



4 August 2015

Wayne Winchester
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Department of Transport
178 Stirling Terrace
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Your ref:

Dear Wayne

Esperance Cleanup Recovery Project, Sentinel Monitoring Program Addendum to Esperance Town Site Compliance and Performance Report

1 Introduction

This report has been prepared as an addendum to GHD's *Esperance Town Site Compliance and Performance Report* (dated June 2012) and is intended to document the findings of a critical and independent review of sentinel monitoring undertaken by the Esperance Cleanup Recovery Project (ECRP) between 2010 and 2012.

This monitoring was undertaken by the ECRP to confirm or otherwise whether lead recontamination had occurred either during, or following cleanup of lead carbonate dust which was expressed across the Esperance town site during handling of lead carbonate material transported by rail from Magellan Metals through the Port of Esperance ("the Port"). The ECRP also investigated the presence of nickel dust since this was also handled and shipped through the Port of Esperance.

Mr Andrew Kohlrusch, Western Australian Department of Environment Regulation (DER) accredited contaminated sites auditor was commissioned by the ECRP to assess whether the project:

1. Met the objectives of the ECRP;
2. Met the requirements of the Deed of Settlement; and
3. Met the desired outcome of the Premier that the clean-up was "thorough and comprehensive".

The key objectives of the ECRP were to:

1. Assess/audit levels of lead and nickel in homes, premises and public places in Esperance and determine the need for cleaning by reference to agreed standards and guidelines;
2. Remove lead and nickel residues in homes, premises and in public places to acceptable standards such that these contaminants do not pose a risk to the health of the Esperance community;
3. Validate the cleaning process;
4. Work with the Esperance community in this project and provide ongoing progress reporting; and
5. Undertake sentinel monitoring to ensure no re-contamination of the Esperance town site.

The auditor has been intensively involved throughout the project and has completed the audit stages as follows:

- A process and methodology audit; and

- A performance and compliance audit.

A process methodology audit was completed in June 2010 which comprised critical and independent review of sampling (investigative) and proposed cleanup methodologies. This included review of written sampling and cleanup methodologies as well as field audits of sampling procedures to assess the levels of nickel and dust in and around homes.

The auditor concluded that:

The entire Project Team demonstrated a strong commitment to achieving the aims of the project, and appeared to work together in a cooperative and supportive fashion. In general the procedures re based on recognised standard procedures. In accordance with normal industrial practice and guidance, the individual procedures have been modified to suit the local conditions found in Esperance and the particular circumstances of the exposure scenarios. The resulting procedures are well written, concise and suitable for use by non-specialised field sampling personnel.

The procedures as written are considered suitable and appropriate to meet the aims of the project, and the recommendations in the following sections of the report are presented to increase clarity and understanding of sampling procedures and cleanup specifications, and to be able to demonstrate adherence to the procedures.

A performance and compliance audit was subsequently undertaken in 2012. This audit was intended to confirm, or otherwise, the satisfactory completion of ECRP's objectives, namely Items 1 and 4 as stated above. The audit concluded that:

The sampling and validation procedures were in general adequately defined in the sampling methodologies. Where changes were required as suggested by the auditor (Interim Audit Advice, Appendix D) the changes were not considered to materially affect the sampling methodologies, but provide clarification pertaining to specific steps in the procedures. The procedures were considered adequate to document the works to be undertaken. Field audits of validation works and validation of samples results by the auditor provided sufficient confidence that sampling and validation was undertaken in accordance with the methodologies prepared. It is the auditor's opinion that the sampling and validation works were sufficient to determine the levels of lead and nickel present in homes within the Esperance town site for the purposes of determining where clean-up was required.

The cleaning procedures prepared by the ECRP were generally sufficient to communicate the requirements of cleaning to be undertaken. While some limitations in the documentation were noted, appropriate explanation was provided by the ECRP team to demonstrate that these issues were not material. The site inspections conducted by the auditor, confirmed the completeness of the procedures. The consistent field teams and validation of documentation also provides further assurance to the auditor that cleaning works were thorough and

comprehensive. Following completion of the performance and compliance audit, the auditor identified that sentinel monitoring had not been completed and that

It is considered by the auditor that the validation procedures following clean-up were adequate to provide assurance that the cleaning process was carried out to acceptable standards, providing confidence that the contaminants did not pose any further risk to the health of the Esperance community.

While an assessment of the QAQC results was not undertaken by the ECRP team, the auditor has undertaken a validation exercise to evaluate that QAQC procedures were sufficient to demonstrate the data representativeness, completeness, precision, accuracy and comparability. This provided an added level of assurance that the data is of an acceptable quality upon which to draw meaningful conclusions regarding sampling, clean-up and validation of the sites.

The variety of community consultation measures provided and the feedback received by the auditor as part of the stakeholder consultation review suggests that the ECRP developed an open and honest relationship with the community which has resulted in the community developing respect for the ECRP team and its activities. The auditor considers the community consultation undertaken by ECRP more than adequate to meet the project objectives of providing ongoing progress reporting throughout the project.

The auditor further concluded that the requirements for the Deed of Settlement had been fulfilled and that the Premier's desired outcome for 'a thorough and comprehensive cleanup' had been achieved.

2 Objective

The objective of this phase of the audit was to establish whether the ECRP's final objective, had been achieved, which as stated in Item 5 above, was to undertake sentinel monitoring to ensure no re-contamination of the Esperance town site. The scope and findings of the sentinel monitoring program was documented in a report entitled *Sentinel Monitoring Program, Final Close Out Report* (9 April 2015).

On this basis, the objectives of this stage of the audit were to assess whether:

- The work undertaken as part of the sentinel monitoring program is adequate to meet the objectives of this phase of the project; and
- The data recovered for the project is of sufficient reliability and integrity to form the basis upon which appropriate conclusions can be drawn.

3 Scope of Work

The scope of this phase of the audit is limited to independent and critical review of the sentinel monitoring program. The auditor notes that the ECRP represents a unique project and while this review has been undertaken with general regard for the relevant guidance, the specific attributes of this project have necessitated an adaptive approach that is consistent with the overall project objectives.

Nonetheless, this review was undertaken with regards to the following legislation and guidance:

- *Contaminated Sites Act 2003*

- *Contaminated Sites Regulations 2006*
- *National Environment Protection Council (NEPC) National Environment Protection Measure (As Amended) 2013*
- Department of Regulation *Contaminated Sites Management Series*
- Australian Standards 3580.10:1:2003 *Methods for Sampling and Analysis of Ambient Air, Method 10.1 Determination of Particulate Matter – Deposited Matter – Gravimetric Method.*

The auditor also completed a site visit and participated in a workshop to visually assess the location of monitors and discuss the general requirements of the close out report for the sentinel monitoring program.

4 Audited Documentation

The following documentation was subject to critical and independent review by the auditor:

- *Sentinel Monitoring Program, Final Close Out Report (ECRP, 2015)*
- Various ad-hoc documentation including:
 - Chain of Custody (CoC) documentation
 - Laboratory Reports
 - Sample Receipt Advice

Following review of the documentation the auditor provided a series of correspondence outlining the findings of the review. This documentation is summarised as follows:

- GHD Pty Ltd (17 December 2014) *Interim Auditor Advice on Sentinel Monitoring Closure Report*
- GHD Pty Ltd (9 June 2015) *Interim Auditor Advice on revised Sentinel Monitoring Closure Report*

A copy of this correspondence prepared by the auditor is provided in Attachment A.

5 Review of Sentinel Monitoring Program

5.1 Verification of site conditions

The auditor completed a site visit on 20 November 2014 to confirm the location of monitors. The auditor was satisfied that the monitors were suitably placed for the purposes of the project which was to assess whether nickel and/or lead recontamination had occurred either during, or following clean-up of lead carbonate dust, which was initially expressed across the Esperance town site during former handling and shipping of the material at the Port.

In addition to the site visit, the auditor met with Matt Devenish (former project manager of the ECRP) and Wayne Winchester (former project director of the ECRP). The focus of the meeting was to discuss the content of the initial version of the sentinel monitoring report prepared by the lead agency. The key outcome of the meeting was that the report needed to make a clear conclusion regarding the objective of the sentinel monitoring program as well as provide additional supporting data.

5.2 Quality and Completeness of Sentinel Monitoring Program

The following provides an overview of the key elements of the sentinel monitoring program and the auditor's assessment of the work completed.

5.2.1 Key elements

The sentinel monitoring commenced in November 2010 at the peak of cleaning activities and ceased two years later in November 2012, eight months after clean-up activities had ceased.

Key elements of the sentinel monitoring program included:

- Selection of nine monitoring locations, two of which were chosen as control sites and the remaining seven of which were within the area of suspected impact. A figure illustrating the spatial extent of the monitoring program is provided as Attachment B (reproduced from ECRP, 2015).
- Placement of three monitors at each of the nine sample locations as follows:
 - One in the roof space (petri dish);
 - One in the living area (petri dish); and
 - One external (dust deposition bottle).
- Collection of three samples at monthly intervals (i.e. over three months) across eight discrete rounds and submission of samples to a NATA accredited laboratory for the following analyses:
 - Lead and nickel concentrations (internal samples)
 - Dust deposition rates and isotopic assignment (external samples).

5.2.2 Auditor's Assessment

The findings of a critical and independent review of the sentinel monitoring program, as undertaken by the auditor, are presented as follows:

6. The auditor has reviewed the number and locations of the monitors distributed throughout the Esperance town site. It is the auditor's opinion that the number of monitors deployed for the sentinel monitoring program is sufficient to meet the objectives of the project. Further, the auditor is of the opinion that the location of monitors provides suitable spatial representation across the subject area to determine whether contamination of lead and/or nickel has reoccurred. It is also the auditor's opinion that both the inclusion and location of control monitors within the sentinel monitoring program provides an appropriate baseline against which contamination from the handling and shipping of lead carbonate dust, can be assessed.
7. The auditor has reviewed the timing and duration of the sentinel monitoring program and provides the following comments:
 - a. The undertaking of monitoring over seasonal cycles for successive annual periods provides sufficient basis upon which seasonal variations or seasonal trends can be established.
 - b. The duration and timing of monitoring is adequate to assess whether there may be residual lead or nickel contamination associated with the primary source of contamination (i.e. former handling and shipping of lead carbonate), or whether lead and/or nickel dust contamination may be present as a result of a secondary source (i.e. clean-up activities).

8. Supporting documentation, including field sheets, chain of custody documentation, sample receipt advice and laboratory reports, were provided to the auditor as separate documentation rather than as an appendix to the report. The auditor has reviewed this information and is satisfied that this supports the reliability and integrity of the data presented and discussed in the report.
9. Review of field and laboratory methodologies used for the sentinel monitoring program indicate that procedures were consistent with relevant Australian Standards, the National Environment Protection Measure (NEPM) (As amended 2013) and general industry standards.
10. The analytical methods used to determine dust deposition rates, lead and nickel concentrations and isotopic assignments, are consistent with industry guidelines and standards.
11. The assessment criteria provided for the dust deposition results obtained for external areas is not directly comparable to the recorded results as they are presented as a dust deposition rate ($\text{mg}/\text{m}^2/\text{month}$), while the nominated assessment criteria is represented as a contaminant concentration ($\mu\text{g}/\text{cm}^2$). Nonetheless, extensive isotopic testing of dust deposition results indicates that dust collected in these devices is not attributable to Magellan lead carbonate. On this basis, the auditor is satisfied that the sentinel sampling undertaken by the ECRP was sufficient to confirm the objectives of the sentinel monitoring program, namely to confirm, or otherwise, that nickel and lead recontamination associated with the former handling of lead carbonate material, has not occurred.

6 Conclusions

On the basis of the information presented, the auditor is of the opinion that the work undertaken by the ECRP is adequate to meet the objectives of the project and data recovered is of sufficient reliability and integrity to form the basis upon which meaningful conclusions can be drawn. To this end, the auditor concurs with the conclusions drawn by the ECRP that:

- Nickel and/lead recontamination (associated with historical handling of lead carbonate material from Magellan Metals at the Port of Esperance) has not occurred;
- The ECRP has been effective in its cleanup of affected premises; and
- There is no ongoing unacceptable risk to residents of and visitors to Esperance associated with recontamination of lead dust from Magellan Metals.

Sincerely
GHD Pty Ltd



Andrew Kohlrusch

WA DEC Accredited Contaminated Sites Auditor
(02) 9239 7187

Attachment A: Auditor Correspondence
Attachment B: Sentinel Monitoring Locations (Reproduced from ECRP, 2015)

Attachment A: Auditor's Correspondence



17 December 2014

Wayne Winchester
Regional Manager, Great Southern
Department of Transport
178 Stirling Terrace
ALBANY WA 6331

Your ref: PO 606544

Dear Wayne

**Esperance cleanup and recovery project
Interim auditor advice on sentinel monitoring closure report**

Andrew Kohlrusch, a Department of Environment Regulation (DER) accredited auditor was engaged by the Department of Transport (DoT) to conduct a compliance and performance audit of the Esperance Cleanup and Recovery Project (ECRP). A compliance and performance audit report was submitted in June 2012 stating that the actions taken to assess, remediate and validate affected properties had resulted in robust, technically justifiable and comprehensive cleanup and validation of the Esperance Town site. The audit report did however note that sentinel air quality monitoring had not yet been completed at the time of issuing the audit report.

This Interim Audit Advice (IAA) letter pertains to a review by the auditor of the document entitled "*Esperance Cleanup and Recovery Project, Sentinel Monitoring Program, Close Out Report, November 2010 to November 2012*", "the close out report".

The auditor's final review of the close out report will form an addendum to the audit report "*Department of Transport, Report for Esperance Clean-up and Recovery Project, Esperance Town Site – Compliance and Performance Audit Report*" – the audit report.

Some comments were provided in the audit report on the sentinel monitoring based upon review of the first two rounds of monitoring, some of which appear to have been incorporated into the close out report. Outstanding items and other issues which are to be addressed in the revised close out report are presented in this IAA.

1 General comments

The close out report provides a reasonable outline of the sentinel monitoring program. However, the report requires some revision and inclusion of additional data and documentation and assessment.

2 Specific comments

2.1 Executive Summary

The executive summary should detail the objectives, scope of work and summarise the findings and conclusions of the monitoring program.

2.2 Background

The report would benefit from mention of the purpose of the nickel testing as a marker of the presence of Magellan lead rather than as an individual contaminant of concern. To this end it is important for the report to reference (where relevant).

2.3 Methodology

The methodology should include the following:

- The person/s who conducted the sampling.
- Laboratory testing schedule.
- Laboratory testing method.
- The assessment criteria adopted for evaluation of results.
- Methods/processes to monitor quality assurance and quality control.
- Commentary on deviations from agreed scope (as per the various relevant modules established by the ECRP).
- The report states that the dust deposition bottles were set up in accordance with AS3580.10.1:2003 however, there is insufficient information provided in the report methodology to demonstrate that this was implemented.
- AS 3580.10.1:2003 states the typical period of exposure for routine monitoring is one month. It is not clear from the methodology presented if the dust deposition bottles were exposed for this length of time or for the entire three month period in between collection events.

2.4 Program summary and discussion

- Field data sheets, chain of custody documentation, sample receipt notification and laboratory reports should be presented in the appendices of the report to enable transparent tracking of the samples, the condition under which they were collected, verification of methods and transcription of data.
- Confirmation of duration between monitoring rounds is required.
- The comment in Section 4.4 (page 5) on seasonal variances should have an appropriate evaluation.
- Lead and nickel results have been presented as program averages. While averages are a useful statistical tool, care should be taken that outliers within data sets are not masked. Raw data should be presented to allow the auditor to check that it has been correctly transcribed/evaluated.
- As assessment criteria have not been presented in the report, it is not possible to determine if the laboratory detection levels are adequate and if the results present an unacceptable exposure risk to human health or the environment.
- The report presents outdoor and indoor results, but should/could also comment on how they compare. For example there are detections of Pb/Ni outdoors though this is not replicated in indoor data.
- The reference to 'absolute nickel' in Section 5.3 (page 7) is not clear.

- Graphs should be provided on distance vs concentrations – comment in Section 5.3 (page 7/8) regarding distance is not clear.
- Raw results should be presented to allow check of data used to generate graphs.
- Where statements have been made regarding influence of proximity to the Esperance Port and other potential point sources, wind directions and geographic features to observed deposition rates, further assessment should be provided to support these statements.

2.5 Conclusion

- An assessment and conclusion should be presented regarding the absence or presence of ongoing risk to residents.

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Should you have any queries regarding these comments, please do not hesitate to contact myself or Pauline Grayson (08 6222 8459).

Kind Regards

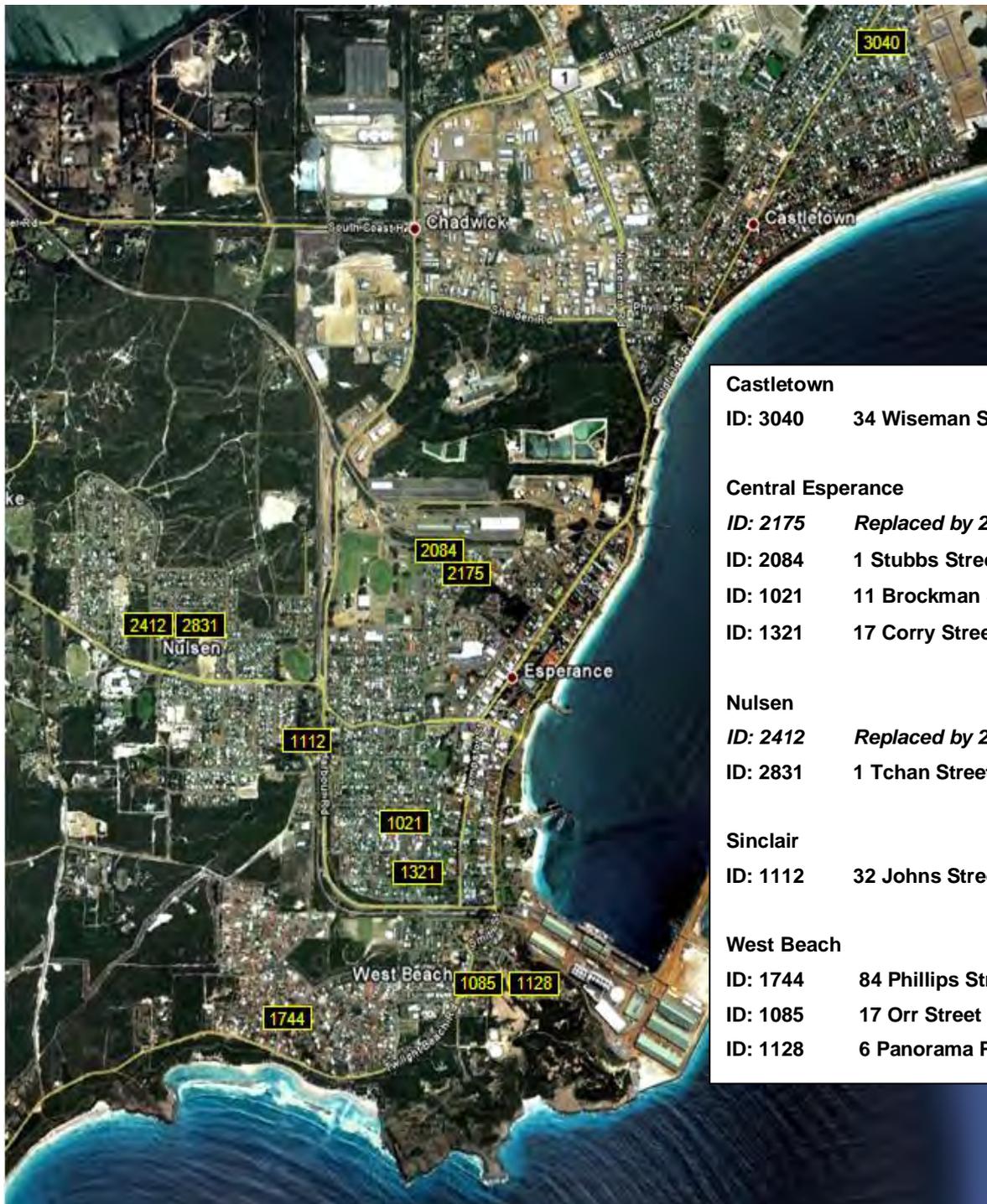


Andrew Kohlrusch

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Attachment B: Sentinel Monitoring Locations

Reproduced from ECRP (2015)



Castletown	
ID: 3040	34 Wiseman Street
Central Esperance	
ID: 2175	<i>Replaced by 2084</i>
ID: 2084	1 Stubbs Street
ID: 1021	11 Brockman Street
ID: 1321	17 Corry Street
Nulsen	
ID: 2412	<i>Replaced by 2831</i>
ID: 2831	1 Tchan Street
Sinclair	
ID: 1112	32 Johns Street
West Beach	
ID: 1744	84 Phillips Street
ID: 1085	17 Orr Street
ID: 1128	6 Panorama Place