan (LEMP), including:
 - Landscape Management Plan (LMP);
- Groundwater Monitoring Plan (GMP) (ENRS, 2014a);
- Pollution Incident Response Management Plan (PIRMP), including:
 - Site Emergency Procedures Manual;
 - Pollution Incident Notification Procedure; and
 - Potential Leachate and Sediments Discharge Plan; and
 - Potential Landfill Gas Emissions Plan;
- Design and Construction Specification(s), Construction Quality Assurance Plan(s) and Report(s) by a Construction Quality Assurance (CQA) Engineer (for each landfill cell stage including leachate barriers, design, installation and collection) (GHD, 2018b; 2018c);
- Six-Monthly Volumetric Survey Plan(s) with Supporting Volumetric Survey Checklist(s), Landfill Facility Information Certificate(s) and Stockpile Information & Schedule of Material Movements.
- Annual Reports (including annual environmental monitoring results and landfill surface gas emission monitoring reports); and
- Annual Returns for EPL No. 5877.

It is noted that, where relevant, post-approval documentation, in meeting relevant approval requirements, has either been:

- prepared by suitably qualified and/or independent professional(s);
- required to be developed in consultation with relevant stakeholders and/or certified; and/or
- subsequently approved by an approval authority (or nominated suitably qualified person).

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	19

The Waste Services Unit SCC also confirmed that the Closure Plan required by EPL No. 5877 Condition O6.16 was 'Not Triggered' as the waste landfilling activities are continuing and the last load of waste is expected to be well beyond six months based on the remaining disposal capacity estimates and the fact that SCC has sought an extension to the approved use period from 29 years to 49 years which is currently the subject of assessment in accordance with Condition 5 of DA No. 90/3061.

3.5 ENVIRONMENTAL PERFORMANCE (AND MANAGEMENT CONTROLS)

The following subsections provide a summary of the relevant management controls applied at the West Nowra Recycling and Waste Facility Stages 1 to 3, as identified in the audit findings detailed in the environmental audit tables (**Attachment 1**), for effective environmental performance.

Conditions of consent of relevance are provided directly beneath each sub-heading for reference to the environmental audit tables in **Attachment 1**.

3.5.1 Planning and Compliance Controls

DA No. 90/3061	Conditions 1 (Standard Conditions 1-5, 7[b]-[f], 8, 11 & 12), 2, 3, 4, 5, 7[e]-[g], 7[i]-[k], 7[m], 10[d][i-iii], 11, 12, 14, 15, 17-25, Notes 1-4, [a], [c], [d] & Dot Point 1.
EPL No. 5877	Conditions A1.1, A2.1, A3.1, A3.2, L1.1, L2.1-L2.4, L3.1-L3.4, O1.1, O2.1, O6.7-O6.16, M7.1, G1.1, G1.2 & G1.3.

Many of the conditions of consent relate directly to planning (including design limits) and compliance controls, most of which are integrated within the environmental management framework and referred in the approval documentation list and discussed separately in the compliance performance section above (**Section 3.2**). The evolution of the environmental management documentation for Stages 1 to 3 of the West Nowra Recycling and Waste Facility is shown on **Schematic A**.

3.5.2 Leachate Control and Irrigation

DA No. 90/3061	Conditions 1 (Standard Condition 7[d]), 4, 7(a), 7(b), 8, 8(a), 20 & Dot-Point [Advice 1-2].
EPL No. 5877	Conditions P1.2, P1.3, O6.1-O6.3, O6.9-O6.13, M2.3, M3.2 & M6.1

Section 6.1 of the LEMP describes the leachate control systems to prevent pollution of waters including:

- leachate barrier system;
- leachate collection system;
- leachate dam;
- leachate monitoring (refer **Section 3.5.17**); and
- other related controls (including swale and table drains, stormwater and sedimentation dams (refer **Section 3.5.3**), and surface water and groundwater monitoring).

The leachate dam was observed during the site inspection (**Plate 25**). The irrigation (utilisation) area was also observed (**Plate 21**) and other associated stormwater and sediment controls (**Section 3.5.2**).

A report on geotechnical assessment works carried out by GHD (2018a) in relation to the existing leachate dam at the West Nowra Recycling and Waste Facility was provided by SCC and includes additional information in regard to the design and construction of the leachate dam in the 1990's. The report concludes (GHD, 2018a):

'... the existing leachate dam is used for the storage of landfill generated leachate from existing landfill stages 1, 2 and 3, and is also intended for storage of landfill generated leachate from the proposed landfill stage 4 extension area. ...

The existing leachate dam has been constructed to the standard and quality required by the Environmental Guidelines: Solid Waste Landfills, 1996. ...

... the existing leachate dam is suitable for purpose and has been licenced to store landfill generated leachate from landfill stages 1, 2 and 3. ...

The proposed storage of landfill generated leachate from stage 4 will be within existing appropriately licenced leachate management infrastructure.'

EPL No. 5877 prescribes the ongoing (staged) requirements for leachate collection systems at the premises. For example, Construction Quality Assurance Plan for Landfill Cell Stage 3E-2 (GHD, 2018b) states the CQA Engineer shall review as-built survey data of the finished sub-grade to verify conforming grades, levels and layer thickness within the allowable tolerance. CQA Engineer compliance checks (e.g. HDPE membrane, leachate collection pipes, etc.) to be completed are listed in the CQA Plan.

Although it is reported in the 2017-18 Annual Report that initial results indicate that existing leachate management infrastructure is fit for purpose, a potential for groundwater contamination was identified below the depth of the current monitoring network. At the end of the audit scope period (24 May 2019), it is understood that the Waste Services Unit SCC is still investigating to acquire sufficient information to inform a Remediation Action Plan.

It is noted that the former DLWC correspondence dated 26 August 1996 (and referred in DA No. 90/3061 Dot Point) relevantly states:

The consultants⁴ reported that the likely source of Stage 2 leachate contamination is the southern end of Stage 1 for the following reasons:

- 1. the Stage 1 landfill cells are not lined with clay and excavated through bedrock;*
- 2. there is 175 m length of the Stage 1 area which is not equipped with leachate collection drains; and*
- 3. the stormwater diversion drains and sump cut deep into bedrock and unlined.*

The above culminated in the DLWC (1996) recommendations as outlined in **Table A1-3 (Attachment 1)**.

The 2016-17 & 2017-18 Annual Reports states that spray irrigation of leachate, from the leachate dam, over licenced utilisation (irrigation) area during favourable weather conditions, was carried out during the reporting period. The first flush dam (**Plate 24**) which captures runoff from the irrigation (utilisation) area was observed during the site inspection.

⁴ Report on Groundwater Hydrology of Proposed West Nowra Landfill Stage 2 Area (Forbes Rigby Pty Ltd, 1996).

3.5.3 Stormwater and Sediment Control

DA No. 90/3061	Conditions 1 (Standard Conditions 7[a] & 7[d]), 7(a), 7(b), 7[l], 8, 8(a), 10(d)[i-iii], 18, 20 & Dot-Point [Advice 1].
EPL No. 5877	Conditions P1.3, O6.1 & O6.3.

Section 6.1.4 of the LEMP describes the stormwater and sediment control systems to prevent erosion and unacceptable sediment loads reporting to receiving waters, and where practicable avoid generation of excessive leachate.

Erosion and sediment control measures described in the LEMP include:

- diversion of upslope waters away from the landfilling operations, and final capped landfill cells;
- limiting the movement of vehicles around the site;
- turfing / revegetation of soil areas;
- dust suppression, using water cart or irrigators, on exposed soil areas;
- construction of silt traps and other control structures, where required;
- the sedimentation dam;
- installation of sediment fences and hay bales, where required; and
- construction of catch / swale drains around the site perimeter to capture waters before leaving the site.

The stormwater and sediment control were observed during the site inspection (**Plates 17-28**). Stormwater management measures are also described in the Annual Reports.

3.5.4 Windblown Litter Control

DA No. 90/3061	Condition 7(c), 7(d) and 7(h).
EPL No. 5877	Condition O6.4.

Section 9.2.1 of the LEMP describes litter control at the premises. The portable fence panels at the active tipping area to mitigate wind-blown litter at time of unloading waste was observed during the site inspection (**Plate 11**). Daily covering of active waste landfilling areas occurs for litter control. The Automated Tarp Deployment System [ATDS]) used was also observed during the site inspection (**Plates 12 & 27**).

A fixed chainwire fence exists around the perimeter. Litter patrols are conducted along the boundary fence by Flagstaff Group several times a week (**Plates 9 & 10**). Reporting of litter control is provided in Section 2.2 of the Annual Reports.

3.5.5 Windblown Dust Control

DA No. 90/3061	Condition 7(i).
EPL No. 5877	Conditions O3 & O3.1.

Section 9.2.4 of the LEMP outlines the dust controls available to use at the premises, including internal access roads being properly formed, drained, surface treated and maintained, and use of dust suppression, using water cart or irrigators, on exposed soil areas. Each Annual Report describes that dust suppression is carried out daily and on an as needs basis.

The Site Emergency Procedure Manual – West Nowra includes reference to the Waste Services “Dust Control – Landfill Sites” Safe Work Instruction.

Speed limits are restricted on the premises to 15 km/hour (**Plate 3**) and rehabilitation areas were observed (**Plates 22 & 23**) which minimises dust emissions.

3.5.6 Noise Control

DA No. 90/3061	Conditions 13 & 16.
EPL No. 5877	Condition O2.1.

Section 9.3 of the LEMP describes the noise controls (including regular maintenance of plant and equipment, noise barriers and contractor commitments) and relevant performance indicators (i.e. complaints).

The operating hours at the West Nowra Recycling and Waste Facility are between 8am and 5pm, 7 days, and is closed on all public holidays except Easter Monday (**Plate 1**).

3.5.7 Vermin Control

DA No. 90/3061	Condition 7(d).
EPL No. 5877	Condition L3.4 & O6.4.

Section 9.2.5 of the LEMP describes the pest and vermin controls (including rodent bait stations, daily cover and free-draining landforms).

Daily covering of active waste landfilling areas occurs for vermin control. The Automated Tarp Deployment System [ATDS]) used was also observed during the site inspection (**Plates 12 & 27**).

3.5.8 Odour Control

DA No. 90/3061	Conditions 7(d), 13 and 17.
EPL No. 5877	Conditions L4, L4.1, O6.4 & O6.7.

Odour management strategies are outlined in Section 9.2.6 of the LEMP, including daily covering of waste. It was noted during the site inspection that wet weather tipping areas were in use at the designated areas prescribed in EPL No. 5877, centrally located at the premises.

3.5.9 Landfill Gas Monitoring and Control

DA No. 90/3061	Conditions 7(d) and 17.
EPL No. 5877	Conditions A2.1, P1.1, M2.2, M2.4, M3, M3.1 & R2.3.

Section 7.2 of the LEMP describes the surface gas emissions and gas accumulation monitoring undertaken at the premises. Section 8.6.2 of the LEMP relevantly describes the final capping system to prevent the emission of landfill gases (methane).

Ten (10) West Nowra Landfill Surface Gas Emission Monitoring reports were prepared by ALS Environmental (2014b; 2015a; 2015b; 2016a; 2016b; 2017a; 2017b; 2018a; 2018b; 2019) during the audit scope period, and are included as attachments to the Annual Environment Monitoring Results reports in the Annual Reports.

Methane gas emission monitoring at the landfill demonstrated all concentrations were below EPL condition limits. Reported methane gas emissions were also below the EPL condition limits in all the buildings within 250 metres of landfilled waste.

It is noted that the gas generator and gas flare are excluded from the premises (another proponent), and were observed during the site inspection (**Plates 5 & 6**) (**Attachment 2 – Figure 6**).

3.5.10 Vegetation Clearance, Rehabilitation and Landscaping

DA No. 90/3061	Conditions 1 (Standard Condition 9), 6, 7(j), 10, 10[d][i-iii], 11, 12, 14, 15, 24, 25 & [b].
EPL No. 5877	Conditions O6.14, O6.15 & O6.16.

The landfilling operation including vegetation clearance is described in Section 5.1.1 of the LEMP. Clearing activities (of any utilizable timber) have not occurred on site during the audit period. The stockpile information sheets report that no wood/trees/timber stockpiled at the premises were won on-site.

Landscaping, including revegetation plans and habitat creation and screening along the boundary of the premises is outlined in Section 5.1.4 of the LEMP and discussed in the Landscape Management Plan (LMP) (as part of the LEMP).

The original West Nowra Landfill Depot Revegetation Plan (Kevin Mills & Associates Pty Limited, 1994) also outlines a set of broad principles for revegetation, including the list of native plant species for the West Nowra site.

Rehabilitation works have been undertaken at Stage 1. It is noted that the top of batter drains and concrete drop down drain exist (**Plates 17, 18, 19 & 20**) and batter stabilisation and vegetation is established (**Plates 22 & 23**).

3.5.11 Soil (including VENM) Management

DA No. 90/3061	Conditions 6(e), 6(f), 7(d), 7(e), 10(d)(ii-iii).
EPL No. 5877	Condition O6.4.

The landfilling operation including soil stripping is described in Section 5.1.1 of the LEMP. Virgin excavated natural material (VENM) stockpile inventories are provided with the volumetric surveys. The LEMP describes that VENM is used as the daily and intermediate cover material at the premises. Where suitable, VENM is also used as the clay base liner for landfill cells.

3.5.12 Weed Control

The control of noxious weeds is carried out by SCC's Weeds Officer, and activities reported in the Annual Reports (**Section 3.5.17**).

3.5.13 Heritage Management

DA No. 90/3061	Condition 9
----------------	-------------

No Aboriginal artifacts or archaeological relics were discovered or uncovered on the premises during the audit scope period.

3.5.14 Vehicle Control and Parking

DA No. 90/3061	Conditions 1 (Standard Condition 6, 7[a], 7[b]), 7[f] & 8), 18 & 19.
EPL No. 5877	Condition O6.6.

Internal access roads, manoeuvring areas, parking and stormwater drainage and design are shown on Figures 1.1 and 1.2 in the LEMP (2008) and survey plans.

Two large carparking and turning circle areas were observed adjacent to the Buy Back Area and Recycling Centre, as well as a staff and visitor parking area at the site entry.

Speed limits are restricted for vehicles on the premises to 15 km/hour (**Plate 3**).

Section 9.2.2 of the LEMP describes the procedures for cleaning vehicles including wheel wash bay. Relevant performance indicators (complaints regarding the tracking of mud and litter) and random audits of vehicles. The vehicle wheel washdown bay was observed during the site inspection (**Plates 15 & 16**).

3.5.15 Fire Prevention and Control

DA No. 90/3061	Condition 7(d).
EPL No. 5877	Conditions L3.4, O4.1, O4.2, R2.1, R2.2, R2.3, R4.1 & R4.2.

Procedures are described in the PIRMP including pre-emptive actions (for fire prevention) triggered by surface gas emissions monitoring and gas accumulation monitoring. The Site Emergency Procedures Manual in the PIRMP identifies fire risk at the premises. The LEMP describes fire prevention techniques (i.e. landfill gas prevention, tyre stockpiling, avoid hazardous waste disposal, appropriate waste oil and fuel storage, and vegetation management).

Section 9.4.1 of the LEMP describes the fire-fighting capacity. The water tanks for fire-fighting capacity at the premises were observed during the site inspection (**Plate 4**).

3.5.16 Site Entry Control and Advertising

DA No. 90/3061	Condition 1 (Standard Condition 10).
EPL No. 5877	Conditions O5.1, O5.2 & O6.5.

A boundary fence secures the perimeter of the premises. Site entry control (including locked entry gate outside of hours) and boomgate at the weighbridge was observed during the site inspection (**Plates 2 & 7**). The western boundary gates were also locked at the time of the physical site inspection (**Plate 29**). Prohibition signage was observed (**Plate 7**).

3.5.17 Environmental Monitoring

DA No. 90/3061	Conditions 8(a), 20 & Dot-Point [Advice 2 & 3]
EPL No. 5877	Conditions P1.1-P1.3, L2.1-L2.4, M1.1-1.3, M2.1-M2.4, M3.1-M3.2, M6.1 & M7.1.

Annual Reports (including annual environmental monitoring results and landfill surface gas emission monitoring reports) (ENRS, 2014b; 2015; 2016a; 2016b; 2017; 2018; and ALS Environmental, 2014b; 2015a; 2015b; 2016a; 2016b; 2017a; 2017b; 2018a; 2018b; 2019) provide a succinct summary of the sampling and analysis of environmental monitoring results collected each year at the premises. The results are provided in support of the Annual Returns for EPL No. 5877 (**Section 3.5.19**).

Relevantly, the scope of the Annual Reports includes (ENRS, 2018):

- *Identification of any deficiencies in environmental performance identified by the monitoring data, trends or environmental incidents, and identification of remedial actions taken or proposed to be taken to address these deficiencies; and*
- *Recommendations on improving the environmental performance of the facility including improvement to the monitoring program.*

Up to (3) leachate monitoring points (including the irrigation utilisation area when in use), up to five (5) surface water monitoring points, and up to twenty-one (21) groundwater monitoring points as well as landfill (methane) gas readings, were sampled and analysed periodically, as required by EPL No. 5877, and the environmental performance conclusions provided below.

Leachate (and Irrigation) Water Quality

The pH in raw leachate was recorded between 4.3-8.8 which indicates the low pH in surrounding groundwater (see below) is likely the result of in-ground process and not direct connection with leachate (ENRS, 2014; 2015; 2016; 2017; 2018).

Leachate salinity reported values between 261 mg/L (Stage 3 Leachate Pumphouse, 21 February 2018) and 4,390 mg/L (Stage 3 Leachate Pumphouse, 2016) which was within the range of historical values. Salinity is expected to vary significantly with leachate concentration and dilution by stormwater in the leachate dam (ENRS, 2014; 2015; 2016; 2017; 2018).

Surface Water Quality and Releases

Salinity in surface water was generally reported below the adopted Trigger Values (2,200 μ S/cm or 1,500 mg/L). Minor exceedances are within historical values (ENRS, 2014; 2015; 2016; 2017; 2018).

Concentrations of nutrients in surface water were generally identified within the range of historical values and below the adopted Trigger Values (ENRS, 2014; 2015; 2016; 2017; 2018). Minor exceedances for ammonia were observed in SW1 with 8.6 mg/L in September 2015, but remained below the previously reported 30.8 mg/L in May 2013 (ENRS, 2014; 2015).

The results of the water quality monitoring of the overflow event (and associated overflow event notification, water sampling and analysis) reported in the *Annual Environmental Monitoring Results 2015-2016* (ENRS, 2016) are discussed separately in **Section 3.7**.

Groundwater Quality

Results for pH in groundwater at the site generally reported low pH levels which are within the range of historical data (ENRS, 2015; 2016; 2017; 2018).

Groundwater salinity was reported between 94 mg/L (BH21, 8 August 2018) and 3,560 mg/L (BH13, 22 November 2017). These are within the range of historical values (ENRS, 2014; 2015; 2016; 2017; 2018).

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	27

Concentrations of nutrients in groundwater were generally identified within the range of historical values and below the adopted Trigger Values (ENRS, 2014; 2015; 2016; 2017; 2018).

Total concentrations in groundwater of Barium, Cadmium, Cobalt, Hexavalent Chromium (Cr VI), Magnesium, Manganese and Mercury were reported below the laboratory limit of reporting (LOR) and/or the adopted Trigger Value. Similar to previous results exceedances of the adopted Trigger Value and Hardness Modified Trigger Value were reported for Aluminium, Arsenic, Copper, Total Chromium, Lead and Zinc (ENRS, 2014; 2015; 2016; 2017; 2018).

The elevated concentrations of selected metals are likely associated with increased mobility from low pH. It is also noted that metals such as Aluminium, Arsenic, Copper and Zinc occur naturally in site aquifers and results may reflect background conditions due to mineral dissolution (ENRS, 2014; 2015; 2016; 2017; 2018).

Reported concentrations of Total Organic Carbon (TOC) have decreased or generally remained similar to the previous reporting periods, which indicates stable environmental conditions at the site (ENRS, 2014; 2015; 2016; 2017; 2018).

Concentrations of TPH, TRH and BTEX were reported below the laboratory LOR and/or the Site Assessment Criteria (SAC). Minor detections of light and heavy fraction hydrocarbons were identified in BH10, Leachate Pumphouse, BH20 and BH21 (ENRS, 2014; 2015; 2016; 2017; 2018).

Results for all tested PAHs in groundwater were typically reported below the LOR (<0.001mg/L) (ENRS, 2017; 2018). However, minor concentrations of Naphthalene were detected in leachate but below the ANZECC Trigger Value of 0.016 mg/L (ENRS, 2014; 2015; 2016).

Based on the above, ENRS (2014; 2015; 2016; 2017; 2018) conclude that:

- there is unlikely to be any significant off-site impacts from site operations; and
- the existing systems (i.e. water/leachate control structures) are generally appropriate.

Gas (Methane) Concentration Levels

The results of the ALS Environmental Landfill Surface Gas Monitoring during the audit scope period show:

- 6 Aug 2014 – 94 data readings below the EPL methane concentration limit.
- 20 Feb 2015 – 120 data readings all below the EPL methane concentration limit.
- 31 Aug 2015 – 148 data readings all below the EPL methane concentration limit.
- 11 Feb 2016 – 143 data readings all below the EPL methane concentration limit.
- 25 Aug 2016 – 121 data readings all below the EPL methane concentration limit.
- 24 Feb 2017 – 165 data readings all below the EPL methane concentration limit.
- 24 Aug 2017 – 235 data readings all below the EPL methane concentration limit.
- 15 Feb 2018 – 232 data readings all below the EPL methane concentration limit.
- 29 Aug 2018 – 230 data readings all below the EPL methane concentration limit.
- 21 Feb 2019 – 226 data readings all below the EPL methane concentration limit.

Table 3 in the Annual Reports provide a summary of the monitoring points including gas accumulation inside buildings within 250 m of deposited waste. Landfill methane gas emissions detected in the buildings were all below EPL condition limits.

3.5.18 Environmental Investigations and Response

DA No. 90/3061	Condition [d] [Advice 3]
EPL No. 5877	Conditions P1.3, L2.1-L2.4, R2.1-R2.3

Surface Water and Groundwater Quality Monitoring Results

As discussed in **Section 3.5.17**, exceedances of water quality Trigger Values have occurred and subsequently been investigated during the audit scope period. In many cases, water samples are taken during the next scheduled sampling run to help identify if any trends are developing. Relevant responses and follow-up recommendations are provided in the Annual Reports and are summarised in **Section 3.10** below.

Groundwater Quality Investigation

As reported in the 2018 Annual Report, it is understood that SCC carried out preliminary groundwater investigation sampling of the existing leachate management system within the former Stage 1 landfill operations and that:

Initial results indicate that existing leachate management infrastructure is fit for purpose. However, a potential for groundwater contamination was identified below the depth of the current monitoring network, to the west of the former unlined Stage 1 landfill area.

It is understood these investigations are being conducted in line with the EPA's recently requested review of the current environmental monitoring regime at the premises (**Section 2.5**).

At the end of the audit scope period (24 May 2019), it is understood that the Waste Services Unit SCC is still investigating to acquire sufficient information to inform a Remediation Action Plan.

3.5.19 Environmental Reporting

DA No. 90/3061	Conditions 20 and [d] [Advice 2].
EPL No. 5877	Conditions M1.1-M1.3, R1.1-R1.8, R3.1-R3.4, R4.1 & R4.2.

Annual Reports

As described in **Section 3.5.17**, environmental performance monitoring was reported annually in the Annual Environmental Monitoring Results Reports (ENRS [2014; 2015; 2016; 2017; 2018]).

Annual Returns and Written Reports

Five (5) Annual Returns were submitted to the EPA in the approved form during the period of the audit scope and included:

- Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-Oct-2013 to 29-Oct-2014, signed and dated 27-11-2014, and received by the EPA on 18-Dec-2014.
- Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-Oct-2014 to 29-Oct-2015, signed and dated 23-12-2015, and received by the EPA on 24-Dec-2015.
- Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-Oct-2015 to 29-Oct-2016, signed and dated 15-12-2016, and received by the EPA on 21-Dec-2016.
- Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-10-2016 to 29-10-2017, signed and dated 7-12-2017, and received by the EPA on 14-Dec-2017.
- Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-10-2017 to 29-10-2018, signed and dated 18-12-2018, and received by the EPA on 18-Dec-2018.

Each of the above Annual Returns concluded in Part C Statement of Compliance – Licence Conditions that all conditions of the licence were complied with (including monitoring and reporting requirements), with the exception of two (2) non-compliances for monitoring at Points 25 and 27 which occurred in October 2016 due to the change in the mobile service provider network (i.e. the monitoring logger on the 2G network was upgraded to a 3G network compliant logger and the recorded data (for a period) was unable to be recovered during the network change-over). The EPA Public Register relevantly noted that the non-compliance matters had been rectified and appropriate action was taken by the licensee (i.e. SCC).

The Waste Services Unit SCC indicated during the audit site interview that for the most recent period since the last Annual Return (30-10-2018) to the end of the audit scope period (24 May 2019), it was understood that all licence conditions had been complied with to date, however in accordance with EPL Condition R1.2 the Annual Return will not be completed until after the end of the reporting period (i.e. 29 October 2019).

No ‘written reports’ by EPL No. 5877 Conditions G3.1, G3.2 and G3.3 were required during the audit scope period.

3.6 COMPLAINTS

Conditions M4.1-M4.4 and M5.1-M5.3 in EPL No. 5877 relate to complaints handling and response.

SCC maintains a general enquiries telephone line (02 4429 3111) during business hours that provides the opportunity to members of the public to make a complaint. It is noted that an on-line “service complaint” webform is also available on the SCC website.

A review of the last five (5) Annual Returns for EPL No. 5877 submitted to the EPA was conducted and the complaints summary provided in **Table 3-4**.

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	30

Table 3-4 Summary of Complaints

Annual Return Reporting Period	Complaint Category				
	Air	Water	Noise	Waste	Other
30-10-2013 to 29-10-2014	0	0	0	0	1 [Odour]*
30-10-2014 to 29-10-2015	0	0	0	0	0
30-10-2015 to 29-10-2016	0	0	0	0	0
30-10-2016 to 29-10-2017	0	0	0	0	0
30-10-2017 to 29-10-2018	0	0	0	0	0

* The 2013/14 Annual Report (SCC, 2014) reports that the complaint was received on 1 April 2014 which is beyond the audit scope period (24 May 2014 – 24 May 2019).

The Waste Services Unit SCC confirmed during the site audit interviews that no reportable complaints were received during the audit scope period between 24 May 2014 and 24 May 2019.

It is also noted that the National Parks and Wildlife Service (NPWS), which has an office at 104 Flatrock Road, Mundamia, has raised concerns in its submission to the adjacent West Nowra Resource Recovery Facility as follows, with reference to the existing waste facility:

'NPWS remains concerned about the increased noise and air quality impacts from both dust and odour on its property, particularly in relation to the ongoing day to day operation of the Resource Recovery Park. This is particularly as the existing waste facility often emits offensive odours depending on the prevailing wind which has been investigated by the EPA.'

3.7 INCIDENTS

A review of the last five (5) Annual Reports prepared for the West Nowra Recycling and Waste Facility was conducted and the incidents and accidents summary provided in **Table 3-5**.

Table 3-5 Summary of Incidents and Accidents

Annual Report Reporting Period	Incident	Accident
30-10-2013 to 29-10-2014	0	1*
30-10-2014 to 29-10-2015	0	0
30-10-2015 to 29-10-2016	1	0
30-10-2016 to 29-10-2017	0	0
30-10-2017 to 29-10-2018	0	0

* The 2013/14 Annual Report (SCC, 2014) reports that the accident related to a customer falling into a bin at the transfer station and action was taken to make modifications to the guardrail system at all SCC Depots and procedures reviewed.

The one (1) incident which occurred during the 5-year audit scope period is reported to have occurred on 7 June 2016, resulting from an overflow of the leachate dam. The *Annual Environmental Monitoring Results 2015-2016* (ENRS, 2016) state that the overflow event (and associated overflow event notification, water sampling and reporting) was triggered following a rainfall event of 316.6 mm (Nowra Boat Shed BOM Station No. 68213) over the Shoalhaven Region between 4 June 2016 and 7 June 2016.

The overflow event was reported to the EPA on 8 June 2016 (EPA Reference No. C08251-2016) and action was taken to reduce the leachate dam level progressively by spray irrigating over licenced utilisation area (Waste Services Unit SCC, 2016).

The results of the water quality monitoring were reported in the *Annual Environmental Monitoring Results 2015-2016* and concluded the following (ENRS, 2016):

These results are generally reported at levels within the range historic values and are not assessed to represent a significant risk of offsite impacts due to the relatively short term period of discharge; low expected volumes, and the site location with no immediate sensitive receptors; ...

Should any change in Site conditions or incident occur which causes a potential environmental impact, a suitable environmental professional should be engaged to further assess the Site and consider requirements for any additional monitoring.

The Waste Services Unit SCC confirmed during the site audit interviews that no further assessment was undertaken nor any additional monitoring specifically in relation to the overflow event, and that besides the incident resulting from the overflow of the leachate dam on 7 June 2016, no other reportable incidents were reported during the audit scope period between 24 May 2014 and 24 May 2019.

Procedures for responses to incidents at the premises are outlined in the Pollution Incident Response Management Plan (PIRMP), including:

- Site Emergency Procedures Manual;
- Pollution Incident Notification Procedure; and
- Potential Leachate and Sediments Discharge Plan; and
- Potential Landfill Gas Emissions Plan.

3.8 SITE INSPECTION AND SITE INTERVIEWS

At the time of the physical site inspection, landfilling activities at the premises were in operation and contained within the approved extents of the development footprint. The SCC personnel (and representatives) interviewed, and with whom accompanied the auditor, were organised and provided vehicular access to development areas at the premises. Where safe, specific areas were accessed on-foot. Ongoing site practices and management controls in place were evident, as demonstrated by the site inspection photographs (**Attachment 5**).

3.9 PREVIOUS ENVIRONMENTAL AUDIT RECOMMENDATIONS

Previous (5-year) environmental audits conducted in accordance with Condition 21 were requested from SCC, but unavailable at the time of preparing this environmental audit.

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	32

3.10 IMPROVEMENT OPPORTUNITIES PREVIOUSLY IDENTIFIED

The Annual Environmental Monitoring Results reports (ENRS, 2014; 2015; 2016; 2017; 2018) in support of each Annual Report include a number of detailed recommendations and improvement opportunities during the audit scope period which have been summarised in **Table 3-6**.

Table 3-6 Detailed Recommendations for Improvement Opportunities

Report	Aspect	Detailed Recommendations
ENRS (2014; 2015; 2016; 2017; 2018)	Rationalising Environmental Monitoring Requirements in EPL No. 5877	Sampling, testing and analysis should continue to be carried out in accordance with EPL No. 5877.
ENRS (2014; 2015)		Analytes which have consistently reported concentrations below the laboratory level of detection since 2008 (e.g. OCPs and OPPs) should be removed from EPL No. 5877.
ENRS (2015)		4-chlorophenol should be removed from the list of analytes in EPL No. 5877 for Point 12 (BH5), Point 13 (BH6) and Point 19 (BH12A) as it is no longer part of the laboratory analysis suite for individual reporting.*
ENRS (2014; 2015; 2016)		The suites for PAHs, OCP and OPP in EPL No. 5877 should be revised to match the available compounds for reporting by the laboratory.
ENRS (2015; 2016; 2017; 2018)		The metals laboratory analysis suite in EPL No. 5877 should be reduced to nine (9) metals: Aluminium, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc.
	Field Sampling Procedures	Total Organic Carbon should be replaced by Dissolved Organic Carbon for groundwater sample points in EPL No. 5877 to avoid the influence of in-bore conditions.
ENRS (2014; 2015; 2016; 2017; 2018)		Low flow sampling of groundwater bores should be undertaken where bore yields permit. At least three (3) well volumes or low flow parameter stabilisation methods applied with field sheets provided to document pumping volumes and field parameters. Alternatively, bores should be purged by bailing and allowed to recharge before re-sampling within 24 hours.
		Field QA/QC should include, at minimum, one (1) rinsate sample per day and field duplicates at the standard rate of 1 in 10, or field QA/QC be conducted in accordance with ALS standard procedures (ALS, 2018a-c).
		Field measurements of the following parameters should be conducted during purging and sampling: Temperature, pH, Electrical Conductivity (EC), Dissolved Oxygen (DO), and Oxidation Reduction Potential (Redox).
ENRS (2017; 2018)		A photographic record of dry surface water monitoring sample sites should be maintained with field sheets.
		Where surface water monitoring sample sites are dry, re-sampling should occur after the next rainfall event or during the next scheduled event.
ENRS (2014; 2015; 2016; 2017; 2018)		Surface water samples should not be filtered in the field; surface water samples should be analysed for total concentrations of metals and metalloids.
		Groundwater samples should be filtered in the field and analysed for dissolved concentrations of metals and metalloids to reduce the chance of variation due to field conditions. Where areas of environmental concern (AECs) are identified, analysis should include total concentrations in addition.
		Scanned field sheets should be reported with the laboratory Certificate of Analysis.

Table 3-6 (Cont.) Detailed Recommendations for Improvement Opportunities

Report	Aspect	Detailed Recommendations
ENRS (2014)	Water Quality Parameters	Monitoring of metal and metalloid concentrations should continue in accordance with EPL No. 5877.
		Monitoring of ammonia concentration levels at Point 17 (BH10) should continue in accordance with EPL No. 5877.
		Nitrate levels at Point 14 (BH7) should be reviewed during the next round of monitoring.^
ENRS (2014; 2015; 2016; 2017; 2018)		Hardness should continue to be calculated for future monitoring rounds to support calculation of Hardness Modified Trigger Values (HMTV) to assess levels of heavy metals against site-specific HMTV.
		Total Phosphorus concentrations should continue to be reported in accordance with EPL No.5877.
		Total Phenols concentrations should continue to be reported in accordance with EPL No.5877.
		Total Aluminium concentration levels should be reviewed after the next sampling event. Ongoing sampling including field filtering and dissolved metals analysis should be considered.
		Field filtering and dissolved metals analysis should be considered for future sampling for Copper concentrations.
ENRS (2014; 2015; 2016)		Results for Total Arsenic concentrations at Point 19 (BH12)* and Point 20 (BH13) should be reviewed following the next round of monitoring.
		Hexavalent Chromium (Dissolved Cr VI) should be removed from list of analytes in EPL No. 5877. [Note below]
ENRS (2017; 2018)		Hexavalent Chromium should continue to be reported in accordance with EPL No.5877.
ENRS (2017; 2018)		Concentrations of Cadmium should continue to be reported in accordance with EPL No.5877.
ENRS (2014; 2015; 2016; 2017; 2018)		Analysis for Dissolved Organic Carbon should be conducted to reduce the potential influence of sample turbidity.
		OCPs and OPPs should cease to be monitored if results continue to be below detectable levels.
ENRS (2017; 2018)		PAHs should cease to be monitored if results continue to be below detectable levels.
ENRS (2016)	Minor detections of hydrocarbons and BTEX were identified in BH10 and Leachate Pump House below the relevant assessment criteria and should be reviewed during subsequent monitoring events.	
ENRS (2017)	Concentrations of TRH should be reviewed after the next round of sampling.	
ENRS (2015; 2016; 2017; 2018)	Concentrations of metals in site waters should continue to be monitoring closely.	
ENRS (2014; 2015; 2016; 2017; 2018)	Comparison of Analyte Concentrations	Water quality results should continue to be sent to a suitably qualified environmental professional to compare analyte concentration levels against relevant guidelines to identify any irregularities so that additional testing can be conducted within the laboratory sample holding timeframes.
ENRS (2015; 2016; 2017; 2018)		Should future monitoring continue to identify elevated concentrations of metals in groundwater additional monitoring may be required to assess background conditions and potential off-site migration. Selected metals may also require speciation to support characterisation and source of potential contaminants.

Table 3-6 (Cont.) Detailed Recommendations for Improvement Opportunities

Report	Aspect	Detailed Recommendations
ENRS (2015; 2016)	Water Monitoring Point Inspections	The surface water sampling site (SW1) should be inspected during the next monitoring event to assess potential sources of ammonia.
ENRS (2015; 2016)		Surface water sampling sites should be inspected during the next monitoring event to identify potential sources of low DO.
ENRS (2015; 2016)		The surface water sampling site (SW2 and SW3) should be inspected during the next monitoring event to assess potential sources of low pH.
ENRS (2017)		BH20 should be re-inspected for indicators of contamination during the next round of sampling.
ENRS (2014; 2015; 2016; 2017; 2018)	Additional Groundwater Monitoring Bores	Should significant increases in analyte concentrations be reported, the need for additional monitoring locations, including groundwater bores, should be reviewed. Additional groundwater monitoring bores may be required up-gradient to characterise background conditions and downgradient to assess potential impacts (if any) to the surrounding environment. The groundwater monitoring network would benefit from additional sentinel bores positioned at greater distances from the landfill to support definition of background groundwater conditions, namely pH and metals concentrations.
ENRS (2014; 2015; 2016; 2017; 2018)	Drainage and Detention Structure Inspections	Annual inspections of drainage and detention structures should be conducted by a suitably qualified professional to assess their structure integrity and identify the need for maintenance, such as: removal of deep-rooted vegetation, removal of sediment build-up and re-lining.
ENRS (2015; 2016; 2017; 2018)	Upgrades to the Environmental Monitoring Network	Maintain vehicle access to all bores.
		High visibility standpipe marker posts should be installed to provide for ready identification by sample staff and reduce risk of damage by plant.
		Water level staff gauges should be installed at surface water and leachate sampling points to facilitate water level records and comparison of site conditions between events.
		Groundwater bores should be deepened or relocated which are reported as dry over more than three (3) successive sampling events. Bores BH11, BH19 and BH23 have been reported as being dry for more than ten (10) quarterly monitoring events. Bores BH2 and BH18 were reported as being dry for three (3) of the four (4) quarterly inspections during the 2017-2018 monitoring period.
ENRS (2018)		Groundwater bores at Bores BH2, BH11, BH18, BH19 and BH23 should be deepened to ensure compliance with Section 4.4 of <i>Environmental Guidelines: Solid Waste Landfills, Second Edition</i> (2016) which requires: <i>If the waste mass is above the groundwater level, the screened section of the well should extend through the upper 5 to 10 metres of the saturated aquifer, or into at least the first water-bearing zone in the case of fractured aquifers.</i>
ENRS (2015; 2016; 2017; 2018)	Precautionary Measures	Dams and holding ponds at the site should be aerated to reduce ammonia concentrations.
ENRS (2016)	Reporting	The results of the monitoring event (including key water quality indicators in LD1, Stage 3 Stormwater Pump and Sedimentation Dam) be documented in the Annual Report.
ENRS (2014; 2015; 2016; 2017; 2018)	Incidents and Potential Environmental Impacts	Should any change in site conditions or incident occur which causes a potential environmental impact, a suitable environmental professional should be engaged to further assess the site and consider requirements for any additional monitoring.

* Point 10 (BH3), Point 12 (BH5) and Point 19 (BH12A) have since been removed from EPL No. 5877.

^ The subsequent report noted that nitrate concentrations at BH7 had reduced significantly.

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	35

It is noted that in August 2014, the groundwater bores were redeveloped to remove silt and blockages to the bore screens to enable low flow sampling and purging where bore yields are suitable.

As discussed in **Section 2.5**, the EPA has recently requested SCC review the current environmental monitoring regime at the premises.

4.0 RECOMMENDATIONS

The recommendations and opportunities for improvement have been provided based on the outcomes of this environmental audit and are summarised in **Table 4-1**. Where relevant, the recommendations have been noted in the environmental audit tables (**Attachment 1**).

Table 4-1 Recommendations of this Environmental Audit and Opportunities for Improvement

Condition	Aspect	Recommendation
DA No. 90/3061 – Condition 5	Maintain Acceptable Standards – Properly Monitor the Impact of Development	SCC should review and, where considered necessary, revise the conditions of DA No. 90/3061 (as amended) to reflect the relevant outcomes of this environmental audit, when assessing and reconsidering Condition 5. <i>[NB: SCC has sought an extension to the approved use period from 29 years to 49 years which is currently the subject of assessment / reconsideration]</i>
DA No. 90/3061 – Conditions 6 to 9	Maintain Acceptable Standards – Environmental Protection	SCC should review and, where considered necessary, revise the Landfill Environmental Management Plan (LEMP) to reflect the requirements of DA No. 90/3061 Conditions 6 to 9 (as amended). Relevant guidelines, standards and policies should be referred to where applicable.
DA No. 90/3061 – Conditions 7(a) & 20	Maintain Acceptable Standards – Dam Sizing & Monitoring	SCC should consider engaging a suitably qualified professional to confirm the sizing / catchment of the existing leachate dam and sediment pond are appropriately designed considering the as-built Stage 1-3 drainage layout, design recurrence interval, duration and freeboard requirements (in accordance with the EPA's <i>Environmental Guidelines: Solid Waste Landfills</i> [2016], if applicable). The LEMP should then be reviewed and, if considered necessary, updated accordingly to include a monitoring program and reference to the Department of Environment and Conservation NSW <i>Managing Urban Stormwater: Soils and Construction Volume 2B Waste Landfills</i> (Landcom, 2008a).
DA No. 90/3061 – Conditions 7(d)-(k) & 22	Maintain Acceptable Standards – Solid Waste Landfills	If the opportunity presents as described above for DA No. 90/3061 Condition 5, SCC should review and, where considered necessary, revise the conditions of DA No. 90/3061 (as amended) to reflect the contemporary requirements of the EPA's <i>Environmental Guidelines: Solid Waste Landfills</i> (2016).
DA No. 90/3061 – Condition 8(a) & Dot Point	Maintain Acceptable Standards – Groundwater Monitoring and Leachate System Improvement Works	SCC should review the current environmental monitoring regime at the premises in line with the recent EPA requests, and continue the groundwater investigations to acquire sufficient information to inform a Remediation Action Plan for the former unlined Stage 1 landfill area. More specifically, and in line with the recommendations for EPL Condition R1.8 below, the groundwater monitoring network should be reviewed, and if necessary revised to reflect the relevant requirements of Section 4.4 of the EPA's <i>Environmental Guidelines: Solid Waste Landfills</i> (2016) and reconsider past DLWC recommendations for monitoring parameters.
DA No. 90/3061 – Condition 18	Maintain Acceptable Standards – Vehicle Access	SCC should review the LEMP and, if considered necessary, update to include reference to the EPA's <i>Managing Urban Stormwater: Soils and Construction Volume 2C Unsealed Roads</i> (2008b) as referred in accordance with the EPA's <i>Environmental Guidelines: Solid Waste Landfills</i> (2016).
DA No. 90/3061 – Condition 21	Maintain Acceptable Standards – Environmental Performance	SCC should consider increasing the frequency of environmental audits to align with the contemporary DPE guideline <i>Independent Audit Post Approval Requirements June 2018</i> of intervals no greater than three (3) years to maintain acceptable standards and to ensure satisfactory compliance.

Table 4-1 (Cont.) Recommendations of this Environmental Audit and Opportunities for Improvement

Condition	Aspect	Recommendation
DA No. 90/3061 – Conditions 24-25 / Standard Condition 9	Maintain Acceptable Standards – Revegetation & Rehabilitation	SCC should review and, if considered necessary, revise the Landscape Management Plan (as part of the LEMP) to reflect the requirements of the approved revegetation plan (for the Sandy Creek buffer), the approved rehabilitation and revegetation plan (for landfill areas) and recognise the habitat corridors under the Shoalhaven LEP 2014.
DA No. 90/3061 – Condition [c]	Extension Modification – Consultation	SCC should consider consulting with the relevant Illawarra Council(s) (e.g. Wingecarribee, Wollongong, Shellharbour, Kiama) in relation to currently proposed extension augmentation (i.e. DA No. 90/3061 Condition 5).
DA No. 90/3061 – Standard Condition 1	Maintain Acceptable Standards – Development Generally	SCC should review and confirm that the development complies with the requirements of the Shoalhaven LEP 2014, and all applicable codes, plans and designs duly adopted by SCC.
EPL No. 5877 – Condition L2.4	Concentration Limits – Overflow Events	SCC should ensure that that comparisons are made in future Annual Returns against the limit conditions prescribed in Condition L2.4 if overflow events are to occur.
EPL No. 5877 – Condition R1.7	Maintain Acceptable Standards – Water Quality Analysis and Interpretation	The next Annual Report for the West Nowra Recycling and Waste Facility Stages 1 to 3, for data collected during the audit scope period after the last Annual Report (i.e. from 30 October 2018 to 24 May 2019), should reflect any new information published in the revised Australian and New Zealand Guidelines for Fresh & Marine Water Quality (2018) if available when analysing and interpreting the monitoring data. Provision of future Annual Reports to NSW Department of Industry – Water should also be considered.
EPL No. 5877 – Condition R1.8 (& P1.3)	Opportunities for Improvement – Detailed Recommendations	The detailed recommendations included in the Annual Environmental Monitoring Results reports, included as an attachment to each Annual Report, should be carried forward in the Annual Report with SCC accountabilities and timeframes for implementation to improve the environmental performance at the premises.
EPL No. 5877 – Condition R4.1	Reporting Conditions – Fires	SCC should review and, where considered necessary, update the Site Emergency Procedure Manual to reflect the reporting requirements of Condition R4.1 in EPL No. 5877 in relation to fires occurring at the premises.
EPL No. 5877 – Condition M2.2 & M2.4	Monitoring & Recording Conditions – Gas Test Methods	The Annual Environmental Monitoring Results Reports and Landfill Surface Gas Emission Monitoring Reports should clarify that testing is conducted in accordance with Benchmark Technique Number 18 of the Environmental Guidelines: Solid Waste Landfills (1996). Results reported should also be converted from ppm to percent by volume to allow direct comparison with the corresponding threshold of 1.25% methane (v/v) prescribed in the guidelines.
EPL No. 5877 – Condition M3.1 & M3.2	Monitoring & Recording Conditions – Approved Methods	The Annual Environmental Monitoring Results Reports and Landfill Surface Gas Emission Monitoring Reports should clarify that testing is conducted in accordance with the Approved Methods Publications, unless another method has been approved by the EPA in writing.
EPL No. 5877 – Condition M4.2	Monitoring & Recording Conditions – Complaints	Complaint response procedures at the West Nowra Recycling and Waste Facility should be documented in the LEMP to reflect all the details required by EPL Condition M4.2, if and when a complaint is received.

Table 4-1 (Cont.) Recommendations of this Environmental Audit and Opportunities for Improvement

Condition	Aspect	Recommendation
EPL No. 5877 – Condition M5.2	Monitoring & Recording Conditions – Complaints	SCC should consider specifying on the SCC website and/or notify the public by other means that the general enquiries telephone number (02 4429 3111) is a complaints line.
EPL No. 5877 – Condition M6.1	Monitoring & Recording Conditions – Irrigation	SCC should review the monitoring records of application of leachate to the licenced utilisation (irrigation) area for the 2016-17 & 2017-18 period and amend future reporting of activities in the next Annual Report.
EPL No. 5877 – Condition M7.1	Monitoring & Recording Conditions – Remaining Capacity	SCC should confirm the remaining disposal capacity, subject to clarification of the (approved) total design/holding capacity for Stages 1-3 as defined in Condition 3 of DA No. 90/3061, and any inconsistency rectified for future reporting.

4.1 NON-COMPLIANCES

As described in **Section 3.2**, twelve (12) ‘Non-Compliant (Low)’ outcomes were identified during the course of this environmental audit.

Five (5) of the 12 ‘Non-Compliant (Low)’ outcomes (Conditions 7[e], 7[g], 7[i], 7[k] and 22) are a direct consequence of DA No. 90/3061 conditions which do not reflect contemporary practices approved by the EPA or as outlined in *Environmental Guidelines: Solid Waste Landfills* (EPA, 2016).

As recommended in **Table 4-1**, if the opportunity presents when assessing and reconsidering DA No. 90/3061 Condition 5, SCC should review and, where considered necessary, revise the conditions of DA No. 90/3061 (as amended) to reflect the contemporary practices and requirements of the EPA’s *Environmental Guidelines: Solid Waste Landfills* (2016).

Three (3) of the 12 ‘Non-Compliant (Low)’ outcomes (EPL No. 5877 Conditions L2.1, L2.2 and L2.4) relate to the analysis and reporting of the June 2016 overflow event in the Annual Return, however it is noted that relevant comparisons and discussion was included in a separate letter report by ENRS (2016). Nevertheless, it is recommended that comparisons against limit conditions be stipulated in future Annual Returns (**Table 4-1**).

Two (2) of the 12 ‘Non-Compliant (Low)’ outcomes (EPL No. 5877 Condition P1.3 and Condition 20 of DA No. 90/3061) are relevant to the current review of environmental monitoring requested by the EPA and ongoing leachate dam and groundwater investigations. As recommended in **Table 4-1**, SCC should consider engaging a suitably qualified professional to confirm the sizing / catchment of the existing leachate dam and sediment pond are appropriately designed considering the as-built Stage 1-3 drainage layout, design recurrence interval, duration and freeboard requirements (in accordance with the EPA’s *Environmental Guidelines: Solid Waste Landfills* [2016]⁵, if applicable).

⁵ The EPA’s *Environmental Guidelines: Solid Waste Landfills* (2016) relevantly states (for leachate): “The dam must have a freeboard that can accept rainfall directly on the dam from a 24-hour rainfall event with a 1-in-25-year average recurrence interval without overflowing.”

The LEMP should then be reviewed and, if considered necessary, updated accordingly to include a monitoring program and reference to the Department of Environment and Conservation NSW *Managing Urban Stormwater: Soils and Construction Volume 2B Waste Landfills* (Landcom, 2008a). Timeframe commitments for the pumping out and transfer of contained water from dams following significant rainfall events to re-establish appropriate freeboard capacity should also be included in the LEMP.

The detailed recommendations included in the Annual Environmental Monitoring Results reports (**Table 3-6**), included as an attachment to each Annual Report, should also be carried forward in the Annual Report with SCC accountabilities and timeframes for implementation to improve the environmental performance at the premises (**Table 4-1**).

Whilst previous environmental audits required by Condition 21 of DA No. 90/3061 were not available, this environmental audit has been conducted in accordance with Condition 21 of DA No. 90/3061 for the West Nowra Recycling and Waste Facility Stages 1 to 3 for the period 24 May 2014 to 24 May 2019. It is recommended future environmental audits be carried out at intervals no greater than three (3) years to align with contemporary DPE (2018) guideline requirements (**Table 4-1**).

Each of the Annual Returns for EPL No. 5877 concluded in Part C Statement of Compliance – Licence Conditions that all conditions of the licence were complied with (including monitoring and reporting requirements), with the exception of two (2) non-compliances for monitoring at Points 25 and 27 which occurred in October 2016. The reported non-compliances related to the logger downloads which the EPA subsequently confirmed had been rectified and appropriate action was taken. No further recommendations are therefore necessary.

The one (1) administrative non-compliance relates to the notification requirements for the telephone complaints line as prescribed in EPL No. 5877, however it is noted that a general enquiries telephone line (02 4429 3111) has been maintained during business hours that provides the opportunity to members of the public to make a complaint (**Section 3.6**). SCC should consider specifying on the SCC website and/or notify the public by other means that the general enquiries telephone number (02 4429 3111) is a complaints line (**Table 4-1**).

4.2 NOT VERIFIED

In addition to the recommendations provided for each “Non-Compliant (Low)” outcomes, recommendations for Conditions of DA No. 90/3061 and EPL No. 5877 for which a “Not Verified” outcome was identified and are included in **Table 4-1**, and relate to the following (**Attachment 1**):

- DA No. 90/3061 Conditions 1 (Standard Conditions 1 & 9), 3, 8, 16, and [c]; and
- EPL No. 5877 Conditions L4.1, M2.2, M2.4, M3.1, M3.2, M7.1 and R2.1.

4.3 OPPORTUNITIES FOR IMPROVEMENT

During the course of the environmental audit it was recognised that while some requirements were unable to be verified and many “Not Triggered” outcomes were made (i.e. beyond the 5-year period of the audit scope), a number of relevant improvement opportunities were identified (including management plans and sub-plans) and have been included in the environmental audit tables (**Attachment 1**).

All recommendations and opportunities for improvement are collectively provided in **Table 4-1**.

5.0 CONCLUSION

An environmental audit has been conducted in accordance with Condition 21 of DA No. 90/3061 for the West Nowra Recycling and Waste Facility Stages 1 to 3 for the period 24 May 2014 to 24 May 2019.

Whilst a number of pre-commencement / building application and building approval requirements which pre-date the scope of this environmental audit were not triggered or considered any further in the environmental audit, it was recognised that the environmental management plans, monitoring and reporting practices currently in place at the West Nowra Recycling and Waste Facility Stages 1 to 3 have evolved and been streamlined to meet, in most cases, contemporary requirements.

Based on the audit findings, it is however recommended that a number of the management plans, monitoring programs and procedures be reviewed, and if necessary, revised to ensure compliance with the specific requirements of DA No. 90/3061 (as amended), in particular to reflect the requirements of the EPA's *Environmental Guidelines: Solid Waste Landfills* (2016).

In conclusion, the existing environmental management framework, roles and responsibilities appear to provide for effective compliance, albeit with some improvements to be made. Landfilling activities were in operation at the time of the site inspection and contained within the approved extents of the development footprint, and monitoring and control measures (including review and response protocols) considered to be sound.

Importantly, it is also noted that the SCC has introduced and implemented industry best practices for landfilling and resource recovery at the premises and therefore the Stage 1 to 3 landfill life expectancy has been extended by several years. With the potential staged integration with the neighbouring West Nowra Resource Recovery Facility (SSD 15_7015) and the proposed landfill extension at Stage 4 (SSD 15_7187) it could further extend an additional 20 years (combined)⁶. Thus, independent environmental audits should be carried out at intervals no greater than three (3) years to align with contemporary DPE guideline requirements to maintain acceptable standards and to ensure satisfactory compliance.

It is also understood that the NSW DPE (correspondence dated 22 September 2017) has indicated a preference for the West Nowra Recycling and Waste Facility to operate under a single, modern planning approval and to consider surrendering all existing planning approvals for the facility (i.e. DA No. 90/3061 [as amended]). Given the relative number of "not verified" compliance status conditions identified during this environmental audit, and recognising that a modification of DA No. 90/3061 [as amended] is currently the subject of assessment by SCC, it is recommended that a response to this environmental audit be prepared in advance of considering the option to surrender all existing development consents (particularly if amendments are made by SCC in accordance with Condition 5 of DA No. 90/3061).

⁶ The Waste Services Unit SSC has separately sought (Application DS19/1237 received by SCC 3 June 2019) to modify (by Section 96 Amendment) Condition 5 of DA No. 90/3061 to increase the approved use period from 29 years to 49 years (i.e. to 24 May 2040).

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	42

6.0 REFERENCES

- ALS (2018a) *Quality Work Instruction Sampling from Lakes and Reservoirs*. Document Number: QWI-EN/67.04.
- ALS (2018b) *Quality Work Instruction Sampling from Rivers and Streams*. Document Number: QWI-EN/67.06.
- ALS (2018c) *Quality Work Instruction Sampling of Groundwaters*. Document Number: QWI-EN/67.11.
- ALS Environmental (2014a) *West Nowra Landfill Surface Gas Emission Monitoring*. Report dated 21 February 2014.
- ALS Environmental (2014b) *West Nowra Landfill Surface Gas Emission Monitoring*. Report dated 6 August 2014.
- ALS Environmental (2015a) *West Nowra Landfill Surface Gas Emission Monitoring*. Report dated 20 February 2015.
- ALS Environmental (2015b) *West Nowra Landfill Surface Gas Emission Monitoring*. Report dated 31 August 2015.
- ALS Environmental (2016a) *West Nowra Landfill Surface Gas Emission Monitoring*. Report dated 11 February 2016.
- ALS Environmental (2016b) *West Nowra Landfill Surface Gas Emission Monitoring*. Report dated 26 August 2016.
- ALS Environmental (2017a) *West Nowra Landfill Surface Gas Emission Monitoring*. Report dated 24 February 2017.
- ALS Environmental (2017b) *West Nowra Landfill Surface Gas Emission Monitoring*. Report dated 24 August 2017.
- ALS Environmental (2018a) *West Nowra Landfill Surface Gas Emission Monitoring*. Report dated 15 February 2018.
- ALS Environmental (2018b) *West Nowra Landfill Surface Gas Emission Monitoring*. Report dated 29 August 2018.
- ALS Environmental (2019) *West Nowra Landfill Surface Gas Emission Monitoring*. Report dated 27 February 2019.
- ANZECC & ARMCANZ (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand.
- ANZG (2018) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Governments and Australian State and Territory Governments, Canberra ACT, Australia. Available at www.waterquality.gov.au/anz-guidelines.

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	43

- ASSMAC (1998) *Acid Sulfate Soils Assessment Guidelines*. NSW Acid Sulfate Soils Management Advisory Committee. August 1998.
- Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I, (Editors) (2019) *Australian Rainfall and Runoff: A Guide to Flood Estimation*. Commonwealth of Australia.
- City Services & Operations Group, Shoalhaven City Council (2008) *West Nowra Recycling and Waste Facility Landscape Management Plan December 2008 Review of Landscape Maintenance*. Report dated December 2008.
- Department of Environment and Conservation (DEC) NSW (2004a) *Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales*. March 2004.
- Department of Environment and Conservation (DEC) NSW (2004b) *Environmental Guidelines: Composting and Related Organics Processing Facilities*. July 2004.
- Department of Environment and Conservation (DEC) NSW (2004c) *Environmental Guidelines: Use of Effluent by Irrigation*. October 2004.
- Department of Environment and Conservation (DEC) NSW (2006a) *Technical Framework: Assessment and Management of Odour from Stationary Sources in NSW*. November 2006.
- Department of Environment and Conservation (DEC) NSW (2006b) *Technical Notes: Assessment and Management of Odour from Stationary Sources in NSW*. November 2006.
- Department of Environment and Conservation (DEC) NSW (2007a) *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*. January 2007.
- Department of Environment and Conservation (DEC) NSW (2007b) *Guidelines for the Assessment and Management of Groundwater Contamination*. March 2007.
- Department of Environment and Energy (2017) *National Greenhouse and Energy Reporting Scheme Measurement – Technical Guidelines for the Estimation of Emissions by Facilities in Australia*. October 2017.
- Department of Environment, Climate Change and Water NSW (DECCW) (2009) *Waste Classification Guidelines Part 1: Classifying Waste*. Revised December 2009 (originally published April 2008).
- Department of Environment, Climate Change and Water NSW (DECCW) (2011) *NSW Road Noise Policy*. March 2011.
- Department of Planning (DoP) (2011). *Hazardous and Offensive Development Application Guidelines Applying SEPP 33*.
- Department of Planning and Environment (DPE) (2015) *Illawarra-Shoalhaven Regional Plan*. Report dated November 2015.
- Department of Planning and Environment (DPE) (2018) *Independent Audit - Post Approval Requirements*. June 2018.

- Department of Primary Industries – Water (2012) *NSW Aquifer Interference Policy: NSW Government Policy for the Licensing and Assessment of Aquifer Interference Activities*. September 2012.
- Department of Primary Industries – Water (2015) *Recycled Water Guidance Document: Recycled Water Management Systems*. May 2015.
- Department of Urban Affairs and Planning (DUAP) & Environment Protection Authority (1998) *Managing Land Contamination Planning Guidelines SEPP 55-Remediation of Land*. Reprinted April 1999 (originally printed August 1998).
- Douglas Partners Pty Ltd (1995) *Report on Landfill Liner Investigation, Proposed West Nowra Landfill Stage 2 Nowra*. July 1995.
- Environment & Natural Resource Solutions (ENRS) (2014a) *Groundwater Monitoring Plan (GWP), West Nowra Recycling and Waste Facility, 120 Flatrock Road Mundamia, NSW 2540, Environment Protection Licence (EPL) 5877*. Report dated 22 January 2014.
- Environment & Natural Resource Solutions (ENRS) (2014b) *Annual Environmental Monitoring Results 30 October 2013 – 29 October 2014, West Nowra Recycling and Waste Facility, 120 Flatrock Road Mundamia, NSW 2540, Environment Protection Licence (EPL) 5877*. Report dated 18 December 2014.
- Environment & Natural Resource Solutions (ENRS) (2015) *Annual Environmental Monitoring Results 30 October 2014 – 29 October 2015, West Nowra Recycling and Waste Facility, 120 Flatrock Road Mundamia, NSW 2540, Environment Protection Licence (EPL) 5877*. Report dated 18 December 2015.
- Environment & Natural Resource Solutions (ENRS) (2016a) *Overflow Water Quality Monitoring Event (07/06/2016) West Nowra Recycling and Waste Facility (EPL 5877) 120 Flatrock Road Mundamia, NSW*. Report dated 15 June 2016.
- Environment & Natural Resource Solutions (ENRS) (2016b) *Annual Environmental Monitoring Results 2015-2016, West Nowra Recycling & Waste Facility, 120 Flatrock Road Mundamia, NSW, 2540, Environment Protection Licence (EPL) 5877*. Report dated 21 December 2016.
- Environment & Natural Resource Solutions (ENRS) (2017) *Annual Environmental Monitoring Results 2016-2017, West Nowra Recycling & Waste Facility, 120 Flatrock Road Mundamia, NSW, 2540, Environment Protection Licence (EPL) 5877*. Report dated 11 December 2017.
- Environment & Natural Resource Solutions (ENRS) (2018) *Annual Environmental Monitoring Results 2017-2018, West Nowra Recycling & Waste Facility, 120 Flatrock Road Mundamia, NSW, 2540, Environment Protection Licence (EPL) 5877*. Report dated 12 December 2018.
- Environment Protection Authority (1996) *Environmental Guidelines: Solid Waste Landfills*. January 1996.

- Environment Protection Authority (1999) *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes*.
- Environment Protection Authority (2000a) *NSW Industrial Noise Policy (2000)*. January 2000.
- Environment Protection Authority (2000b) *Environmental Guidelines: Use and Disposal of Biosolids Products*. December 2000.
- Environment Protection Authority (2003) *Contaminated Sites: Guidelines on Significant Risk of Harm from Contaminated Land and the Duty to Report*. Revised July 2003 (originally published April 1999).
- Environment Protection Authority (2014) *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*. December 2014.
- Environment Protection Authority (2015) *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*. September 2015.
- Environment Protection Authority (2016) *Environmental Guidelines: Solid Waste Landfills. Second Edition, 2016*. April 2016.
- Environment Protection Authority (2017) *Noise Policy for Industry*. October 2017.
- Forbes Rigby Pty Ltd (1996) *Report on Groundwater Hydrology of Proposed West Nowra Landfill – Stage 2*. August 1996.
- GHD (2015) *Shoalhaven City Council West Nowra Resource Recovery Park EIS Noise Assessment*. November 2015.
- GHD (2018a) *Shoalhaven City Council Geotechnical Services, West Nowra Recycling and Waste Facility Mundamia, Report*. April 2018.
- GHD (2018b) *Shoalhaven City Council West Nowra Recycling and Waste Facility Construction Quality Assurance Plan Landfill Cell Stage 3E-2*. Report dated August 2018.
- GHD (2018c) *Shoalhaven City Council West Nowra Recycling and Waste Facility Construction Quality Assurance Report Landfill Cell Stage 3E-2*. Report dated October 2018.
- Kevin Mills & Associates Pty Limited (1994) *West Nowra Landfill Depot Revegetation Plan*. Waste Service NSW Shoalhaven City Council. December 1994.
- Landcom (2008a) *Managing Urban Stormwater: Soils and Construction Volume 2B Waste Landfills*.
- Landcom (2008b) *Managing Urban Stormwater: Soils and Construction Volume 2C Unsealed Roads*.
- Locale Consulting Pty Ltd (2015) *Proposed Extension to Existing Landfill West Nowra Recycling and Waste Facility State Significant Development Application Supporting Document*. Prepared for Shoalhaven City Council. July 2015.
- NSW Government (2015) *Independent Audit Guideline - Post-Approval Requirements of State Significant Developments*. October 2015.

- Shoalhaven City Council (2008) *Landfill Environmental Management Plan – West Nowra Recycling and Waste Facility*. Report dated April 2008.
- Shoalhaven City Council (2014) *Annual Report – West Nowra Recycling and Waste Facility 2013 / 2014*.
- Shoalhaven City Council (2017a) *Waste Reduction Management Strategy – 2017/18 to 2021-22*.
- Shoalhaven City Council (2017b) *Waste Services Pollution Incident Notification Procedure*.
- Shoalhaven City Council (2018) *Landfill Cell Stage 3F – Preliminary Design and Construction Specifications*. Report dated 20 November 2018.
- Sinclair Knight and Partners (SK&P) (1990) *Proposed Extensions to West Nowra Waste Depot. Statement of Environmental Effects*. Shoalhaven City Council. Report dated June 1990.
- State of NSW and EPA (2012) *Environmental Guidelines: Preparation of Pollution Incident Response Management Plans*.
- State of NSW and EPA (2014) *Waste Classification Guidelines Part 1: Classifying Waste*. November 2014.
- Transport for NSW (2014) *Illawarra Regional Transport Plan*. Report dated March 2014.
- Waste Recycling & Processing Service of NSW (1994) *West Nowra Landfill Depot Management Plan*. October 1994.
- Waste Service NSW (1994) *Shoalhaven City Council West Nowra Waste Depot – Surface Water Management Plan*. December 1994.
- Waste Services Unit, Shoalhaven City Council (2015) *Annual Report – 2014 / 2015 – West Nowra Recycling and Waste Facility, Flatrock Road West Nowra*.
- Waste Services Unit, Shoalhaven City Council (2016) *Annual Report – 2015 / 2016 – West Nowra Recycling and Waste Facility, Flatrock Road West Nowra*.
- Waste Services Unit, Shoalhaven City Council (2017) *Annual Report – 2016 / 2017 – West Nowra Recycling and Waste Facility, Flatrock Road West Nowra*.
- Waste Services Unit, Shoalhaven City Council (2018) *Annual Report – 2017 / 2018 – West Nowra Recycling and Waste Facility, Flatrock Road West Nowra*.
- Waste Services Unit, Shoalhaven City Council (2019) *Pollution Incident Response Management Plan PIRMP – West Nowra Recycling and Waste Facility*. Report dated 25 March 2019.

7.0 ABBREVIATIONS AND ACRONYMS

AEC	Areas of Environmental Concern
ANC	Administrative Non-Compliance
ANZECC	Australian and New Zealand Environment and Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
AS	Australian Standard™
ASSMAC	Acid Sulfate Soils Management Advisory Committee
BTEX	Benzene Toluene Ethylbenzene Xylenes
CaLM	Conservation and Land Management (Department of)
CCC	Community Consultative Committee
CQA	Construction Quality Assurance
DA	Development Application
DEC	Department of Environment and Conservation
DECCW	Department of Environment, Climate Change and Water
DIPNR	Department of Infrastructure, Planning and Natural Resources
DLWC	Department of Land and Water Conservation
DNR	Department of Natural Resources
DO	Dissolved Oxygen
DoI	Department of Industry
DP	Deposited Plan
DPE	Department of Planning and Environment
DPIE	Department of Planning, Industry and Environment
DUAP	Department of Urban Affairs and Planning
EC	Electrical Conductivity
EIS	Environmental Impact Statement
ENRS	Environment & Natural Resource Solutions
EPA	Environment Protection Authority
EPL	Environmental Protection Licence

EMS	Environmental Management System
GMP	Groundwater Monitoring Plan
HB	Handbook
HDPE	High Density Polyethylene
HMTV	Hardness Modified Trigger Values
ISO	International Organization for Standardization
LEMP	Landfill Environmental Management Plan
LGA	Local Government Area
LMP	Landscape Management Plan
LOR	Limit of Reporting
No.	Number
NOW	NSW Office of Water
NRAR	Natural Resource Access Regulator
NPWS	National Parks and Wildlife Service
NSW	New South Wales
OCP	Organochlorine Pesticides
OEH	Office of Environment and Heritage
OPP	Organochlorine Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PIRMP	Pollution Incident Response Management Plan
QA/QC	Quality Assurance and Quality Control
Redox	Oxidation Reduction Potential
SAC	Site Assessment Criteria
SCC	Shoalhaven City Council
SCS	Soil Conservation Service
SEE	Statement of Environmental Effects
SEPP	State Environmental Planning Policy
SK&P	Sinclair Knight & Partners
SPCC	State Pollution Control Commission

SSD	State Significant Development
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TRH	Total Recoverable Hydrocarbons
TSS	Total Suspended Solids
The HG Institute	The Hydro-Geologie Institute
TPH	Total Petroleum Hydrocarbons
VENM	Virgin Excavated Natural Material
μS/cm	MicroSiemens per centimetre

ATTACHMENT 1
ENVIRONMENTAL AUDIT TABLES

Table A1-1
Conditions of DA No. 90/3061 [24 May 1991] including Amendments [14 December 1994 and 17 September 1996]

DEVELOPMENT CONSENT (ID)	REQUIREMENT (SUMMARY)	EVIDENCE COLLECTED	AUDIT FINDINGS	COMPLIANCE STATUS ^A
General – 1	Compliance with Standard Conditions, where applicable, a copy of which is attached.	Standard Conditions are provided in Table A1-2 below.	Refer to Table A1-2 .	Refer to Table A1-2 .
General – 2	This consent relates to extensions to waste depot as illustrated on plan(s) submitted with development application number 90/3061. Any alteration to the abovementioned plan(s) shall be submitted for the approval of the City Planner prior to submission of the building application.	DA lodged 23-Oct-1990. Plan of Lots 436 & 437 DP 808415. Site interview (27 June 2019). The original plan(s) submitted with DA No. 90/3061, and any alterations, and City Planner approval correspondence was initially requested however was agreed to be beyond the audit scope period.	Refer to Table 1-1 . Approval timeframe (<i>prior to submission of the building application</i>) pre-dates and is beyond the 5-year scope of this environmental audit.	Not Triggered.
	No works, other than those approved under this consent, shall be carried out without first having obtained Council's written consent.	Refer to below conditions.	Refer to below conditions.	Noted.
General – 3	In accordance with the assessment undertaken, the proposed extensions are approved in the three (3) consecutive stages and related locations as indicated on Figure No. 3 (included with the Statement of Environmental Effects prepared on Shoalhaven City Council's behalf by Sinclair Knight & Partners). The life expectancy and capacity of each stage is as follows:	Figure No. 3 in SEE prepared by SK&PM (June 1990) – Refer Figure 1 . Six-Month Volumetric Surveys* received between December 2013 – December 2018. Landfill total design capacity stated as 2,066,119 m ³ , with void space remaining at: December 2013 = 962,117 m ³ ; and December 2018 = 708,090 m ³ .	Extensions have occurred in three (3) consecutive stages in general accordance with Figure No. 3 (Figure 1). Stage 1 & Stage 2 landfilling activities pre-date and are beyond the 5-year scope of this environmental audit. Rehabilitation works have been undertaken at Stage 1. It is noted the landfill total design capacity reported in the Six-Month Volumetric Surveys as being available exceeds the combined approved holding capacity for Stages 1-3 of 1,964,717 m ³ in DA No. 90/3061, however the current void space remaining indicates is yet to exceed, and Volumetric Surveys show "Area included in Change of Void Space" as pink dotted line. Refer to EPL Condition M7.1 .	Not Verified.

	Stage 1 - North of the existing depot, and west to the existing 38 m AHD contour, comprises 421,317 cubic metres and life expectancy of 8 years.	Six-Month Volumetric Surveys* received between December 2013 – December 2018 show no landfill change at Stage 1. Site interview and inspection (27 June 2019) (Plates 22 & 23).	Besides the built infrastructure, only rehabilitation works have occurred at Stage 1 during 5-year scope and used for stockpiling and irrigation (utilisation) area. Volumetric survey plans show the western extent of Stage 1 to the existing 38 m AHD contour. Stage 1 works pre-date and are beyond the 5-year scope of this environmental audit.	Not Triggered.
	Stage 2 - West of the existing depot comprises 5 trenches with a holding capacity of 453,600 cubic metres and life expectancy of 8 years.	Six-Month Volumetric Surveys* received between December 2013 – December 2018 show no landfill change at Stage 2. Site interview and inspection (27 June 2019).	Only rehabilitation works have occurred at Stage 2 during 5-year scope and used for stockpiling.	Not Triggered.
	Stage 3 - South of the existing depot comprises 9 trenches with a holding capacity of 1,089,800 cubic metres and life expectancy of 13 years.	Six-Month Volumetric Surveys* received between December 2013 – December 2018 show Cells 3A to 3I (9 trenches). Site interview and inspection (27 June 2019) (Plates 27 & 28).	Stage 3 active landfilling activities. Six-Month Volumetric Surveys show a total of 9 trenches/cells as follows: 1. Cell 3A 2. Cell 3B/1 & 3B/2 3. Cell 3C/1 & 3C/2 [Landfill + Capping] 4. Cell 3D/1 & 3D/2 [Landfill] 5. Cell 3E/1 & 3E/2 [Base Prep.+Lined+Landfill] 6. Cell 3F/1 & 3F/2 [Anticipated July 2019] 7. Cell 3G/1 & 3G/2 8. Cell 3H 9. Cell 3I It is noted the landfill total design capacity reported in the Six-Month Volumetric Surveys as being available exceeds the combined approved holding capacity for Stages 1-3 of 1,964,717 m ³ in DA No. 90/3061, however the current void space remaining indicates is yet to exceed, and Volumetric Surveys show "Area included in Change of Void Space" as pink dotted line. Refer to EPL Condition M7.1 .	Not Verified.
General – 4	To ensure works associated with stages 2 and 3 are to the satisfaction of Council specific details regarding excavation of cover material, placement and construction of bunds and ponds, access, car parking, sediment and erosion control measures and leachate treatment and disposal associated with	Landfill Environmental Management Plan [LEMP] (April 2008). Annual Reports (2013-2018). Six-Month Volumetric Surveys* received between December 2013 –	Refer to Table 1-1 . Approval timeframe (<i>prior to works and rehabilitation commencing</i>) pre-dates and is beyond the 5-year scope of this environmental	Not Triggered.

	later stages shall be submitted for approval of the City Planner prior to works and rehabilitation commencing.	December 2018. Site interview (27 June 2019). Specific details of works associated with stages 2 and 3, and City Planner approval correspondence was initially requested however was agreed to be beyond the audit scope period.	audit.	
General - 5	To ensure the future amenity of the location and in order to properly monitor the impact of the development, the approved use shall be limited for a period of 29 years from the endorsement date of the consent and the approved use shall lapse at the expiration of this period.	Record of Endorsement of Consent (24 May 1991).	29 Years from Endorsement Date is 24 May 2020. Refer below.	Compliant.
	The applicant may, however, prior to the expiration date, write to Council seeking reconsideration of this condition.	Application for Modification of Development Consent (DA No. 90/3061) dated 22 May 2019. Receipt of Application from Council dated 3 June 2019 (No. DS19/1237). Site interview (27 June 2019).	Council has sought an extension to the approved use period from 29 years to 49 years. Currently the subject of assessment / reconsideration. <i>It is recommended that in order to properly monitor the impact of the development, the Conditions of DA No. 90/3061 be reviewed and, where necessary, be revised to reflect the outcomes of this environmental audit.</i>	Not Verified.
Environmental Protection – 6	A comprehensive soil and water management plan is to be submitted for the approval of the City Health Surveyor prior to release of the building application. This plan shall be prepared by a suitably qualified professional independent of Council and in consultation with the Soil Conservation Service of New South Wales and fully detailed work procedures are required. The plan must incorporate details on the following: (a) Trench excavation. (b) Stockpiling. (c) Progressive capping and progressive final rehabilitation. (d) Clearing strategy. (e) Topsoil management. (f) Revegetation details (i.e. mulching, topsoil and subsoil testing, staging).	Landfill Environmental Management Plan [LEMP] (April 2008). Soil & Water Management Plan (Figure 2). Surface Water Management Plan. The City Health Surveyor approval correspondence, record of SCS consultation and suitably qualified independent professional details were initially requested however was agreed to be beyond the audit scope period. Site interview and inspection (27 June 2019).	Refer to Table 1-1 . Approval timeframe (<i>prior to release of the building application</i>) pre-dates and is beyond the 5-year scope of this environmental audit. Notwithstanding details of trench excavation (cut/fill), stockpiling (locations, type and volume), progressive works are shown on the Six-Month Volumetric Surveys* and other details are provided (in part) in the LEMP. Soil and mulching stockpiles were observed during the site inspection. <i>[Notwithstanding the above, it is recognised that since the original Development Application (DA No. 90/3061) was endorsed, and amended, more than 20 years ago, the relevant environmental management plans, monitoring and reporting practices and standards at the West Nowra Recycling and Waste Facility – Stages 1-3 have significantly evolved and been streamlined to reflect the introduction of, and changes to, NSW</i>	Not Triggered. (Not Verified)

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	A1-3

			<i>Government policy, legislation, departments, guidelines and licence conditions. as well as improved landfilling operations, implementation of best practices, and innovative and alternative landfilling/recycling practices. Therefore, it is recommended that the LEMP be reviewed and if necessary revised to incorporate relevant details of this condition]</i>	
Environmental Protection – 7	To ensure that development does not have an adverse environmental impact, the following shall be observed: (a) a detailed sediment and erosion plan shall be prepared to mitigate the potential impact of the development both during construction and upon completion. The plan shall incorporate a leachate management control system and sediment control system designed to contain the entire runoff from a 1:10 year storm event and sediment control ponds design to cater for a storm event up to 1:100 year recurrence. Such measures shall be provided for all three (3) stages of the development. The plan shall be prepared by a suitably qualified professional in consultation with the Soil Conservation Service of New South Wales and submitted with the Building Application for approval by a suitably qualified person to be nominated by the General Manager.	West Nowra Waste Depot Surface Water Management Plan (1994). First Flush Dam and Leachate Dam Civil Works [Plan No. 97/20] including Q100 Weir and Spillway. First Flush Dam and Leachate Dam – Civil Works [Plan Nos. 97/20 {Sheets 9, 10 & 11}] – Soil Erosion and Sediment Control Notes. Landfill Environmental Management Plan [LEMP] (April 2008). <i>Environmental Guidelines: Solid Waste Landfills</i> (2016) The original detailed sediment and erosion plan, suitably qualified person nominated by the General Manager approval correspondence, record of SCS consultation and suitably qualified professional details were initially requested however was agreed to be beyond the audit scope period. Site interview and inspection (27 June 2019) (Plates 24, 25, 26 & 28).	Refer to Table 1-1 . Approval timeframe (with the Building Application for approval) pre-dates and is beyond the 5-year scope of this environmental audit. Based on the Surface Water Management Plan (1994), the 10 year, 6 hour storm event was used to size the sediment control ponds. The one (1) reportable incident at the West Nowra Recycling and Waste Facility during the audit scope period relates to the sizing/overflow of the leachate dam. It is noted that Condition 7 of DA No. 90/3061 requires that the leachate management control system and sediment control system is to be “... <i>designed to contain the entire runoff from a 1:10 year storm event and sediment control ponds design to cater for a storm event up to 1:100 year recurrence. Such measures shall be provided for all three (3) stages of the development.</i> ” While the recurrence interval is prescribed, the Condition does not stipulate the duration to be considered (e.g. number of hours). It is also noted that EPA’s <i>Environmental Guidelines: Solid Waste Landfills</i> (2016) states (for leachate): “ <i>The dam must have a freeboard that can accept rainfall directly on the dam from a 24-hour rainfall event with a 1-in-25-year average recurrence interval without overflowing.</i> ” On the basis that the condition required that “... <i>measures shall be provided for all three (3) stages of the development</i> ”, there was not	Not Triggered. (Not Verified)

			sufficient verifiable evidence to confirm that an acceptable standard had been maintained. <i>[It is therefore recommended that the sizing of the existing system/ponds be confirmed by a suitably qualified professional that an appropriate design duration and freeboard is maintained]</i> <i>The Environmental Guidelines: Solid Waste Landfills</i> (2016) make reference to <i>Managing Urban Stormwater: Soils and Construction Volume 2B Waste Landfills</i> (NSW DECC, 2008a) and <i>Managing Urban Stormwater: Soils and Construction Volume 2C Unsealed Roads</i> (NSW DECC, 2008b). The next revision of the LEMP should therefore include reference to these contemporary standards. It is also worth noting that in 2016, and again in 2019, the national guideline document used for estimation of design flood characteristics in Australia, Australian Rainfall and Runoff (ARR), was updated (Ball J, et al, 2019). However, a search of the status of the SCC Shoalhaven flood program (https://www.shoalhaven.nsw.gov.au/Environment/Flood-Risk/Flood-program) shows that whilst flood risk mapping is not available for the premises (i.e. between Sandy Creek and Cabbage Tree Creek) the surface is >30mAH.	
	(b) A leachate treatment/disposal plan, addressing "contaminated" and "uncontaminated" runoff and underground and overland flow of leachate. In this regard, overland flow should be diverted around disturbed areas to prevent pollution of trenches. The leachate treatment/disposal plan shall be subject to approval by State Pollution Control Commission prior to works commencing. Such plan shall specify biological treatment and disposal of leachate by spray irrigation, with associated runoff controls from irrigated areas.	Leachate Management System Plan (November 1990) Leachate Collection Pipeline – Cell 2B [Plan Reference G267927] Construction Quality Assurance Plan Landfill Cell Stage 3E-2 (GHD, 2018b). Construction Quality Assurance Report Landfill Cell Stage 3E-2 (GHD, 2018c). Landfill Cell Stage 3F - Preliminary Design and Construction Specifications dated 20 November 2018. Landfill Environmental Management Plan [LEMP] (April 2008).	Refer to Table 1-1. Approval timeframe (<i>prior to works commencing</i>) pre-dates and is beyond the 5-year scope of this environmental audit for works prior to the 3E-2 Cell. The State Pollution Control Commission was abolished by the Protection of the Environment Administration Act, 1991 (Act No.60, 1991) and the Environment Protection Authority was established from 1 March 1992. Refer to EPL No. 5877 Condition O6.10. <i>[As referred above re: evolution, it is recommended that the LEMP be reviewed and if</i>	Not Triggered. (Not Verified)

Document ID	Version	Date		Page
HG-R7011	B	25 July 2019		A1-5

		Site interview and inspection (27 June 2019) (Plates 21, 24, 25, 26 & 28).	<i>necessary revised to incorporate relevant details of this condition, particularly in relation to description of biological treatment and irrigation runoff controls]</i>	
	(c) A detailed strategy plan addressing control of wind blown litter, disposal of vegetation and timber waste shall be prepared and submitted for the approval by a suitably qualified person to be nominated by the General Manager prior to release of the building approval.	Landfill Environmental Management Plan [LEMP] (April 2008). West Nowra Landfill Depot Management Plan (1994) (superseded). Details of the suitably qualified person nominated by the General Manager approval correspondence was requested however was agreed to be beyond the audit scope period. Site interview and inspection (27 June 2019) (Plates 13 & 14).	Refer to Table 1-1 . Approval timeframe (<i>prior to release of the building approval</i>) pre-dates and is beyond the 5-year scope of this environmental audit. Section 9.2.1 of the LEMP describes litter control at the premises. Litter patrols are conducted along the boundary fence by Flagstaff Group several times a week (Plates 9 & 10). Section 6.0 of the superseded West Nowra Landfill Depot Management Plan (1994) also includes the landfilling strategy. <i>[As referred above re: evolution, it is recommended that the LEMP be reviewed and if necessary revised to incorporate relevant details of this condition, particularly in relation to disposal of vegetation and timber waste]</i>	Not Triggered. (Not Verified)
	This strategy plan shall be clearly displayed for the information of all staff.	LEMP (April 2008). Site interview (27 June 2019).	The LEMP is available in the site office at the premises.	Compliant.
	(d) To reduce the risk of fire, odour and wind blown matter and vermin the trenches are to be covered with a minimum of 15 cm of soil or similar material at the end of every day and adequate gas vents implemented.	LEMP (April 2008). Annual Reports (2013-2018). PIRMP. Site interview and inspection (27 June 2019) (Plate 27). <i>Environmental Guidelines: Solid Waste Landfills</i> (2016).	The Annual Reports [#] summary of operations state: " <i>Daily covering of active waste landfilling areas</i> ". Feedback during the site interview confirmed the daily cover procedure was in accordance with the contemporary requirements of the EPA's <i>Environmental Guidelines: Solid Waste Landfills</i> (2016), i.e. 150 mm cover. It is noted that EPL No. 5877 Condition O6.4 allows for an approved alternative form of daily cover using an Automated Tarp Deployment System [ATDS] which is not reflected in Condition 7(d). While the adequacy of gas vents was not assessed as part of this audit scope, procedures are in place (PIRMP) including pre-emptive actions (for fire prevention) triggered by surface	Compliant.

			gas emissions monitoring and gas accumulation monitoring.	
	(e) If any deposit consists of mainly putrescible organic material it should be covered with 60 cm of soil or similar material.	LEMP (April 2008). Site interview (27 June 2019). <i>Environmental Guidelines: Solid Waste Landfills</i> (2016).	Feedback during the site interview confirmed the cover procedure at the premises was in accordance with the contemporary requirements of the EPA's <i>Environmental Guidelines: Solid Waste Landfills</i> (2016). The condition of DA No. 90/3061 does not currently reflect the EPA Guideline. <i>If the opportunity presents as described above for DA No. 90/3061 Condition 5, SCC should review, and if necessary revise the conditions of DA No. 90/3061 (as amended) to reflect the contemporary requirements of the EPA's Environmental Guidelines: Solid Waste Landfills (2016).</i>	Non-Compliant (Low)
	(f) No waste is to remain uncovered for in excess of 24 hours.	LEMP (April 2008). Site interview (27 June 2019). <i>Environmental Guidelines: Solid Waste Landfills</i> (2016).	Feedback during the site interview confirmed the cover procedure at the premises was in accordance with the contemporary requirements of the EPA's <i>Environmental Guidelines: Solid Waste Landfills</i> (2016), and is covered daily.	Compliant.
	(g) No layer of waste shall exceed 60 cms in depth.	Site interview (27 June 2019). <i>Environmental Guidelines: Solid Waste Landfills</i> (2016).	Feedback during the site interview confirmed the maximum layer of waste is 4 m in depth at the premises and the cover procedure was in accordance with the contemporary requirements of the EPA's <i>Environmental Guidelines: Solid Waste Landfills</i> (2016), and covered daily. The condition of DA No. 90/3061 does not currently reflect the EPA Guideline. <i>If the opportunity presents as described above for DA No. 90/3061 Condition 5, SCC should review, and if necessary revise the conditions of DA No. 90/3061 (as amended) to reflect the contemporary requirements of the EPA's Environmental Guidelines: Solid Waste Landfills (2016).</i>	Non-Compliant (Low)
	(h) To control wind-blown litter on-site, particularly from the westerly winds, the erection of a portable fence around the subject trench being filled shall be required. Details of type and location of fencing shall be submitted for approval by a suitably	LEMP (April 2008). Annual Reports (2013-2018). Site interview and inspection (27 June 2019).	Refer to Table 1-1 . A fixed chainwire fence exists around the perimeter of the Depot. Regular litter patrols are	Not Triggered. (Compliant)

	qualified person to be nominated by the General Manager prior to release of the building application.		carried out of the perimeter fencing to collect any windblown litter. Reporting of litter control is provided in Section 2.2 of the Annual Reports. The portable fence panels at the active tipping area to mitigate wind-blown litter at time of unloading waste was observed during the site inspection (Plate 11).	
	(i) To reduce wind-blown dust during periods of extending dry weather watering of unsealed areas and the strategic positioning of a series of steel posts supporting a wire mesh shall be necessary.	LEMP (April 2008). Annual Reports (2013-2018). Site Emergency Procedure Manual – West Nowra. Site interview (27 June 2019).	Section 9.2.4 of the LEMP outlines the dust controls available to use at the premises. As described in each Annual Report: “Dust suppression will be carried out daily and on an as needs basis.” The Site Emergency Procedure Manual – West Nowra includes reference to the Waste Services “Dust Control – Landfill Sites” Safe Work Instruction. Steel posts supporting a wire mesh are not utilised at the premises. The condition of DA No. 90/3061 does not currently reflect the EPA Guideline. <i>If the opportunity presents as described above for DA No. 90/3061 Condition 5, SCC should review, and if necessary revise the conditions of DA No. 90/3061 (as amended) to reflect the contemporary requirements of the EPA’s Environmental Guidelines: Solid Waste Landfills (2016).</i>	Non-Compliant (Low)
	(j) Following completion of filling in trenches, such (sic) be covered with 1 metre of final cover, compacted and revegetated with grass/turf cover as soon as practicable.	LEMP (April 2008). Site interview and inspection (27 June 2019) (Plates 22, 23 & 27). <i>Environmental Guidelines: Solid Waste Landfills</i> (2016).	Cover procedures are described in the LEMP. During the site interview it was explained that the final cover (capping) is carried out in accordance with the EPA’s <i>Environmental Guidelines: Solid Waste Landfills</i> (2016). Revegetated areas were observed for early stages at the premises (Plates 22 & 23).	Compliant.
	(k) Boundary corners of disturbed areas are to be clearly designated by galvanised posts set in concrete in that area of the land comprising the garbage depot to be classified as Unhealthy Building Land.	Site interview (27 June 2019).	Feedback during the site interview confirmed that landfill areas are managed in accordance with the EPA’s <i>Environmental Guidelines: Solid Waste Landfills</i> (2016).	Non-Compliant (Low)

			Galvanised posts set in concrete are not used at the premises nor is there any explicit classification as Unhealthy Building Land. The condition of DA No. 90/3061 does not currently reflect the EPA Guideline. <i>If the opportunity presents as described above for DA No. 90/3061 Condition 5, SCC should review, and if necessary revise the conditions of DA No. 90/3061 (as amended) to reflect the contemporary requirements of the EPA's Environmental Guidelines: Solid Waste Landfills (2016).</i>	
	(l) To ensure protection of sensitive creek environs no discharge shall be permitted into Mundami(a) Creek.	Annual Reports (2013-2018). Annual Returns (2014-2018). Site interview and inspection (27 June 2019) (Plates 24, 25 & 26).	There were no reported discharges to Mundamia Creek in the Annual Returns or Annual Reports during the audit period. The one (1) reportable incident at the West Nowra Recycling and Waste Facility which occurred during the audit scope period was to Sandy Creek.	Compliant.
	(m) The four existing eucalypt trees located along the western perimeter of the proposed extension of Stage 1, are to be retained, and a ten (10) metre buffer strip extending to the east of these trees is to be retained in an undisturbed state.	Site inspection and interview (27 June 2019).	Stage 1 works pre-date and are beyond the 5-year scope of this environmental audit. Several existing eucalypt trees located along the western perimeter of Stage 1, and associated buffer area, were however observed during the site inspection on 27 June 2019.	Not Triggered. (Compliant)
Environmental Protection – 8	To ensure the leachate management control system and sediment control system operate to optimum design capacity at all times, devices shall be regularly cleaned out of sediment and other build-ups which will potentially reduce the efficiency of the devices.	Landfill Environmental Management Plan [LEMP] (April 2008). <i>Environmental Guidelines: Solid Waste Landfills</i> (2016). Site interview and inspection (27 June 2019) (Plates 24, 25 & 26).	The LEMP lists “Quantity of sediment in sediment control structures” as a performance indicator and maintenance of sediment control structures the responsibility of the site supervisor. The EPA's <i>Environmental Guidelines: Solid Waste Landfills</i> (2016) make reference to <i>Managing Urban Stormwater: Soils and Construction Volume 2B Waste Landfills</i> (NSW DECC, 2008a) and <i>Managing Urban Stormwater: Soils and Construction Volume 2C Unsealed Roads</i> (NSW DECC, 2008b). The next revision of the LEMP should therefore include reference to these contemporary standards.	Not Verified.

	(a) A leachate collection system shall be installed and operational for the proposed extension of Stage 1, which will capture and convey all surface and subsurface flows of leachate to the existing leachate treatment and disposal system. Such system shall be installed prior to the placement of garbage in any area not serviced by the existing leachate collection system. When installing the subsurface leachate collection system care shall be exercised to ensure that all subsurface flows are collected and that adequate gradients exist on the collection lines to successfully convey all polluted material to the existing leachate collection system. This system shall be installed as detailed in the West Nowra Waste EPA Depot Licence.	EPL No. 5877. Annual Report (2018). Construction Quality Assurance Plan Landfill Cell Stage 3E-2 (GHD, 2018b). Construction Quality Assurance Report Landfill Cell Stage 3E-2 (GHD, 2018c). Site interview and inspection (27 June 2019) (Plates 24, 25 & 26).	Refer to Table A1-4. Stage 1 works pre-date and are beyond the 5-year scope of this environmental audit. Although it is reported in the 2017-18 Annual Report that initial results indicate that existing leachate management infrastructure is fit for purpose, a potential for groundwater contamination was identified below the depth of the current monitoring network, to the west of the former unlined Stage 1 landfill area and that: <i>"A remediation action plan will be prepared for EPA, outlining any proposed management strategies to mitigate potential risks and remediate any contaminated groundwater within the former unlined Stage 1 landfill area."</i> At the end of the audit scope period (24 May 2019), it is understood that the Waste Services Unit SCC is still investigating to acquire sufficient information to inform a Remediation Action Plan. The EPL No. 5877 prescribes the requirements for leachate collection systems at the premises. For example, Construction Quality Assurance Plan for Landfill Cell Stage 3E-2 states the CQA Engineer shall review as-built survey data of the finished sub-grade to verify conforming grades, levels and layer thickness within the allowable tolerance. CQA Engineer compliance checks (e.g. HDPE membrane, leachate collection pipes, etc.) to be completed are listed in the CQAP.	Not Triggered. (<i>Not Verified</i>)
Artifacts/Relics – 9	Should any Aboriginal artifacts or archaeological relics be discovered on the subject site or uncovered as a result of carrying out approved works, the applicant shall notify the Regional Archaeologist at the National Parks and Wildlife Service of New South Wales immediately. No further disturbance to the location shall occur until a complete assessment and clearance has been obtained from the Authority.	Site interview (27 June 2019).	Personnel confirmed during the site interview that no Aboriginal artifacts or archaeological relics were discovered or uncovered on the premises during the audit scope period.	Compliant.

Landscaping – 10	To maintain and enhance the amenity of the area, a detailed landscape and rehabilitation plan shall be submitted prior to release of the Building Approval for approval of the City Planner. Such a plan shall be prepared by a suitably qualified professional independent of Council. This plan shall incorporate: (a) General site landscaping treatment. (b) Species, numbers and the location of trees and shrubs proposed. (c) Heavily landscaped tree and shrub perimeter planting of the site.	LEMP – LMP (Appendix 3). Record of EPA & CaLM consultation (refer Attachment 3). Site inspection (Plates 22 & 23).	Refer to Table 1-1 . Approval timeframe (<i>prior to release of the building approval</i>) pre-dates and is beyond the 5-year scope of this environmental audit.	Not Triggered.
	(d) Rehabilitation and revegetation of all disturbed areas. The site rehabilitation plan shall be prepared in accordance with requirements of the Department of Conservation and Land Management and the Environment Protection Authority. In this regard such a rehabilitation plan should outline the following details;	Record of EPA & CaLM consultation (refer Attachment 3).	Approval timeframe (<i>prior to release of the building approval</i>) pre-dates and is beyond the 5-year scope of this environmental audit. Nevertheless, the record of consultation with CaLM and EPA is provided.	Not Triggered. (Compliant)
	(i) Although the final landfill batter of the proposed extension is on an acceptable grade of less than 1V:3H it has a long batter length which could lead to erosion problems if not adequately controlled. To achieve this control a mid point diversion bank should be constructed to divert the batter runoff water along the bank and deposit it at a stable and well vegetated water disposal area. There may be a requirement to construct a concrete drop down drain at the outlet of the bank to carry the water safely down the batter to the disposal point. A land survey of the bank line will determine if this drop down drain is necessary.	Site inspection and interview (27 June 2019). Record of EPA & CaLM consultation (refer Attachment 3).	Stage 1 works (and commencement of Stage 2 works; refer to Attachment 3) pre-date and are beyond the 5-year scope of this environmental audit. However, it is noted that the top of batter drains and concrete drop down drain exist (Plates 17, 18, 19 & 20) and batter stabilisation and vegetation is established (Plates 22 & 23).	Not Triggered.
	(ii) On completion of each section of the landfill, the entire batter section (including the bank) must be covered with topsoil/growing medium (minimum 100 mm), seeded in accordance with the Waste Service NSW recommendations, fertilised and covered with straw mulch.			
	(iii) Urgent attention is required to topsoil the completed landfill batters (minimum 100 mm cover) and to revegetate batters using a seed mix approved by the Department of Conservation and Land Management. Following topsoiling, seeding and fertilising, the batter should be protected from erosion damage during the establishment phase by mulching with straw at a rate of 250 bales/hectare.			

	Drainage works are also required to be provided along the top of the batter to prevent uncontrolled drainage of the landfill top from damaging the batters.			
Landscaping – 11	To protect important vegetation in close proximity to Sandy Creek and Mundania Creek the existing track leading from the northern part of the site to Sandy Creek shall be closed and rehabilitated. Details of revegetation shall be incorporated into a landscape plan to be submitted prior to release of the building approval for Stage 1 works.	Site interview (27 June 2019).	Refer to Table 1-1 . Approval timeframe (<i>prior to release of the building approval for Stage 1 works</i>) pre-dates and is beyond the 5-year scope of this environmental audit.	Not Triggered.
Landscaping – 12	To ensure the landscaping and rehabilitation is both carried out and maintained for at least twelve (12) months following completion of the project, the applicant shall enter into a Landscape Bond and Completion/Maintenance Agreement for the amount of \$5,000. Such documents (enclosed) shall be completed and submitted with the building application.	Site interview (27 June 2019). [NB: <i>Landscape Bond and Completion/Maintenance Agreement requested</i>]	Refer to Table 1-1 . Approval timeframe (<i>submitted with the building application</i>) pre-dates and is beyond the 5-year scope of this environmental audit.	Not Triggered.
Amenity of Surrounding Areas – 13	To limit the impact of the development on adjoining residents, all work shall be restricted to the hours of 7.00 am - 6.00 pm Monday - Sunday.	Entry Sign (Plate 1). Site interview and inspection (27 June 2019).	Operating hours at the West Nowra Recycling and Waste Facility are between 8am and 5pm, 7 days, and is closed on all public holidays except Easter Monday (Plate 1).	Compliant.
Amenity of Surrounding Areas – 14	A natural buffer zone is to be maintained along the western boundary and the north-western corner of the site at all times.	Six-Month Volumetric Surveys*, Annual Reports# and aerial photographs. Landscape Management Plan December 2008 Review of Landscape Maintenance. Site inspection and interview (27 June 2019) (Plate 29).	Available plans and photographs demonstrate a natural buffer zone has been maintained along the western boundary and north-western corner of the site during the 5-year scope of this environmental audit.	Compliant.
Amenity of Surrounding Areas – 15	No disturbance is to take place within 250 metres of Sandy Creek or Mundania Creek except for the area affected by the Stage 2 landfill area as indicated on the plan submitted to Council's Development Services Division on 11 April 1996, where no disturbance is to take place within 200 metres of Sandy Creek to ensure the future protection of the sensitive creek environments.	Plan submitted to Council's Development Services Division on 11 April 1996 requested. Six-Month Volumetric Surveys* received between December 2013 – December 2018 show 'buffer zone between boundary and active area' at Stage 3. Site inspection/interview (27 June 2019) (Plate 29).	Stage 2 landfill area works pre-date and are beyond the 5-year scope of this environmental audit.	Not Triggered.
Amenity of Surrounding Areas – 16	Noise emissions are not to exceed background noise levels when measured at the nearest affected property.	Landfill Environmental Management Plan [LEMP] (April 2008).	The LEMP (2008) states the closest residents to the landfilling operation (at that time) were approximately 780 metres away. Nearby	Not Verified.

Document ID	Version	Date		Page
HG-R7011	B	25 July 2019		A1-12

		West Nowra Resource Recovery Park EIS Noise Assessment (November 2015). Site interview (27 June 2019).	sensitive receivers and land uses have since been identified in the West Nowra Resource Recovery Park EIS Noise Assessment (November 2015) and background noise levels recorded at two locations (18 Bamarang Road and 41 Flatrock Road) from 25 January to 3 February 2014 (pre-dating the scope of this environmental audit). Section 9.3 of the LEMP (2008) states that the performance indicator is that noise emanating from the site shall not exceed the limits set out in the NSW <i>Industrial Noise Policy, 2000</i>, for daytime and night time noise measured at any point within one (1) metre of any residential boundary. Monitoring of maximum and background noise is reported as being conducted 'as required'. No noise measurements have been conducted, thus, whether or not the noise emissions have exceeded background noise levels 'when measured at the nearest affected property' has not been verified. It is noted however that no reportable complaints have been received during the 5-year scope of this environmental audit and the corrective actions as outlined in the LEMP (2008) is to conduct a comprehensive review of operations and practices if excessive numbers of noise complaints are received.	
Amenity of Surrounding Areas – 17	Should future residential release areas encroach towards the waste depot it will be necessary for future gas collection valves to be installed to reduce the impact of methane odour on nearby residential areas.	Illawarra-Shoalhaven Regional Plan. Shoalhaven LEP 2014. PIRMP. West Nowra Landfill Surface Gas Emission Monitoring Reports (ALS Environmental [2014a; 2014b; 2015a; 2015b; 2016a; 2016b; 2017a; 2017b; 2018a; 2018b]) Site interview (27 June 2019). Environmental Assessment - 109 Lot Subdivision (105 Residential Lots, Village Centre and Public Open Space) [Withdrawn]	Regionally significant release areas are mapped south of the premises in the Illawarra-Shoalhaven Monitoring Report 2017 (DPE, 2017) for the Illawarra-Shoalhaven Regional Plan, and coincidental with 'general residential' zone lands under the Shoalhaven LEP 2014. Residential release areas did not encroach within the immediate surrounds of the premises during the 5-year audit scope period. Nevertheless, while the adequacy of gas vents was not assessed as part of this audit scope, procedures are in place (PIRMP) including pre-emptive actions triggered by surface gas (methane) emissions monitoring and gas accumulation monitoring.	Not Triggered.

			It is also noted that an Air Quality Assessment was prepared as part of an EIS (GHD 2014) for the Resource Recovery Park. The assessment was undertaken with consideration of the Approved Methods for the Modelling and Assessment of Pollutants in NSW (DEC, 2005) and showed that for the existing landfill operations (and the adjacent Resource Recovery Park), the relevant criterion would be met and contained mostly within the site, extending to the east just over Flatrock Road but meeting the criteria as there are no residences at the modelled locations.	
Vehicle Access/Car Parking – 18	The layout of roads, manoeuvring bays and car parking for Stage 1 is considered appropriate. Any further stages will require a detailed design showing internal access roads, manoeuvring areas and stormwater drainage and design.	LEMP (2008), including Figures 1.1 and 1.2. Six-Month Volumetric Surveys*. Site interview (27 June 2019). Managing Urban Stormwater: Soils and Construction Volume 2C Unsealed Roads (2008b).	Stage 2 landfill area works pre-date and are beyond the 5-year scope of this environmental audit. Internal access roads, manoeuvring areas and stormwater drainage and design are shown on Figures 1.1 and 1.2 in the LEMP (2008) and survey plans. As referred in the EPA's Environmental Guidelines: Solid Waste Landfills (2016), detailed guidance on erosion and sediment control for access tracks is provided in <i>Managing Urban Stormwater: Soils and Construction Volume 2C Unsealed Roads</i> (NSW DECC, 2008b). <i>It is recommended that the LEMP should be reviewed, and if necessary updated, to include reference to the EPA's Managing Urban Stormwater: Soils and Construction Volume 2C Unsealed Roads (2008b).</i>	Not Triggered. (Not Verified)
Vehicle Access/Car Parking – 19	Specific design details of proposed access roads for stage 2 and 3 to be submitted to Council for approval of the City Engineer, prior to works of such stages commencing.	As above.	Approval timeframe (<i>prior to works of such stages commencing</i>) pre-dates and is beyond the 5-year scope of this environmental audit.	Not Triggered.
Monitoring – 20	To ensure the effectiveness of the operation frequent monitoring programmes shall be undertaken. In this respect, runoff dams and leachate walls shall be monitored every two months to ensure they are operating at the optimum design capacity and utilization of site volume shall be monitored yearly to ascertain the actual life expectancy of the operation. Results	Six-Month Volumetric Surveys*. EPL No. 5877. Annual Returns. Annual Reports#.	Utilisation of site volume is monitored every six months and the volume remaining recorded. Whilst runoff dams and leachate walls are not monitored every two months, monitoring programs are undertaken in accordance with the	Non-Compliant (Low)

	of monitoring shall be submitted to Council for approval by a suitably qualified person nominated by the General Manager in the form of performance monitoring reports. If such reports are unsatisfactory, Council will have the ability to review the consent and the operations of the waste depot.	Approval of the Annual Reports by a suitably qualified person nominated by the General Manager requested. Site interview (27 June 2019).	detailed requirements (and at relevant frequencies) prescribed in EPL No. 5877. Refer to Condition 7(a). <i>[It is therefore recommended that the sizing/catchment of the existing system/ponds be confirmed by a suitably qualified professional that an appropriate design duration and freeboard is maintained]</i> No records of formal approval of the Annual Reports by a suitably qualified person nominated by the General Manager were available.	
Monitoring – 21	To ensure satisfactory compliance with all conditions of consent and maintain acceptable standards an environmental audit shall be undertaken by a suitably qualified professional every five (5) years.	DA No. 90/3061 (as amended) EPL No. 5877. Site interview (27 June 2019).	This environmental audit has been prepared to fulfil the requirements of Condition 21 for the five (5) year period between 24 May 2014 and 24 May 2019. Previous environmental audits conducted in accordance with Condition 21 were requested from SCC, but unavailable at the time of reporting. This environmental audit did not consider the outcomes of previous audits, nor compliance or standards prior to 24 May 2014. <i>Note, SCC should consider increasing the frequency of environmental audits to align with the contemporary DPE guideline Independent Audit Post Approval Requirements June 2018 of intervals no greater than three (3) years to maintain acceptable standards and to ensure satisfactory compliance.</i>	Non-Compliant (Low)
Conditions of City Health Surveyor – 22	Development consent shall be strictly in compliance with recommendations of Statement of Environmental Effects prepared by Sinclair, Knight and Partners, dated June 1990, except as otherwise modified by this approval.	SEE prepared by SK&P dated June 1990. LEMP. EPL No. 5877. Site interview (27 June 2019).	Given the evolution and streamlining of requirements to reflect the introduction of, and changes to, NSW Government policy, legislation, departments, guidelines and licence conditions, as well as improved landfilling operations, implementation of best practices, and innovative and alternative landfilling/recycling practices, over the past 20 years and more, the audit scope has not completed an assessment of 'strict' compliance for the period 24 May 2014 to 24 May 2019 against the recommendations of	Non-Compliant (Low)

			the Statement of Environmental Effects (SEE), prepared by Sinclair Knight and Partners, dated June 1990 (i.e. Condition 22 of DA No. 90/3061). By way of example, strict compliance cannot be achieved as landfill design parameters are now superseded by the requirements of the EPA's <i>Environmental Guidelines: Solid Waste Landfills</i> (2016). However, for completeness and transparency, a copy of the SEE Description of the Proposal (Section 3.3) and Proposed Operational Safeguards (Section 3.4) is provided in Enclosure 1 . <i>If the opportunity presents as described above for DA No. 90/3061 Condition 5, SCC should review, and if necessary revise the conditions of DA No. 90/3061 (as amended) to reflect the contemporary requirements of the EPA's Environmental Guidelines: Solid Waste Landfills (2016).</i>	
Conditions of City Health Surveyor – 23	This approval is subject to the development complying with all conditions and requirements of the State Pollution Control Commission and Soil Conservation Service of New South Wales. Such details shall be submitted with the building application.	EPL No. 5877. Prior Record of Consultation (CaLM) dated 29 November 1994. Site interview (27 June 2019).	The State Pollution Control Commission was abolished by the Protection of the Environment Administration Act, 1991 (Act No.60, 1991) and the Environment Protection Authority was established from 1 March 1992. In 1991, the Soil Conservation Service were abolished and their functions were incorporated with the Land Titles Office and the Valuer General's Department under the Department of Conservation and Land Management (CaLM). In 1995, CaLM was succeeded by the Department of Land and Water Conservation (DLWC). Compliance with the requirements of EPL No. 5877 are provided separately in Table A1-4 .	Refer to Table A1-4 .
Conditions of City Health Surveyor – 24	The area indicated on the plan submitted on 13 September 1996, and shown as "vegetation" area, shall be revegetated in consultation with the Department of Land and Water Conservation to improve the effectiveness of the vegetation buffer to Sandy Creek. A revegetation plan prepared in consultation with the Department of Land and Water Conservation shall be submitted for approval within 6 months	Plan submitted on 13 September 1996, and shown as "vegetation" area and revegetation plan requested. Site interview and inspection (27 June 2019) (Plate 29).	Refer to Table 1-1 . Approval timeframe (<i>submitted for approval within 6 months of the date of this amended consent</i>) pre-dates and is beyond the 5-year scope of this environmental audit. However, in the absence of the approved revegetation plan its implementation	Not Triggered. (Not Verified)

	from the date of this amended consent, and revegetation of this area shall be carried out in accordance with the approved plan.		(i.e. revegetation of this area shall be carried out in accordance with the approved plan) was not verified. It is therefore recommended that the existing Landscape Management Plan (as part of the LEMP) be reviewed and if necessary revised to reflect the requirements of the approved revegetation plan.	
Conditions of City Health Surveyor – 25	A rehabilitation and revegetation plan for the landfill areas, showing how the landfill cells will be progressively rehabilitated and revegetated at the conclusion of each landfill cell stage, shall be prepared in consultation with the Department of Land and Water Conservation and submitted for approval within 12 months from the date of this amended consent. Rehabilitation and revegetation of the landfill areas shall be carried out in accordance with the approved plan.	Rehabilitation and revegetation plan requested. Site interview and inspection (27 June 2019) (Plates 22 & 23).	Refer to Table 1-1 . Approval timeframe (submitted for approval within 12 months of the date of this amended consent) pre-dates and is beyond the 5-year scope of this environmental audit. However, in the absence of the approved rehabilitation and revegetation plan its implementation (i.e. Rehabilitation and revegetation of the landfill areas shall be carried out in accordance with the approved plan) was not verified. It is therefore recommended that the existing Landscape Management Plan (as part of the LEMP) be reviewed and if necessary revised to reflect the requirements of the approved rehabilitation and revegetation plan.	Not Triggered. (Not Verified)
Notes – 1	If the development is not substantially commenced within a period of two years from the granting of this approval then it lapses and is considered void. Council may extend the approval for a further twelve months provided that a written application is made with the appropriate fee and setting out reasons before the expiry of two years from the date of this consent.	Site interview (27 June 2019).	Refer to Table 1-1 . Two years from the granting of the approval (24 May 1993), and substantial development commencement, pre-date the scope of this five year audit.	Not Triggered.
Notes – 2	If a new Environmental Planning Instrument prohibiting this development is gazetted within one year of the granting of this consent then the consent is valid only for one year after the new Instrument comes into force.	N/A.	Refer to Table 1-1 . One year of the granting of consent (24 May 1992) pre-dates the scope of this five year audit.	Not Triggered.
Notes – 3	Any Building Application which is required for construction must be submitted before the expiry of the two year period for which the consent is valid or, if this is extended, before the expiry of any period of extension should this be granted. Sufficient time should be given for such Building Application to be considered and subsequent development to be substantially commenced.	SCC DA Tracking System: - DA 16/1432 - DA 16/1511 - DS 16/1478 - DA 19/1412 Initial Building Application data also requested however agreed to be beyond the audit scope period.	Refer to Table 1-1 . Pre-dates the scope of this five year audit.	Not Triggered.

		Site interview (27 June 2019).		
Notes – 4	Section 97 of the Act confers on an applicant who is dissatisfied with the determination of a consent authority a right of appeal to the Land and Environment Court exercisable within twelve (12) months after receipt of this notice.	N/A.	Refer to Table 1-1 . Twelve months after receipt of the notice (24 May 1992) pre-dates the scope of this five year audit.	Not Triggered.
Advice to Applicants of the City Health Surveyor – a	A building application, which is a requirement under Part XI of the Local Government Act 1919 as amended, together with plans and specifications, in accordance with Ordinance 70 must be submitted to and approved by Council prior to works proceeding.	SCC DA Tracking System: - DA 16/1432 - DA 16/1511 - DS 16/1478 - DA 19/1412 Initial Building Application data also requested however agreed to be beyond the audit scope period.	Refer to Table 1-1 . Approval timeframe (<i>prior to works proceeding</i>) pre-dates and is beyond the 5-year scope of this environmental audit.	Not Triggered.
Advice to Applicants of the City Health Surveyor – b	The applicant to notify the Forestry Commission of New South Wales to arrange for Commission to remove any utilizable timber prior to any clearing.	Site interview (27 June 2019). Six-Monthly Volumetric Survey Plan(s) with Supporting Volumetric Survey Checklist(s), Landfill Facility Information Certificate(s) and Stockpile Information & Schedule of Material Movements.	Clearing activities (of any utilizable timber) have not occurred on site during the audit period. The stockpile information sheets report that no wood/trees/timber stockpiled at the premises were won on-site.	Not Triggered.
Advice to Applicants of the City Health Surveyor – c	The applicant to consult with Illawarra County Council in relation to possible extension augmentation.	Application for Modification of Development Consent (DA No. 90/3061) dated 22 May 2019. Receipt of Application from Council dated 3 June 2019 (No. DS19/1237). Site interview (27 June 2019). Record of consultation of recent Modification Application requested with ISJO.	Whilst the application was made on 3 June 2019, the document is dated 22 May 2019 (within the audit scope period). <i>It is recommended SCC consider consulting with the relevant Council(s) (e.g. Wingecarribee, Wollongong, Shellharbour, Kiama) in relation to the currently proposed extension augmentation.</i>	Not Verified.
Advice to the Applicants of the City Planner – d	The north-eastern portion of the subject site has been identified under the Illawarra Regional Environmental Plan as being affected by a designated Services Corridor. In this respect all future development shall be designed to avoid the corridor.	Shoalhaven LEP 2014 (refer Figure 5).	The premises to which Stages 1-3 of the West Nowra Recycling and Waste Facility apply, do not relate to the corridor shown in the Shoalhaven LEP 2014 (refer Figure 5).	Not Triggered. (Compliant)
Advice to the Applicant – Dot Point	The applicant is advised to consider the groundwater monitoring and leachate system improvement works (ie Recommendation 1, 2 and 3) recommended in the correspondence dated 26 August 1996 from the Department of Land and Water Conservation (Hydrogeology Section), a copy of which is attached.	Correspondence dated 26 August 1996 from the Department of Land and Water Conservation (Hydrogeology Section). Annual Report (2018). Annual Environmental Monitoring Results Report (2018).	Recommendation is provided as advice to consider only. Refer to Table A1-3 . Other recommendations for groundwater monitoring and improvement works are discussed separately (Condition 8[a]). More specifically, and in line with the requirements of the EPA's <i>Environmental</i>	Noted.

		<i>Environmental Guidelines: Solid Waste Landfills (2016).</i>	<i>Guidelines: Solid Waste Landfills (2016), the groundwater monitoring network should be reviewed, and if necessary revised, to reflect the relevant requirements of Section 4.4 of the Guidelines for groundwater monitoring. As per EPL Condition R1.8, the detailed recommendations included in the Annual Environmental Monitoring Results reports, included as an attachment to each Annual Report, should be carried forward in the Annual Report with SCC accountabilities and timeframes for implementation to improve the environmental performance at the premises.</i>	
--	--	--	--	--

* For Period Ending:

- December 2013 (Plan Reference 2824_233 A and Supporting Volumetric Survey Checklist, Landfill Facility Information Certificate, Stockpile Information & Schedule of Material Movements)
- June 2014 (Plan Reference 2824_241 and Supporting Volumetric Survey Checklist, Landfill Facility Information Certificate, Stockpile Information & Schedule of Material Movements)
- December 2014 (Plan Reference 2824_253 and Supporting Volumetric Survey Checklist, Landfill Facility Information Certificate, Stockpile Information & Schedule of Material Movements)^
- June 2015 (Plan Reference 2824_267 and Supporting Volumetric Survey Checklist, Landfill Facility Information Certificate, Stockpile Information & Schedule of Material Movements)
- December 2015 (Plan Reference 2824_273 and Supporting Volumetric Survey Checklist, Landfill Facility Information Certificate, Stockpile Information & Schedule of Material Movements)
- June 2016 (Plan Reference 2824_282 and Supporting Volumetric Survey Checklist, Landfill Facility Information Certificate, Stockpile Information & Schedule of Material Movements)
- December 2016 (Plan Reference 2824_287 and Supporting Volumetric Survey Checklist, Landfill Facility Information Certificate, Stockpile Information & Schedule of Material Movements)
- June 2017 (Plan Reference 2824_291 and Supporting Volumetric Survey Checklist, Landfill Facility Information Certificate, Stockpile Information & Schedule of Material Movements)
- December 2017 (Plan Reference 2824_294 and Supporting Volumetric Survey Checklist, Landfill Facility Information Certificate, Stockpile Information & Schedule of Material Movements)
- June 2018 (Plan Reference 2824_298 and Supporting Volumetric Survey Checklist, Landfill Facility Information Certificate, Stockpile Information & Schedule of Material Movements)
- December 2018 (Plan Reference 2824_313 and Supporting Volumetric Survey Checklist, Landfill Facility Information Certificate, Stockpile Information & Schedule of Material Movements) [Figure 4]

^ Reported details incomplete.

For Period Ending:

- 29 October 2014 (Annual Report – 2013 / 2014)
- 29 October 2015 (Annual Report – 2014 / 2015)
- 29 October 2016 (Annual Report – 2015 / 2016)
- 29 October 2017 (Annual Report – 2016 / 2017)
- 29 October 2018 (Annual Report – 2017 / 2018)

^ In some circumstances, documented evidence was received despite a 'Not Triggered' outcomes based on the agreed audit scope (5-year) period. A secondary compliance status (in parentheses) has been provided as an indicator only to assist the reader identifying where a compliant outcome was noted, or if not verified.

Table A1-2
Standard Conditions – Condition 1 of Development Consent DA No. 90/3061 [24 May 1991]

APPROVAL (ID)	REQUIREMENT (SUMMARY)	EVIDENCE COLLECTED	AUDIT FINDINGS	COMPLIANCE STATUS
Standard Conditions – 1	Development Generally: The development shall comply with the requirements of City of Shoalhaven Local Environmental Plan, 1985 and all codes, plans and designs duly adopted by Council which apply to the development.	Standard Conditions. Shoalhaven Local Environmental Plan 2014. Site interview (27 June 2019). SCC DA Tracking System: - DA 16/1432 - DA 16/1511 - DS 16/1478 - DA 19/1412	The City of Shoalhaven Local Environmental Plan 1985 has been superseded and was replaced by Local Environmental Plan 2014 which commenced on 31 October 2014 (within the audit scope period). It is however noted (below) that several DA been assessed and approved which post-date the introduction of the Shoalhaven LEP 2014. Refer Table 3-1 . <i>It is recommended SCC confirm that development on the premises comply with the requirements of the Shoalhaven Local Environmental Plan 2014, and all applicable codes, plans and designs duly adopted by SCC.</i>	Not Verified.
Standard Conditions – 2	Building Approval: A building application shall be submitted for approval by Council. Such application shall comply in all respects with the requirements of the Local Government Act, 1919 (as amended), Ordinance 70 and any other applicable ordinances and regulations, and all codes, plans and designs duly adopted by Council.	DA No. 90/3061. Standard Conditions. Local Government Act, 1993. CC16/1485 (Cover over Existing Weighbridge Office – Construction Certificate). CC16/2443 (Waste Transfer Station – Construction Certificate). OC17/1344 (Cover over Existing Weighbridge Office – Final Occupation Certificate). OC17/2265 (Waste Transfer Station – Interim Occupation Certificate).	Refer Table 3-1 . Construction and occupation certificates were issued during the audit scope period: 21 July 2016: CC16/1485 27 March 2017: CC16/2443 5 April 2017: OC17/1344 22 November 2017: OC17/2265 Approval timeframe for many buildings on the premises pre-dates and is beyond the 5-year scope of this environmental audit.	Compliant. (Not Triggered)
Standard Conditions – 3	Siting of Buildings: The siting of buildings is to be as finally determined by the terms of the Development Consent (i.e. as indicated in the conditions of consent or as shown on the approved plan).	DA No. 90/3061. CC16/1485 (Cover over Existing Weighbridge Office – Construction Certificate). CC16/2443 (Waste Transfer Station – Construction Certificate).	Refer Table 3-1 . Construction and occupation certificates were issued during the audit scope period: 21 July 2016: CC16/1485 27 March 2017: CC16/2443 5 April 2017: OC17/1344	Compliant. (Not Triggered)

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	A1-20

		OC17/1344 (Cover over Existing Weighbridge Office – Final Occupation Certificate). OC17/2265 (Waste Transfer Station – Interim Occupation Certificate).	22 November 2017: OC17/2265 The siting of many buildings on the premises pre-dates and is beyond the 5-year scope of this environmental audit.	
Standard Condition – 4	Certificate of Compliance: The issue of a Certificate of Compliance under Section 317A of the Local Government Act, certifying that the building has been erected in accordance with the approved plans and specifications and the requirements of law generally, shall be dependent on full compliance with all conditions and requirements herein and as otherwise specified by Council.	CC16/1485 (Cover over Existing Weighbridge Office – Construction Certificate). CC16/2443 (Waste Transfer Station – Construction Certificate). OC17/1344 (Cover over Existing Weighbridge Office – Final Occupation Certificate). OC17/2265 (Waste Transfer Station – Interim Occupation Certificate).	Refer Table 3-1 . Construction and occupation certificates were issued during the audit scope period: 21 July 2016: CC16/1485 27 March 2017: CC16/2443 5 April 2017: OC17/1344 22 November 2017: OC17/2265 Approval timeframe for many erected buildings on the premises pre-dates and is beyond the 5-year scope of this environmental audit.	Compliant. (Not Triggered)
Standard Condition – 5	Restrictive Covenants & Instruments: The applicant should note that there could be covenants in favour of persons other than Council restricting what may be built or done upon the subject land. The applicant is advised to check the position before commencing any work.	N/A.	Refer to Table 1-1 . Approval timeframe (<i>before commencing any work</i>) pre-dates and is beyond the 5-year scope of this environmental audit.	Not Triggered.
Standard Condition – 6	Car Parking: (a) The number of parking spaces and parking areas as shown on the plans submitted for development approval, or as otherwise specified by Council are to be provided for on the site. (b) All spaces are to be reserved for or used for the purposes shown on the plans or as otherwise specified by Council. (c) No employees shall be denied the right to use any employee parking space. (d) In the case of multiple use or occupancy on the site, an appropriate number of car parking spaces will be allocated to each user or occupier, and shown on the building plans, in accordance with Council's Parking Code, or as may be otherwise specified by Council. (e) The details of the construction of the parking area and the means of physical identification of the parking spaces and the use for which they are reserved, are to be shown on the building application plans and described in the specifications and shall form part of the building application and shall be subject to approval with the application.	N/A.	Refer to Table 1-1 . Approval timeframe (<i>subject to approval with the application</i>) pre-dates and is beyond the 5-year scope of this environmental audit.	Not Triggered.

Standard Condition – 7	Site and Engineering Works: (a) All design works for stormwater drainage, kerb and gutter and vehicle movement and parking areas shall be carried out by a Consulting Civil Engineer and Practising Registered Surveyor. Details of such works shown on plans submitted with the Development Application are accepted as indicated only and are not approved for construction purposes. Pavement design shall be supported by test results for both in-situ material and proposed pavement materials. It is the applicants responsibility to ensure that the proposed works do not interfere with public utilities and services (including, but not limited to water, sewer, gas electricity and telephone). Any necessary alterations to services will be at the applicants expense.	N/A.	Refer to Condition 18 & 19 of DA No. 90/3061. Approval timeframe (<i>prior to works of such stages commencing</i>) pre-dates and is beyond the 5-year scope of this environmental audit.	Not Triggered.
	(b) Plans and specifications for those works shall be submitted to Council for approval, as part of the Building Application and no works shall be carried out prior to approval being given. Where any works have access to a road under the control of the Department of Main Roads, Council will submit plans and specifications to the Department for their concurrence and Council is not able to issue an approval until this has been obtained.	N/A.	Refer to Table 1-1 . Approval timeframe (<i>submitted to Council for approval, as part of the Building Application and no works shall be carried out prior to approval being given</i>) pre-dates and is beyond the 5-year scope of this environmental audit.	Not Triggered.
	(c) Where the works involve relocation or alteration to public utilities, the applicant shall submit to Council evidence that satisfactory arrangements have been made with the appropriate Authority for the works to be carried out.	Site interview (27 June 2019).	No works involving relocation or alteration to public utilities occurred during the audit scope period.	Not Triggered.
	(d) Council is not responsible for quality control of civil works carried out on private property, but requires a certificate from an approved supervising Consulting Engineer or registered surveyor with appropriate test results stating that the works have been carried out in accordance with the approved plans and specifications.	First Flush Dam and Leachate Dam – Civil Works [Plan Nos. 97/20 {Sheets 1, 3, 4, 5, 6, 7 & 8}, 97/27 and 97/84] Site interview (27 June 2019). Construction Quality Assurance Plan Landfill Cell Stage 3E-2 (GHD, 2018b). Construction Quality Assurance Report Landfill Cell Stage 3E-2 (GHD, 2018c).	Most civil works pre-date the audit scope period. Construction Quality Assurance Plan for Landfill Cell Stage 3E-2 states the CQA Engineer shall review as-built survey data of the finished sub-grade to verify conforming grades, levels and layer thickness within the allowable tolerance. CQA Engineer compliance checks (e.g. HDPE membrane, leachate collection pipes, etc.) to be completed are listed in the CQAP.	Not Triggered. (Noted)
	(e) Where the development involves works on public land (including, but not limited to, public roads and footpaths), the City Engineer or his nominee will inspect the works at the following stages, and adequate notice must be given: - Prior to backfilling of any trenches	Site interview (27 June 2019).	No relevant works or notifications occurred during the audit scope period.	Not Triggered.

	- Prior to pouring of kerb and gutter, footpath crossings or other concrete works - Prior to construction of block paving - At completion of subgrade preparation - At completion of pavement construction - Prior to bitumen sealing. For such notification and inspections, please contact the District Engineer on 216011.			
	(f) Where any works are carried out on or adjacent to a public road: i. Adequate protection shall be provided for the travelling public. Warning and protective devices shall comply with the provision of the Department of Main Roads publication "Interim Guide to Signs and Markings". Particular attention is drawn to Section 4.14 "Roadworks and Special Purposes". ii. The applicant or Sub-contractor shall comply with the requirements of the Construction Safety Act and Occupational Health and Safety Act and Regulations. iii. All plant and equipment shall be appropriately registered and insured, indemnifying Council against any liability.	Site interview (27 June 2019). Work Health and Safety Act 2011. Work Health and Safety Regulation 2017.	No relevant works occurred during the audit scope period.	Not Triggered.
Standard Condition – 8	Commercial Vehicles: All commercial vehicles, including cars, utilities, station wagons, vans, lorries or other vehicles or plant operated by the company or occupier, as part of the activities involved in carrying out the use, shall use the off-street car parking provided.	Site interview (27 June 2019).	Confirmed during site interview.	Compliant.
Standard Condition – 9	Landscaping: The landscaping areas as shown on the approved plans or as modified or amended in the consent granted, shall be provided and maintained at all times by the owner of the land. Such areas shall be maintained in accordance with the principles of the specific plan which shall be submitted with the building application for separate approval, which plan shall provide for and show appropriate plantings and improvements for the embellishment of the area, or the quiet enjoyment by the occupants of the site. The potential scale of the shrub and tree growth shall be specified. All such landscaping areas shall not be used for parking, storage or other commercial or industrial use, and where necessary and considered desirable by Council, kerbing and barriers shall be provided to the satisfactions of Council to prevent unauthorised use. All fencing on boundaries shall be shown on the landscape plan.	Site Inspection Photographs (Plates 10, 22 & 23). Landscape Management Plan. Site interview (27 June 2019).	Landscaping areas are described in the Landscape Management Plan (as part of the LEMP). <i>As for Condition 24 & 25 of DA No. 90/3061, it is recommended that the existing Landscape Management Plan (as part of the LEMP) be reviewed and if necessary revised to reflect the requirements of the approved plan.</i>	Not Verified.

Standard Condition – 10	Advertisements and all Signs and Advertising: All advertisements as defined in Ordinance 55 and including all signs, advertising signs, company symbols, or display materials, whether indicated in the application for development consent or proposed to be erected at any other time, either on their own supports or on a display board or hoarding, or attached or forming part of any building, or located within the building, and capable of being seen from a public place shall be the subject of a separate application to Council for individual specific approval before being erected or fixed or placed in position. All such application and advertisements shall comply with the requirements of Ordinance 55 or any other requirement as specified by Council. This requirement shall not apply to signs within the building in the case of a shop and where such signs relate to specific goods for the sale or on display within the shop.	Site Inspection Photographs (Plate 1). Site interview (27 June 2019). State Environmental Planning Policy (SEPP) No. 64-Advertising and Signage.	Refer to Table 1-1 . Approval timeframe (<i>before being erected or fixed or placed in position</i>) pre-dates and is beyond the 5-year scope of this environmental audit. It is noted SEPP No. 64 was commenced on 16 March 2001.	Not Triggered. (Not Verified)
Standard Condition – 11	Use of Site: Where no specific user has been nominated in the application for development consent, then it shall be the responsibility of the owner, the managing agent and the proposed user, individually and collectively to make application for and obtain consent to use the premises or site before the use commences.	DA No. 90/3061. Scope, opening meeting and site interview (27 June 2019).	Refer to Table 1-1 . Approval timeframe (<i>before the use commences</i>) pre-dates and is beyond the 5-year scope of this environmental audit.	Not Triggered.
Standard Condition – 12	Approval from Government Departments: Applicants should be aware that Council's approval is under the terms of the Environmental Planning and Assessment Act only. Any other approval or requirements of other Government Departments or Authorities must be obtained separately. Amongst other things, approval may be required: (a) If public entertainment is to be conducted in the building or the building is already licenced under the Theatres and Public Halls Act. Generally, public entertainment takes place where a building is open to the public. A charge is made before admission may be procured or a charge for entertainment is made after admission. If in doubt applicants should contact the Department of Services, 121 Macquarie Street, Sydney. (b) From the Department of Industrial Relations who have requirements under the Factories, Shops and Industries Act, 1960. Particularly in respect of amenities. The DIR should be consulted prior to lodgement of a building application.	DA No. 90/3061. Scope, opening meeting and site interview (27 June 2019).	Noted. The audit scope relates only to DA No. 90/3061 and EPL No. 5877.	Not Triggered.

	(c) If an application involves licenced premises including liquor and wine shops the necessary consent must be obtained from the Licencing Court as required by the Liquor Act, 1982. (d) If petrol, diesel or liquid petroleum gas facilities are proposed approved must be obtained from the Department of Mines (Explosive Goods Branch).			
--	---	--	--	--

Table A1-3
Recommendations 1-3 from the Department of Land and Water Conservation (Hydrogeology Section) [Correspondence dated 26 August 1996]

APPROVAL (ID)	REQUIREMENT (SUMMARY)	EVIDENCE COLLECTED	AUDIT FINDINGS	COMPLIANCE STATUS
Recommendations / Actions – 1	Measures to reduce the volume of leachate leaking into the groundwater which includes the following should be implemented: a. relocation of the stormwater diversion drain and sump and/or lining the drain and sump with bentonite, and b. upgrading the leachate pond by providing a low permeability and compacted clay liner (with coefficient of permeability on 10^{-9} m/sec).	DLWC Correspondence (26 August 1996). Site interview (27 June 2019). GHD (April 2018) Shoalhaven City Council Geotechnical Services, West Nowra Recycling and Waste Facility Mundamia, Report (GHD, 2018a).	Recommendation is provided as advice for the applicant to consider only. Approval timeframe pre-dates and is beyond the 5-year scope of this environmental audit. Nevertheless, Table 1 in GHD (2018a) includes summary of permeability test results of 10^{-10} m/sec. Other recommendations for groundwater monitoring and improvement works are discussed separately (Condition 8[a]). More specifically, and in line with the requirements of the EPA's <i>Environmental Guidelines: Solid Waste Landfills</i> (2016), the groundwater monitoring network should be reviewed, and if necessary revised, to reflect the relevant requirements of Section 4.4 of the Guidelines for groundwater monitoring. As per EPL Condition R1.8, the detailed recommendations included in the Annual Environmental Monitoring Results reports, included as an attachment to each Annual Report, should be carried forward in the Annual Report with SCC accountabilities and timeframes for implementation to improve the environmental performance at the premises.	Noted.
Recommendations / Actions – 2	A Groundwater Management Plan should be prepared and submitted to the Department for review. This is basically the groundwater monitoring program. The parameters used for groundwater monitoring should include aluminium, methyl blue and boron since their presence has already been detected. The results of leachate, groundwater and surface water monitoring should be evaluated and reported annually. The report on monitoring should be submitted to EPA and the Department for review.	Groundwater Monitoring Plan (ENRS, 2014a).	Recommendation is provided as advice for the applicant to consider only. While the approval timeframe for the original Groundwater Management Plan in accordance with this recommendation pre-dates and is beyond the 5-year scope of this environmental audit, other recommendations for groundwater monitoring and improvement works are discussed separately (Condition 8[a]).	Noted.

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	A1-26

			More specifically, and in line with the requirements of the EPA's <i>Environmental Guidelines: Solid Waste Landfills</i> (2016), the groundwater monitoring network should be reviewed, and if necessary revised, to reflect the relevant requirements of Section 4.4 of the Guidelines for groundwater monitoring. As per EPL Condition R1.8, the detailed recommendations included in the Annual Environmental Monitoring Results reports, included as an attachment to each Annual Report, should be carried forward in the Annual Report with SCC accountabilities and timeframes for implementation to improve the environmental performance at the premises. There was no evidence that reports on monitoring have been provided to the DLWC (or equivalent contemporary NSW Water Department) during the audit scope period. <i>[Note: it is therefore recommended the monitoring parameters be reviewed considering the 1996 recommendations and future provision of Annual Reporting to NSW Department of Industry – Water be considered]</i>	
Recommendations / Actions – 3	Monitoring of both creek and groundwater should be undertaken to ensure that water quality goals are being maintained. These are defined in the Australia and New Zealand Guidelines for Fresh and Marine Waters (1922) [sic].	Annual Environmental Monitoring Results Reports (2014-2018). ANZ Guidelines (2018).	Recommendation is provided as advice for the applicant to consider only. Australia and New Zealand Guidelines for Fresh and Marine Waters (1992) were replaced with ANZECC & ARMCANZ (2000) and referred to in the Annual Environmental Monitoring Results Reports (2014-2018). Refer to EPL Condition R1.8. <i>Note: It is noted that the ANZECC & ARMCANZ (2000) guidelines were revised in 2018 and presented as an online platform (www.waterquality.gov.au/anz-guidelines) to facilitate updates as new information becomes available. It is therefore recommended that the Annual Report for data collected during the audit scope period after the last Annual Report</i>	Compliant.

			<i>(i.e. from 30 October 2018 to 24 May 2019) reflect any new information if available when analysing and interpreting the monitoring data.</i>	
--	--	--	---	--

Table A1-4
Conditions of Environment Protection Licence (EPL) No. 5877 [23 November 2018]

APPROVAL (ID)	REQUIREMENT (SUMMARY)	EVIDENCE COLLECTED	AUDIT FINDINGS	COMPLIANCE STATUS											
Administrative Conditions – A1	What the licence authorises and regulates:	EPL No. 5877.	Refer below.	Noted.											
Administrative Conditions – A1.1	This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation. Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.	Six-Monthly Volumetric Survey Plan(s) with Supporting Volumetric Survey Checklist(s), Landfill Facility Information Certificate(s) and Stockpile Information & Schedule of Material Movements. Annual Reports (2014-2018).	The stockpile information sheets for the audit period each year report ‘composts’ are as follows: - June 2014: 1,358t (Comp 11-15, 65-66 + Veg25) - December 2015:1,235t (27-28, 74-82 + Veg28) - December 2016: 1,609t (84, 92-98 + Veg30) - December 2017:1,892t (109-111 + Veg33) - December 2018: 1,800t (120-131 + Veg35) All other activities are at any scale.	Compliant.											
	<table><tr><th>Scheduled Activity</th><th>Fee Based Activity</th><th>Scale</th></tr><tr><td>Composting</td><td>Composting</td><td>> 5000 - 50000 T annual capacity to receive organics</td></tr><tr><td>Waste processing (non-thermal treatment)</td><td>Non-thermal treatment of general waste</td><td>Any annual processing capacity</td></tr><tr><td>Waste disposal (application to land)</td><td>Waste disposal by application to land</td><td>Any capacity</td></tr><tr><td>Waste storage</td><td>Waste storage - other types of waste</td><td>Any other types of waste stored</td></tr></table>				Scheduled Activity	Fee Based Activity	Scale	Composting	Composting	> 5000 - 50000 T annual capacity to receive organics	Waste processing (non-thermal treatment)	Non-thermal treatment of general waste	Any annual processing capacity	Waste disposal (application to land)	Waste disposal by application to land
Scheduled Activity	Fee Based Activity	Scale													
Composting	Composting	> 5000 - 50000 T annual capacity to receive organics													
Waste processing (non-thermal treatment)	Non-thermal treatment of general waste	Any annual processing capacity													
Waste disposal (application to land)	Waste disposal by application to land	Any capacity													
Waste storage	Waste storage - other types of waste	Any other types of waste stored													
Administrative Conditions – A2	Premises or plant to which this licence applies:	EPL No. 5877.	Refer below.	Noted.											
Administrative Conditions – A2.1	The licence applies to the following premises:	Plan Reference No. 2824_182 provided (Figure 6), which shows the gas generator and flare. Site inspection and interview (27 June 2019).	Lots and DPs relate to Stages 1 to 3. Noted that the gas generator and gas flare are excluded (another proponent), and were observed during the site inspection (Plates 5 & 6). No changes to the premises have occurred during the audit scope period.	Compliant.											
	<table><tr><th>Premises Details</th></tr><tr><td>WEST NOWRA RECYCLING AND WASTE FACILITY</td></tr><tr><td>FLAT ROCK ROAD</td></tr><tr><td>MUNDAMIA</td></tr><tr><td>NSW 2540</td></tr><tr><td>LOT 436 DP 808415, LOT 437 DP 808415, LOT 1 DP 847203, LOT 1 DP 870268, LOT 1 DP 1018193</td></tr><tr><td>EXCLUDING THE GAS GENERATOR AND GAS FLARE AS SHOWN ON PLAN REFERENCE NO. 2824_182 DATED 18 AUGUST 2011 (EPA REFERENCE DOC11/38133)</td></tr></table>				Premises Details	WEST NOWRA RECYCLING AND WASTE FACILITY	FLAT ROCK ROAD	MUNDAMIA	NSW 2540	LOT 436 DP 808415, LOT 437 DP 808415, LOT 1 DP 847203, LOT 1 DP 870268, LOT 1 DP 1018193	EXCLUDING THE GAS GENERATOR AND GAS FLARE AS SHOWN ON PLAN REFERENCE NO. 2824_182 DATED 18 AUGUST 2011 (EPA REFERENCE DOC11/38133)				
Premises Details															
WEST NOWRA RECYCLING AND WASTE FACILITY															
FLAT ROCK ROAD															
MUNDAMIA															
NSW 2540															
LOT 436 DP 808415, LOT 437 DP 808415, LOT 1 DP 847203, LOT 1 DP 870268, LOT 1 DP 1018193															
EXCLUDING THE GAS GENERATOR AND GAS FLARE AS SHOWN ON PLAN REFERENCE NO. 2824_182 DATED 18 AUGUST 2011 (EPA REFERENCE DOC11/38133)															
Administrative Conditions – A3	Information supplied to the EPA	EPL No. 5877.	Refer below.	Noted.											
Administrative Conditions – A3.1	Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence. In this condition the reference to "the licence application" includes a reference to:	The notices and summary of applications available on the EPL Public Register during the audit scope period were viewed.	Works and activities observed during the site inspection related to the licenced waste activities at the premises including that subject to licence variation applications (e.g. QA/QC documentation for future landfill cell (Plate 28))	Compliant.											

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	A1-29

	a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.	Construction Quality Assurance Plan Landfill Cell Stage 3E-2 (GHD, 2018b). Construction Quality Assurance Report Landfill Cell Stage 3E-2 (GHD, 2018c). Landfill Cell Stage 3F - Preliminary Design and Construction Specifications dated 20 November 2018. Site inspection (27 June 2019).	and Automated Tarp Deployment System [ATDS]) (Plate 12). The CRT Glass Waste Cell was also discussed.																					
Administrative Conditions – A3.2	The document titled "Draft Landfill Environment Management Plan (LEMP), West Nowra Recycling & Waste Depot, Flatrock Road, West Nowra; Ref No. 9723127.G; December 1997" submitted to the EPA on 19 December 1997 is not to be taken as part of the documentation in A3.1, other than those parts specifically referenced in this licence.	LEMP (2008). Draft Landfill Environment Management Plan (LEMP) [19 December 1997] requested.	The latest LEMP is dated 2008. <i>It is recommended that this condition be amended (if unnecessary) and/or refer to the LEMP when next revised.</i>	Noted. (Not Verified)																				
Discharges to Air and Water and Applications to Land – P-1	Location of monitoring/discharge points and areas	EPL No. 5877.	Refer below.	Noted.																				
Discharges to Air and Water and Applications to Land – P-1.1	The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point. <table><tr><th colspan="4">Air</th></tr><tr><th>EPA Identification no.</th><th>Type of Monitoring Point</th><th>Type of Discharge Point</th><th>Location Description</th></tr><tr><td>24</td><td>Gas accumulation monitoring</td><td></td><td>Inside all buildings within 250 meters of deposited waste as shown on drawing 2824_16 referenced as EPA WOF 9346.</td></tr></table>	Air				EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description	24	Gas accumulation monitoring		Inside all buildings within 250 meters of deposited waste as shown on drawing 2824_16 referenced as EPA WOF 9346.	Drawing 2824_16 (Figure 7). Annual Reports (2014-2018). Site interview (27 June 2019).	Table 3 in the Annual Reports provide a summary of the monitoring points including gas accumulation inside buildings within 250 m of deposited waste. Landfill methane gas emissions detected in the buildings were all below EPL condition limits.	Compliant.								
Air																								
EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description																					
24	Gas accumulation monitoring		Inside all buildings within 250 meters of deposited waste as shown on drawing 2824_16 referenced as EPA WOF 9346.																					
Discharges to Air and Water and Applications to Land – P-1.2	The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.	EPL No. 5877.	Refer below.	Noted.																				
Discharges to Air and Water and Applications to Land – P-1.3	The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point. <table><tr><th colspan="4">Water and land</th></tr><tr><th>EPA Identification no.</th><th>Type of Monitoring Point</th><th>Type of Discharge Point</th><th>Location Description</th></tr><tr><td>1</td><td>Leachate Quality Monitoring</td><td></td><td>Leachate dam LD1 as shown on drawing 2824_16 referenced as EPA WOF9346</td></tr><tr><td>2</td><td></td><td>Overflow drain</td><td>Overflow from first flush dam DP2 as shown on drawing 2824_16 referenced as EPA WOF9346</td></tr><tr><td>3</td><td>Overflow drain</td><td>Overflow drain</td><td>Overflow from sedimentation dam 1 DP3 as shown on drawing 2824_16 referenced as EPA WOF9346</td></tr></table>	Water and land				EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description	1	Leachate Quality Monitoring		Leachate dam LD1 as shown on drawing 2824_16 referenced as EPA WOF9346	2		Overflow drain	Overflow from first flush dam DP2 as shown on drawing 2824_16 referenced as EPA WOF9346	3	Overflow drain	Overflow drain	Overflow from sedimentation dam 1 DP3 as shown on drawing 2824_16 referenced as EPA WOF9346	EPL No. 5877.	Refer below.	Noted.
Water and land																								
EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description																					
1	Leachate Quality Monitoring		Leachate dam LD1 as shown on drawing 2824_16 referenced as EPA WOF9346																					
2		Overflow drain	Overflow from first flush dam DP2 as shown on drawing 2824_16 referenced as EPA WOF9346																					
3	Overflow drain	Overflow drain	Overflow from sedimentation dam 1 DP3 as shown on drawing 2824_16 referenced as EPA WOF9346																					
		Drawing 2824_16 (undated) (Figure 7). Bore Location Plan dated 17/01/14 (DOC14/6276-01) provided in ENRS (2014a) (Figure 9). Annual Environmental Monitoring Results Reports (2014-2018).	Annual Environmental Monitoring Results Reports (ENRS, 2014; 2015; 2016; 2017; 2018) include specific reference to (Figure 10): 1. LD1 2. DP2 3. DP3	Non-Compliant (Low)																				

5 Surface water monitoring 6 Surface water monitoring 7 Surface water monitoring 8 Groundwater monitoring 9 Groundwater monitoring 11 Groundwater monitoring 13 Groundwater monitoring 14 Groundwater monitoring 17 Groundwater monitoring 18 Groundwater monitoring 20 Groundwater monitoring	Immediately downstream from the leachate dam at the boundary of the site as shown on drawing 2824_16 referenced as EPA WOF9346. Upstream of site in Sandy Creek as shown on drawing 2824_16 referenced as EPA WOF9346. Downstream of site in Sandy Creek as shown on drawing 2824_16 referenced as EPA WOF9346. Groundwater monitoring well labelled BH1 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275936 N6137766 Groundwater monitoring well labelled BH2 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01). E275914 N6137656 Groundwater monitoring well labelled BH4A on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275896 N6137573 Groundwater monitoring well labelled BH6 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275871 N6137469 Groundwater monitoring well labelled BH7 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275872 N6137469 Groundwater monitoring well labelled BH10 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275775 N6137366 Groundwater monitoring well labelled BH11 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275830 N6137492 Groundwater monitoring well labelled BH13 on diagram titled "Bore Location Plan" May 17/01/14 (DOC14/6276-07) E275996 N6137489	Site interview (27 June 2019).	5. SW1* 6. SW3 7. SW2 8. BH1 (dry) (NB: No water quality monitoring is however required by Condition M2.3 of the EPL) 9. BH2 11. BH4A 13. BH6 14. BH7 17. BH10 18. BH11 (dry) 20. BH13 21. BH14 25. Pipeline from LD1 26. Utilisation (Irrigation) Area 27. Leachate PH (pumphouse) 29. BH16 30. BH17 31. BH18 (dry) 32. BH19 (dry) 33. BH20 34. BH21 (dry) 35. BH22 (dry) 36. BH23 (dry) <i>*It is recommended that the location of the surface water monitoring location be shown immediately downstream from the leachate dam at the boundary of the premises, or otherwise clarify with the EPA.</i> As demonstrated above, a number of groundwater sampling locations have been recorded dry. Consistent with the detailed recommendations in ENRS (2018) consideration should be given to deepening the bores at locations where more than 3 successive sampling events have been dry to ensure compliance with Section 4.4 of <i>Environmental Guidelines: Solid Waste Landfills</i>, Second Edition	
--	---	---------------------------------------	--	--

	<table><tr><td>21</td><td>Groundwater monitoring</td><td>Groundwater monitoring well labelled BH14 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E276421 N6137653</td></tr><tr><td>25</td><td>Leachate Volume Monitoring</td><td>Pipeline from Leachate Dam (LD1) to irrigation area as shown on drawing 2824_16 referenced as EPA WOF 9346</td></tr><tr><td>26</td><td>Utilisation Area</td><td>Irrigation area as shown on drawing 2824_16 referenced as EPA WOF9346</td></tr><tr><td>27</td><td>Leachate Volume and Quality</td><td>leachate pumphouse for Stage 3</td></tr><tr><td>29</td><td>Groundwater monitoring</td><td>Groundwater monitoring well labelled BH16 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275750 E6137137</td></tr><tr><td>30</td><td>Groundwater monitoring</td><td>Groundwater monitoring well labelled BH17 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275750 N6137142</td></tr><tr><td>31</td><td>Groundwater monitoring</td><td>Groundwater monitoring well labelled BH18 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275707 N6137202</td></tr><tr><td>32</td><td>Groundwater monitoring</td><td>Groundwater monitoring well labelled BH19 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E276132 N6137061</td></tr><tr><td>33</td><td>Groundwater monitoring</td><td>Groundwater monitoring well labelled BH20 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E276171 N6137736</td></tr><tr><td>34</td><td>Groundwater Monitoring</td><td>Groundwater monitoring well labelled BH21 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275742 N6136900</td></tr><tr><td>35</td><td>Groundwater monitoring</td><td>Groundwater monitoring well labelled BH22 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275821 N6136791</td></tr><tr><td>36</td><td>Groundwater monitoring</td><td>Groundwater monitoring well labelled BH23 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275942 N6136774</td></tr></table>	21	Groundwater monitoring	Groundwater monitoring well labelled BH14 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E276421 N6137653	25	Leachate Volume Monitoring	Pipeline from Leachate Dam (LD1) to irrigation area as shown on drawing 2824_16 referenced as EPA WOF 9346	26	Utilisation Area	Irrigation area as shown on drawing 2824_16 referenced as EPA WOF9346	27	Leachate Volume and Quality	leachate pumphouse for Stage 3	29	Groundwater monitoring	Groundwater monitoring well labelled BH16 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275750 E6137137	30	Groundwater monitoring	Groundwater monitoring well labelled BH17 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275750 N6137142	31	Groundwater monitoring	Groundwater monitoring well labelled BH18 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275707 N6137202	32	Groundwater monitoring	Groundwater monitoring well labelled BH19 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E276132 N6137061	33	Groundwater monitoring	Groundwater monitoring well labelled BH20 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E276171 N6137736	34	Groundwater Monitoring	Groundwater monitoring well labelled BH21 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275742 N6136900	35	Groundwater monitoring	Groundwater monitoring well labelled BH22 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275821 N6136791	36	Groundwater monitoring	Groundwater monitoring well labelled BH23 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275942 N6136774		(2016) which requires: <i>If the waste mass is above the groundwater level, the screened section of the well should extend through the upper 5 to 10 metres of the saturated aquifer, or into at least the first water-bearing zone in the case of fractured aquifers.</i>	
21	Groundwater monitoring	Groundwater monitoring well labelled BH14 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E276421 N6137653																																						
25	Leachate Volume Monitoring	Pipeline from Leachate Dam (LD1) to irrigation area as shown on drawing 2824_16 referenced as EPA WOF 9346																																						
26	Utilisation Area	Irrigation area as shown on drawing 2824_16 referenced as EPA WOF9346																																						
27	Leachate Volume and Quality	leachate pumphouse for Stage 3																																						
29	Groundwater monitoring	Groundwater monitoring well labelled BH16 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275750 E6137137																																						
30	Groundwater monitoring	Groundwater monitoring well labelled BH17 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275750 N6137142																																						
31	Groundwater monitoring	Groundwater monitoring well labelled BH18 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275707 N6137202																																						
32	Groundwater monitoring	Groundwater monitoring well labelled BH19 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E276132 N6137061																																						
33	Groundwater monitoring	Groundwater monitoring well labelled BH20 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E276171 N6137736																																						
34	Groundwater Monitoring	Groundwater monitoring well labelled BH21 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275742 N6136900																																						
35	Groundwater monitoring	Groundwater monitoring well labelled BH22 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275821 N6136791																																						
36	Groundwater monitoring	Groundwater monitoring well labelled BH23 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275942 N6136774																																						
Limit Conditions – L1	Pollution of Waters	EPL No. 5877.	Refer below.	Noted.																																				
Limit Conditions – L1.1	Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.	Records of any orders/prosecutions on EPL Public Register. EPA Consultation.	Based on the search of the Public Register, there have been no orders/prosecutions in the past 5 years (within the scope of this audit). The EPA confirmed (18 June 2019) that there are no significant outstanding matters that are not represented on the Protection of the Environment Operations Act 1997 Public Register (Attachment 3).	Compliant.																																				
Limit Conditions – L2	Concentration Limits	EPL No. 5877.	Refer below.	Noted.																																				

Limit Conditions – L2.1	For each monitoring/discharge point or utilisation area specified in the table/s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.	Annual Returns (2014-2018). EPL No. 5877.	The Annual Returns include a Statement of Compliance for the audit scope period. However, refer below EPL Condition L2.4 .	Non-Compliant (Low)																																																
Limit Conditions – L2.2	Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.	EPL No. 5877.	Refer below.	Non-Compliant (Low)																																																
Limit Conditions – L2.3	To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\.	EPL No. 5877.	Refer below.	Noted.																																																
Limit Conditions – L2.4	Water and/or Land Concentration Limits: <table><tr><th colspan="6">POINT 2</th></tr><tr><th>Pollutant</th><th>Units of Measure</th><th>50 percentile concentration limit</th><th>90 percentile concentration limit</th><th>3DGM concentration limit</th><th>100 percentile concentration limit</th></tr><tr><td>pH</td><td>pH</td><td></td><td></td><td></td><td>6.5-8.5</td></tr><tr><td>Total suspended solids</td><td>milligrams per litre</td><td></td><td></td><td></td><td>50</td></tr></table> <table><tr><th colspan="6">POINT 3</th></tr><tr><th>Pollutant</th><th>Units of Measure</th><th>50 percentile concentration limit</th><th>90 percentile concentration limit</th><th>3DGM concentration limit</th><th>100 percentile concentration limit</th></tr><tr><td>pH</td><td>pH</td><td></td><td></td><td></td><td>6.5-8.5</td></tr><tr><td>Total suspended solids</td><td>milligrams per litre</td><td></td><td></td><td></td><td>50</td></tr></table>	POINT 2						Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile concentration limit	pH	pH				6.5-8.5	Total suspended solids	milligrams per litre				50	POINT 3						Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile concentration limit	pH	pH				6.5-8.5	Total suspended solids	milligrams per litre				50	Annual Returns (2014-2018). EPA – Quarterly and Annual Results – West Nowra – PDF requested. Site interview (27 June 2019). Overflow Water Quality Monitoring Event (07/06/2016) West Nowra Recycling and Waste Facility (EPL 5877) 120 Flatrock Road Mundamia, NSW. (ENRS, 15 June 2016).	The results of monitoring reported in the 2016 Annual Return at Monitoring Point 3 (DP3) were as follows: pH – 1 sample pH = 5.6 (< range of 6.5 to 8.5) TSS – 1 sample TSS = 115 mg/L (> 50 mg/L) No overflow events occurred during 2014 & 2015. <i>It is recommended that comparisons be made in future Annual Returns against the limit conditions prescribed in Condition L2.4.</i>	Non-Compliant (Low)
POINT 2																																																				
Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile concentration limit																																															
pH	pH				6.5-8.5																																															
Total suspended solids	milligrams per litre				50																																															
POINT 3																																																				
Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile concentration limit																																															
pH	pH				6.5-8.5																																															
Total suspended solids	milligrams per litre				50																																															
Limit Conditions – L3	Waste	EPL No. 5877.	Refer below.	Noted.																																																
Limit Conditions – L3.1	The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled “Waste” and meeting the definition, if any, in the column titled “Description” in the table below. Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled “Activity” in the table below. Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled “Other Limits” in the table below. This condition does not limit any other conditions in this licence.	Annual Returns (2014-2018). Variation notices including: • 29 September 2015 (to permit the construction of a Cathode Ray Tube [CRT] Glass Waste Mono-cell); • 23 November 2015 (to allow for the disposal of CRT Glass Waste in the CRT Glass Waste Cell); • 11 January 2016 (to reflect the last load of CRT Glass Waste had been	The Annual Returns include a Statement of Compliance for the audit scope period. It is noted that the EPL was accordingly varied to allow for Cathode Ray Tube glass waste to be received and disposed during the audit scope period.	Compliant.																																																

	<table border="1"> <thead> <tr> <th>Code</th><th>Waste</th><th>Description</th><th>Activity</th><th>Other Limits</th></tr> </thead> <tbody> <tr> <td>NA</td><td>General solid waste (non-putrescible)</td><td>As defined in Schedule 1 of the POEO Act, as in force from time to time</td><td>Waste disposal (application to land) Waste storage Composting Waste processing (non-thermal treatment)</td><td>NA</td></tr> <tr> <td>NA</td><td>General solid waste (putrescible)</td><td>As defined in Schedule 1 of the POEO Act, as in force from time to time</td><td>Waste disposal (application to land)</td><td>NA</td></tr> <tr> <td>NA</td><td>Asbestos waste</td><td>As defined in Schedule 1 of the POEO Act, as in force from time to time</td><td>Waste disposal (application to land)</td><td>NA</td></tr> <tr> <td>NA</td><td>Waste tyres</td><td>As defined in Schedule 1 of the POEO Act, as in force from time to time</td><td>Waste disposal (application to land)</td><td>NA</td></tr> <tr> <td>NA</td><td>Waste</td><td>Any waste received on site that is below licensing thresholds in Schedule 1 of the POEO Act, as in force from time to time</td><td>-</td><td>NA</td></tr> </tbody> </table>	Code	Waste	Description	Activity	Other Limits	NA	General solid waste (non-putrescible)	As defined in Schedule 1 of the POEO Act, as in force from time to time	Waste disposal (application to land) Waste storage Composting Waste processing (non-thermal treatment)	NA	NA	General solid waste (putrescible)	As defined in Schedule 1 of the POEO Act, as in force from time to time	Waste disposal (application to land)	NA	NA	Asbestos waste	As defined in Schedule 1 of the POEO Act, as in force from time to time	Waste disposal (application to land)	NA	NA	Waste tyres	As defined in Schedule 1 of the POEO Act, as in force from time to time	Waste disposal (application to land)	NA	NA	Waste	Any waste received on site that is below licensing thresholds in Schedule 1 of the POEO Act, as in force from time to time	-	NA	received to the CRT Glass Waste Cell); and 28 September 2016 (to reflect that the QA/QC documentation for the capped CRT Glass Waste Cell had been submitted). Six-Monthly Volumetric Survey Plan(s) with Supporting Volumetric Survey Checklist(s), Landfill Facility Information Certificate(s) and Stockpile Information & Schedule of Material Movements. Annual Report (2014-2018). Site inspection (27 June 2019) (Plates 7 & 8).	The stockpile information sheets for the audit period each year report the waste storage and disposal. The Annual Reports provide a summary of operations (and tonnages) including: - Landfilling of putrescible waste. - Landfilling of asbestos waste. - Tyre storage.	
Code	Waste	Description	Activity	Other Limits																														
NA	General solid waste (non-putrescible)	As defined in Schedule 1 of the POEO Act, as in force from time to time	Waste disposal (application to land) Waste storage Composting Waste processing (non-thermal treatment)	NA																														
NA	General solid waste (putrescible)	As defined in Schedule 1 of the POEO Act, as in force from time to time	Waste disposal (application to land)	NA																														
NA	Asbestos waste	As defined in Schedule 1 of the POEO Act, as in force from time to time	Waste disposal (application to land)	NA																														
NA	Waste tyres	As defined in Schedule 1 of the POEO Act, as in force from time to time	Waste disposal (application to land)	NA																														
NA	Waste	Any waste received on site that is below licensing thresholds in Schedule 1 of the POEO Act, as in force from time to time	-	NA																														
Limit Conditions – L3.2	The stockpiles of waste or recovered materials must not exceed the following limits at any one time: a) Processed and unprocessed garden waste and/or wood waste – 5,000 tonnes; b) Processed and unprocessed building and demolition waste – 10,000 tonnes; c) Scrap metal – 5,000 tonnes; and d) Glass – 5,000 tonnes.	Six-Monthly Volumetric Survey Plan(s) with Supporting Volumetric Survey Checklist(s), Landfill Facility Information Certificate(s) and Stockpile Information & Schedule of Material Movements. Annual Report (2014-2018). Site inspection (27 June 2019) (Plates 13 & 14).	Inventory estimates for tonnages accepted/recovered and stockpiled at the facility are provided in the Annual Reports as follows: Garden / Wood Waste (Green Waste) - 2014: 3,003t (stockpiled <2,000 t) - 2015: 3,053t - 2016: 3,839t - 2017: 3,211t - 2018: 3,270t (stockpiled <1,000 t) Building / Demolition Waste - 2014: 2,921t - 2015: 2,146t - 2016: 2,743t - 2017: 2,778t - 2018: 2,615.90t (stockpiled <500t) Scrap Metal - 2014: 522t - 2015: 673t (stockpiled <200 t) - 2016: 966t (stockpiled <20 t) - 2017: 847t - 2018: 1,073t (stockpiled <50 t) Glass - 2014: 39t (stockpiled <2,000 t) - 2015: 34t (stockpiled <2,000 t) - 2016: 45t (stockpiled <600 t) - 2017: 44t	Compliant.																														

Limit Conditions – L3.3	The licensee must not dispose of any tyres on the premises which; a) have a diameter of less than 1.2 metres; and b) are delivered at the premises in a load containing more than 5 whole tyres; and c) became waste in the Sydney Metropolitan Area.	Site interview (27 June 2019).	- 2018: 63t (stockpiled <100 t) Protocols confirmed during the site interview.	Compliant.
Limit Conditions – L3.4	Tyres stockpiled on the premises must: a) not exceed fifty (50) tonnes of tyres at any one time; and b) be located in a clearly defined area away from the tipping face; and c) be managed to control vermin; and d) be managed to prevent any tyres from catching fire.	Site interview (27 June 2019) (Plate 8). Six-Monthly Volumetric Survey Plan(s) with Supporting Volumetric Survey Checklist(s), Landfill Facility Information Certificate(s) and Stockpile Information & Schedule of Material Movements. Annual Report (2014-2018).	Inventory estimates for tyres stockpiled at the facility are provided in the Annual Reports as follows: - 2014: 13t - 2015: 30t - 2016: 24t - 2017: 21t - 2018: 31.2t	Compliant.
Limit Conditions – L4	Potentially offensive odour	EPL No. 5877.	Refer below.	Noted.
Limit Conditions – L4.1	The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises.	Annual Report (2014-2018). NPWS EIS Submission (29 February 2016) – West Nowra Resource Recovery Facility. <i>Technical Framework: Assessment and Management of Odour from Stationary Sources in NSW</i> (DEC, 2006a). <i>Technical Notes: Assessment and Management of Odour from Stationary Sources in NSW</i> (DEC, 2006b).	It is noted that no reportable complaints have been received during the 5-year scope of this environmental audit. One (1) odour complaint was recorded prior to the audit period. While referring to the adjacent West Nowra Resource Recovery Facility, the NPWS EIS Submission relevantly states: <i>“This is particularly as the existing waste facility often emits offensive odours depending on the prevailing wind which has been investigated by the EPA.”</i> Odour management strategies are outlined in the LEMP including daily covering of waste. Odour management is however not discussed in the Annual Reports. <i>It is recommended the LEMP be reviewed and if necessary revised to reference the EPA Technical Framework / Notes and future Annual Reports describe odour management performance at the premises.</i>	Not Verified.
Operating Conditions – O1	Activities must be carried out in a competent manner	EPL No. 5877.	Refer below.	Noted.

Operating Conditions – O1.1	Licensed activities must be carried out in a competent manner. This includes: a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.	Site inspection and interview (27 June 2019). Six-Monthly Volumetric Survey Plan(s) with Supporting Volumetric Survey Checklist(s), Landfill Facility Information Certificate(s) and Stockpile Information & Schedule of Material Movements. Annual Report (2014-2018).	Activities observed during the site inspection (i.e. wet weather areas) were being carried out in a competent manner.	Compliant.
Operating Conditions – O2	Maintenance of plant and equipment	EPL No. 5877.	Refer below.	Noted.
Operating Conditions – O2.1	All plant and equipment installed at the premises or used in connection with the licensed activity: a) must be maintained in a proper and efficient condition; and b) must be operated in a proper and efficient manner.	LEMP (2008). Site inspection and interview (27 June 2019).	Workshops on premises observed and subject to periodic maintenance confirmed during site interview. Section 9.3.1 of the LEMP relevantly states that plant and equipment shall be regularly maintained.	Compliant.
Operating Conditions – O3	Dust	EPL No. 5877.	Refer below.	Noted.
Operating Conditions – O3.1	All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.	LEMP (2008). Site inspection and interview (27 June 2019).	Speed limits restricted on the premises to 15 km/hour (Plate 3). Rehabilitation areas observed (Plates 22 & 23). LEMP refers to dust controls including internal access roads being properly formed, drained, surface treated and maintained, and use of dust suppression, using water cart or irrigators, on exposed soil areas.	Compliant.
Operating Conditions – O4	Emergency response	EPL No. 5877.	Refer below.	Noted.
Operating Conditions – O4.1	The licensee must have in place and implement procedures to minimise the risk of fire at the premises.	LEMP (2008). PIRMP – Site Emergency Procedures Manual. Site inspection and interview (27 June 2019). (Plates 4, 8, 13 & 14)	The LEMP describes fire prevention techniques (i.e. landfill gas prevention, tyre stockpiling, avoid hazardous waste disposal, appropriate waste oil and fuel storage, and vegetation management). Green waste and timber wood stockpiles are centrally located at the premises. Section 9.4.1 of the LEMP describes the fire-fighting capacity. The Site Emergency Procedures Manual identifies fire risk at the premises.	Compliant.

Operating Conditions – O4.2	The licensee must extinguish fires at the premises as soon as possible.	PIRMP – Site Emergency Procedures Manual. Site inspection and interview (27 June 2019).	Procedures are in place in the PIRMP. The personnel were not aware of any fires at the premises during audit scope period.	Compliant.
Operating Conditions – O5	Processes and management	EPL No. 5877.	Refer below.	Noted.
Operating Conditions – O5.1	The licensee must take all practicable steps to control entry to the premises.	Site inspection and interview (27 June 2019). (Plates 2, 7 & 10)	A boundary fence secures the perimeter of the premises. Site entry control (including locked entry gate outside of hours) and boomgate at the weighbridge.	Compliant.
Operating Conditions – O5.2	The licensee must ensure that all gates are locked whenever the landfill is unattended.	Site inspection and interview (27 June 2019). (Plate 2)	The lock on the site entry gate was observed (Plate 2). The western boundary gates were also locked at the time of site inspection.	Compliant.
Operating Conditions – O6	Waste management	EPL No. 5877.	Refer below.	Noted.
Operating Conditions – O6.1	Leachate impounded in the surface leachate storage ponds and leachate collected by the subsurface leachate collection system may be irrigated on the following utilisation area(s): a) Point No. 26 - Irrigation Area; and b) Irrigation at tip face.	Site inspection and interview (27 June 2019). (Plate 21)	The irrigation (utilisation) area was observed and confirmed during the site interview. Refer to Condition M6.1 .	Compliant.
Operating Conditions – O6.2	The volume of leachate directed to the utilisation area must not exceed the capacity of the area to assimilate the leachate.	LEMP (2008). Site inspection and interview (27 June 2019). (Plate 21)	The irrigation (utilisation) area was observed and procedures confirmed during the site interview. Refer to Condition M6.1 .	Compliant.
Operating Conditions – O6.3	The landfill surface must be contoured to ensure that stormwater is managed separately from leachate.	Site inspection and interview (27 June 2019). Figures 1, 2 & 4. Surface Water Management Plan.	Diversion bunds and drains were observed and evident to separately manage stormwater from leachate at the premises. (Plates 17-20 & 24-26)	Compliant.
Operating Conditions – O6.4	a) Daily cover Daily cover must be either: i) virgin excavated natural material (VENM); or ii) approved alternative daily cover. Note: for the purpose of condition O6.4 (a) (i) the cover material must be applied to a minimum depth of 15 centimetres over all exposed landfilled waste prior to ceasing operations at the end of each day. Note: for the purpose of condition O6.4 (a) (ii) the approved ADC is the "tarpLOX" Automatic Tarp Deployment System (ATDS) applied to achieve the Required Outcomes of the	LEMP (2008). Site inspection and interview (27 June 2019). (Plates 12 & 27) Six-Monthly Volumetric Survey Plan(s) with Supporting Volumetric Survey Checklist(s), Landfill Facility Information Certificate(s) and Stockpile Information & Schedule of Material Movements. Site Interview/Checklist.	Works and activities observed during the site inspection related to the licenced waste activities at the premises including that subject to licence variation applications (e.g. Automated Tarp Deployment System [ATDS]) (Plate 12). The cover procedures are outlined in the LEMP and were confirmed during the site interview. VENM stockpile inventory are provided with the volumetric surveys.	Compliant.

	Chapter 8 (Covering of Waste) of the EPA's Environmental Guidelines: Solid Waste Landfills (2016). b) Intermediate cover Intermediate cover material must be VENM and must be applied to a depth of 30 centimetres over surfaces of the landfilled waste at the premises which are to be exposed for more than 90 days. c) Cover material stockpile At least two weeks of VENM cover material must be available at the premises under all weather conditions. This material may be won on site, or alternatively a cover stockpile must be maintained adjacent to the tip face.			
Operating Conditions – O6.5	The licensee must have in place and implement procedures to identify and prevent the disposal of any waste not permitted by this licence to be disposed of at the premises.	West Nowra Landfill Depot Management Plan. Site inspection and interview (27 June 2019). (Plate 7)	Weighbridge boomgate and prohibition signage was observed (Plate 7). Sections 5.2.1 and 5.2.2 prescribe the permitted and excluded wastes, and procedures for acceptance of special wastes. Variations to EPL No. 5877 to accept CRT waste was also noted.	Compliant.
Operating Conditions – O6.6	Vehicles leaving the premises must not track materials to external surfaces.	LEMP (2008). Annual Returns (2014-2018). Site inspection and interview (27 June 2019). (Plates 15 & 16)	Section 9.2.2 of the LEMP (2008) describes the procedures for cleaning vehicles including wheel wash bay. Relevant performance indicators (complaints regarding the tracking of mud and litter) and random audits of vehicles. The Annual Returns include a Statement of Compliance for the audit scope period. The vehicle wheel washdown bay was observed during the site inspection.	Compliant.
Operating Conditions – O6.7	The licensee must only dispose of waste at the premises in landfill cell stages 3C-2, 3D-2, 3E-1 and 3E-2 or the Wet Weather Area unless the EPA amends this licence to expressly permit waste disposal elsewhere at the premises. Note: For the purposes of this condition, "Wet Weather Area" refers to the area labelled "Wet Weather Tipping Area 1" and "Wet Weather Tipping Area 2" on the drawing "West Nowra Recycling and Waste Facility – Wet Weather Tipping Areas - Site Plan" (Plan Reference: 2824_252) dated 11 December 2014 (EPA Reference DOC14/308730).	Plan Showing 'Wet Weather Tipping Areas' [Plan Reference No. 2824_252] dated 11 December 2014 (EPA Reference DOC14/308730) (Figure 8). Site inspection and interview (27 June 2019).	Wet weather tipping areas were in use during the site inspection at the designated areas shown on Figure 8 .	Compliant.

Operating Conditions – O6.8	The licensee must not exhume any landfilled waste unless approved in writing by the EPA.	Site inspection and interview (27 June 2019).	Consistent with the EPL Notices, personnel were not aware of any exhumation of landfill waste occurring during the audit scope period.	Compliant.
Operating Conditions – O6.9	The licensee must obtain approval from the EPA prior to constructing any landfill cells at the premises.	Construction Quality Assurance Plan Landfill Cell Stage 3E-2 (GHD, 2018b). Construction Quality Assurance Report Landfill Cell Stage 3E-2 (GHD, 2018c). Landfill Cell Stage 3F - Preliminary Design and Construction Specifications dated 20 November 2018.	Approval procedures are evident, including variation notices demonstrating the EPA approval prior to construction during the audit scope period.	Compliant.
Operating Conditions – O6.10	The licensee must provide a report to the EPA which details the design, construction, operation and rehabilitation of any new landfill cell. This report must be submitted to the EPA at least six months before the licensee intends to construct the cell, and it must include details on a QA/QC program which can demonstrate that the cell was constructed to meet its design specifications.	Construction Quality Assurance Plan Landfill Cell Stage 3E-2 (GHD, 2018b). Construction Quality Assurance Report Landfill Cell Stage 3E-2 (GHD, 2018c). Landfill Cell Stage 3F - Preliminary Design and Construction Specifications dated 20 November 2018.	Reports were provided to EPA.	Compliant.
Operating Conditions – O6.11	The licensee must construct landfill cell 3F in accordance with the designs, specifications, methods and construction quality assurance plan contained in "Landfill Cell Stage 3F - Preliminary Design and Construction Specifications" dated 20 November 2018 and associated drawings. This includes a leachate barrier on the cell floor and walls comprising, from bottom to top: a) a prepared sub-grade; b) a geosynthetic clay liner; c) a geomembrane; d) a protection geotextile; e) a leachate collection layer comprising 300 mm of gravel and collection pipework. A geonet drainage geocomposite may be used as an alternative to the gravel drainage material along the landfill cell batter walls; and f) a separation geotextile.	Landfill Cell Stage 3F - Preliminary Design and Construction Specifications dated 20 November 2018.	3F Anticipated Commencement Date = July 2019.	Not Triggered.
Operating Conditions – O6.12	Following construction of landfill cell 3F, the licensee must submit a Construction Quality Assurance Report on the quality assurances that were implemented to ensure that the works comply with the approved designs, specifications and methods.	Construction Quality Assurance Report Landfill Cell Stage 3E-2 (GHD, 2018b) (example).	3F Anticipated Commencement Date = July 2019	Not Triggered.
Operating Conditions – O6.13	The licensee must not deposit any waste in landfill cell 3F until the EPA has approved the Construction Quality Assurance Report in writing.	Construction Quality Assurance Report Landfill Cell Stage 3E-2 (GHD, 2018c) (example).	3F Anticipated Commencement Date = July 2019	Not Triggered.

Operating Conditions – O6.14	The licensee must ensure that the landfill cells are capped progressively during operations and specifically at times when the level of waste reaches final heights.	Annual Returns (2014-2018). Construction Quality Assurance Report Landfill Cell Stage 3E-2 (GHD, 2018c) (example).	The Annual Returns include a Statement of Compliance for the audit scope period.	Compliant.
Operating Conditions – O6.15	The licensee must ensure that the final capping of all landfill cells is in accordance with EPA's "Environmental Guidelines: Solid Waste Landfills, Second Edition" dated 2016.	LEMP (2008).	Section 8.6.3 of the LEMP describes the landfill closure and post closure monitoring and maintenance and relevantly states: <i>When sufficient evidence is provided that the former landfilling operation is stable and non-polluting, Council shall seek to complete all obligations and settle any financial assurance by submitting a Certified Statement of Completion which states that the site remediation work has been completed and further environmental management of the site is not required. Notwithstanding, it is recommended that the LEMP should be reviewed, and if necessary updated, to include reference to Environmental Guidelines: Solid Waste Landfills, Second Edition.</i>	Not Triggered.
Operating Conditions – O6.16	The last licensee must prepare and submit to the EPA within six months prior to the last load of waste being landfilled, a closure plan in accordance with section 76 of the Protection of the Environment Operations Act 1997.	Six-Monthly Volumetric Survey Plan(s) with Supporting Volumetric Survey Checklist(s), Landfill Facility Information Certificate(s) and Stockpile Information & Schedule of Material Movements. Site Interview/Checklist.	Void space remaining as of 31 December 2018 (end of last survey period) was 708,090 m ³ at the West Nowra Recycling and Waste Facility – Stages 1 to 3). The Waste Services Unit SCC confirmed that the Closure Plan had not been triggered during the audit scope as the waste landfilling activities are ongoing and the last load of waste is expected to be well beyond six months based on the remaining disposal capacity estimates. Note: SCC has sought an extension to the approved use period from 29 years to 49 years which is currently the subject of assessment in accordance with Condition 5 of DA No. 90/3061. Section 8.6.3 of the LEMP outlines the requirements for the Certified Statement of Completion.	Not Triggered.
Monitoring and Recording Conditions – M1	Monitoring records	EPL No. 5877.	Refer below.	Noted.

Monitoring and Recording Conditions – M1.1	The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.	EPL No. 5877. Annual Returns (2014-2018).	Refer below.	Noted.							
Monitoring and Recording Conditions – M1.2	All records required to be kept by this licence must be: a) in a legible form, or in a form that can readily be reduced to a legible form; b) kept for at least 4 years after the monitoring or event to which they relate took place; and c) produced in a legible form to any authorised officer of the EPA who asks to see them.	Annual Returns (2014-2018). Annual Reports (2014-2018).	Annual Returns and supporting Annual Reports and Monitoring Results were provided in a legible form for the audit scope period (5-years).	Compliant. (<i>Not Triggered</i>)							
Monitoring and Recording Conditions – M1.3	The following records must be kept in respect of any samples required to be collected for the purposes of this licence: a) the date(s) on which the sample was taken; b) the time(s) at which the sample was collected; c) the point at which the sample was taken; and d) the name of the person who collected the sample.	Annual Environmental Monitoring Results Reports (ENRS [2014; 2015; 2016; 2017; 2018]).	Samples are collected and analysed by SCC’s preferred contractor, ALS Environmental. Chain of custody and sample field sheets are provided as an attachment to the Annual Environmental Monitoring Results Reports.	Compliant.							
Monitoring and Recording Conditions – M2	Requirement to monitor concentration of pollutants discharged	EPL No. 5877.	Refer below.	Noted.							
Monitoring and Recording Conditions – M2.1	For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:	EPL No. 5877.	Refer below.	Noted.							
Monitoring and Recording Conditions – M2.2	Air Monitoring Requirements	EPL No. 5877.	Refer below.	Noted.							
	POINT 24 <table><tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr><tr><td>Methane</td><td>percent by volume</td><td>Every 6 months</td><td>Special Method 1</td></tr></table>	Pollutant	Units of measure	Frequency	Sampling Method	Methane	percent by volume	Every 6 months	Special Method 1	West Nowra Landfill Surface Gas Emission Monitoring Reports (ALS Environmental [2014a; 2014b; 2015a; 2015b; 2016a; 2016b; 2017a; 2017b; 2018a; 2018b])	Methane (percent by volume) was monitored every 6 months during the audit scope period and reported in the ALS Environmental reports in ppm units. <i>NB: It is recommended that results be converted from ppm to percent by volume to allow direct comparison with the corresponding threshold of 1.25% methane (v/v) prescribed in Benchmark Technique Number 18 of the Environmental Guidelines: Solid Waste Landfills (1996).</i>
Pollutant	Units of measure	Frequency	Sampling Method								
Methane	percent by volume	Every 6 months	Special Method 1								
	Water and / or Land Monitoring Requirements	EPL No. 5877.	Refer below.	Noted.							

Monitoring and Recording Conditions – M2.3	POINT 1 <table><thead><tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr></thead><tbody><tr><td>Alkalinity (as calcium carbonate)</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Aluminium</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Arsenic</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Barium</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Benzene</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Bicarbonate</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Cadmium</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Calcium</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Carbonate</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Chloride</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Chromium (hexavalent)</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Chromium (total)</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Cobalt</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Conductivity</td><td>microsiemens per centimetre</td><td>Yearly</td><td>Probe</td></tr><tr><td>Copper</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Ethyl benzene</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Fluoride</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Lead</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Magnesium</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Manganese</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Mercury</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Nitrate</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Nitrite</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Nitrogen (ammonia)</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Organochlorine pesticides</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Organophosphate pesticides</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>pH</td><td>pH</td><td>Yearly</td><td>Probe</td></tr><tr><td>Phosphate</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Phosphorus (total)</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Polycyclic aromatic hydrocarbons</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Potassium</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Sodium</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Sulfate</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Toluene</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Total dissolved solids</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Total organic carbon</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Total petroleum hydrocarbons</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Total Phenolics</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Total suspended solids</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Xylene</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Zinc</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr></tbody></table>	Pollutant	Units of measure	Frequency	Sampling Method	Alkalinity (as calcium carbonate)	milligrams per litre	Yearly	Grab sample	Aluminium	milligrams per litre	Yearly	Grab sample	Arsenic	milligrams per litre	Yearly	Grab sample	Barium	milligrams per litre	Yearly	Grab sample	Benzene	milligrams per litre	Yearly	Grab sample	Bicarbonate	milligrams per litre	Yearly	Grab sample	Cadmium	milligrams per litre	Yearly	Grab sample	Calcium	milligrams per litre	Yearly	Grab sample	Carbonate	milligrams per litre	Yearly	Grab sample	Chloride	milligrams per litre	Yearly	Grab sample	Chromium (hexavalent)	milligrams per litre	Yearly	Grab sample	Chromium (total)	milligrams per litre	Yearly	Grab sample	Cobalt	milligrams per litre	Yearly	Grab sample	Conductivity	microsiemens per centimetre	Yearly	Probe	Copper	milligrams per litre	Yearly	Grab sample	Ethyl benzene	milligrams per litre	Yearly	Grab sample	Fluoride	milligrams per litre	Yearly	Grab sample	Lead	milligrams per litre	Yearly	Grab sample	Magnesium	milligrams per litre	Yearly	Grab sample	Manganese	milligrams per litre	Yearly	Grab sample	Mercury	milligrams per litre	Yearly	Grab sample	Nitrate	milligrams per litre	Yearly	Grab sample	Nitrite	milligrams per litre	Yearly	Grab sample	Nitrogen (ammonia)	milligrams per litre	Yearly	Grab sample	Organochlorine pesticides	milligrams per litre	Yearly	Grab sample	Organophosphate pesticides	milligrams per litre	Yearly	Grab sample	pH	pH	Yearly	Probe	Phosphate	milligrams per litre	Yearly	Grab sample	Phosphorus (total)	milligrams per litre	Yearly	Grab sample	Polycyclic aromatic hydrocarbons	milligrams per litre	Yearly	Grab sample	Potassium	milligrams per litre	Yearly	Grab sample	Sodium	milligrams per litre	Yearly	Grab sample	Sulfate	milligrams per litre	Yearly	Grab sample	Toluene	milligrams per litre	Yearly	Grab sample	Total dissolved solids	milligrams per litre	Yearly	Grab sample	Total organic carbon	milligrams per litre	Yearly	Grab sample	Total petroleum hydrocarbons	milligrams per litre	Yearly	Grab sample	Total Phenolics	milligrams per litre	Yearly	Grab sample	Total suspended solids	milligrams per litre	Yearly	Grab sample	Xylene	milligrams per litre	Yearly	Grab sample	Zinc	milligrams per litre	Yearly	Grab sample	Annual Returns (2014-2018). Annual Environmental Monitoring Results Reports (ENRS [2014; 2015; 2016; 2017; 2018]).	The Annual Returns include a Statement of Compliance for the audit scope period. Based on review of data, the monitoring required by this condition appears to have been completed as per the required frequencies and all relevant parameters were monitored. <i>However, it is noted that ENRS recommend that the EPL be amended to remove 4-chlorophenol from the list of required analytes for points 12 (BH5), 13 (BH6), and 19 (BH12A) as it is no longer part of the laboratory suite for individual reporting.</i>	Compliant.
	Pollutant	Units of measure	Frequency	Sampling Method																																																																																																																																																																								
	Alkalinity (as calcium carbonate)	milligrams per litre	Yearly	Grab sample																																																																																																																																																																								
Aluminium	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Arsenic	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Barium	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Benzene	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Bicarbonate	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Cadmium	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Calcium	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Carbonate	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Chloride	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Chromium (hexavalent)	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Chromium (total)	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Cobalt	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Conductivity	microsiemens per centimetre	Yearly	Probe																																																																																																																																																																									
Copper	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Ethyl benzene	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Fluoride	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Lead	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Magnesium	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Manganese	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Mercury	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Nitrate	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Nitrite	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Nitrogen (ammonia)	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Organochlorine pesticides	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Organophosphate pesticides	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
pH	pH	Yearly	Probe																																																																																																																																																																									
Phosphate	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Phosphorus (total)	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Polycyclic aromatic hydrocarbons	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Potassium	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Sodium	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Sulfate	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Toluene	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Total dissolved solids	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Total organic carbon	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Total petroleum hydrocarbons	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Total Phenolics	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Total suspended solids	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Xylene	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
Zinc	milligrams per litre	Yearly	Grab sample																																																																																																																																																																									
POINT 3 <table><thead><tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr></thead><tbody><tr><td>pH</td><td>pH</td><td>Daily during any discharge</td><td>Grab sample</td></tr><tr><td>Total suspended solids</td><td>milligrams per litre</td><td>Daily during any discharge</td><td>Grab sample</td></tr></tbody></table>	Pollutant	Units of measure	Frequency	Sampling Method	pH	pH	Daily during any discharge	Grab sample	Total suspended solids	milligrams per litre	Daily during any discharge	Grab sample																																																																																																																																																																
Pollutant	Units of measure	Frequency	Sampling Method																																																																																																																																																																									
pH	pH	Daily during any discharge	Grab sample																																																																																																																																																																									
Total suspended solids	milligrams per litre	Daily during any discharge	Grab sample																																																																																																																																																																									
POINT 5,6,7 <table><thead><tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr></thead><tbody><tr><td>Biochemical oxygen demand</td><td>milligrams per litre</td><td>Quarterly</td><td>Grab sample</td></tr><tr><td>Conductivity</td><td>microsiemens per centimetre</td><td>Quarterly</td><td>Probe</td></tr><tr><td>Dissolved Oxygen</td><td>milligrams per litre</td><td>Quarterly</td><td>Probe</td></tr><tr><td>Nitrogen (ammonia)</td><td>milligrams per litre</td><td>Quarterly</td><td>Grab sample</td></tr><tr><td>pH</td><td>pH</td><td>Quarterly</td><td>Grab sample</td></tr><tr><td>Potassium</td><td>milligrams per litre</td><td>Quarterly</td><td>Grab sample</td></tr><tr><td>Total dissolved solids</td><td>milligrams per litre</td><td>Quarterly</td><td>Grab sample</td></tr><tr><td>Total organic carbon</td><td>milligrams per litre</td><td>Quarterly</td><td>Grab sample</td></tr></tbody></table>	Pollutant	Units of measure	Frequency	Sampling Method	Biochemical oxygen demand	milligrams per litre	Quarterly	Grab sample	Conductivity	microsiemens per centimetre	Quarterly	Probe	Dissolved Oxygen	milligrams per litre	Quarterly	Probe	Nitrogen (ammonia)	milligrams per litre	Quarterly	Grab sample	pH	pH	Quarterly	Grab sample	Potassium	milligrams per litre	Quarterly	Grab sample	Total dissolved solids	milligrams per litre	Quarterly	Grab sample	Total organic carbon	milligrams per litre	Quarterly	Grab sample																																																																																																																																								
Pollutant	Units of measure	Frequency	Sampling Method																																																																																																																																																																									
Biochemical oxygen demand	milligrams per litre	Quarterly	Grab sample																																																																																																																																																																									
Conductivity	microsiemens per centimetre	Quarterly	Probe																																																																																																																																																																									
Dissolved Oxygen	milligrams per litre	Quarterly	Probe																																																																																																																																																																									
Nitrogen (ammonia)	milligrams per litre	Quarterly	Grab sample																																																																																																																																																																									
pH	pH	Quarterly	Grab sample																																																																																																																																																																									
Potassium	milligrams per litre	Quarterly	Grab sample																																																																																																																																																																									
Total dissolved solids	milligrams per litre	Quarterly	Grab sample																																																																																																																																																																									
Total organic carbon	milligrams per litre	Quarterly	Grab sample																																																																																																																																																																									

POINT 9,11,14,17,18,20,21,29,30,31,32,33,34,35,36	Pollutant	Units of measure	Frequency	Sampling Method	
	Alkalinity (as calcium carbonate)	milligrams per litre	Quarterly	Grab sample	
	Aluminium	milligrams per litre	Yearly	Grab sample	
	Arsenic	milligrams per litre	Yearly	Grab sample	
	Barium	milligrams per litre	Yearly	Grab sample	
	Benzene	milligrams per litre	Yearly	Grab sample	
	Bicarbonate	milligrams per litre	Yearly	Grab sample	
	Cadmium	milligrams per litre	Yearly	Grab sample	
	Calcium	milligrams per litre	Quarterly	Grab sample	
	Carbonate	milligrams per litre	Yearly	Grab sample	
	Chloride	milligrams per litre	Quarterly	Grab sample	
	Chromium (hexavalent)	milligrams per litre	Yearly	Grab sample	
	Chromium (total)	milligrams per litre	Yearly	Grab sample	
	Cobalt	milligrams per litre	Yearly	Grab sample	
	Copper	milligrams per litre	Yearly	Grab sample	
	Ethyl benzene	milligrams per litre	Yearly	Grab sample	
	Fluoride	milligrams per litre	Yearly	Grab sample	
	Lead	milligrams per litre	Yearly	Grab sample	
	Magnesium	milligrams per litre	Yearly	Grab sample	
	Manganese	milligrams per litre	Yearly	Grab sample	
	Mercury	milligrams per litre	Yearly	Grab sample	
	Nitrate	milligrams per litre	Yearly	Grab sample	
	Nitrite	milligrams per litre	Yearly	Grab sample	
	Nitrogen (ammonia)	milligrams per litre	Quarterly	Grab sample	
	Organochlorine pesticides	milligrams per litre	Yearly	Grab sample	
	Organophosphate pesticides	milligrams per litre	Yearly	Grab sample	
	pH	pH	Quarterly	Probe	
	Phosphate	milligrams per litre	Yearly	Grab sample	
	Polycyclic aromatic hydrocarbons	milligrams per litre	Yearly	Grab sample	
	Potassium	milligrams per litre	Quarterly	Grab sample	
	Redox potential	millivolts	Yearly	Probe	
	Sodium	milligrams per litre	Quarterly	Grab sample	
	Standing Water Level	metres	Quarterly	In situ	
	Sulfate	milligrams per litre	Quarterly	Grab sample	
	Toluene	milligrams per litre	Yearly	Grab sample	
	Total dissolved solids	milligrams per litre	Quarterly	Grab sample	
	Total organic carbon	milligrams per litre	Quarterly	Grab sample	
	Total petroleum hydrocarbons	milligrams per litre	Yearly	Grab sample	
	Total Phenolics	milligrams per litre	Yearly	Grab sample	
	Xylene	milligrams per litre	Yearly	Grab sample	
	Zinc	milligrams per litre	Yearly	Grab sample	
	POINT 13	Pollutant	Units of measure	Frequency	Sampling Method
	2,3,4,5-Tetrachlorophenol	nanograms per litre	Yearly	Grab sample	
	2,3,4,6-Tetrachlorophenol	nanograms per litre	Yearly	Grab sample	
	2,3,4-trichlorophenol	nanograms per litre	Yearly	Grab sample	
	2,3,5,6-tetrachlorophenol	nanograms per litre	Yearly	Grab sample	
	2,3,5-trichlorophenol	nanograms per litre	Yearly	Grab sample	
	2,3,6-trichlorophenol	nanograms per litre	Yearly	Grab sample	
	2,3-dichlorophenol	nanograms per litre	Yearly	Grab sample	
	2,4,5-trichlorophenol	nanograms per litre	Yearly	Grab sample	
	2,4,6-trichlorophenol	nanograms per litre	Yearly	Grab sample	
	2,4-Dichlorophenol	nanograms per litre	Yearly	Grab sample	
	2,5-dichlorophenol	nanograms per litre	Yearly	Grab sample	
	2,6-dichlorophenol	nanograms per litre	Yearly	Grab sample	
2-Chlorophenol	nanograms per litre	Yearly	Grab sample		
3,4-dichlorophenol	nanograms per litre	Yearly	Grab sample		
3,5-dichlorophenol	nanograms per litre	Yearly	Grab sample		
3-chlorophenol	nanograms per litre	Yearly	Grab sample		
4-Chlorophenol	nanograms per litre	Yearly	Grab sample		

	<table><tr><td>Alkalinity (as calcium carbonate)</td><td>milligrams per litre</td><td>Quarterly</td><td>Grab sample</td></tr><tr><td>Aluminium</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Arsenic</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Barium</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Benzene</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Bicarbonate</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Cadmium</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Calcium</td><td>milligrams per litre</td><td>Quarterly</td><td>Grab sample</td></tr><tr><td>Carbonate</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Chloride</td><td>milligrams per litre</td><td>Quarterly</td><td>Grab sample</td></tr><tr><td>Chromium (hexavalent)</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Chromium (total)</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Copper</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Ethyl benzene</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Fluoride</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Lead</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Mercury</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Nitrate</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Nitrite</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Nitrogen (ammonia)</td><td>milligrams per litre</td><td>Quarterly</td><td>Grab sample</td></tr><tr><td>Organochlorine pesticides</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Organophosphate pesticides</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Pentachlorophenol</td><td>nanograms per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>pH</td><td>pH</td><td>Quarterly</td><td>Probe</td></tr><tr><td>Phosphate</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Polycyclic aromatic hydrocarbons</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Potassium</td><td>milligrams per litre</td><td>Quarterly</td><td>Grab sample</td></tr><tr><td>Redox potential</td><td>millivolts</td><td>Yearly</td><td>Probe</td></tr><tr><td>Sodium</td><td>milligrams per litre</td><td>Quarterly</td><td>Grab sample</td></tr><tr><td>Standing Water Level</td><td>metres</td><td>Quarterly</td><td>In situ</td></tr><tr><td>Sulfate</td><td>milligrams per litre</td><td>Quarterly</td><td>Grab sample</td></tr><tr><td>Total dissolved solids</td><td>milligrams per litre</td><td>Quarterly</td><td>Grab sample</td></tr><tr><td>Total organic carbon</td><td>milligrams per litre</td><td>Quarterly</td><td>Grab sample</td></tr><tr><td>Total petroleum hydrocarbons</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Total Phenolics</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Xylene</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Zinc</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr></table>	Alkalinity (as calcium carbonate)	milligrams per litre	Quarterly	Grab sample	Aluminium	milligrams per litre	Yearly	Grab sample	Arsenic	milligrams per litre	Yearly	Grab sample	Barium	milligrams per litre	Yearly	Grab sample	Benzene	milligrams per litre	Yearly	Grab sample	Bicarbonate	milligrams per litre	Yearly	Grab sample	Cadmium	milligrams per litre	Yearly	Grab sample	Calcium	milligrams per litre	Quarterly	Grab sample	Carbonate	milligrams per litre	Yearly	Grab sample	Chloride	milligrams per litre	Quarterly	Grab sample	Chromium (hexavalent)	milligrams per litre	Yearly	Grab sample	Chromium (total)	milligrams per litre	Yearly	Grab sample	Copper	milligrams per litre	Yearly	Grab sample	Ethyl benzene	milligrams per litre	Yearly	Grab sample	Fluoride	milligrams per litre	Yearly	Grab sample	Lead	milligrams per litre	Yearly	Grab sample	Mercury	milligrams per litre	Yearly	Grab sample	Nitrate	milligrams per litre	Yearly	Grab sample	Nitrite	milligrams per litre	Yearly	Grab sample	Nitrogen (ammonia)	milligrams per litre	Quarterly	Grab sample	Organochlorine pesticides	milligrams per litre	Yearly	Grab sample	Organophosphate pesticides	milligrams per litre	Yearly	Grab sample	Pentachlorophenol	nanograms per litre	Yearly	Grab sample	pH	pH	Quarterly	Probe	Phosphate	milligrams per litre	Yearly	Grab sample	Polycyclic aromatic hydrocarbons	milligrams per litre	Yearly	Grab sample	Potassium	milligrams per litre	Quarterly	Grab sample	Redox potential	millivolts	Yearly	Probe	Sodium	milligrams per litre	Quarterly	Grab sample	Standing Water Level	metres	Quarterly	In situ	Sulfate	milligrams per litre	Quarterly	Grab sample	Total dissolved solids	milligrams per litre	Quarterly	Grab sample	Total organic carbon	milligrams per litre	Quarterly	Grab sample	Total petroleum hydrocarbons	milligrams per litre	Yearly	Grab sample	Total Phenolics	milligrams per litre	Yearly	Grab sample	Xylene	milligrams per litre	Yearly	Grab sample	Zinc	milligrams per litre	Yearly	Grab sample			
Alkalinity (as calcium carbonate)	milligrams per litre	Quarterly	Grab sample																																																																																																																																																					
Aluminium	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Arsenic	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Barium	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Benzene	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Bicarbonate	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Cadmium	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Calcium	milligrams per litre	Quarterly	Grab sample																																																																																																																																																					
Carbonate	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Chloride	milligrams per litre	Quarterly	Grab sample																																																																																																																																																					
Chromium (hexavalent)	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Chromium (total)	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Copper	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Ethyl benzene	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Fluoride	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Lead	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Mercury	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Nitrate	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Nitrite	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Nitrogen (ammonia)	milligrams per litre	Quarterly	Grab sample																																																																																																																																																					
Organochlorine pesticides	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Organophosphate pesticides	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Pentachlorophenol	nanograms per litre	Yearly	Grab sample																																																																																																																																																					
pH	pH	Quarterly	Probe																																																																																																																																																					
Phosphate	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Polycyclic aromatic hydrocarbons	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Potassium	milligrams per litre	Quarterly	Grab sample																																																																																																																																																					
Redox potential	millivolts	Yearly	Probe																																																																																																																																																					
Sodium	milligrams per litre	Quarterly	Grab sample																																																																																																																																																					
Standing Water Level	metres	Quarterly	In situ																																																																																																																																																					
Sulfate	milligrams per litre	Quarterly	Grab sample																																																																																																																																																					
Total dissolved solids	milligrams per litre	Quarterly	Grab sample																																																																																																																																																					
Total organic carbon	milligrams per litre	Quarterly	Grab sample																																																																																																																																																					
Total petroleum hydrocarbons	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Total Phenolics	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Xylene	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
Zinc	milligrams per litre	Yearly	Grab sample																																																																																																																																																					
POINT 27																																																																																																																																																								

	<table><tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr><tr><td>Alkalinity (as calcium carbonate)</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Aluminium</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Arsenic</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Barium</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Benzene</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Bicarbonate</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Cadmium</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Calcium</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Carbonate</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Chromium (hexavalent)</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Chromium (total)</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Cobalt</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Conductivity</td><td>microsiemens per centimetre</td><td>Yearly</td><td>Probe</td></tr><tr><td>Copper</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Ethyl benzene</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Fluoride</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Lead</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Magnesium</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Manganese</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Mercury</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Nitrate</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Nitrite</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Nitrogen (ammonia)</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Organochlorine pesticides</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Organophosphate pesticides</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>pH</td><td>milligrams per litre</td><td>Yearly</td><td>Probe</td></tr><tr><td>Phosphate</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Phosphorus (total)</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Polycyclic aromatic hydrocarbons</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Potassium</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Sodium</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Sulfate</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Toluene</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Total dissolved solids</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Total organic carbon</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Total petroleum hydrocarbons</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Total Phenolics</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Total suspended solids</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Xylene</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr><tr><td>Zinc</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr></table>	Pollutant	Units of measure	Frequency	Sampling Method	Alkalinity (as calcium carbonate)	milligrams per litre	Yearly	Grab sample	Aluminium	milligrams per litre	Yearly	Grab sample	Arsenic	milligrams per litre	Yearly	Grab sample	Barium	milligrams per litre	Yearly	Grab sample	Benzene	milligrams per litre	Yearly	Grab sample	Bicarbonate	milligrams per litre	Yearly	Grab sample	Cadmium	milligrams per litre	Yearly	Grab sample	Calcium	milligrams per litre	Yearly	Grab sample	Carbonate	milligrams per litre	Yearly	Grab sample	Chromium (hexavalent)	milligrams per litre	Yearly	Grab sample	Chromium (total)	milligrams per litre	Yearly	Grab sample	Cobalt	milligrams per litre	Yearly	Grab sample	Conductivity	microsiemens per centimetre	Yearly	Probe	Copper	milligrams per litre	Yearly	Grab sample	Ethyl benzene	milligrams per litre	Yearly	Grab sample	Fluoride	milligrams per litre	Yearly	Grab sample	Lead	milligrams per litre	Yearly	Grab sample	Magnesium	milligrams per litre	Yearly	Grab sample	Manganese	milligrams per litre	Yearly	Grab sample	Mercury	milligrams per litre	Yearly	Grab sample	Nitrate	milligrams per litre	Yearly	Grab sample	Nitrite	milligrams per litre	Yearly	Grab sample	Nitrogen (ammonia)	milligrams per litre	Yearly	Grab sample	Organochlorine pesticides	milligrams per litre	Yearly	Grab sample	Organophosphate pesticides	milligrams per litre	Yearly	Grab sample	pH	milligrams per litre	Yearly	Probe	Phosphate	milligrams per litre	Yearly	Grab sample	Phosphorus (total)	milligrams per litre	Yearly	Grab sample	Polycyclic aromatic hydrocarbons	milligrams per litre	Yearly	Grab sample	Potassium	milligrams per litre	Yearly	Grab sample	Sodium	milligrams per litre	Yearly	Grab sample	Sulfate	milligrams per litre	Yearly	Grab sample	Toluene	milligrams per litre	Yearly	Grab sample	Total dissolved solids	milligrams per litre	Yearly	Grab sample	Total organic carbon	milligrams per litre	Yearly	Grab sample	Total petroleum hydrocarbons	milligrams per litre	Yearly	Grab sample	Total Phenolics	milligrams per litre	Yearly	Grab sample	Total suspended solids	milligrams per litre	Yearly	Grab sample	Xylene	milligrams per litre	Yearly	Grab sample	Zinc	milligrams per litre	Yearly	Grab sample			
Pollutant	Units of measure	Frequency	Sampling Method																																																																																																																																																																					
Alkalinity (as calcium carbonate)	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Aluminium	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Arsenic	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Barium	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Benzene	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Bicarbonate	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Cadmium	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Calcium	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Carbonate	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Chromium (hexavalent)	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Chromium (total)	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Cobalt	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Conductivity	microsiemens per centimetre	Yearly	Probe																																																																																																																																																																					
Copper	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Ethyl benzene	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Fluoride	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Lead	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Magnesium	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Manganese	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Mercury	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Nitrate	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Nitrite	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Nitrogen (ammonia)	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Organochlorine pesticides	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Organophosphate pesticides	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
pH	milligrams per litre	Yearly	Probe																																																																																																																																																																					
Phosphate	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Phosphorus (total)	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Polycyclic aromatic hydrocarbons	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Potassium	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Sodium	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Sulfate	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Toluene	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Total dissolved solids	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Total organic carbon	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Total petroleum hydrocarbons	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Total Phenolics	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Total suspended solids	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Xylene	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Zinc	milligrams per litre	Yearly	Grab sample																																																																																																																																																																					
Monitoring and Recording Conditions – M2.4	For the purposes of the above table, Special Method 1 means methane monitoring in accordance with Benchmark Technique Number 18 of the Environmental Guidelines: Solid Waste Landfills (1996).	Environmental Guidelines: Solid Waste Landfills (1996). West Nowra Landfill Surface Gas Emission Monitoring Reports (ALS Environmental [2014a; 2014b; 2015a; 2015b; 2016a; 2016b; 2017a; 2017b; 2018a; 2018b]) Site interview (27 June 2019). ALS Environmental (pers. comm. 20 June 2019).	The ALS monitoring reports state: “... in accordance with EPA requirements, on a day when the wind speed was below 10 km per hour, using a calibrated LaserOne portable gas monitor specifically designed for landfill gas monitoring.” Whilst “Benchmark Technique Number 18 of the Environmental Guidelines: Solid Waste Landfills (1996)” are not explicit in the reporting, a representative from ALS Environmental indicated that the gas accumulation monitoring is compliant. It is noted that the frequency is prescribed in EPL No. 5877.	Not Verified.																																																																																																																																																																				

Monitoring and Recording Conditions – M3	Testing methods - concentration limits	EPL No. 5877.	Refer below.	Noted.
Monitoring and Recording Conditions – M3.1	Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with: a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place. Note: The Protection of the Environment Operations (Clean Air) Regulation 2010 requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".	Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (DEC, 2007a). West Nowra Landfill Surface Gas Emission Monitoring Reports (ALS Environmental [2014a; 2014b; 2015a; 2015b; 2016a; 2016b; 2017a; 2017b; 2018a; 2018b]) Site interview (27 June 2019). ALS Environmental (pers. comm. 20 June 2019).	Methane monitoring is as required by Condition M2.4. The ALS monitoring reports state: <i>"... in accordance with EPA requirements, on a day when the wind speed was below 10 km per hour, using a calibrated LaserOne portable gas monitor specifically designed for landfill gas monitoring."</i> Whilst the "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW" (DEC, 2007a) are not explicit in the reporting, a representative from ALS Environmental indicated that the testing methods are compliant. <i>It is therefore recommended that future reports should clarify that testing is conducted in accordance with the Approved Methods Publications, unless another method has been approved by the EPA in writing.</i>	Not Verified.
Monitoring and Recording Conditions – M3.2	Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.	Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales (DEC, 2004a). Annual Environmental Monitoring Results Reports (ENRS [2014; 2015; 2016; 2017; 2018]). Site interview (27 June 2019). ENRS (pers. comm. 20 June 2019).	Each Annual Environmental Monitoring Results Report includes the objective to meet the monitoring requirements of EPL 5877. Whilst the "Approved Methods or the Sampling and Analysis of Water Pollutants in NSW" (DEC, 2004a) are not explicit in the reporting, a representative from ENRS indicated that the testing methods are compliant. <i>It is therefore recommended that future reports should clarify that testing is conducted in accordance with the Approved Methods Publications, unless another method has been approved by the EPA in writing.</i>	Not Verified.
Monitoring and Recording Conditions – M4	Recording of pollution complaints	EPL No. 5877.	Refer below.	Noted.

Monitoring and Recording Conditions – M4.1	The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.	Annual Returns (2014-2018). Annual Reports (2014-2018). Site interview (27 June 2019).	Based on a review of the Annual Returns, Annual Reports and site interview, no reportable complaints were received during the audit scope period between 24 May 2014 and 24 May 2019. It is noted that the 2013/14 Annual Report (SCC, 2014) reports that the complaint was received on 1 April 2014 which is beyond the audit scope period (24 May 2014 – 24 May 2019).	Not Triggered.
Monitoring and Recording Conditions – M4.2	The record must include details of the following: a) the date and time of the complaint; b) the method by which the complaint was made; c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; d) the nature of the complaint; e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the licensee, the reasons why no action was taken.	Annual Returns (2014-2018). Annual Reports (2014-2018). Site interview (27 June 2019).	Based on a review of the Annual Returns, Annual Reports and site interview, no reportable complaints were received during the audit scope period between 24 May 2014 and 24 May 2019. It is noted that the 2013/14 Annual Report (SCC, 2014) reports that the complaint was received on 1 April 2014 which is beyond the audit scope period (24 May 2014 – 24 May 2019). However, during the site interviews it was evident that complaint handling and response procedures may not specifically address Condition M4.2. <i>Although no reportable complaints were received during the audit scope period, it is recommended that the form for recording complaints (when received), and complaint response procedures at the West Nowra Recycling and Waste Facility, be documented in the LEMP to reflect all the details required by EPL No. 5877 Condition M4.2.</i>	Not Triggered.
Monitoring and Recording Conditions – M4.3	The record of a complaint must be kept for at least 4 years after the complaint was made.	Annual Returns (2014-2018). Annual Reports (2014-2018). Site interview (27 June 2019).	Based on a review of the Annual Returns, Annual Reports and site interview, no reportable complaints were received during the audit scope period between 24 May 2014 and 24 May 2019. It is noted that the 2013/14 Annual Report (SCC, 2014) reports that the complaint was received on 1 April 2014 which is beyond the audit scope period (24 May 2014 – 24 May 2019).	Not Triggered.
Monitoring and Recording Conditions – M4.4	The record must be produced to any authorised officer of the EPA who asks to see them.	Annual Returns (2014-2018). Annual Reports (2014-2018). Site interview (27 June 2019).	Based on a review of the Annual Returns, Annual Reports and site interview, no reportable complaints were received during the audit scope period between 24 May 2014 and 24 May 2019.	Not Triggered.

Document ID	Version	Date		Page
HG-R7011	B	25 July 2019		A1-47

			It is noted that the 2013/14 Annual Report (SCC, 2014) reports that the complaint was received on 1 April 2014 which is beyond the audit scope period (24 May 2014 – 24 May 2019).	
Monitoring and Recording Conditions – M5	Telephone complaints line	EPL No. 5877.	Refer below.	Noted.
Monitoring and Recording Conditions – M5.1	The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.	SCC Website. (https://shoalhaven.nsw.gov.au/My-Council/About-Council/Contact-us) Site interview (27 June 2019). General enquiries telephone line (02 4429 3111).	SCC maintains a general enquiries telephone line (02 4429 3111) during business hours that provides the opportunity to members of the public to make a complaint. It is noted that an on-line “service complaint” webform is also available on the SCC website. The telephone line was called by the auditor on 3 July 2019.	Compliant.
Monitoring and Recording Conditions – M5.2	The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.	SCC Website. (https://shoalhaven.nsw.gov.au/My-Council/About-Council/Contact-us) Site interview (27 June 2019).	The SCC maintains a webpage at the SCC website that includes a list of telephone numbers to ‘contact us’, including, of relevance: - General enquiries: 02 4429 3111 - Recycling and Waste Depots – Nowra: 02 4421 5281 However, the website does not factually specify that the telephone line is a complaints line.	Administrative Non-Compliance
Monitoring and Recording Conditions – M5.3	The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.	EPL No. 5877 (issued > 5 years).	Condition appears to now be redundant.	Not Triggered.
Monitoring and Recording Conditions – M6	Requirement to monitor volume or mass	EPL No. 5877.	Refer below.	Noted.
Monitoring and Recording Conditions – M6.1	For each discharge point or utilisation area specified below, the licensee must monitor: a) the volume of liquids discharged to water or applied to the area; b) the mass of solids applied to the area; c) the mass of pollutants emitted to the air; at the frequency and using the method and units of measure, specified below.	EPL No. 5877. Annual Returns (2014-2018). Annual Reports (2014-2018). Annual Environmental Monitoring Results Reports (ENRS [2014; 2015; 2016; 2017; 2018]). Site interview (27 June 2019).	The records of monitoring at Points 25 and 27 are included in the Annual Returns as follows: 2013-14: 12 measurements. 2014-15: 12 measurements. 2015-16: 0 measurements. 2016-17: 12 measurements.*	Non-Compliant (Low)

	POINT 25 <table><tr><th>Frequency</th><th>Unit of Measure</th><th>Sampling Method</th></tr><tr><td>Monthly</td><td>cubic metres</td><td>Flow meter and continuous logger</td></tr></table> POINT 27 <table><tr><th>Frequency</th><th>Unit of Measure</th><th>Sampling Method</th></tr><tr><td>Monthly</td><td>cubic metres</td><td>Flow meter and continuous logger</td></tr></table>	Frequency	Unit of Measure	Sampling Method	Monthly	cubic metres	Flow meter and continuous logger	Frequency	Unit of Measure	Sampling Method	Monthly	cubic metres	Flow meter and continuous logger		2017-18: 12 measurements.* Each of the Annual Returns concluded in Part C Statement of Compliance – Licence Conditions that all conditions of the licence were complied with (including monitoring and reporting requirements), with the exception of two (2) non-compliances for monitoring at Points 25 and 27 which occurred in October 2016 due to the change in the mobile service provider network (i.e. the monitoring logger on the 2G network was upgraded to a 3G network compliant logger and the recorded data [for a period] was unable to be recovered during the network change-over). The EPA Public Register relevantly noted that the non-compliance matters had been rectified and appropriate action was taken by the licensee (i.e. SCC). <i>* It is noted that the 2016-17 & 2017-18 Annual Reports states that spray irrigation of leachate, from leachate dam, over licenced utilisation (irrigation) area during favourable weather conditions, was carried out during the reporting period. Both Annual Returns however report that the mean and highest result for monitoring of leachate applied to the irrigation area is zero.</i>	
Frequency	Unit of Measure	Sampling Method														
Monthly	cubic metres	Flow meter and continuous logger														
Frequency	Unit of Measure	Sampling Method														
Monthly	cubic metres	Flow meter and continuous logger														
Monitoring and Recording Conditions – M7	Other monitoring and recording conditions	EPL No. 5877.	Refer below.	Noted.												
Monitoring and Recording Conditions – M7.1	The licensee must monitor the remaining disposal capacity (in cubic metres) of the landfill.	Six-Monthly Volumetric Survey Plan(s) with Supporting Volumetric Survey Checklist(s), Landfill Facility Information Certificate(s) and Stockpile Information & Schedule of Material Movements. DA No. 90/3061 Condition 3.	Each Landfill Facility Information Certificate during the audit scope period states the remaining disposal capacity as follows: - Jun-2014: 897,135 m³; - Dec-2014: Not recorded*; - Jun-2015: 870,292 m³; - Dec-2015: 839,467 m³; - Jun-2016: 820,595 m³; 30-Dec-2016: 796,125 m³;	Not Verified.												

			• 30-Jun-2017: 787,356 m³; • 30-Dec-2017: 763,325 m³; • 30-Jun-2018: 732,216 m³; and • 31-Dec-2018: 708,090 m³. * Whilst the information certificate for Dec-2014 was blank, the remaining disposal capacity was recorded for June-2015 within the Annual Return period. <i>Note: The total design capacity reported in the Landfill Facility Information Certificates is 2,066,199 m³. This volume exceeds the combined approved holding capacity for Stages 1-3 of 1,964,717 m³ in Condition 3 of DA No. 90/3061. Thus, the remaining disposal capacity (approved) should be confirmed and if necessary revised.</i>	
Reporting Conditions – R1	Annual return documents	EPL No. 5877. Annual Returns (2014-2018).	Refer below.	Noted.
Reporting Conditions – R1.1	The licensee must complete and supply to the EPA an Annual Return in the approved form comprising: 1. a Statement of Compliance, 2. a Monitoring and Complaints Summary, 3. a Statement of Compliance - Licence Conditions, 4. a Statement of Compliance - Load based Fee, 5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan, 6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and 7. a Statement of Compliance - Environmental Management Systems and Practices. At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.	EPA Public Register (https://apps.epa.nsw.gov.au/prpoeoapp/). Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-Oct-2013 to 29-Oct-2014, signed and dated 27-11-2014, and received by the EPA on 18-Dec-2014. Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-Oct-2014 to 29-Oct-2015, signed and dated 23-12-2015, and received by the EPA on 24-Dec-2015. Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-Oct-2015 to 29-Oct-2016, signed and dated 15-12-2016, and received by the EPA on 21-Dec-2016. Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-10-2016 to 29-10-2017, signed and	Annual Returns were completed and returned to the EPA in the approved form for the period of the audit scope for reporting periods: • 30-Oct-2013 to 29-Oct-2014; • 30-Oct-2014 to 29-Oct-2015; • 30-Oct-2015 to 29-Oct-2016; • 30-Oct-2016 to 29-Oct-2017; and • 30-Oct-2017 to 29-Oct-2018.	Compliant.

		dated 7-12-2017, and received by the EPA on 14-Dec-2017. Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-10-2017 to 29-10-2018, signed and dated 18-12-2018, and received by the EPA on 18-Dec-2018. Pollution Incident Response Management Plan (25 March 2019). Aqua Data website (www.shoalhaven.nsw.gov.au/Environment/Aqua-Data)		
Reporting Conditions – R1.2	An Annual Return must be prepared in respect of each reporting period, except as provided below. Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.	As Above. EPL No. 5877 dictionary. Site interview (27 June 2019).	The Annual Return for the 30-Oct-2018 to 29 Oct-2019 reporting period (which includes the audit scope period to 24 May 2019) cannot be completed until after the end of the reporting period (i.e. 29 October 2019).	Compliant.
Reporting Conditions – R1.3	Where this licence is transferred from the licensee to a new licensee: a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period. Note: An application to transfer a licence must be made in the approved form for this purpose.	EPA Public Register (https://apps.epa.nsw.gov.au/prpoeoapp/). EPL No. 5877 (dated 22-Mar-2013). EPL No. 5877 (dated 28-Aug-2015). EPL No. 5877 (dated 29-Sep-2015). EPL No. 5877 (dated 23-Nov-2015). EPL No. 5877 (dated 11-Jan-2016). EPL No. 5877 (dated 28-Sep-2016). EPL No. 5877 (dated 7-Dec-2017). EPL No. 5877 (dated 23-Nov-2018). Site interview (27 June 2019).	The EPA Public Register indicates that the licence was not transferred during the audit scope period. The licensee stated on EPL No.5877 (Shoalhaven City Council, PO Box 42, Nowra NSW 2541) was unchanged following all seven (7) variations during the audit scope period. The Waste Services Unit SCC personnel also confirmed during the audit site interview that the licence had not transferred to a new licensee, nor was an application made, during the audit scope period.	Not Triggered.
Reporting Conditions – R1.4	Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on: a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.	EPA Public Register (https://apps.epa.nsw.gov.au/prpoeoapp/). EPL No. 5877 (dated 22-Mar-2013). EPL No. 5877 (dated 28-Aug-2015). EPL No. 5877 (dated 29-Sep-2015). EPL No. 5877 (dated 23-Nov-2015). EPL No. 5877 (dated 11-Jan-2016). EPL No. 5877 (dated 28-Sep-2016). EPL No. 5877 (dated 7-Dec-2017). EPL No. 5877 (dated 23-Nov-2018).	The EPA Public Register indicates that the licence was not surrendered or revoked during the audit scope period. The Waste Services Unit SCC personnel confirmed during the audit site interview that the SCC had not surrendered the licence, nor was it revoked by the EPA or Minister, during the audit scope period.	Not Triggered.

Reporting Conditions – R1.5	The Annual Return for the reporting period must be supplied to the EPA via eConnect EPA or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').	Site interview (27 June 2019). EPA Public Register (https://apps.epa.nsw.gov.au/prpoeoapp/). Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-Oct-2013 to 29-Oct-2014, signed and dated 27-11-2014, and received by the EPA on 18-Dec-2014. Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-Oct-2014 to 29-Oct-2015, signed and dated 23-12-2015, and received by the EPA on 24-Dec-2015. Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-Oct-2015 to 29-Oct-2016, signed and dated 15-12-2016, and received by the EPA on 21-Dec-2016. Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-10-2016 to 29-10-2017, signed and dated 7-12-2017, and received by the EPA on 14-Dec-2017. Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-10-2017 to 29-10-2018, signed and dated 18-12-2018, and received by the EPA on 18-Dec-2018.	Annual Returns were supplied to the EPA not later than 60 days after the end of each reporting period, during the audit scope period, as follows: • EPA received 30-Oct-2013 to 29-Oct-2014 Annual Return on 18-Dec-2014: 51 days. • EPA received 30-Oct-2014 to 29-Oct-2015 Annual Return on 24-Dec-2015: 57 days. • EPA received 30-Oct-2015 to 29-Oct-2016 Annual Return on 21-Dec-2016: 54 days. • EPA received 30-Oct-2016 to 29-Oct-2017 Annual Return on 14-Dec-2017: 47 days. • EPA received 30-Oct-2017 to 29-Oct-2018 Annual Return on 18-Dec-2018: 51 days.	Compliant.
Reporting Conditions – R1.6	The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.	Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-Oct-2013 to 29-Oct-2014, signed and dated 27-11-2014, and received by the EPA on 18-Dec-2014. Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-Oct-2014 to 29-Oct-2015, signed and dated 23-12-2015, and received by the EPA on 24-Dec-2015.	The Waste Services Unit SCC personnel confirmed during the audit site interview that the SCC has and continues to retain a copy of the Annual Returns for at least 4 years (as provided by the Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-Oct-2013 to 29-Oct-2014, signed and dated 27-11-2014) during the audit scope period.	Compliant.

		Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-Oct-2015 to 29-Oct-2016, signed and dated 15-12-2016, and received by the EPA on 21-Dec-2016. Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-10-2016 to 29-10-2017, signed and dated 7-12-2017, and received by the EPA on 14-Dec-2017. Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-10-2017 to 29-10-2018, signed and dated 18-12-2018, and received by the EPA on 18-Dec-2018. Site interview (27 June 2019).		
Reporting Conditions – R1.7	Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by: a) the licence holder; or b) by a person approved in writing by the EPA to sign on behalf of the licence holder.	Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-Oct-2013 to 29-Oct-2014, signed, certified and dated 27-11-2014, and received by the EPA on 18-Dec-2014. Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-Oct-2014 to 29-Oct-2015, signed, certified and dated 23-12-2015, and received by the EPA on 24-Dec-2015. Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-Oct-2015 to 29-Oct-2016, signed, certified and dated 15-12-2016, and received by the EPA on 21-Dec-2016. Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-10-2016 to 29-10-2017, signed, certified and dated 7-12-2017, and received by the EPA on 14-Dec-2017. Annual Return Shoalhaven City Council Licence 5877: Reporting Period from 30-10-2017 to 29-10-2018, signed,	The Annual Returns supplied to the EPA during the audit scope period were certified and signed by Russell Desmond Pigg as the General Manager of the Shoalhaven City Council (in accordance with s377 of the Local Government Act 1993).	Compliant.

		certified and dated 18-12-2018, and received by the EPA on 18-Dec-2018.		
Reporting Conditions – R1.8	The Annual Return must be accompanied by / or include an Annual Report which must contain an assessment of environmental performance relevant to licence conditions including: a) tabulated results of all monitoring data required to be collected by this licence; b) a graphical presentation of data from at least the last three years (if available) in order to show variability and / or trends. Any statistically significant variations or anomalies should be highlighted and explained; c) an analysis and interpretation of all monitoring data; d) an analysis of and response to any complaints received; e) identification of any deficiencies in environmental performance identified by the monitoring data, trends or incidents and of remedial action taken or proposed to be taken to address these deficiencies; and f) recommendations on improving the environmental performance of the facility.	Shoalhaven City Council (2014) Annual Report – West Nowra Recycling and Waste Facility 2013 / 2014. Waste Services Unit, Shoalhaven City Council (2015) Annual Report – 2014 / 2015 – West Nowra Recycling and Waste Facility, Flatrock Road West Nowra. Waste Services Unit, Shoalhaven City Council (2016) Annual Report – 2015 / 2016 – West Nowra Recycling and Waste Facility, Flatrock Road West Nowra. Waste Services Unit, Shoalhaven City Council (2017) Annual Report – 2016 / 2017 – West Nowra Recycling and Waste Facility, Flatrock Road West Nowra. Waste Services Unit, Shoalhaven City Council (2018) Annual Report – 2017 / 2018 – West Nowra Recycling and Waste Facility, Flatrock Road West Nowra. Annual Environmental Monitoring Results Reports (ENRS [2014; 2015; 2016; 2017; 2018]). West Nowra Landfill Surface Gas Emission Monitoring Reports (ALS Environmental [2014a; 2014b; 2015a; 2015b; 2016a; 2016b; 2017a; 2017b; 2018a; 2018b]) Site interview (27 June 2019).	Results of water quality monitoring data in the Annual Environmental Monitoring Results Reports during the audit scope period (ENRS, 2014; 2015; 2016; 2017; 2018) present graphically in charts at least (where available) three years of data to show variability and trends. Statistical analysis is included and explained in the reports, including comparisons to laboratory detection limits, relevant guidelines for threshold concentrations, trigger levels and investigation levels, and highlights provided (e.g. exceedances and where concentrations are detected for a first time). A record of complaints (including no reportable complaints) is reported in the Annual Reports. An analysis of the one complaint received on 1 April 2014, and response, is included in the 2013/14 Annual Report however was beyond the audit scope period (was before 24 May 2014). The Waste Services Unit SCC personnel confirmed during the audit site interview that no reportable complaints were received during the audit scope period since the last Annual Report (<i>i.e. from 30 October 2018 to 24 May 2019</i>). Detailed recommendations are included in each of the Annual Environmental Monitoring Results reports, however is unclear how SCC accountabilities are assigned and timeframes for implementation to improve the environmental performance at the premises. <i>Note: It is noted that the ANZECC & ARM CANZ (2000) guidelines were revised in 2018 and presented as an online platform (www.waterquality.gov.au/anz-guidelines) to facilitate updates as new information becomes available. It is therefore recommended that the</i>	Compliant.

Document ID	Version	Date		Page
HG-R7011	B	25 July 2019		A1-54

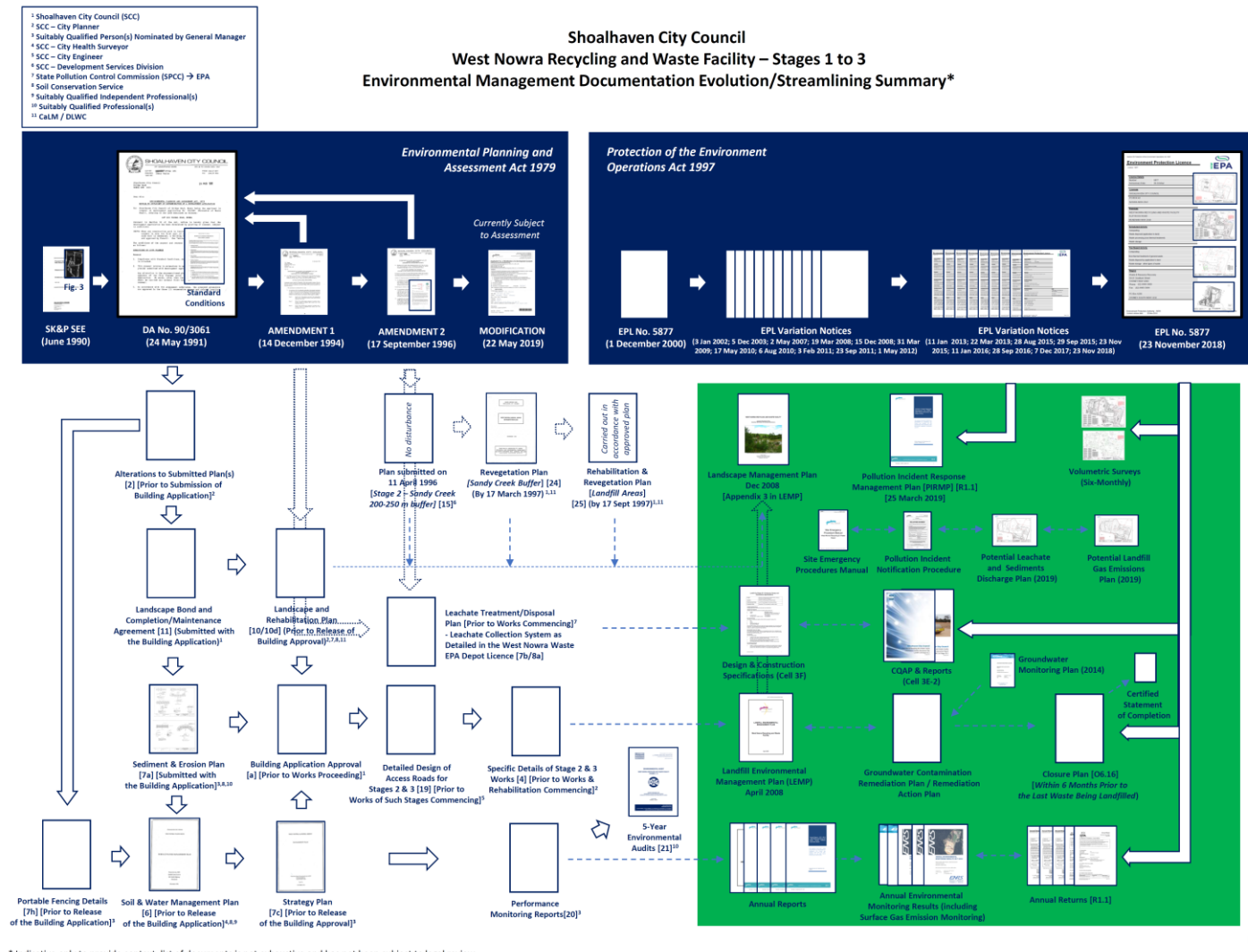
			<i>Annual Report for data collected during the audit scope period after the last Annual Report (i.e. from 30 October 2018 to 24 May 2019) reflect any new information if available when analysing and interpreting the monitoring data.</i>	
Reporting Conditions – R2	Notification of environmental harm Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.	EPL No. 5877. PIRMP. Pollution Incident Notification Procedure. Annual Report (2016). EPA Reference No. C08251-2016.	Refer below.	Noted.
Reporting Conditions – R2.1	Notifications must be made by telephoning the Environment Line service on 131 555.	PIRMP. Pollution Incident Notification Procedure. Site interview (27 June 2019).	The SCC Waste Services Pollution Incident Notification Procedure explicitly refers to the EPA – Environment Line (131 555).	Not Verified.
Reporting Conditions – R2.2	The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.	Annual Report (2016). EPA Reference No. C08251-2016. EPA Consultation (17-18 June 2019). Site interview (27 June 2019).	Notification of the one (1) incident on 7 June 2016 was reported to the EPA on 8 June 2016 (EPA Reference No. C08251-2016).	Compliant.
Reporting Conditions – R2.3	The licensee must notify the EPA within 24 hours in accordance with condition R2.1 if any landfill gas monitoring required by this licence detects methane concentrations above 1.25% (v/v), and increase the frequency of monitoring to daily, until the EPA determines otherwise.	Annual Reports (2014-2018). ALS Environmental Landfill Surface Gas Monitoring Reports (2014-2019). Site interview (27 June 2019).	The results of the ALS Environmental Landfill Surface Gas Monitoring during the audit scope period show: • 6 Aug 2014 – 94 data readings below the EPL methane concentration limit. • 20 Feb 2015 – 120 data readings all below the EPL methane concentration limit. • 31 Aug 2015 – 148 data readings all below the EPL methane concentration limit. • 11 Feb 2016 – 143 data readings all below the EPL methane concentration limit. • 25 Aug 2016 – 121 data readings all below the EPL methane concentration limit. • 24 Feb 2017 – 165 data readings all below the EPL methane concentration limit. • 24 Aug 2017 – 235 data readings all below the EPL methane concentration limit. • 15 Feb 2018 – 232 data readings all below the EPL methane concentration limit.	Not Triggered.

			29 Aug 2018 – 230 data readings all below the EPL methane concentration limit. 21 Feb 2019 – 226 data readings all below the EPL methane concentration limit.	
Reporting Conditions – R3	Written report	EPL No. 5877.	Refer below.	Noted.
Reporting Conditions – R3.1	Where an authorised officer of the EPA suspects on reasonable grounds that: a) where this licence applies to premises, an event has occurred at the premises; or b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence, and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.	POEO Public Register. Annual Reports (2014-2018). EPA Reference No. C08251-2016. EPA Consultation (17-18 June 2019). Site interview (27 June 2019).	This condition was not triggered during the audit scope period.	Not Triggered.
Reporting Conditions – R3.2	The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.	POEO Public Register. Annual Reports (2014-2018). EPA Reference No. C08251-2016. EPA Consultation (17-18 June 2019). Site interview (27 June 2019).	This condition was not triggered during the audit scope period.	Not Triggered.
Reporting Conditions – R3.3	The request may require a report which includes any or all of the following information: a) the cause, time and duration of the event; b) the type, volume and concentration of every pollutant discharged as a result of the event; c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event; d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort; e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants; f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and g) any other relevant matters.	POEO Public Register. Annual Reports (2014-2018). EPA Reference No. C08251-2016. EPA Consultation (17-18 June 2019). Site interview (27 June 2019).	This condition was not triggered during the audit scope period.	Not Triggered.

Reporting Conditions – R3.4	The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.	POEO Public Register. Annual Reports (2014-2018). EPA Reference No. C08251-2016. EPA Consultation (17-18 June 2019). Site interview (27 June 2019).	This condition was not triggered during the audit scope period.	Not Triggered.
Reporting Conditions – R4	Other reporting conditions	EPL No. 5877.	Refer below.	Noted.
Reporting Conditions – R4.1	The licensee must record the following data in relation to fires occurring at the premises: a) Time and date when the fire started. b) Whether the fire was authorised by the licensee, and, if not, the circumstances which ignited the fire. c) The time and date that the fire burnt out or was extinguished. d) The location of fire (eg. clean timber stockpile, putrescible garbage cell, etc). e) Prevailing weather conditions at the time of the fire. f) Observations made in regard to smoke direction and dispersion. g) The amount of waste that was combusted by the fire. h) Action taken to extinguish the fire; i) Action taken to prevent a reoccurrence. The data must be recorded on each day that the fire is burning.	Site interview (27 June 2019).	There were no fires reported on the premises during the audit reporting period. <i>It is however recommended that the Site Emergency Procedure Manual be updated to reflect the reporting conditions of EPL No. 5877 Condition R4.1 in relation to fires occurring at the premises.</i>	Not Triggered.
Reporting Conditions – R4.2	The licensee or its employees or agents must notify the occurrence of all fires on the premises in accordance with conditions R2.1 and R2.2 as soon as practical after becoming aware of the fire.	PIRMP. Site Emergency Procedure Manual – West Nowra. Pollution Incident Notification Procedure. Site interview (27 June 2019).	Documented notification procedures for fire (tip; bushfire; plant and equipment; and buildings) are included in Section 4.3.9 of the Site Emergency Procedure Manual. There were no fires reported on the premises during the audit reporting period.	Compliant.
General Conditions – G1	Copy of licence kept at the premises or plant	EPL No. 5877.	Refer below.	Noted.
General Conditions – G1.1	A copy of this licence must be kept at the premises to which the licence applies.	EPL No. 5877. POEO Public Register. Site inspection/interview (27 June 2019).	Copy available at the weighbridge/office on the premises. Accessible on-line on the POEO Public Register.	Compliant.
General Conditions – G1.2	The licence must be produced to any authorised officer of the EPA who asks to see it.	POEO Public Register. Site inspection/interview (27 June 2019). Site interview (27 June 2019).	Copy available at the weighbridge/office on the premises. Accessible to the public on the POEO Public Register. However, no request was made during the audit scope period.	Not Triggered.

General Conditions – G1.3	The licence must be available for inspection by any employee or agent of the licensee working at the premises.	POEO Public Register. Site inspection/interview (27 June 2019).	Copy available at the weighbridge/office on the premises. Accessible to the public on the POEO Public Register.	Compliant.
------------------------------	--	---	---	------------

ATTACHMENT 2
SCHEMATIC AND FIGURES



Schematic A – Environmental Management Documentation Evolution/Streamlining Summary

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	A2-1

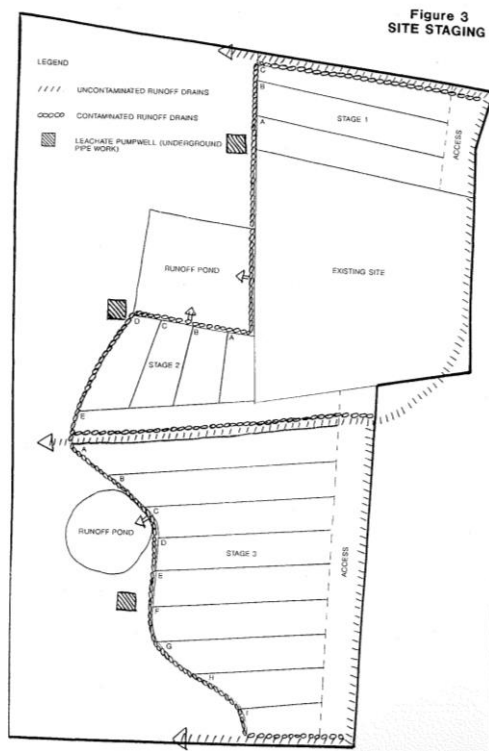


Figure 1 – Original West Nowra Recycling and Waste Facility Design [Source: Figure No.3 in SEE SK&P (1990)]



Figure 2 – West Nowra Recycling and Waste Facility [Soil & Water Management Plan]

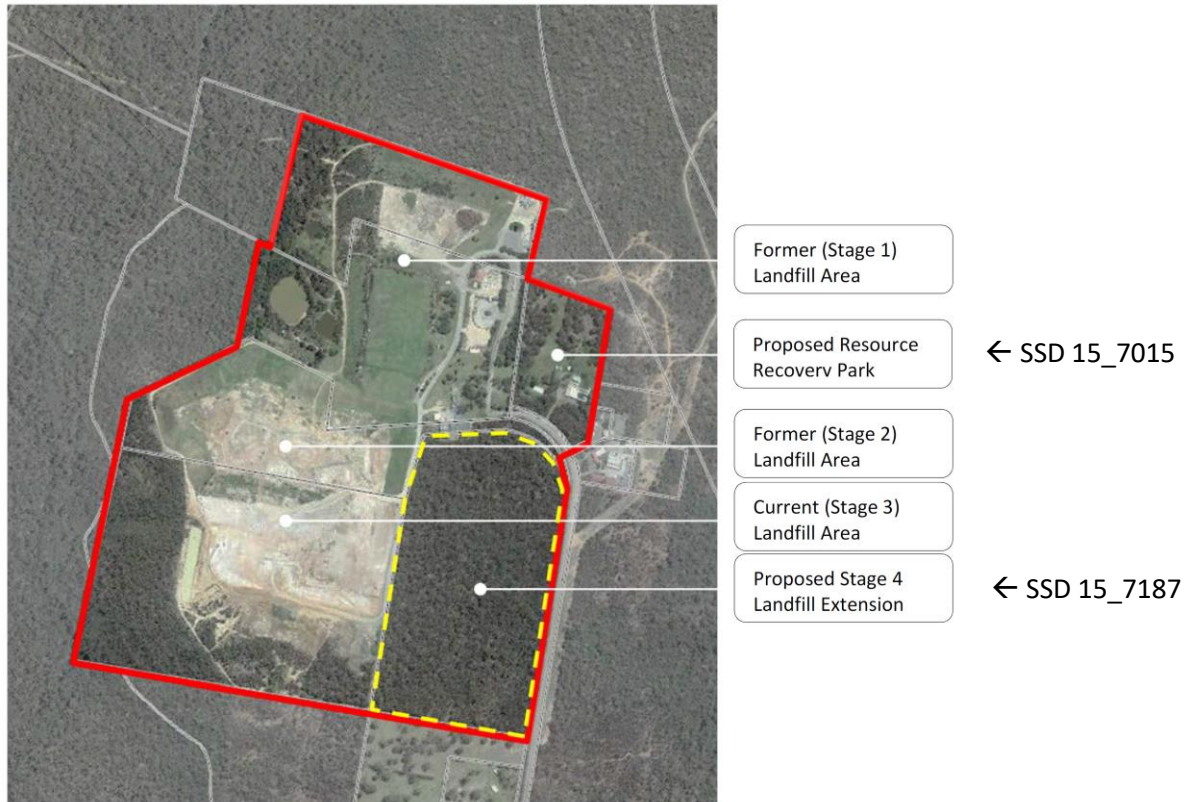


Figure 3 – West Nowra Recycling and Waste Facility [Source: Figure 2 in Locale Consulting Pty Ltd, 2015]

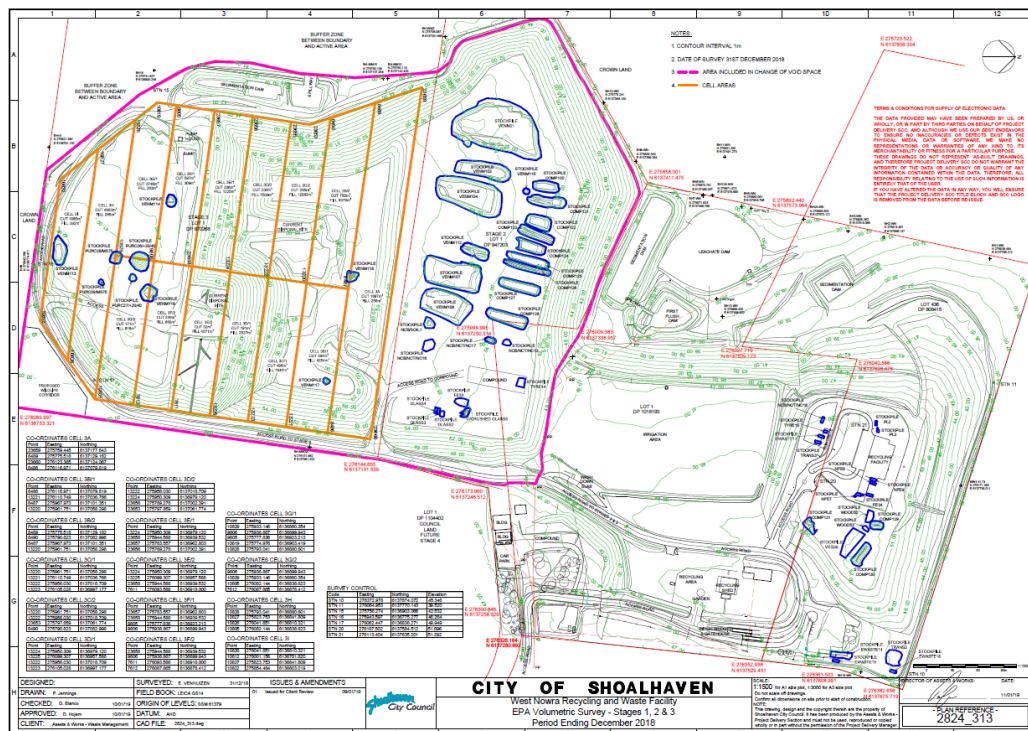


Figure 4 – Volumetric Survey – Stages 1, 2 & 3 Period Ending December 2018

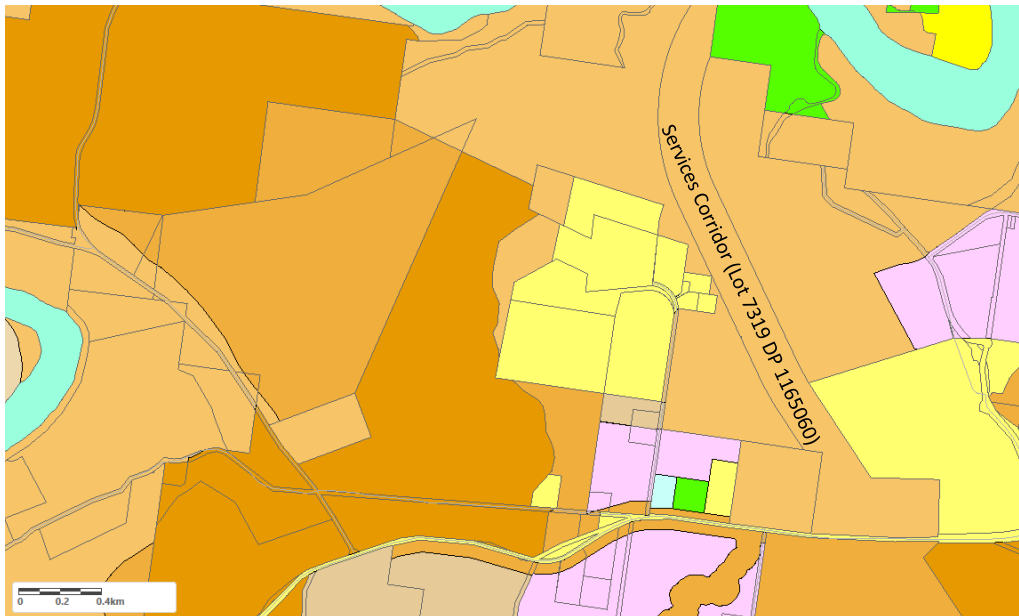


Figure 5 – Land Zoning [Source: Shoalhaven Local Environmental Plan 2014]

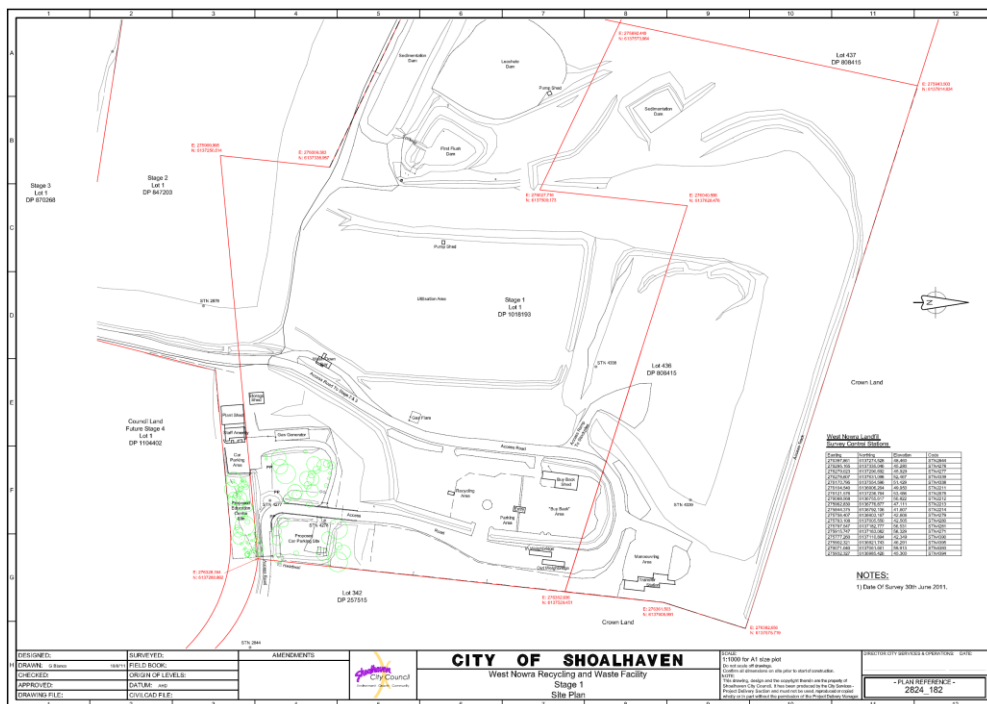


Figure 6 – Plan Showing Gas Generator and Gas Flare Excluded from Premises to which EPL No. 5877 Applies [Plan Reference No. 2824_182]

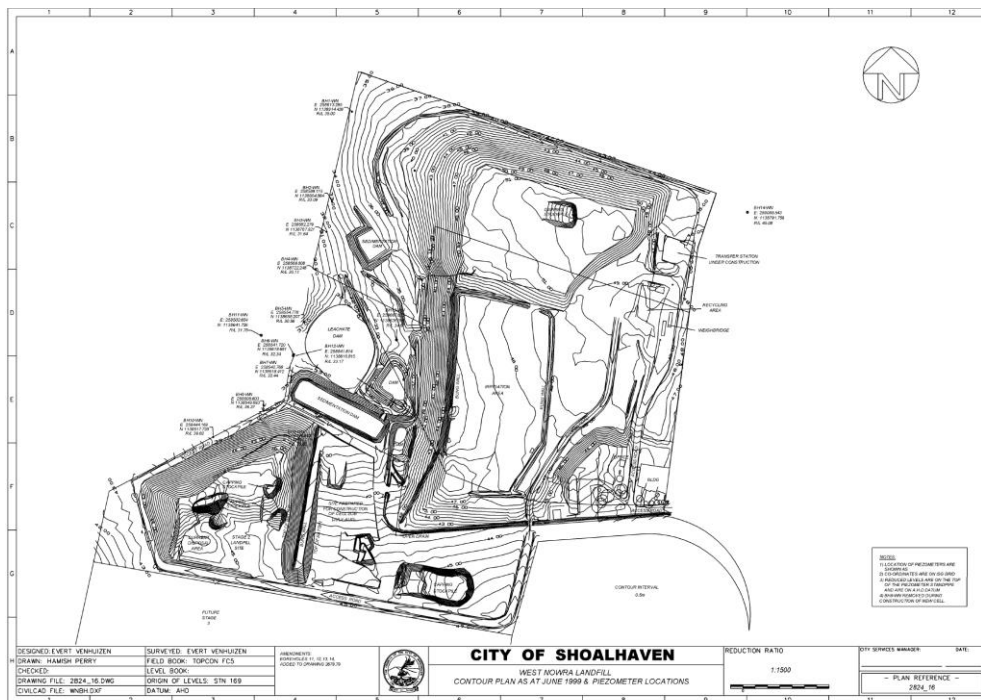


Figure 7 – Plan Showing Deposited Waste at Premises as Reference for Distance to Gas Accumulation Monitoring in Buildings [Plan Reference No. 2824_16]

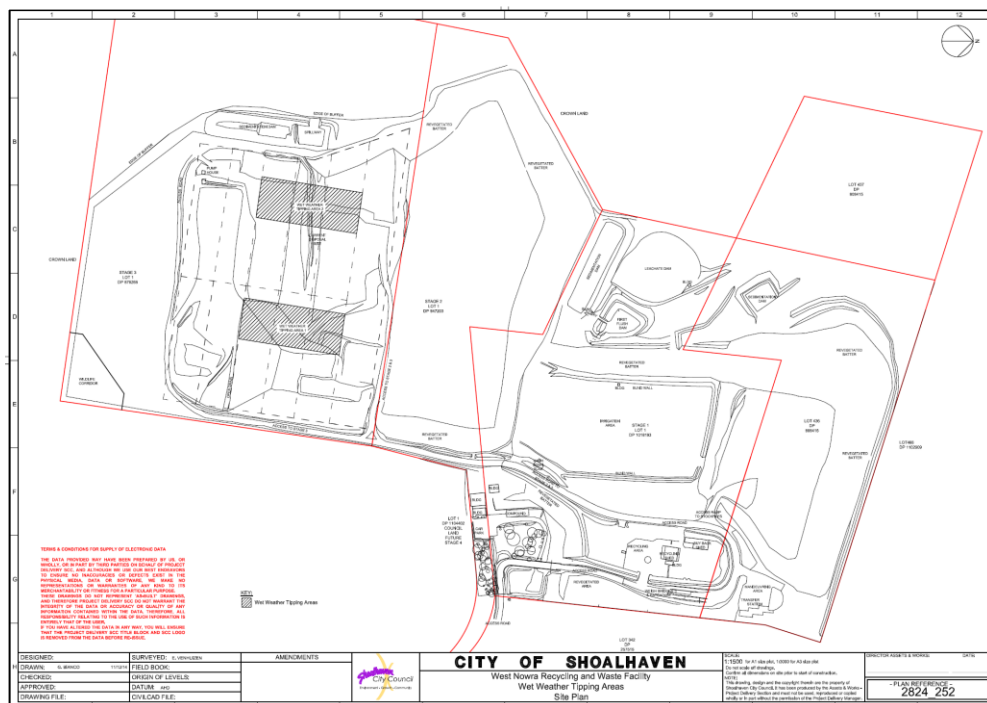


Figure 8 – Plan Showing 'Wet Weather Tipping Areas' [Plan Reference No. 2824_252]

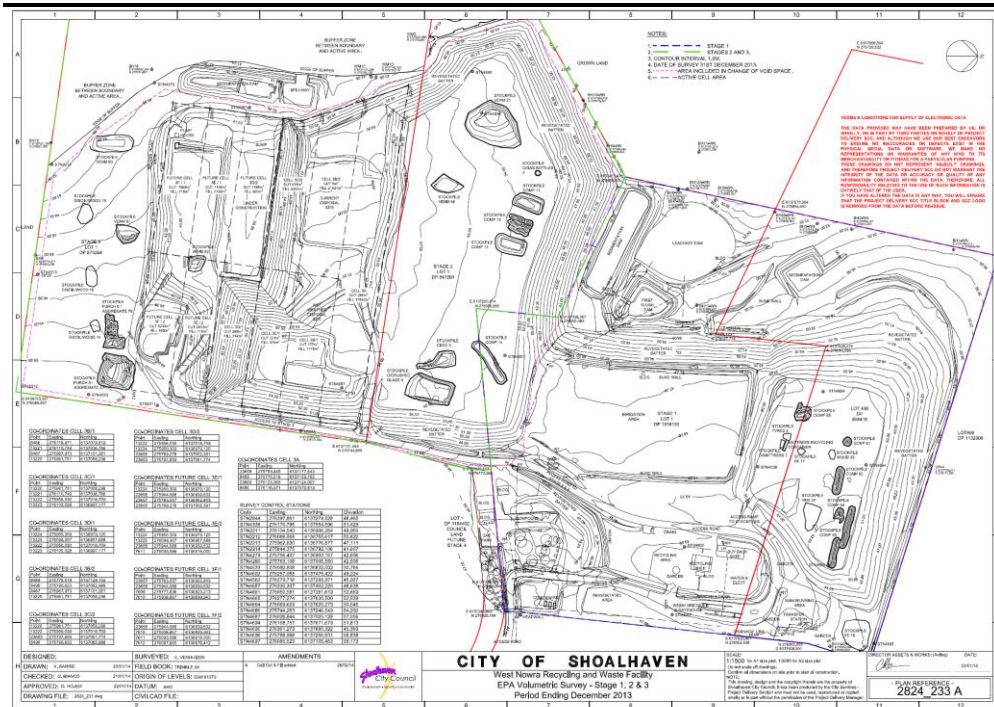


Figure 9 – Plan Showing 'Bore Locations' [Plan Reference No. 2824_233A dated 22/01/14]

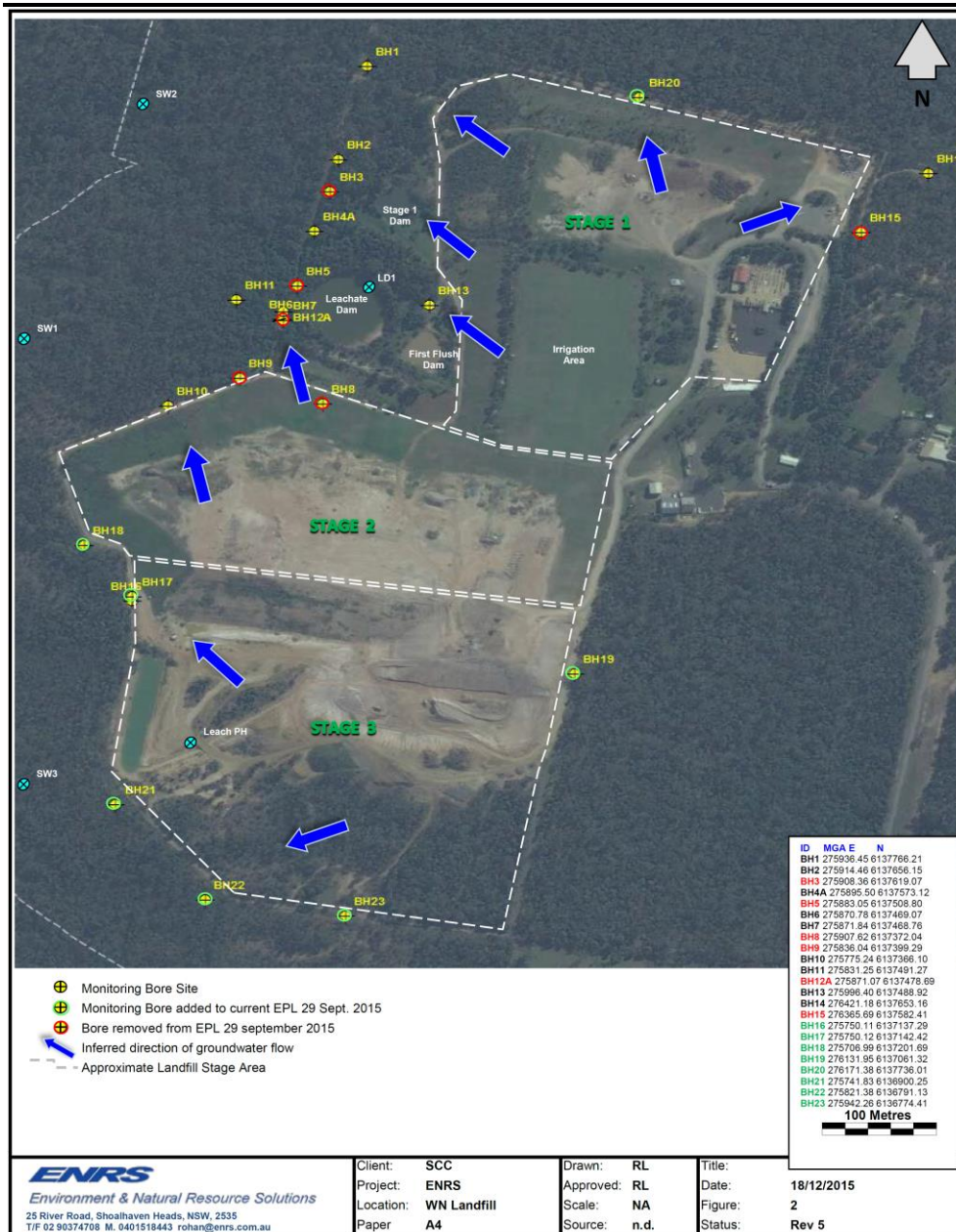


Figure 10 – Site Layout & Bore Monitoring Plan [Source: ENRS, 2018]

ATTACHMENT 3
CONSULTATION RECORDS

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	A3

From: Greg Frost <Greg.Frost@epa.nsw.gov.au>
Sent: Tuesday, 18 June 2019 4:02 PM
To: Aaron Hagenbach
Subject: RE: West Nowra Recycling and Waste Facility - Stages 1-3 [Environmental Audit - DA No.90/3061]

Good afternoon Aaron

Thank you for your email and contacting me by phone to discuss this matter.

As we discussed on the phone, records of compliance and licencing matters are available on the EPA's Public Register. There are no significant outstanding matters that are not represented on the Public Register.

In terms of looking to the future, the EPA have recently requested that Council review the current environmental monitoring regime in place at the premises to ensure that it is fit-for-purpose.

If you wish to discuss this further, please do not hesitate to contact me.

Regards

Greg Frost
 Operations Officer – Waste Compliance
 Waste & Resource Recovery, NSW Environment Protection Authority
 P: 02 4224 4113 M: 0438 345 772
greg.frost@epa.nsw.gov.au www.epa.nsw.gov.au [@NSW EPA](#) [EPA YouTube](#)
 Report pollution and environmental incidents on 131 555 (NSW only) or +61 2 9995 5555



From: Aaron Hagenbach [mailto:aaron@thehgoinstitute.com.au]
Sent: Monday, 17 June 2019 2:28 PM
To: EPA WARR Waste Operations Mailbox <waste.operations@epa.nsw.gov.au>
Cc: Greg Frost <Greg.Frost@epa.nsw.gov.au>; Rohan Last <rohan@enrs.com.au>
Subject: West Nowra Recycling and Waste Facility - Stages 1-3 [Environmental Audit - DA No.90/3061]

To whom it may concern,

On behalf of the Waste Services Unit Shoalhaven City Council (key contact: Giordano Bianco – 02 4429 3554), Environment & Natural Resource Solutions (ENRS) has been commissioned to manage and program an environmental audit for the West Nowra Recycling & Waste Facility Stages 1 to 3 for the 5-year period between 24 May 2014 to 24 May 2019, in accordance with the existing Development Consent (DA No. 90/3061).

The environmental audit will specifically relate to the conditions of the following approval documents:

- Development Consent – Extension of Waste Depot (DA No. 90/3061) – endorsed 24 May 1991, and including:
 - Amendment of Development Consent – Extension of Waste Depot (DA No. 90/3061) – 14 December 1994;
 - Amendment of Development Consent – Extension of Waste Depot (DA No. 90/3061) – 17 September 1996; and

- Environment Protection Licence (EPL) No. 5877 – latest issued 23 November 2018.

I have been engaged by ENRS to lead the environmental audit in accordance with DA No. 90/3061 as the suitably qualified professional, and am writing to seek information on any current key issues or pre-existing matters of interest to the environmental audit relevant to the above 5-year period, and in particular any feedback on environmental performance at the premises relating to EPL No. 5877 for consideration and noting in the audit report.

Please provide any feedback via return email as soon as possible, or if you should have any queries, please contact me directly on 0498 568 373.

Regards,

Aaron S Hagenbach | Director and Principal Environmental Engineer

PMR Strategies Pty Ltd, trading as

THE HYDRO-GEOLOGie INSTITUTE

aaron@thehginstitute.com.au

Mobile 0498 568 373

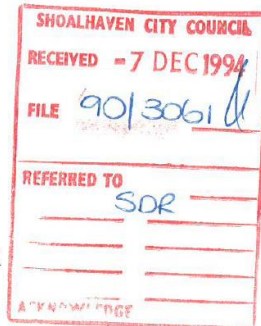
EMAIL NOTICE

The contents of this email communication and any attachment(s) are confidential, and may also be subject to legal privilege. If you are not the intended recipient to whom it is addressed, any disclosure, unauthorised use, forwarding, printing, copying, adapting, distribution or action taken in reliance on any part of this email is prohibited. Whilst all reasonable attempts are made, it is recognised that information sent via email may be intercepted and/or corrupted and it is therefore the responsibility of the recipient to ensure that the contents of this email are virus free and no responsibility is accepted for any loss or damage arising in any way from its receipt or use.

This email is intended for the addressee(s) named and may contain confidential and/or privileged information. If you are not the intended recipient, please notify the sender and then delete it immediately. Any views expressed in this email are those of the individual sender except where the sender expressly and with authority states them to be the views of the Environment Protection Authority.

PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

The General Manager
Shoalhaven City Council
PO Box 42
NOWRA NSW 2541



38515

Environment
Protection
Authority
New South Wales

NSW Government Offices
84 Crown Street
Wollongong
NSW 2500
PO Box 513
Wollongong
East
NSW 2520

Telephone 042 26 8100
Facsimile 042 27 2348

Your Reference: 90/3061 SDR:CM
Your Reference: 281418A1:BB
Contact: Bob Buchanan

Dear Sir/Madam

**PROPOSED EXTENSION TO WEST NOWRA WASTE DEPOT
LOT 436 DP 808415 YALWAL ROAD, NOWRA**

I refer to Council's letter dated 2 November 1994 on the above proposal and to the on-site meeting held on 15 November 1994 at which the Environment Protection Authority (EPA) was represented.

The EPA is satisfied that the extension to the waste depot is of a relatively minor nature and that no significant environmental impact will result from the proposal should Development Consent be given.

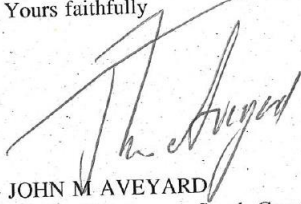
As discussed at the meeting, however, the EPA is concerned that the issue of progressive rehabilitation of the whole site needs to be addressed before Stage II is commenced. Council confirmed at the meeting that a Management Plan for Rehabilitation was a condition of consent for the entire life of the waste depot (Stages I-III) and that with the extra breathing space allowed by Stage I extension this plan could be finalised before the commissioning of Stage II in early to mid-1995.

The EPA was pleased to see the recent progress with the leachate control system at the base of the western batter and wishes to thank Council officers for the brief tour of these facilities at the depot.

2

Please contact the above designated officer if you require any clarification of our comments on this matter.

Yours faithfully



JOHN M AVEYARD
Regional Manager - South Coast
for Director-General

5/14/97

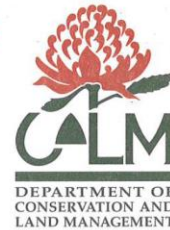
29 November, 1994

39056

SDR

**The General Manager
Shoalhaven City Council
P.O. Box 42
Nowra, NSW. 2541**

SHOALHAVEN CITY COUNCIL	
RECEIVED	12 DEC 1994
FILE	90/3061 <i>PR</i>
REFERRED TO	SDR <i>SP 6/12</i>
DATE	



DEPARTMENT OF
CONSERVATION AND
LAND MANAGEMENT
64 North St
PO Box 309
Nowra NSW 2541
Phone (044) 23 0122
Fax (044) 23 3011

Attention: Mr. Stephen Richardson

Re: Application for Variation to Development Consent, West Nowra Landfill.

Following an on site meeting with Council, EPA, N.P. & W.S. and the District Soil Conservationist of C.a.L.M. and a review of the plans for the variation, please find listed below the Department's comments for your attention in this matter:

1. The Department has no objections to the proposed minor extensions to the No.2 cell of Stage I at the West Nowra Landfill, provided the following measures are implemented as part of the extension;
2. The cell extension excavation must be kept back a minimum of 10 metres from the existing tree line immediately adjacent to the swale drain levee bank. All the existing trees must remain undamaged.
3. Although the proposed final landfill batter of this proposed extension is on an acceptable grade of less than 1V:3H, it has a long batter length which could lead to erosion problem if not adequately controlled. To achieve this control a mid slope diversion bank should be constructed to divert the batter runoff water along the bank and deposit it at a stable and well vegetated water disposal area. There may be a requirement to construct a concrete drop down drain at the outlet of the bank to carry the water safely down the batter to the disposal point. A land survey of the bank line will determine if this drop down drain is necessary.
4. On completion of each section of the landfill, the entire batter section (including the bank) must be covered with topsoil (minimum 100mm), seeded with an approved seedmix, fertilised and cover with straw mulched.

Incorporates: the Crown Lands Service, Forestry Policy Unit, Land Information Centre, Land Titles Office, Soil Conservation Service and Valuer-General's Office.

5. During the inspection the meeting discussed the lack of topsoiling and revegetation on the completed cells batters. These batters are in an extremely vulnerable state to the effects of soil erosion cutting through the batters causing erosion of the batters, sedimentation problems, potential exposure of garbage and the increased infiltration of rainfall into the landfill increasing the volume of leachate production.

Urgent action must be taken to bring in **topsoil** for spreading over the completed landfill batters (minimum 100mm cover) and then revegetate the batters as follows:

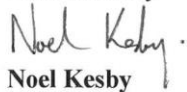
Sow seedmix;	spring summer	autumn winter
	Japanees Millet @ 35kg/ha	Ryecorn @ 35kg/ha
	Hiafa White Clover 5kg	Hiafa White Clover 5kg
	Couch 5kg	NZ Red Clover 8kg
	NZ Red Clover 8kg	K.V.Ryegrass 5kg
	Carpet Grass 5kg	Fescue Grass 5kg
	Hardenbergia 1kg	Hardenbergia 1kg
	Kennedia rubicunda 1kg	Kennedia rubicunda 1kg

Fertiliser; Grower 11 or equivalent N:P:K spread at 300kg/ha.

6. Following topsoiling, seeding and fertilising, the batters should be protected from erosion damage during the establishment phase by mulching with straw at 250 bales per ha.
7. There will also be a requirement to construct some drainage earthworks along the top of the batter to prevent uncontrolled drainage of the landfill top from damaging the batters.
8. The above measures should be documented on a rehabilitation plan for the landfill site.

Should you require any further assistance in this matter please do not hesitate to contact me at this office.

Your faithfully



Noel Kesby
District Soil Conservationist
Nowra

Waste Management Section
Shoalhaven City Council
PO Box 42 Nowra 2541



m.p.m.c.



Contact: Susana A. Realica
Phone: (02) 9895 7526
Fax: 02 891 5884
e-mail: sreality@dlwc.nsw.gov.au

Our Ref: 001653
[G:\SUSAN\REVIEWS\WNO\WRA2.doc]
Your Ref: 89/2611

Attention: Mr. William Paterson/Michael Dale

26 August, 1996

Dear Sir

Re: West Nowra Landfill Development Consent Amendment

Issue:

WPP

Shoalhaven City Council's Waste Management Section proposes to amend Condition 15 of the development consent as follows: "No disturbance is to take place within 250 m of Sandy Creek or Mundania Creek except for the Stage 2 landfill area where the no disturbance is to take place within 200 m of Sandy Creek; to ensure the future protection of the creek."

Due to the extreme urgent need to begin construction of the new landfill cells, a meeting was held last 22nd of August by Mr. William Paterson and Mr. Michael Dale of the Shoalhaven City Council with Mr. George Gates, Miss Susana Realica of the Hydrogeology Unit and Mr. Philip Hawes of the Ecological Services Unit of the Department of Land and Water Conservation to discuss the proposed amendment and obtain a decision.

Background:

The results of the initial review of the proposed amendment conducted by the Department was contained in a letter from Sydney South Coast Regional Director to Council dated 27.07.96. It indicated the Department concerns which are largely based on the lack of technical information. As a result of discussions between the Department and Council, two reports were submitted as supplement to the proposed amendment of the development consent. These were:

1. Report on Landfill Liner Investigation, Proposed West Nowra Landfill - Stage 2 Nowra, by Douglas Partners Pty Ltd, July 1995, and
2. Report on Groundwater Hydrology of Proposed West Nowra Landfill Stage 2 Area, by Forbes Rigby Pty Ltd, August 1996.

Macquarie Towers 10 Valentine Avenue Parramatta NSW 2150 PO Box 3720 Parramatta 2124 DX 28360 Parramatta
Telephone: (02) 895 6211 International: (61 2) 895 6211 Facsimile: (02) 895 7281

- 2 -

Current Situation:

Drilling of the exploratory holes used in the groundwater investigation by Forbes Rigby showed that the geology of the landfill area consists of sandstone bedrock often deeply weathered over the site resulting to a loose, semi-confined sandy layer which is considered permeable.

The Forbes Rigby consultants described the quality of groundwater at the Stage 2 area as having low leachate contamination based on the following:

1. Groundwater is fairly acid with pH in the range of 4.3 - 4.7.
2. Electrical conductivity and chloride are high ranging 1800 - 2700 $\mu\text{S}/\text{cm}$ and 540 - 800 mg/L , respectively.
3. Ammonia nitrogen ($\text{NH}_3\text{-N}$) is about 0.2 - 0.4 mg/L .
4. Methylene blue active substances (a measure of common anionic detergents) and boron which are both above detection levels.
5. Chemical Oxygen Demand (COD) ranging from 24 -54 indicating contamination with soluble organic compounds possibly from landfill leachate.
6. High aluminium (maximum of 4.6 mg/L) which results from clay dissolution under low pH (acidic) groundwater.

The consultants reported that the likely source of Stage 2 leachate contamination is the southern end of Stage 1 for the following reasons:

1. the Stage 1 landfill cells are not lined with clay and excavated through bedrock;
2. there is 175 m length of the Stage 1 area which is not equipped with leachate collection drains; and
3. the storm water diversion drains and sump cut deep into bedrock and unlined.

Summary:

The groundwater contained in the sandstone are in general saline. In areas where recharge from rain or river water is occurring such as in areas around the creeks and the Shoalhaven River the groundwater is expected to be of better quality making it suitable for stock watering. It is recommended that present and future beneficial use of the groundwater be maintained such that its quality would be suitable for stock use.

The likelihood of leachate contaminated groundwater ending up in Sandy Creek is considered high and even the groundwater consultants recognise this possibility.

Reducing the buffer zone especially at the northern side of Stage 2 where the leachate pond and sediment basin are located would mean reduced distance and time from the leachate source to reach the unnamed creek which discharge to Sandy Creek. This would result to lesser opportunities for chemical reactions such as ion exchange, absorption, dilution and

– 3 –

precipitation which makes the leachate more stable. The current situation already provides low attenuation capacity of the formation because of the shallow groundwater table. Reduction in the buffer zone would only result to a short circuit in the discharge of the leachate contaminated groundwater to the surface water leading to adverse impacts.

The reduction in the buffer zone towards the west of the Stage 2 landfill will not pose the same problem since the landfill cells in that area will be lined with a clay liner compacted to the EPA standards. These are defined in NSW EPA (1995) Environmental Guidelines.

Recommendations/Actions:

It is recommended that the reduction in the buffer zone requested by the Waste Management Section of the Shoalhaven Council be granted under the following conditions:

1. Measures to reduce the volume of leachate leaking into the groundwater which includes the following should be implemented:
 - a. relocation of the stormwater diversion drain and sump and/or lining the drain and sump with bentonite, and
 - b. upgrading the leachate pond by providing a low permeability and compacted clay liner (with coefficient of permeability of 10^{-9} m/sec).
2. A Groundwater Management Plan should be prepared and submitted to the Department for review. This is basically the groundwater monitoring program. The parameters used for groundwater monitoring should include aluminium, methyl blue and boron since their presence has already been detected. The results of leachate, groundwater and surface water monitoring should be evaluated and reported annually. The report on monitoring should be submitted to EPA and the Department for review.
3. Monitoring of both creek and groundwater should be undertaken to ensure that water quality goals are being maintained. These are defined in the Australian and New Zealand guidelines for Fresh and Marine Waters (1922).
4. The vegetation within the degraded areas of the buffer zone should be rehabilitated/enhanced to provide additional protection to the aquatic/riparian environment.
5. Vehicular tracks should not be within the buffer zone, any existing tracks which are not required should be revegetated.

It is understood that Council is considering a change in the buffer zone towards the northern portion of Stage 2 landfill to enable relocation and construction of a better designed leachate pond in order to minimise leachate contamination of the groundwater. This proposal would probably involve the excavation cutting directly into the groundwater as the groundwater table in the area is at 0.6 m below ground level (BGL) with the water bearing zone at 1.8 m BGL. A more practical solution would appear to be to maintain the buffer zone and upgrade the existing leachate pond.

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	A3-9

– 4 –

The Department would be pleased to discuss any changes to the conditions Council may be contemplating. This should facilitate an understanding of the conditions for which approval of an EPA license to operate the landfill may be granted.

Yours faithfully,

M. Williams 
Manager, Hydrogeology
NSW Department of Land and Water Conservation

cc: John Ross, Sydney South Coast Region

ATTACHMENT 4
SUITABLY QUALIFIED PROFESSIONAL DETAILS

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	A4

Qualifications, Certification and Memberships

Bachelor of Engineering (BE), Environmental (Env), *Honours* The University of Queensland
Exemplar Global Certification (No. 205215) – Environmental Management Systems Auditor:
Principal Auditor Grade
MIEAust (EA ID: 2118491) and MIAH Australian National Chapter (No. 139990)

Training Courses Completed

Lead Auditor – Environmental Management Systems (fulfils TPECS requirements of the following Exemplar Global qualifications):

- Exemplar Global AU – Auditing Management Systems (ISO 19011:2018)
- Exemplar Global TL – Leading MS Audit Teams (ISO 19011:2018)
- Exemplar Global EM – Environmental Management Systems (ISO 14001:2015)

Prior Career Experience and Capabilities

Prior to establishing **THE HYDRO-GEOLOG^{ie} INSTITUTE**, more than 10 years of experience was gained in senior environmental manager and then specialist project manager roles for an environment and planning consulting company specialising in environmental impact assessments, strategic planning and environmental management, and regulatory approvals and compliance at Local, State and Federal Government levels. Prior to this, several years of experience was also gained in environmental engineering and environmental project management roles. Works have involved coordinating and collaborating with planning and environmental specialists across a broad range of disciplines, including groundwater, surface water, flooding, geochemistry, subsidence of natural and built features, waste management, heritage, noise, air, traffic, ecology, soils and rehabilitation, visual landscapes and socio-economics.

Declaration of Independence

Shoalhaven City Council - Stages 1-3 of the West Nowra Recycling and Waste Facility

I, Aaron Hagenbach:

- am not related to any proponent, owner, operator or other entity involved in the delivery of the project;
- do not have any pecuniary interest in the project, proponent or related entities;
- have not provided services previously to the project;
- am not an Environmental Representative for the project; and
- will not accept any inducement, commission, gift or any other benefit from auditee organisations, their employees or any interested party, or knowingly allow colleagues to do so.



Aaron Hagenbach

Director & Principal Environmental Engineer

25 July 2019

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	A4-1

ATTACHMENT 5
SITE INSPECTION PHOTOGRAPHS [27 JUNE 2019]

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	A5



Plate 1 – Site Entry [Operating Hours / Contact Number / Emergency Assembly Point]



Plate 3 – Site Entry Sign [Speed Restrictions]



Plate 2 – Site Entry [Gate Lock / Security Fence]



Plate 4 – Water Tanks [Fire-Fighting Capacity]



Plate 5 – Gas Generator



Plate 7 – Weighbridge Cover & Prohibition Sign



Plate 6 – Gas Flare



Plate 8 – Tyre Stockpile



Plate 9 – Litter Control at Boundary Fence (1)



Plate 11 – Litter Control Portable Fencing



Plate 10 – Litter Control at Boundary Fence (2)



Plate 12 – Litter Control Automatic Tarp Deployment System



Plate 13 – Green Waste Stockpile



Plate 15 – Vehicle Washdown Area (1)



Plate 14 – Timber Wood Stockpile



Plate 16 – Vehicle Washdown Area (2)



Plate 17 – Stormwater Drain Top of Batter (1)



Plate 19 – Drop Down Drain



Plate 18 – Stormwater Drain Top of Batter (2)



Plate 20 – Stormwater Drain Outlet (Below Drop Down Drain)



**Plate 21 – Irrigation (Utilisation) Area
with Stormwater Drain in Foreground**



Plate 22 – Stage 1 North Batter Rehabilitation (1)



Plate 23 – Stage 1 North Batter Rehabilitation (2)



Plate 24 – First Flush Dam



Plate 25 – Leachate Dam



Plate 26 – Sedimentation Dam



Plate 27 – Active Landfill Cell Area



Plate 28 – Future Landfill Cell Preparation



Plate 29 – Western Boundary Vegetation

ATTACHMENT 6
INDEPENDENT AUDIT DECLARATION

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	A6

INDEPENDENT AUDIT DECLARATION FORM*

Project Name: West Nowra Recycling & Waste Facility
Consent Number: DA No. 90/3061 (Shoalhaven City Council)
Description of Project: Stages 1 to 3
Project Address: 120 Flatrock Road, Mundamia, NSW
Proponent: Waste Services Unit, Shoalhaven City Council
Title of Audit: Environmental Audit – West Nowra Recycling & Waste Facility Stages 1-3
Date: 25 July 2019

I declare that I have undertaken the Independent Audit and prepared the contents of the attached Independent Audit Report and to the best of my knowledge:

- the audit has been undertaken in accordance with relevant condition(s) of consent and the *Independent Audit Post Approval Requirements (Department 2018)*;
- the findings of the audit are reported truthfully, accurately and completely;
- I have exercised due diligence and professional judgement in conducting the audit;
- I have acted professionally, objectively and in an unbiased manner;
- I am not related to any proponent, owner or operator of the project neither as an employer, business partner, employee, or by sharing a common employer, having a contractual arrangement outside the audit, or by relationship as spouse, partner, sibling, parent, or child;
- I do not have any pecuniary interest in the audited project, including where there is a reasonable likelihood or expectation of financial gain or loss to me or spouse, partner, sibling, parent, or child;
- neither I nor my employer have provided consultancy services for the audited project that were subject to this audit except as otherwise declared to the Department prior to the audit; and
- I have not accepted, nor intend to accept any inducement, commission, gift or any other benefit (apart from payment for auditing services) from any proponent, owner or operator of the project, their employees or any interested party. I have not knowingly allowed, nor intend to allow my colleagues to do so.

Notes:

- a) Under section 10.6 of the *Environmental Planning and Assessment Act 1979* a person must not include false or misleading information (or provide information for inclusion in) in a report of monitoring data or an audit report produced to the Minister in connection with an audit if the person knows that the information is false or misleading in a material respect. The proponent of an approved project must not fail to include information in (or provide information for inclusion in) a report of monitoring data or an audit report produced to the Minister in connection with an audit if the person knows that the information is materially relevant to the monitoring or audit. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000; and
- b) The *Crimes Act 1900* contains other offences relating to false and misleading information: section 307B (giving false or misleading information – maximum penalty 2 years imprisonment or 200 penalty units, or both)

Name of Auditor: Aaron Hagenbach

Signature: 

Qualification: Exemplar Global 205215 / Principal Auditor - Environmental Management Systems Auditor

Company: PMR Strategies Pty Ltd (t/a The Hydro-Geologie Institute)

Company Address: PO Box 5367 Port Macquarie, NSW, 2444

* This Independent Audit Declaration Form has been included with the environmental audit, without amendment, to that in the *Independent Audit Post Approval Requirements (2018)*. However, it is noted that the objective of the environmental audit is to meet the requirement of Condition 21 of DA No. 90/3061 and, as expressly stated within this report, has been generally guided by (where relevant) the contemporary NSW Department of Planning and Environment (DPE) guidelines for independent audits (NSW Government, 2015; DPE, 2018).

Document ID	Version	Date	Page
HG-R7011	B	25 July 2019	A6-1

ENCLOSURE 1
SECTION 3.3 (DESCRIPTION OF PROPOSAL) AND
SECTION 3.4 (PROPOSED OPERATIONAL SAFEGUARDS)
[EXCERPTS FROM SEE (SK&P, JUNE 1990)]

- . life greater than 20 years
- . screening from public roadway
- . room for leachate ponding and treatment
- . all weather access road
- . absence of urban development
- . available water for fire fighting
- . recreational or industrial end use.

Although a TWMP has not been developed for the City, a number of the recommendations for such a plan relating to solid waste disposal, as described above, are being implemented within the City.

The City has been divided into areas according to waste collection. These are:

- . northern region, where rubbish collected is removed to the West Nowra Waste Depot;
- . southern region, where rubbish collected is removed to the Milton - Ulladulla Waste Depot;
- . central region, where waste from Huskisson, Vincentia and Sanctuary Point will be removed to the Huskisson Waste Depot.

Studies are being undertaken at present for the siting of the new central region depot at Huskisson, and the new southern regional depot near Ulladulla. The existing depots at these locations are nearing the end of their life expectancy; the waste will eventually go to the central region depot at Huskisson is currently taken to West Nowra.

Local depots still operate at Sussex Inlet, Bandalong and North Durras, but their future is limited. Local depots at Callala, Greenwell Point, Sanctuary Point, Currarong and Culburra have recently been closed. A waste transfer station was established at Callala in October 1989, the waste being brought ultimately to West Nowra.

The existing West Nowra depot is nearing the end of its life expectancy, and it was concluded by the City Department of Health and Building that the appropriate strategy would be to extend the existing site, rather than seek a new one. The criteria for site consideration listed above can be met by the extension of the existing site, and the presence of the necessary infrastructure for waste disposal suggests that extending the present site would be more practical than finding and constructing a new site.

3.3 Description of Proposal

3.3.1 Site Selection

The new waste depot is designed to fit the contours and constraints of the boundaries of the 39 hectares of Crown land selected by Council (Figure 2).

The site contours, and the need to leave sufficient buffer for the preservation of Sandy Creek and its associated vegetation communities, reduced the total area available to about 20 hectares. Areas for runoff ponds, leachate wells and access roads are also required within the 39 hectares designated.

Emphasis was also placed on using areas already disturbed by gravel extraction, although areas previously undisturbed were included in the design.

3.3.2 Description of Proposal and Management Strategies

3.3.2.1 Landfill Design Parameters

Landfill design parameters proposed for the site extension are detailed below.

Maximum height above existing ground level: 10 m.

Trench	depth	:	4 - 5m
	width	:	50 m
	length	:	varying
Daily Cover		:	150 mm
Final Cover		:	1 m
Landfill Capacity (Total)		:	1 964 717 m ³
Life of Landfill		:	29 years

In general, the extensions to the West Nowra Waste Depot will be operated as the existing section is now. That is, staffing arrangements, site equipment and hours of opening will remain. Details of operation are described in Section 3.3.4.

Landfill capacity was calculated by finding the approximate area of the site to be used then multiplying by 10 m, the height of each cell. The total landfill capacity is 1 964 717 m³ (considering access paths to each stage site), while each stage has the following capacity:

Stage 1	:	421 317 m ³
Stage 2	:	453 600 m ³
Stage 3	:	1 089 800 m ³

Actual waste deposits occupy 80% of the volume and domestic solid waste constitutes about two thirds of this volume.

Data presented in Appendix F (Table 1) were used to calculate the life of the landfill. Assuming the West Nowra Waste Depot serves areas 1 and 2 (Shoalhaven City Council, 1988) with population increases of 1.8% and 5.4% respectively, population estimates were made to the year 2030. An initial estimate of waste generation per capita was made for 1991 and this was increased by 1% each year. Total weight of domestic solid waste per year was calculated and converted to compacted volume generated per year assuming a compacted density of 600 kg/m³. A cumulative volume filled tally is kept for each year in the last column of Appendix F (Table 1). All assumptions are conservative and it is likely that the life of the landfill will be greater than that stated here, if efficient landfill techniques are followed (the depth of the trench was not included in the volume calculation as it is not known how deep they can be). It is then a simple matter of comparing the available landfill capacity for domestic wastes (two thirds total) to the last column to find the year of landfill exhaustion. The life of each stage follows:

Stage 1	:	8 years
Stage 2	:	8 years
Stage 3	:	13 years
Total life	:	29 years

The domestic waste capacity is outlined in Appendix F (Table 2).

3.3.2.2 General Siting

Despite 39 hectares of land available at West Nowra for extensions, it is good management to leave certain areas untouched. The northwest corner of the site from the existing leachate lagoon to Sandy Creek will be left as a natural buffer for the creek environment. Similarly a small buffer zone along the western boundary is kept untouched mainly because surface drainage to runoff ponds would be impeded if the area was utilised. Leachate collection and runoff control are discussed in Section 3.4.

3.3.2.3 Staging

The general extension area can be split into three stages of operation (see Figure 3). The method of filling will basically be the same as currently used, that is, a combination of the trench and area methods. Once the trench is filled, it will continue to be worked using the area method until a height of around 10 metres is reached. Details of these methods are explained in the operation section.

Figures 4 to 7 show a conceptual final contour design. They are only to give an idea of how the final land contours will lie to aid planning of future land uses. This report does not present a detailed management plan and the drawings contain some discrepancies (eg existing landfill site does not cover complete area shown on Figure 4 - recycle bay, equipment shed etc in the southeast corner). The final slope of the land is shown as 1% (to aid runoff), with 20% slope on the sides of the mound. A 20% slope will not cause excessive erosion especially when revegetated.

3.3.2.4 Cover Material and Compaction

After the waste is spread in layers (of less than 60 cm) it must be compacted well. The chances of underground fire and blown litter problems are reduced. Because each cell will be approximately 10 metres high, good compaction is important to prevent differential settling of the lifts.

At this site, cover material is available by utilising the trench method of landfill operation. Depending on how deep the trenches are made, there will be between 0.6 metres and 1 metre of porous silty sandy clay with highly weathered bedrock deeper down. The types of soils used as landfill cover material can be rated for their suitability for the following functions:

1. prevention of rodent tunnels
2. prevention of fly strikes
3. moisture infiltration (thus leachate) minimisation
4. venting of decomposition gas
5. pleasing appearance and control of blowing litter
6. support of vegetation.

As an absolute minimum, 20% of the total material deposited (cover and waste) must be cover. That is, for every 4 m³ compacted waste deposited, 1 m³ cover material is required. Therefore approximately 392 943 m³ of soil material is required to cover the expected capacity at West Nowra of 1 964 717 m³. To get this amount from the trenches, they must be excavated to a depth of 4 metres. This may not be possible if the weathered bedrock is difficult to excavate. Cover material would need to be available from the following sources:

- quarry overburden
- spoil from Council roadworks etc
- inert cover materials delivered to site from subdivisions and other works

3.3.2.5 Firefighting

Through compaction of garbage and daily cover, the risk of fire in the landfill is significantly reduced. Also, gas production will not be allowed to build up to explosive compositions with the use of adequate gas vents. Town water is connected to the West Nowra Waste Depot site and can thus be used to fight any small fires. In the case of large fires, the District fire authorities would be called.

3.3.3 Alternative Treatment Technologies

There are many options for treatment and disposal of garbage, apart from landfill. These include waste reduction by incineration, pulverisation and recycling. That is, the landfill is still required but through waste reduction, the life is prolonged. Recycling is perhaps the most economic and should be considered by the Shoalhaven City Council. The others require considerable capital expenditure and construction.

3.3.3.1 Recycling

A study in 1986-88 by the NSW Recycling Committee found that 45% of total household wastes are 'potentially recyclable' but difficult to find markets for. Therefore only 2 - 3% of the waste stream is currently recovered by recycling. The cost of collection and disposal however, are not offset. The committee is now working on:

- increasing local awareness of recycling opportunities at household level
- increasing and improving source separation at household level
- increasing range of material that can be separated at source for recycling
- investment opportunities for recycling materials from commercial and industrial sources.

The method of recycling introduced at Nowra will rely on the community to separate the recyclable wastes from the rest. Machines can do this job but capital expenditure is required. These recyclable wastes can be retrieved at the source, place of waste pickup, transfer station or waste depot. This means provision for recycling should not only be considered with respect to the West Nowra waste depot but also to the whole community. Supermarkets are good locations for voluntary recycling bins. The St Vincent De Paul and Salvation Army run successful second hand clothing bins in such places.

Companies that use recycled materials, should set aside an amount of money to pay contractors or community groups to collect the material. This payment however, can be held down by the low cost of raw material for new products.

The recycling centre at the depot is seen to be the final opportunity for recycling, but definitely not the only one. In trials, it was found provision of special containers for recyclable wastes and more frequent service (eg weekly instead of 4-6 weekly service) improves both participation and recovery rates.

There are two reasons why such a small percentage of the waste stream is recycled. Land in Australia is so abundant at the moment that cost of disposal is relatively low. Also energy raw materials are plentiful and cheap. In the future, these costs may increase, making recycling more viable. The Recycling Directory issued by the Waste Management Authority lists materials that are currently recycled and company contacts.

At the moment, the most practically recycled materials are paper and aluminium cans. Buy-back collection schemes for aluminium cans are highly successful with a recovery of 60% of all cans sold. The WMA has developed a procedure for introduction of an office waste paper

recycling scheme in government offices. They also say a feasibility study into a newsprint plant using de-inked pulp is warranted.

Glass recycling is a success in New Zealand. Collection of cullet (broken glass) in NSW is through recycling contractors, many of whom operate house-to-house collection. Plastic containers are being used at the expense of recyclable glass and metal containers. There is no real market for mixed plastics in Australia at the moment, although HDPE milk bottles and clear PVC fruit juice containers have been collected in Geelong for recycling.

For steel cans to be reused effectively, householders will have to wash them. According to the NSW Recycling Committee, there is 16 kg/cap/yr ferrous metals in the domestic waste stream. This can be used by foundries and BHP group and export opportunities are good. Future recovery of this steel depends on devising more economic collection methods.

Organic materials such as plant and tree clippings can be burned, mulched or composted to reduce the quantity of waste. A Victorian study found in 1985 that 16% of the population were effecting a 27% reduction in garbage weight through backyard composting.

In general, increased participation in recycling programs should be encouraged by:

- social and monetary incentives
- feedback
- convenience (main motivating factor in using house - house collection)
- education

Education and information programmes should be targeted at two levels in the community. That is, the general community for the promotion of environmental awareness and the individual with specific information on how, when and where.

Shire Councils not part of capital cities usually have low participation in recycling schemes. Kur-ing-gai Municipal Council has had a very successful recycling service for the past ten years and in 1989 recovered more than 10 000 tonnes from the residential waste stream. This represents in excess of 22% of domestic waste generated within the Municipality.

The recycled materials are collected each month from the kerbside and include glass, P.E.T. plastic, paper/cardboard and aluminium cans. In addition to kerbside collection, Council has a recycling depot handling paper/cardboard, glass, P.E.T. plastics, aluminium cans, home mechanic oil, used clothing and car batteries and three aluminium buy back centres operated by Alcoa. The Kur-ing-gai Council operates a landfill for vegetation only and is currently seeking approvals for the establishment of a vegetation recycling plant.

Each residence in the area is supplied with a calendar via letter box drop, which indicates the households' recycling days. Reminder leaflets are also delivered several days before a pick up.

The success of the recycling service in Kur-ing-gai Municipality is due to the following actions:

1. Promotion of the service by publications and pamphlets, talks to school groups and major displays at shopping centres.
2. Press releases and advertising in local papers.
3. Constant and regular monitoring of the service by the one operating contractor.
4. Dedicated staff at Council committed to the principle and success of recycling.

In conclusion, future strategies for a Shoalhaven City Council recycling service should include improved public education and cooperation, and government encouragement and participation.

3.3.3.2 Composting

Composting plants processing solid waste and sewage sludge are operating successfully overseas. Modern composting systems consist of the following steps:

1. Front end processing (separation of recyclable materials etc);
2. Composting process (bacterial decomposition of the organic fraction of municipal solid waste);
3. Back end processing (removal of contaminants, product preparation and marketing).

The four general market areas for compost material are:

- . agriculture (vineyards, market gardens);
- . ornamental plant cultivation;
- . landscaping;
- . special uses such as filtering material and sound insulation.

The market for organic fertilizers appears to be growing rapidly.

Composting is environmentally desirable because it reduces the need for landfill space and returns organic matter to the soil, improving its structure and nutrient value. However, solid waste and sewage sludge both contain levels of heavy metals and pathogens. These contaminants potentially limit use of compost products and impose operating criteria on the compost process.

At the present time, establishment of a composting plant, financed at commercial interest rates would result in net unit operating costs considerably higher than current waste disposal charges. Opportunities may be available, however, to reduce these costs. These would include:

- . different financing options;
- . multi-shift operation;
- . higher product values;
- . variable costs of waste disposal with different disposal technology.

3.3.3.3 Combustion of Municipal Solid Waste in an "as received" Form

This information is taken largely from a report by Dr Andre Krol of Chemsas Pty Ltd. The report was an overview of world and local waste disposal practice forming part of a Refuse Management Strategy developed for Brisbane City Council by Sinclair Knight & Partners.

Grate Combustion

The waste considered here has received no mechanical processing before being fed to the waste combustor (incinerator).

The process for grate combustion of municipal solid wastes involves feeding the waste into a slow moving grate. The grate agitates material and moves it through zones designed to achieve drying, ignition, and burn-out prior to discharge. Air needed for combustion is classed as primary air (fed through the grate into the base of the waste layer) and secondary air (fed into the area above the waste). The hot combustion gases leaving the process are cooled, passed through some form of pollution control equipment and then discharged from

the stack. The minimum capacity usually processed in a conventional combustion plant is 100 tonnes/day.

The early grate combustion plants were poorly operated. However, the process has been substantially upgraded by various manufacturers since the mid 1970's in response to environmental concerns.

Energy can now be recovered from the hot combustion gases, and the potential sale of it is the major consideration for the use of grate combustion. Another consideration that must be made is the availability of landfill for the disposal of ash.

During the 1980's there was concern over emissions from the combustion plants, particularly 'dioxins' and mercury. Environmental impacts of solid waste combustion and methods of emission control were reviewed in Sweden where 60 % of all solid waste is combusted via grate combustion. After careful consideration of all the EIS's, the combustion plants were allowed to continue operation.

In Canada, a multi-million dollar research and development programme was established. It involves the testing of various municipal waste combustors and emissions control equipment.

The flyash removed from the gases by the air pollution control equipment must be disposed of using appropriate landfill technology. Bottom ash from the grate is not a problem, with high combustion efficiency operations.

The economic suitability of grate combustion in West Nowra would depend heavily on the market for generated low grade energy.

Two Stage Combustion

For capacities less than 100 tonnes per day, two stage or modular combustion is used. Solid waste is fed to a primary chamber where it is dried, starved air pyrolysis occurs, and the resulting carbon is then burnt out by the addition of more air. The waste is transported within the chamber by use of a grate, rams, a moving hearth, or the rotation of the chamber itself (rotary kiln configuration).

The gaseous products from the first chamber pass into a secondary chamber in which more air is added, and high temperature, long residence time gas phase combustion occurs. Heat recovery and gas cleaning follows.

The benefits offered by this configuration include:

- . reduction of particle entrainment to gas stream;
- . reduction of the volatilisation of metals and salts;
- . smoothing of the variation in demand for oxygen by the burning waste;
- . destruction of organics in the waste stream.

The two stage combustion system has been used in both the USA and Canada over the last 20 years.

3.3.3.4 Refuse Derived Fuels

The term 'refuse derived fuels' (RDF) is used to imply some form of mechanical processing and removal of components from the municipal solid waste stream to produce a higher energy value fuel product.

In Europe the following terminology is used to describe the different grades of RDF:

- . Coarse RDF - municipal solid waste subject to some extent of pulverization and removal of ferrous metal;
- . Fluff RDF - that fraction of coarse RDF, produced on mechanical classification, which has the highest energy value by weight as a combustible fuel. For example, paper, textiles and light plastic fractions;
- . Pelletised RDF - Fluff RDF which has undergone some form of compression into discrete uniform pellets.

Prescreening prior to combustion will minimise the transfer of moisture, heavy metals and other contaminants into the fuel fraction.

The principal market for the RDF product is in combustion systems designed to produce useful energy. The major problem with the RDF method of disposal is developing a market for the product. Typically, process steam and/or electricity are the final use of the energy.

Combustion of RDF

The choice of combustor depends on the local market forces. The type of combustor dictates the grade of RDF required for operation.

The combustion systems using coarse RDF include grate combustion and 'bubbling fluidised beds' (RDF combusted while suspended in an upward flow of air).

Fluff RDF is a better fuel product than coarse RDF because it has a higher calorific value, lower moisture content, lower concentrations of heavy metal contaminants, and smaller ash residues after combustion. The disadvantages of fluff RDF are that it does not have a high bulk density for storage/transport, and it cannot be stored for extended periods. Fluff RDF is combusted in circulating fluidised beds. This system can operate at high or low loads.

Pelletised RDF can be stored for extended periods. The UK adopted the strategy that pelletised RDF could replace coal in the boiler market place. However, there has been considerable consumer resistance to its use. The demonstration projects in the UK, testing the suitability of different boiler systems for pelletised RDF combustion, are still in progress, but a potential problem of burning RDF in small plants is the lack of suitable emissions control.

Since cement manufacture is a highly energy intensive process, it may be possible to use waste materials as a fuel source. In fact, with some modifications to the control system, low grade fluff RDF has been used successfully at a cement kiln in the UK since 1979. The process is particularly suited to solid wastes in that the combination of high temperatures, long residence times and alkaline environment ensures a high combustion efficiency and low acid emissions.

The technology of RDF production and combustion is sufficiently proven for consideration in a practical waste management plan, but the feasibility will hinge on whether a market place can be found for the produced RDF or a combustor can be built for the fuel.

3.3.3.5 Neutralysis

The neutralysis process has been developed in Brisbane. It consists of a mechanical front end which produces a material similar to coarse RDF. It is then mixed with clay and liquid waste, and extruded to produce pellets suitable for firing in a rotating kiln system. The solid product is a light weight aggregate which can be used in the construction industry. Little if any residue is left for disposal. Because the process is new, it would be wise to wait until both the process and market for product aggregate is established on a commercial scale.

3.3.3.6 Pyrolysis

Pyrolysis is the thermal processing of municipal solid waste with either a complete absence of oxygen or a supply below that necessary for complete combustion. The products can either be gaseous or liquid depending on the process conditions employed. These processes are currently in the research and development or demonstration stage, and are not regarded as viable options for a waste management plan at present.

3.3.4 Operational Details

3.3.4.1 Description of Proposed Landfilling Methods

As mentioned previously, both the trench and area methods will be used for the landfilling of the West Nowra Waste Depot extension site. In the trench method, solid waste is dumped in an excavated trench. Cover material, which is taken from the spoil of the excavation, is spread and compacted over the waste to form the basic cell structure. The trench is made narrow enough so that the top of the trench is reached at the end of the days operation. Once the trench is filled, the waste is spread in 40 - 60 cm layers, compacted and another similar layer is built on top. This is the area method. At the end of the day, the 'lift' is covered with about 15 cm of soil and compacted again. Usually a bund is built, against which the waste can be tipped and compacted. Once the complete trench/cell is finished, a 60 cm layer of final cover material must be applied and the area revegetated to prevent unnecessary erosion and dust problems.

3.3.4.2 General Operation and Guidelines

The general operation of the extension will be similar to that used currently. There is no reason to change the hours of opening, site equipment, or staffing arrangements.

The truck wash facility will drain to a drain leading to a runoff pond. All ancillary facilities (eg recycle bay) will remain in place as they are fairly central to all operations. Access roads and turning bays will be designed in accordance with the location of the trenches.

Improvements in recycling attitudes throughout the waste catchment area may lead to the need of a larger recycle bay. The landfill site will be secured by a fence to prevent entry by trespassers and scavengers and illegal dumping of dangerous wastes. Litter control around the site can be improved by erecting a portable fence around the particular trench being filled and the residential tipping trench. This will catch any windblown litter. Monthly litter patrols along site boundaries can reduce the litter problem also.

Following are general guidelines favoured by several agencies and researchers, including the UNSW Centre for Waste Management:

1. All deposits of waste should be made in individual layers
2. No layer should exceed 60 cm in depth
3. When the layers are completely compacted to the appropriate lift height, the lift should be covered with 15 cm of soil or other similar material
4. No waste should be left uncovered for a period longer than 24 hours
5. Adequate precautions should be taken to prevent fire
6. Adequate precautions should be taken to ensure that vermin cannot live in the landfill

7. If any deposit consists mainly of putrescible organic material it should be covered with 60 cm of soil or similar material
8. Landfill staff should be sufficiently trained, equipped and of adequate number to maintain the site according to the guidelines
9. Each lift should be allowed to settle before the next lift is started
10. Private cars should not mix in the dumping area with collection vehicles
11. Completed lifts should be grassed as soon as possible.

3.3.4.3 Operation of Each Stage

The suggested operation of each stage is described below. It is only a brief guideline, presented to illustrate the landfilling methods.

Stage 1

Stage 1 can be considered an extension to the existing waste depot. The south trench (A) should be filled first followed by the next two (see Figure 3). The slope of the final cover (1% to north and 1% to west) can be continued from the existing landfill. The operational steps are as follows:

1. Bund top of finished landfill 'lift' to divert contaminated runoff (runoff in contact with landfill) to existing drain
2. The runoff drain should be extended to the north as each trench is excavated
3. Bund the three free edges of the trench to prevent uncontaminated runoff (from unworked area) from entering the trench
4. As trench is built up, extend to match and join with the next door trench
5. 15 cm of cover material must be applied and compacted before the end of the day's operation
6. Move bund from the first trench edge to the just completed 'lift' edge ready for the next trench development
7. Cover with 1 metre of final cover and compact
8. Revegetate area

The existing access road can be extended north to serve stage 1.

Stage 2

Four trenches in Stage 2 run from north to south and the fifth (E) runs west to east. The first trench to be filled is the one next to the western boundary of the existing landfill (A) and trench E will be filled last. The runoff drain around the south and west sides of the existing site need not remain provided a new runoff drain is positioned at the boundary of stages 2 and 3, leading to the lagoon. This drain is separate to the uncontaminated subsurface stormwater drain shown in Figure 3. The runoff drain should be completed before trench activity is commenced. The 'lifts' should then be completed as outlined above in stage 1.

Access to trenches A to D should be via the long trench E which is then filled from west to east.

Stage 3

Stage 3 trenches will be worked in the same manner as the other stages. A new runoff pond and pumpwell must be constructed along with a secure stormwater drain running along the stage 2/stage 3 boundary (see Section 3.4). This boundary will also be the high point of the finished landfill area with stage 3 sloping 1% south, and 1% west. The runoff drain, north on the new pond must be constructed entirely before operation of trenches A & B but the rest of the drain can be constructed as landfilling of each trench progresses. The access road to the last trench of stage 2 can simply be extended to the end of the worked area as required.

3.3.4.4 Services

The existing services provided (power and water) should be adequate for the extension of the waste depot. Illawarra Electricity has indicated that it will be necessary for easements to be created over the existing overhead lines on the site at the time of development.

3.3.5 Ultimate Use of the Site and Life of the Proposed Depot

The waste generation projections outlined in Section 3.3.2 indicated that the three staged development of the extended waste depot should provide a total life of 29 years. As described in Section 3.4.7 this rate of usage will need to be monitored. It will also be necessary to undertake a study, in line with future long term planning strategies, to find alternative site(s) for waste disposal, which are appropriately located to serve the expanding community.

The future use of the extended depot area has been identified in Council planning studies as most likely to be an area for a regional sporting complex. In general, this would be an appropriate use given the future residential development proposed for the area within the next 20 - 30 years. The detailed timing proposed for this residential development has not been established. Should it occur more quickly than proposed, and there is a strong demand to develop up to the boundaries of the waste depot, the potential exists for depot operation to cease at the end of stage 2 (16 years); an alternative waste depot site would obviously need to be found within that time frame.

Should residential development be less urgent, the full 29 years life of the proposed extension may be achieved, although it is likely a buffer separating the depot and future residential development would be needed until the depot is full.

Before a final decision is reached on the use of the completed landfill, settlement and structural characteristics of the landfill must be considered. For example, surface settlement would need to be assessed, and this depends on the initial compaction, characteristics of the wastes, degree of decomposition and the height of the completed fill.

Tchobanoglous et al (1977) indicated that settlement at waste depots generally occurs for about 5 years after completion. During that time the landfill will contract to about 75 percent of its original height (with average compaction). Following closure of the depot, it may take up to 5 years before the site is usable for its ultimate use.

3.4 Proposed Operational Safeguards

3.4.1 General

This section describes the design and operational safeguards to be implemented, and takes into consideration:

- . gas control
- . water quality
- . air quality
- . visual impact

- . noise control
- . monitoring

3.4.2 Control of Gases

3.4.2.1 Gases

Ninety percent of the gas produced by the anaerobic decomposition of organic solid waste components is methane and carbon dioxide. Movement of the gas is due to pressure gradient and diffusion. Methane movement is not restricted to up. If rain is percolating through the fill, gas is displaced sideways. For unvented landfills, lateral movement depends on characteristics of cover material and surrounding soil.

Methane is explosive if in compositions of 5 - 15% and oxygen is present. This situation arises when gas migrates through soil and rock to accumulate in closed places such as basements of buildings. Possible routes for the gas into void spaces after land reclamation include:

- . Cracks and joins in concrete rafts (differential subsidence of the decomposing refuse under a raft may cause crack to occur. Gas leaking through such cracks has been ignited by welding equipment and blow lamps).
- . Permeation of concrete rafts (when refuse settles, an inverted set of voids left will fill with CH_4/CO_2 gas).
- . Drainage systems (Sewage and Soakaway systems - pipes delivering water to the soakaways act as paths for methane to return to buildings).
- . Inverted catchment features (eg overhanging roof structures).

During landfill operations, explosions can occur onsite. If voids are created by drilling, or shafts are constructed for leachate removal, or refuse is disturbed during excavation of trenches for services, there is always a possibility of a methane/air explosion. Ignition can be caused by electrical equipment, vehicle ignition systems, tools or excavators hitting, stones or rocks, welding equipment or cigarettes. Sudden changes in atmospheric pressure or temperature can cause quite rapid expansion of gas into previously safe areas. Mobile homes, parked vehicles, landfill operators huts can also act as collection vessels for landfill gas as it moves vertically upwards from cracks in top cover or up soakaway pipes or carpark drainage systems.

Carbon dioxide is dense and thus accumulates at the bottom of a landfill. Eventually it finds its way into the ground water and lowers the pH. This in turn increases the hardness and mineral content of the water.

If residential areas are planned or exist in the vicinity, gas ventilation is essential. Gas can migrate long distances. Hydrogen sulphide and methyl mercaptans have 'bad' distinct smells at parts per million levels, but when filtered through large pore vents the gas is oxidised, getting rid of the smell. When vents are used, staff should be made aware of the dangers.

The rate of production of gas is difficult to determine, and continuous production of the gas means on-going collection and venting takes priority in design for future use of the land.

Apart from explosion and asphyxiation problems associated with landfill gas, it can displace oxygen in the soil above the refuse and suffocate roots of covering vegetation. If one metre of topsoil is used, this problem is avoided.

3.4.2.2 Gas Vents

The venting of methane can be either passive or active. Several passive systems can be installed:

- . impermeable clay cutoff walls 0.7 to 1 m wide to prevent gas seepage near buildings. It must be kept moist to avoid cracking.
- . cell vents or barrier vents can be installed. These are trench beds of 20-40 mm wide and as deep as fill, filled with gravel. They can be situated between cells, about 40 m apart or at edges of the landfill. The tops of the trenches should be kept clear at all times and shaped so rainwater drains away from the opening.
- . control of downward movement of gas (CO_2) can be accomplished by installing perforated pipes in the gravel layer at the bottom of the landfill.

Active systems are mechanical means of withdrawing the gas.

Depending on the final land use, the most appropriate gas control methods are cell vents or barrier vents. The developments in the utilisation of gas from landfill sites will have repercussions on the reclamation of landfill sites in the future. There will be a tendency for sites to be constructed so as to maximise gas production over as few years as possible, and for all larger sites to have some form of gas control.

3.4.3 Water Pollution Control Methods

There are two basic methods of preventing water pollution from occurring as a result of solid land filling, namely:

- . interception of all surface drainage and groundwater entering the landfill area and re-routing of those waters either around the landfill or through it in a sealed drainage system; and
- . collection and treatment of all waters that fall on or pass through the landfill.

Surface or groundwater moving through a landfill will pick up both dissolved and suspended solid matter and microbial waste products. Such water, known as leachate, can be grossly polluting and highly odourous. The other principal form of pollution to surface waters which can result from landfilling is due to silt laden runoff from stockpiled cover material, excavated areas or non-grassed areas of the site.

It is obviously most important to ensure that clean water passing through the site in high quantities does not become contaminated with leachate or sediment and create a significantly more difficult treatment problem.

It is an objective of good landfill design to separate non-polluted and polluted waters to ensure that pollution is minimised, and therefore long term treatment costs of polluted waters are minimised.

The basic features of the site water control system include:

- . main drainage
- . leachate collection and treatment
- . siltation control
- . leachate minimisation measures.

These features are discussed below.

3.4.3.1 Main Drainage and Siltation Control

The landfill site selected for the development is clear of main drainage waterways. However, in order to ensure that all excavations are kept as dry as possible, surface drains will be required upstream of all excavations to divert surface flow around the site.

A significant form of potential pollution from landfills is siltation of downstream watercourses and, on this site, protection of the creek drainage immediately downstream of the site and ultimately the Shoalhaven River is of concern. To counteract this problem a contour drain will be provided downstream of all worked areas of the site.

Contaminated surface runoff and truck wash water from the worked site may be channelled to the existing pond on site. This pond will need to be upgraded to perform sediment control functions. The detention time in the pond will need to be such that clean overflow will occur in a 1:10 year storm event. The pond will need to be cleaned out and maintained regularly.

The placement of drains in the site layout proposed is such that stages 1 and 2 of the development can drain to the upgraded pond. The development of stage 3 will require the development of a new sedimentation pond as shown in Figure 3.

3.4.3.2 Leachate Control and Minimisation

Leachate is the liquid that has percolated through solid waste and extracted dissolved or suspended materials from it. The liquid proportion is liquid produced from waste decomposition or surface drainage, rainfall or groundwater.

Typical leachate compositions from landfills (Tchobanoglous et al, 1977) are:

	Typical	mg/L Range
BOD	10 000	2 000 - 30 000
TOC	6 000	1 500 - 20 000
COD	18 000	3 000 - 45 000
Total Suspended Solids	500	200 - 1 000
Organic nitrogen	200	10 - 600
Ammonia nitrogen	200	10 - 800
Nitrate	25	5 - 40
Total phosphorus	30	1 - 70
Orthophosphorus	20	1 - 50
Alkalinity	3 000	1 000 - 10 000
pH	6	5.3 - 8.5
Total hardness (as CaCO ₃)	3 500	300 - 10 000
Calcium	1 000	200 - 3 000
Magnesium	250	50 - 1 500
Sulphate	300	100 - 1 500
Total Iron	60	50 - 600

Due to the potential risk involved in allowing leachate to percolate to the groundwater, best practice calls for its elimination or containment. Clay liners have been the preferred method of containment, although membrane liners have been used.

Leachate Minimisation Methods

Solid waste landfills have a large capacity to absorb water prior to leachate formation. Particularly in low rainfall areas where good soil conditions exist, leachate production can be reduced to insignificant levels.

The principal means of minimising leachate formation by good site management techniques include:

- . good compaction and coverage of the wastes which acts to limit infiltration into the landfill
- . grading of the site (particularly exposed areas) to slopes of not less than one in one hundred, which helps run-off from the site and limits infiltration
- . provision of an impermeable capping layer
- . elimination of any area on the site where ponding can occur
- . revegetation of areas which are filled to final design levels. The increased evapotranspiration from these areas limits infiltration and therefore production of leachate
- . diversion of all surface waters and groundwaters either through or around the site.

In all landfills, however, some leachate will form. Depending on such factors as the downstream environment etc a small amount of leachate may be tolerable, and no treatment necessary. On this site, however, it is important to ensure that leachate does not escape from the site to the downstream environment. The proposed management technique is to ensure that leachate production is minimised and that any which is produced is efficiently collected and treated. The proposed leachate collection and treatment measures are discussed below.

Leachate Control

Currently leachate and surface runoff from drains at the West Nowra Waste Depot are allowed to flow into a 'leachate' pond, west of the existing fill. The level is kept down by evaporation, but following heavy rains the pond overflows to bushland. Natural attenuation of contaminants may occur, but this method of operation is unacceptable as leachate control.

Water samples were taken from the leachate dam in February and March 1990. These data are shown in Appendix B. In general the readings are low compared with the typical leachate readings described above. Nutrient levels, suspended solids, iron and zinc are all higher than in uncontaminated waters, and the occasional discharge of these waters should be prevented.

A subsoil leachate collection system will be implemented for the extensions to the depot. This is almost impossible to implement on a completed landfill, but stages 1, 2 and 3 can be served. A collection system of this type would involve perforated pipes or gravel drains placed in the bottom of certain trenches. Leachate follows the easiest path and will drain away to a pump well installed as shown in Figure 3. The pump well will have a single pump activated by level switches. Overflow to the runoff pond is provided if pump failure occurs. The leachate will be pumped through a spray system irrigating the completed, grassed, landfill areas. Evaporation reduces the amount of liquid returning as leachate.

A calculation of leachate generation will be required before pumpwells and irrigation systems can be designed. A guideline for this calculation is outlined in Appendix G.

3.4.4 Noise Abatement

Noise generating activities during construction will include general soil cover excavation and construction of access roads, drains and dams by earthmoving equipment. Operational noise will be generated by garbage delivery trucks and site machinery.

The only full time machinery during the operational phase will be the dozer and compactor. These plant have a sound power level output of approximately 105 Lw dB(A) re 1 pW. The site will operate during daylight hours only, as described in Section 3.1.4.

The major nearby noise receptors are the site managers cottage, and other residential buildings located along Flatrock Road, as shown in Figure 1. The potential noise impacts of the development upon these residences are addressed in Chapter 4, but it is not anticipated that noise levels resulting from the development on existing residences will be of significance.

3.4.5 Air Quality

It is expected that odours will be restricted to the working face area, and as long as daily coverage is provided, no significant odour problems are envisaged outside the site boundaries. Odours are presently apparent outside the existing operation, due primarily to the absence of daily coverage. A buffer would be required between the workface and the nearest residences if daily coverage is not undertaken.

The timing of future residential development in the area needs to be considered in the light of the life of the operation of the waste depot. A residential development strategy to ensure that areas near or contiguous with the extended waste depot are not developed while the depot is still in operation. Again a buffer area would be necessary to ensure no inconvenience to residents while the depot is operating.

Dust creation on landfill sites is associated with traffic over non-sealed roads, and wind blown dust from non-vegetated areas. A sealed access road will be provided to the landfill area and the operating area can be kept to a minimum at any time by good staged development of the site. In addition, watering of unsealed areas can be used if necessary to suppress dust. This dust hazard would be periodic, and associated with extended dry periods and/or strong wind conditions.

Litter can be a problem on many landfill sites. The problem can be reduced by maintaining the working face to a minimum area and good compaction of waste as it is received at the site. The existence of boundary fences can act to reduce the problem. The most effective means is a series of steel posts supporting a wire mesh fencing which can be strategically located on site as wind conditions dictate.

3.4.6 Visual Quality

Very limited visual access to the site can be gained by vehicles using Longreach Road and Evans Road, and from residences along these ridge lines. However, should urban residential development proceed in the area, potential exists for these residences to have a view of the depot. Visual impact reduction opportunities include rehabilitation and revegetation of areas fringing the existing depot and proposed depot extensions.

A planned rehabilitation strategy for eventually returning the area to an appropriate land use such as recreational playing fields will be developed in detail at the latter stages of the life of the landfill operation, and will be undertaken in accordance with advice from relevant authorities. Currently, the final landscape plan can only be developed to a concept design stage, and would require the landform to exhibit a low soil erosion potential and stable slopes with acceptable surface drainage patterns and successful vegetation establishment to support an appropriate landuse.

3.4.7 Monitoring Programmes

It is proposed that the landfill operation be monitored, firstly in terms of its effectiveness in controlling leachate, and secondly in terms of the rate of utilisation of site volume.

Runoff dams and leachate wells should be regularly monitored (say 2 monthly). Parameters measured should include pH, suspended solids, nutrients, metals. The sampling programme should also include water from the adjoining watercourses.

Monitoring of the rate of utilisation of site volume is necessary to confirm the projected life of the site. This is best done by six monthly or yearly surveys of the site contours.