

ESPERANCE CLEANUP AND RECOVERY PROJECT

MINUTES OF STEERING COMMITTEE MEETING

3 SEPTEMBER 2009, ESPERANCE

Present:

Mr Michael Jackson	Co-ordinator, Esperance Community Consultations (Chair)
Ms Jenny Brodie-Hall	Community Representative
Mr Paul Clifton	Shire of Esperance
Ms Michelle Crisp	Locals for Esperance Development (LED)
Mr Matthew Devenish	Esperance Cleanup and Recovery Project (ECRP)
Dr Charles Douglas	Department of Health (DOH)
Mr John Fischer	Department of Transport (DOT)
Mr Lindsay Gillam	Department of Health (DOH)
Mr Peter McCafferty	Chemistry Centre
Mr. Alex Leonard	Esperance Port Authority
Mr Martin Matisons	Department of Health (DOH)
Ms Pam Norris	Locals for Esperance Development (LED)
Ms Samantha Parkyn	Esperance Cleanup and Recovery Program (ECRP)
Mr Peter Skitmore	Department Environment and Conservation (DEC)
Mr Kieron Smith	Esperance Cleanup and Recovery Project (ECRP)
Mr Marcus Tromp (ECCI)	Esperance Chamber of Commerce and Industry
Mr Wayne Winchester	Esperance Cleanup and Recovery Project (ECRP)

Apologies:

Ms Christine Smith	Community Representative
Mr Richard Grant	Esperance Port Authority (EPA)

Observers

Mr Peter Flynn	Department of Transport (DOT)
Mr Peter Beard	Department of Transport (DOT)

1. Opening of Meeting and Review of Agenda

The Chair welcomed Members and noted apologies from Christine Smith. Peter Flynn and Peter Beard were welcomed to the meeting.

Members noted that the Minister for Transport planned to visit Esperance on 25th September for a range of meetings. It was suggested that the Minister should meet with the ECRP Project Team and with Community Members of the Steering Committee as this would provide the opportunity to hear first hand about the progress of the ECRP.

2. Minutes of Previous Meeting

The Minutes from the previous meeting 25 June 2009 were accepted as a true record.

Action: That the minutes of the meeting held 25 June 2009 were accepted as a true record of the meeting. The Minutes are to be loaded onto the ECRP OnCue web page.

3. Actions from the previous meeting

Item 6-Development of Cleanup Standards for Esperance Roof Cavities, Ceiling Voids and Roof Surfaces.

Action 1: DOH was requested to provide the location of the 6 homes from which samples from ceiling voids were previously taken.

Status: Members noted that DOH had provided this information. Updated maps of the Esperance townsite were tabled with the data from these sites included.

Action 2: The Steering Committee agreed that the consent form should be amended to request the home owner's consent to the release of sample results to the ECRP Steering Committee.

Status: Members noted that this action had been completed and the amended consent form was included in the Cleaning Procedures.

Action 3: DOH was requested to provide the rationale for the recommended cleanup standards for Esperance.

Status: Members noted:

- Papers provided by Michelle Crisp as follows- 'Exposure of U.S Children to Residential Dust Lead,1999-2004:II The Contribution of Lead Contaminated Dust to Children's Blood Lead Levels' - Sherry L Dixon et al, and 'Screening Housing to Prevent Lead Toxicity in Children' – Bruce P. Lanphear et al.
- Email communications between Michelle Crisp and Bruce Lanphear with regard to cleanup standards for lead.
- The DOH has reviewed the articles in light of the overall scientific literature on this issue and will not be amending its recommendations on the clean-up guidelines for Esperance. The information pertinent to the decision was:
 - Though one study utilised actual blood lead measurements in children it only correlated them with predicted lead dust levels in the home. In order to provide strong evidence for amending guidelines, the study would have needed to measure blood lead and dust lead levels in the same house.
 - Another study looked at blood lead levels in children as well as a range of environmental lead levels in and around

the homes of the children. The study results showed that lead in window sills, window troughs and soil were above guidelines but floor lead dust levels were below guidelines. Also there were many other factors that exhibited stronger correlations with blood lead.

- Some of the scientific literature has erroneously been using weak correlations to imply causation.
 - The US EPA has not changed its dust guidelines. The US guidelines were based on a solid scientific review of the literature at the time.
 - The NHMRC has recently undertaken a very thorough and up to date review of the scientific literature on the health effects of lead and have established its general guideline for the population in terms of blood lead at 10 micrograms per decilitre.
- Michelle Crisp requested it be minuted that she felt that 0.01ug/cm² was a more appropriate floor dust level to be setting for the Esperance situation.
 - Advice from Dr Douglas that blood lead testing had been a voluntary program in Esperance and that there had been no requests for blood lead testing for many months. Because of this, Dr Douglas advised that it was difficult to know what the current blood lead levels of children were in Esperance due to the lack of voluntary testing. Dr Douglas further advised that blood lead levels in two children were being monitored on an ongoing basis.
 - Further, blood testing of those workers who had been occupationally exposed to lead carbonate had reduced to 'normal' levels, though it was pointed out that workers are required to use PPE.
 - Community members made comments of the recurring problem with getting the data due to the trauma for the children.
 - Community Members asked whether 'pin prick' testing would be a suitable alternative to blood lead testing. Dr Douglas advised that 'pin prick' testing was not a reliable method of assessing lead exposure.
 - Community members then suggested a one off intravenous blood testing program be conducted after the cleanup of Esperance is completed, would be useful as a final validation step. If this was presented to the community as a one off testing program to confirm the cleaning had been effective and all community members were encouraged to participate, it could give the community the assurance this cleanup had been done properly. All committee members including DOH were very supportive of this and it was agreed that the gantt chart should be amended to incorporate this further action.

Action: Insert further step in the gantt chart to include blood lead testing of the Esperance community after the cleanup has concluded.

Action 4: Obtain details of Brian Gulson's studies of lead levels in Sydney homes for presentation to the Committee.

Status: Members noted that this information had been obtained. Details are provided under item 7.

Item 9 Isotope testing of samples from both the Esperance 21 homes and Albany samples

Action: ChemCentre was requested to prepare a short summary report setting out the reason for the survey, what was found and explaining the results of the isotopic analyses undertaken.

Status: Peter McCafferty advised that this document was being prepared and that it would be provided for circulation out of session following this meeting.

Action: Summary of isotope testing of Esperance samples to be circulated OOS.

Item 10 Development of ECRP Cleaning Procedures

Action: ECRP Cleaning Procedures to be further developed out of session by a Working Group of members of the Steering Committee {Project Director, DOH, DEC and an Esperance community member [Pam Norris]}. Once drafted, to the satisfaction of these members, the document to be tabled at the next meeting of Steering Committee.

Status: Members noted that the Working Group had met out of session and the ECRP Cleaning Procedures had been completed. The Cleaning Procedures had been used by the ECRP Project Team to develop a statement of requirements for the cleaning contractors. A copy of the Cleaning Procedures was tabled at the meeting and appears as Attachment 2 of this report. Discussion of this matter appears under item 9.

Item 12 Draft ECRP Communications Plan

Action 1: Project Director to arrange removal of the fact sheets on nickel from the OnCue website.

Status: Members noted that this action had been completed.

Action 2: Project Director was requested to revise the Communications Plan taking into consideration the comments made at the meeting, and explore the opportunity of an ECRP booth at the Esperance Agricultural Show.

Status: Members noted advice from the Project Director that the Communications Plan had been amended to incorporate Member's comments. The document was a 'live' document and would be kept under continuing review.

Members also noted that a Booth had been booked for the ECRP Project at the Esperance Agricultural Show to be held on 16-17 October 2009. Steering Committee members, especially Community members, were invited to assist, visit or participate on that booth during the Show. The information to be displayed will be distributed to the Steering Committee.

Item 13 Update on Esperance Port Authority Environmental Emission Data

Action: DEC [Peter Skitmore] was requested to provide the DEC Vegetation Monitoring Study results for 2008 and 2009 [when available] for the OnCue website and overlay these results with the data from the survey of 21 homes.

Status: Members noted:

- A presentation of this data by Peter Skitmore at the Meeting. The data covered the 2008 analyses for both lead and nickel in old leaves, new leaves, flowers and deciduous leaves. This data had been overlaid over the map of Esperance and Mr Skitmore had drawn contours where the levels had dropped to minimal levels.
- There was considerable consistency between these maps. Members considered that they provided additional and valuable data further confirming the area of impact.
- Advice from Mr Skitmore that the results of the vegetation studies are likely to be released within two weeks of the date of this meeting.
- Mr Skitmore agreed to provide the maps and data to the Project Team to assist with the cleanup project.

Action: Mr Skitmore to provide the maps showing the DEC surveys on lead and nickel levels in Esperance vegetation to the ECRP Project Team.

Item 14(i) Sampling of children's playgrounds for lead

Action: Further investigative work to be conducted on the origin of lead levels in Esperance playgrounds.

Status: Members noted:

- That the responsibility for the monitoring lead and nickel levels in children's playgrounds had been transferred to the ECRP Project Team.
- Niton testing of the soft fall sand in four Esperance playgrounds had shown very low lead levels. Samples of all four playgrounds showed lead levels below the limit of detection [i.e.10mg.kg].
- There was nothing to indicate that lead dusts are being mobilised around the children's playgrounds.
- Previous isotope testing had shown that detected lead was not of Magellan origin. One potential source was from the pigments used in the plastic or fibreglass covering of the play equipment

particularly yellow coloured components and that was being further investigated.

- The Shire of Esperance was reviewing the orientation of the sprinklers in children's playground areas to ensure that play equipment is 'washed' regularly.
- The ECRP Project Team will monitor lead and nickel levels in playgrounds, including school playgrounds, more intensively during the "A Type" sampling program.

Item 14(iii) Current status of the EsPA loading protocol for nickel shipments and any planned changes to this.

Action: Seek advice from the EsPA to determine if any changes to the ship loading protocol are planned.

Status: Members noted:

- Advice from the EsPA that there are no plans at this time to change the loading protocol for nickel shipments.
- The EsPA will review the loading protocol as the improvements to the nickel infrastructure are completed.
- The EsPA will consult through the Port Consultative Committee and with the broader Esperance community with respect to any changes to the shiploading protocol.
- The EsPA were informed of the need to consult with DEC if any change to protocol was intended.
- The importance of retaining a loading protocol [which does not allow loading in onshore winds] was reinforced to the EsPA, because of the potential for recontamination of the townsite after the cleanup had been done.

Item 14(iv) Prescribed method for the determination of the annualised guideline for nickel emissions

Action: DOH was requested to provide the documentation used in determining the annualised guideline for nickel emissions and the impact of particle sizes of nickel sulphide concentrate into the lungs.

Status: Members noted advice from Peter McCafferty that development of the prescribed method was well advanced and would be available for distribution OOS shortly.

Item 14(v) Video Conference Link for Steering Committee meetings

Action: Explore the option of convening future Steering Committee meetings by video conferencing.

Status: Members noted:

- Advice from the Project Director that the option of convening further meetings of the Steering Committee by video conferencing had been explored.
- Facilities for video conferencing were available in Esperance.
- The cost of convening in Esperance is about \$8,200 whereas the cost of video conferencing is about \$1,800 - a considerable saving in terms of costs and time.

It was agreed that the next meeting of the Committee would be convened by video conference.

4. Project Update by ECRP Project Director

Members noted:

- Two ECRP Project Updates dated 20 July and 10 August 2009 prepared by the Project Director setting out a short summary of the progress on issues regarding the ECRP.
- These project Updates covered the following issues:
 - Remobilisation Project
 - Data Management Project
 - Trial Cleaning Project.
 - Cleaning Procedures Project
 - Sampling Protocols Project
 - Cleanup Guidelines for Roof Spaces, Ceiling Voids and Roof Surfaces
 - Laboratory Analysis of samples
 - Communications Plan
 - On Cue Website
 - Office Administration
 - Purchase of Niton XRF analyser, and
 - Community presentations
- A further Project Update dated 3rd September would be released following this meeting.
- Project Updates are available on the OnCue website [www.oncue.org.au]

5. Overview of the ECRP – Sub-projects and Timelines – Gantt Chart

Members noted an updated ECRP gantt chart prepared by the Project Team. This chart will be further updated as the project progresses.

6. Niton demonstration

Members noted:

- A demonstration of the Niton XRF analyser by Kieron Smith.
- The instrument has a level of detection with a confidence limit of 10mg/kg for lead and 40mg/kg for nickel. The instrument provides the results of the analysis in about one minute depending on the concentration of lead and nickel in the sample.

- The analyser has been initially leased for the ECRP pending the delivery of a new instrument for the project which is being purchased at an approximate cost of \$95k.
- The Niton will be used in the ECRP project for a range of analyses including roof spaces, ceiling voids, soils, gutter sludge. Reference samples will be confirmed by chemical analysis. For those samples requiring a lower limit of detection, such as those taken from the interior of homes, chemical analysis will be utilised.

7. Development of Cleanup Guidelines for Esperance Roof Cavities, Ceiling Voids and Roof Surfaces.

a) Overview of sampling program for Esperance and Albany homes

Members noted:

- The results of analysis for both lead and nickel in both Albany and Esperance. 18 samples were taken from roof spaces in Esperance homes. These homes were selected from the earlier survey of 21 homes along 4 transects. Samples were taken for roof spaces in 19 Albany homes. Homes in Albany were selected on a range of criteria such as age, roof construction, distance from the port etc with the purpose to gain a broad cross section of homes.
- A presentation by Kieron Smith, ECRP Project Manager, Evaluation and Monitoring on the sampling procedures used in the Esperance and Albany roof space and roof surface survey. The presentation included details on roof construction, insulation types identified etc.
- The concentrations of lead and nickel in Esperance and Albany roof spaces together with the 'loadings' [expressed as $\mu\text{g}/\text{cm}^2$].
- Two samples in Esperance exceeded lead concentrations of 500mg/kg, while a total of 4 samples exceeded 300mg/kg.
- That the roof type was not specified in the listing of results for the Esperance homes.
- One home in Albany had shown very high levels of lead. This home was about 110 years old and had a false ceiling. The likely causes of these elevated levels were use of lead paints and the proximity to previous industrial sources. All home owners had been advised of the results of this testing.
- All of the data on lead and nickel in roof spaces in Esperance homes, together with previous DOH data, had been 'spatially mapped' across the Esperance townsite.
- Surface swabs of roof surfaces of homes in both Esperance [7 samples] and Albany [18 samples] were also taken.

b) Steering Committee discussion

Professor Brian Gulson, Graduate School of the Environment, Macquarie University participated in the discussion of this item by teleconference. Professor Brian Gulson is a leading national and international expert on lead levels in urban environments.

Members noted:

- Lead and nickel levels in some roof spaces in Esperance homes are elevated above background levels and require cleaning to an agreed level.
- Nickel has been transported through the Port of Esperance for about 40 years.
- Members of the Esperance Community have stated that their homes have been contaminated with lead and nickel, they did not cause it and want it removed.
- Lead will normally be found at various concentrations in roof voids even in non industrial areas, mainly as a result of leaded petrol residues and in some cases, migrated leaded paint dust.
- The Government has committed to a 'comprehensive cleanup' of lead in the Esperance townsite.
- There are no national or international cleanup guidelines or health based guidelines for lead or nickel in roof spaces that can be applied to Esperance.
- The JBS website (www.lead.org.au/bblp/Ceiling-Dust/sld017.htm) quotes the following comment for lead levels in ceiling dusts:

i. low biohazard	< 300mg/kg
ii. moderate biohazard	300 to 2000mg/kg
iii. high biohazard	above 2000mg/kg and refers to 'verbal advice from the NSW Health Department that it views levels above 1000mg/kg in ceiling dusts may pose a health risk to pre school children <u>if accessible</u> .'
- Where clean up programs of roof spaces in homes and premises in other Australian towns have been conducted, the concentrations of lead have been considerably higher than levels found to date in Esperance. The towns where such remediation has occurred in Australia include Broken Hill, and Port Pirie.
- DOH advises that it is not appropriate to set a guideline for cleanup of Esperance roof spaces on health based criteria because there are no significant exposure pathways from this source to the occupants of the home. This applies particularly to the most vulnerable population groups - young children and pregnant women.
- DOH advises that if a cleanup guideline was to be set based on health criteria, it would be in the order of 1000+mg/kg for lead. If this level [i.e 1000mg/kg] was applied, this would mean, on the basis of data currently available, that no roof spaces in Esperance would require cleaning.

- The reasons health guidelines have not been established for ceiling spaces in terms of the general public are:
 - i. absence of a direct exposure pathway;
 - ii. a lack of exposure to the most sensitive members of the public (young children and pregnant mothers)
 - iii. no length of time of exposure;
 - iv. no correlation between ceiling lead dust levels and blood lead levels of residents; and
 - v. considerable variation in ceiling structure in terms of amount of dust intrusion into homes.

- A health guideline can be approached from two angles.
 - i. From a direct exposure scenario based on exposure and this would need to take into account duration of exposure and would be most relevant for the occupational situation.
 - ii. By comparing blood lead data with ceiling lead dust data whilst removing the confounding other sources of exposure (paint, soil, water, occupational etc).
- There is an occupational health issue but it can be managed with appropriate work practices and protective equipment.
- The Steering Committee has previously identified that there are potential pathways whereby lead from ceiling dusts and roof spaces may enter the internal areas of homes such as the following:
 - i. ceiling penetrations such as downlights, ceiling fans, exhaust fans and ventilator shafts,
 - ii. crevices between cornices and walls
 - iii. tradespersons accessing the roof spaces and subsequently contaminating internal areas, and
 - iv. during renovations.
- As stated above, the survey of lead and nickel levels in roof spaces in Esperance shows:
 - i. The highest concentrations of lead and nickel are in close proximity to the port.
 - ii. Two of 21 homes sampled exceeded 500mg/kg mean concentration of lead
 - iii. Four homes exceeded 300mg/kg mean concentration of lead
 - iv. The lead loading (i.e. total amount of dust matter) is also a significant consideration and needs to be 'factored' into the decision making process.
 - v. There were significant variations in the results of both lead and nickel concentrations when analysed using the Niton and by the ChemCentre.
 - vi. Factors which influence the lead and nickel concentrations and loadings include distance from the port, type of roof construction, presence or absence of sarking and age of the home.

- The survey of lead and nickel levels in roof spaces in Albany shows:
 - i. considerably higher concentrations of lead in some older homes [about 100 years old] than found in Esperance homes sampled.
 - ii. levels of lead also appear to be related to similar factors to those in Esperance i.e, previous industrial exposure, type of roof construction, presence or absence of sarking, the age of homes, and home renovations (especially if lead paint is present).
 - iii. considerably lower nickel concentrations than Esperance, [which is to be expected as nickel concentrates have not been exported through the port of Albany]
- As more data is accumulated, the 'zone of impact' of emissions on the town of Esperance is, and is expected to become, even clearer. That is, the data obtained from the following studies shows some level of consistency:
 - i. DOH - UWA rainwater tank study
 - ii. DEC vegetation studies
 - iii. Data from the survey of 21 homes.

It is anticipated that the broad sampling of the Esperance townsite [Type "A" sampling] will add further confirmation to the data already available.

- Professor Brian Gulson's work in studying lead levels in ceiling dusts in non industrialised homes in Sydney, shows levels in the range from 105mg/kg to about 960mg/kg with a mean of 520mg/kg. For nickel the mean was 24 mg/kg (min 10mg/kg and max 33mg/kg).
- Written advice from Professor Gulson on a recommended cleanup guideline for lead in roof spaces in Esperance. In particular the following advice from Professor Gulson that he does not support setting an actual guideline level for the following reasons:

'I also do not think it is possible to set a (health) guideline based on exposure or intake because of the uncertainty in pathways from the ceiling to the living spaces.

It makes no sense to undertake, for example, an assessment of the contribution from dust to blood leads using one of the pharmacokinetic models if the residents are not going to be exposed to the dust. Evaluation of the possible pathways would be part of a residence assessment and should tie in with other data from the residence mentioned below.

Another point is that we do not have any bioavailability (or more correctly bioaccessibility) data on either the Ni or Pb concentrate – as far as I know.'

- Professor Gulson recommended that any decision to clean roof spaces should be based on a decision tree approach, including:
 1. proximity to the port,
 2. wind direction,
 3. soil and interior dust values,
 4. roof construction (including presence or absence of sarking),
 5. age of house,
 6. interior (i.e. any pathways from the ceiling),
 7. life style of occupants.
- The Project Team needs to have a decision making tool that is defensible to any potential concerns from community members.

The Steering Committee considered:

- That to set a cleanup guideline based only on the concentration of lead in roof spaces is not the preferred option. Rather that the decision whether to clean a roof space needs to be made on a case by case assessment taking the following points into consideration;
 - i. The location of the premises in relation to the zone of impact
 - ii. The results of sampling for lead and nickel in the roof space and the concentrations and loadings determined.
 - iii. The age of the home, roof type, presence or absence of sarking, condition of the home, and in particular, potential pathways for entry of ceiling dusts into the home.
- There are likely to be borderline cases where the Project Team would seek further deliberation on the circumstances of particular premises and whether cleaning of the roof spaces and other areas should be undertaken.
- That a Reference Panel should be established for this purpose and be comprised of the following Members of the Steering Committee:
 - i. Ms Pam Norris - Community member
 - ii. Mr Lindsay Gillam - DOH
 - iii. Mr Peter Skitmore - DEC
- The Steering Committee therefore requested the Project Team to assess the need for cleaning of roof spaces using a 'decision tree' approach taking into consideration the following factors:
 - i. The proximity of the premises to the port and evidence of the 'zone of impact'
 - ii. The results of sampling for lead and nickel in the roof space and the concentrations and loadings determined.
 - iii. The age of the home, roof type, presence or absence of sarking, condition of the home and in particular pathways for entry of ceiling dusts into the home.

Actions:

The ECRP Project Team to develop a 'decision tree tool' for assessment of the cleaning requirements for roof spaces.

A Reference Panel is established for referral by the Project Team of particular issues concerning cleaning of roof spaces.

8. Development of ECRP Sampling Protocols

Members noted:

- A presentation by Sarah Taylor of Golder Associates on Data Gap Analysis and Sampling and Analysis Plan.
- The supporting documentation would be assessed by the Working Group on Sampling.
- That it would be desirable if the membership of the Working Group included Mr Peter Skitmore in view of his experience in this field and community member Michelle Crisp also be given the opportunity to comment in view of her extensive research in this area.
- That the Working Group on Sampling to provide a response to the Golder report and the final report should be implemented as soon as possible.

Action:

The Working Group on Sampling to provide a response to the Golder Report. The final report will then be implemented as soon as possible.

9. Development of ECRP Cleaning Procedures

Members noted:

- A copy of the 'ECRP Cleaning Procedures' and the 'Guidance Note to Householders'.
- The ECRP Cleaning Procedures have been used as a basis for the 'Specification/Statement of Requirements' for prospective contractors for the cleaning of some of the 21 homes and first 'batch' of homes. The Cleaning Procedures will be 'fine tuned' as a result of those cleaning operations.

A copy of the ECRP Cleaning Procedures is set out in Attachment 2.

10. Assessment of the cleaning requirements of the 21 homes, trial and validation of cleaning procedures.

Members noted:

- A presentation by Matthew Devenish ECRP Project Manager on his assessment of the cleaning requirements of the 21 homes based upon the analysis of samples taken and the ECRP cleanup guidelines established.

Members supported the approach taken by the Project Team in the assessment of the cleaning requirements for these homes.

11. Update on Esperance Port Authority Environmental Emission Data

Discussion of this item was not possible due to lack of time. However, Peter Skitmore agreed to provide Members, out of session, a copy of the latest data on Air Quality Monitoring by the Esperance Port Authority. Members agreed that this presentation should be placed on the OnCue website.

Action: DEC [Peter Skitmore] to provide Members a copy of the latest data on Air Quality Monitoring by the Esperance Port Authority. This presentation to be placed on the OnCue website.

12. Other issues

Members noted that Mr Geoff Adam had made comments on the cleanup of the Esperance townsite and had contacted some Members. Members also noted that Mr Adam is not a resident of Esperance.

13. Next meeting-11 November 2009

ESPERANCE CLEANUP AND RECOVERY PROJECT

STEERING COMMITTEE MEETING

3 September 2009, ESPERANCE

SUMMARY OF ACTIONS

1. Minutes of Previous Meeting

That the minutes of the meeting held 25 June 2009 were accepted as a true record of the meeting. The Minutes are to be loaded onto the ECRP OnCue web page.

2. Blood lead testing

Insert further step in the gantt chart to include blood lead testing of the Esperance community after the cleanup has concluded.

3. Isotope testing of samples from both the Esperance 21 homes and Albany samples

Summary of isotope testing of Esperance and Albany samples to be circulated OOS.

4. DEC Survey on Esperance vegetation

Mr Skitmore to provide the maps showing the DEC surveys on lead and nickel levels in Esperance vegetation to the ECRP Project Team.

5. Prescribed method for the determination of the annualised guideline for nickel emissions

Prescribed method for the determination of the annualised guideline for nickel emissions to distributed to Members OOS.

6. Development of Cleanup Guidelines for Esperance Roof Cavities, Ceiling Voids and Roof Surfaces.

The ECRP Project Team to develop a 'decision tree tool' for assessment of the cleaning requirements for roof spaces. A Reference Panel is established for referral by the Project Team of particular issues concerning cleaning of roof spaces.

7. Development of ECRP Sampling Protocols

The Working Group on Sampling to provide a response to the Golder Report. The final report will then be implemented as soon as possible.

8. Update on Esperance Port Authority Environmental Emission Data

DEC [Peter Skitmore] to provide Members a copy of the latest data on Air Quality Monitoring by the Esperance Port Authority. This presentation to be placed on the OnCue website.

ESPERANCE CLEANUP AND RECOVERY PROJECT

PROCEDURES FOR CLEANING HOMES AND OTHER PREMISES

1. Purpose

This document sets out the procedures for cleaning of homes and other premises to be undertaken by contractors as part of the Esperance Cleanup and Recovery Project (ECRP).

2. Background

The handling of lead carbonate at the Esperance port during the period April 2005 to January 2007 caused significant contamination of part of the Esperance townsite and environment.

The Inquiry into the cause and extent of lead pollution in the Esperance Area by the Education and Health Standing Committee, tabled in the Legislative Assembly on 6 September 2007 provides definitive background.

The Inquiry showed that as a result of emissions of lead from the Port of Esperance, residential and commercial premises in the town of Esperance, as well as the environment, have been contaminated by lead dust, with consequential impacts on the community including elevated blood lead levels in children.

There remains lead and nickel contamination in the town of Esperance.

The Government has given a commitment to a comprehensive cleanup of the Esperance townsite. The Premier's statement to the Legislative Assembly on 3 December 2008 refers.

A Steering Committee has been established to oversee the ECRP. This Steering Committee includes officers from Department of Health (DOH), Department of Environment and Conservation (DEC), Department of Transport (DOT), the Shire of Esperance and community representatives.

The DOT has been appointed as the responsible agency to manage the ECRP.

3. The Scope of the ECRP

The scope of the ECRP is to cleanup residues of lead carbonate and nickel sulphide concentrates to meet the cleanup guidelines recommended by DOH and endorsed by Steering Committee. The cleanup guidelines are set out in clause 5.

4. The sampling, cleaning and validation process

All premises will be subject to a process of:

- **Sampling** - to determine the levels of lead and nickel present, comparison to the cleanup guidelines and to determine what areas, if any, require cleaning. [As detailed in the ECRP Sampling Protocols]
- **Cleaning** - to remove any lead and nickel residues to the accepted cleanup guidelines.
- **Validation** - to ensure that the cleaning has been effective and cleanup guidelines have been achieved, the cleaning process must be immediately followed by validation sampling.

After the sampling of each premise has been undertaken and the results of that sampling are available, a case assessment of each premise will be made by the ECRP Project Manager. The Project Manager will determine the nature and extent of cleaning that is required and will prepare a project worksheet for each premise detailing the cleaning required. The specific approvals of the occupier with regard to cleaning as set out in the Consent Form must be taken into consideration in preparing the project worksheet.

The Project Manager will provide specific written instructions as set out in the project worksheet to the cleaning contractor on the nature and extent of cleaning to be carried out for each premise. The Project Manager will also brief the cleaning team. This project worksheet will be confirmed with the occupier prior to commencement of cleaning.

An ongoing monitoring program will be conducted for a number of premises to ensure that they remain free from contamination after cleaning. This ongoing surveillance monitoring program is yet to be developed.

5. Esperance Cleanup guidelines

The following guidelines have been recommended by the DOH and endorsed by the ECRP Steering Committee:

- **Rainwater tanks:** 0.01mg/L for lead and 0.02mg/L for nickel. [Source:- Australian Drinking Water Guidelines]
- **Soils:** 300mg/kg for lead; and 600mg/kg for nickel. [Source:- National Health Investigational level for Residential Property]
- **Internal and external surfaces readily accessed by young children:** 0.04µg/cm² for lead. This includes floors, window ledges and other internal surfaces. It also includes external surfaces such as 'cubby houses' and play equipment frequently used by young children. [Source: - DOH]
- **Internal and external surfaces readily accessed by adults:** 0.4µg/cm² for lead. [Source: - DOH]
- **Roof spaces/ceiling voids and roof surfaces:** yet to be determined.

6. Objectives of the cleaning process

Where cleaning is required, the objectives of the cleaning process are:

- to remove all residues from every possible surface and item within the home or premise,
- to contain those residues, and

- to dispose of all residues so that they do not cause contamination at any other time in and around the home or premise or at the point of disposal and in accordance with relevant legislation.

A focus of the cleaning program will be on areas of accumulation of dusts and residues.

7. The cleaning sequence

The ECRP Project Manager will make a case by case assessment of each premise to determine the nature and extent of the cleaning to be carried out. The sequence of the cleaning operation should be organised so that any cleaning is not compromised by subsequent cleaning. In other words, the section of the premise where most dust has accumulated should be cleaned first and the most sensitive areas cleaned last. All efforts should be made to minimise the mobilization of any dust in the cleaning process. Therefore the following cleaning sequence is recommended:

- a) roof spaces and ceiling voids
- b) roof surfaces
- c) gutters and rainwater tanks
- d) exterior areas
- e) internal areas.

8. Notification to the owner occupier of the home or premise

Owners of premises will be notified that the sampling and, where necessary, cleaning is to be carried out and that permission from occupiers of premises will be subsequently sought. In the case where the owner is not the occupier of the premise, owners will be encouraged to make suitable arrangements with the occupier.

The occupier of the home or premise must be notified in advance of the intended sampling and cleaning program. Consent must be given prior to any sampling and cleaning taking place. A copy of the ECRP Consent Form is set out in Attachment 1 together with Guidance Notes for Householders.

The results of sampling and cleaning validation testing must be provided to the occupier of each home or premise.

9. Physical properties of the lead carbonate

The lead carbonate is in the form of a fine grey to black dust. The lead residues can generally be removed to meet the cleanup guidelines by a combination of dry and wet cleaning as appropriate. That is, it can be removed by normal cleaning methods.

10. Ongoing management of rainwater tanks

In regard to ongoing management of rain water tanks, residents should be encouraged to fit a first-flush diverter to rainwater tanks to divert the first winter rains from the roof as part of normal practice. Residents should also be encouraged to have a regular cleaning regime in place to ensure gutters are kept free of debris and dust accumulations.

11. Cleaning procedures subject to continuing review and improvement

These ECRP cleaning procedures will be subject to a process of continuing review and improvement on the basis of the experience gained in sampling, cleaning and validation testing of homes and other premises in Esperance.

12. Definitions

'ECRP'	Esperance Cleanup and Recovery Project.
'Wet Cleaning'	Clean warm water (about 30-40 ⁰ C) with a detergent added.
'HEPA vacuum'	A high-efficiency particulate air vacuum cleaner with a powerhead nozzle.
'Premises'	Includes homes, schools, day care centres, commercial premises, government buildings etc.

PART A. CLEANING ROOF SPACES AND CEILING VOIDS

Relevant cleanup guidelines

The specific cleanup guidelines relevant to Cleaning Roof Spaces and Ceiling Voids are still to be determined by the ECRP Steering Committee.

General principles

If cleaning of roof spaces and ceiling voids is required, this cleaning must be carried out before cleaning the internal surfaces of the premise.

Any removal and replacement of asbestos cement sheeting necessary to gain access to roof voids must be carried out by a licenced asbestos removal operator.

Materials from the roof space or ceiling void must not be taken through the internal areas of the home or premise.

Safety requirements

The following safety clothes and equipment is required:

- Disposable coveralls. These should be disposed of later by firmly wrapping in paper and placing in the rubbish bin.
- Dust mask (P1 or P2 rating).
- Disposable gloves.
- Disposable boots. Rubber Wellington boots or boots which can be washed afterwards are also acceptable.
- Safety harness and restraint if required.

Safety protocols for electrical hazards and working at heights must be observed at all times.

Procedure

- a) The ECRP Project Manager will determine if an inspection and testing of roof spaces and ceiling voids of homes and other premises is required.

Where inspection and testing is carried out, the ECRP Project Manager will issue a written report which will provide any specific directions for the cleaning of roof spaces and ceiling voids.

- b) In those homes and other premises which have insulation installed into the roof spaces and ceiling voids, this must be removed in a manner which contains the lead and nickel residues and does not disperse these residues into or around the premises.

All insulation material must be placed in large plastic bags within the roof space with a minimum of disturbance to prevent dust dispersion. The filled bags must be sealed prior to removal from the void.

The sealed bags must be removed from the roof spaces externally by removing the roof covering.

All removed insulation material must be assessed (tested) against the criteria for appropriate disposal. This remains to be determined. [It is suggested that samples of insulation materials be taken in the survey of roof spaces etc and submitted to the ChemCentre to determine the characteristics of this material in order to assess it against the Department of Environment and Conservation *Landfill Waste Classification and Waste Definitions 1996 (as amended)*. This is necessary in determining the appropriate disposal requirements.]

- c) After insulation materials have been removed from roof spaces and ceiling voids, the upper surfaces of the ceiling and supporting structure must be cleaned using a HEPA vacuum system.
- d) In the case of those homes and premises from which insulation has been removed and after roof spaces and ceiling voids have been cleaned, new insulation materials of an equivalent type and thermal R rating must be fitted.
- e) After cleaning, roof spaces and ceiling voids must be tested to determine if cleaning has been effective in removing residues and cleanup standards have been achieved. Use of a Niton XRF is recommended for the testing and confirmation that the cleaned roof spaces and ceiling voids meet the guidelines.
- f) All dust residues from roof spaces and ceiling voids as contained in sealed bags from HEPA vacuum systems, must be assessed (tested) against the disposal criteria for appropriate disposal.

Validation of the cleaning process

The cleaning process must be immediately followed by validation sampling to ensure that the cleaning of roof spaces and ceiling voids has been effective and cleanup guidelines have been achieved.

PART B. CLEANING ROOF SURFACES

Relevant cleanup guidelines

The specific cleanup guidelines relevant to Cleaning Roof Surfaces are still being determined by the ECRP Steering Committee.

Where lead or nickel concentrations in rain water are found to exceed the cleanup guidelines, and roof cleaning is required, it shall be carried out according to the following procedure.

General principles

It is important that all safety precautions are complied with and understood before attempting to clean dust affected roofs. Extra caution needs to be exercised when using water and detergent on roofs that are likely to already pose a significant fall hazard.

This procedure is based on knowledge of the problem in Esperance, and an understanding of the chemistry of lead and its compounds in the environment.

The use of detergent is to aid removal of the lead dust by removing any normal grime (e.g. from vehicle exhaust, natural dust and debris materials, etc) that may occur and provide a surface on which the lead may adhere. Special detergents (including those that claim to be specifically for lead removal) are not warranted. Common household detergent has been found to be equally effective in lead dust removal. The use of more corrosive solutions or lead-chelating agents is not recommended.

Swab samples of the roof surface must be taken before and after cleaning to provide a quantitative measure of the effectiveness of the cleaning.

Note: Under no circumstances should pressure cleaning be undertaken on any asbestos roof. This is a dangerous and illegal procedure. Any cleaning of asbestos must be carried out by a licensed operator.

Safety requirements

The following safety clothes and equipment is required:

- Disposable coveralls. These should be disposed of later by firmly wrapping in paper and placing in the rubbish bin.
- Dust mask (P1 or P2 rating).
- Disposable gloves.
- Disposable boots. Rubber Wellington boots or boots which can be washed afterwards are also acceptable.
- Safety harness and restraint.

Safety protocols for working at heights must be observed at all times.

Procedure

- a) Neighbours to the premise must be advised that the roof cleaning is to be carried out and that they should stay inside, away from any overspray that may occur during the cleaning. Similarly ensure that the occupants of the premise (including pets) are not in the vicinity during the cleaning operation.

Disconnect or divert the inlet pipe away from the rainwater tank to a suitable alternate container or tank (fitting of a diverter makes this a very simple task). The consent of the owner/occupier for this is required.

- b) Visually inspect the roof for potential problems such as cracked or loose tiles or sheets, damaged ridge capping or other potential problems. These should be repaired as part of normal household maintenance (or at least covered with plastic sheeting during the roof cleaning).
- c) Cover any roof vents, air conditioner inlets or chimneys if they are nearby and likely to be a vector for the ingress of airborne material during the cleaning.
- d) Prepare a detergent solution as follows: General household detergent is suitable. Mix the detergent in solution at a rate of about 5% (e.g. 50mL per litre or 2 cups of detergent to a 10L bucket).
- e) Working from the highest point of the roof downwards, spray the detergent solution liberally onto all surfaces of the roof, adjoining flashing and gutters. [The detergent acts as a release agent for residues.] Pay particular attention to areas that may accumulate dust and particulate material such as valleys and gutters. Avoid spraying 'against the flow direction' of the tile or roofing material or leaks may be experienced.

Where warranted, wet brushing of the roof surfaces may be required.

- f) When the entire surface has been liberally coated with detergent solution re-spray the roof (using high pressure) with fresh water. The roof should be sprayed with water until the foam from the detergent no longer persists.
- g) The water collected from the cleaning operation shall be disposed of in the same way as the contaminated rain water tank water, see Part C below.

Validation of the cleaning process

The cleaning process must be immediately followed by validation sampling to ensure that the cleaning of roof surfaces has been effective and cleanup guidelines have been achieved.

PART C. CLEANING RAINWATER TANKS AND GUTTERS

Relevant cleanup guidelines

The specific cleanup guidelines relevant to Cleaning Rainwater Tanks and Gutters are:

- *Rainwater tanks*: 0.01mg/L for lead and 0.02mg/L for nickel.

Where lead or nickel concentrations in rain water are found to exceed these cleanup guidelines, and tank and gutter cleaning is required, it shall be carried out according to the following procedure.

General principles

The intention of this Part is to ensure that rain water tanks and gutters are cleaned of lead and nickel sediments and tanks can be used to capture rainwater. Roof cleaning must precede gutter and tank cleaning as the lead from the roof surface is likely to be transferred to gutters and tanks.

Procedure

- a) Prior to any cleaning of gutters and rain water tanks under the ECRP, sampling and analysis must be carried out. The ECRP Project Manager must give written directions to the contractor for cleaning rain water tanks and gutters for each premise.
- b) All tanks and gutters are to be inspected prior to cleaning. A report on the current status of the tank and gutters is to be prepared covering the type and composition of the tank and its state of repair. The results of analysis of the tank water for both lead and nickel are to be included in or attached to the report. The Questionnaire and Checklist for Rainwater Tank Inspection is set out in Attachment 2.
- c) Prior to cleaning tanks or gutters, the tank must be drained to within 10-15 cm of the floor of the tank, or to the outlet. The water from the tank should be drained into an area where it can be readily soaked into the soil such as a garden bed.
- d) All roof gutters must be cleaned using pressurised water to remove residues from the gutter preferably into a suitable holding tank so as to avoid further contamination of the rainwater tank. If residues drain into the rainwater tank, this will increase the effort required to clean the rainwater tank.

Where it is necessary to divert the material into a holding tank and modification to the roof plumbing is required, the consent of the owner/occupier is required.

- e) The internal sides and bottom of rainwater tanks must be cleaned using pressurised water. The sludge residues remaining in the tank must be vacuumed into a vacuum truck. The tank must then be rinsed with clean water and again drained. When the truck is full, the accumulated sludge material should be transferred into an approved holding tank.

- f) Wastewater and sludge from rain water tanks and gutters must be assessed and tested to determine the appropriate disposal site, in compliance with the DEC requirements.

Validation of the cleaning process

The cleaning process must be immediately followed by validation sampling to ensure that the cleaning of gutters, the rainwater tank and the roof has been effective and cleanup guidelines have been achieved.

PART D. CLEANING EXTERNAL SURFACES

Relevant cleanup guidelines

The specific cleanup guidelines relevant to Cleaning External Surfaces are:

- *External surfaces readily accessed by young children:* 0.04µg/cm² for lead. This includes external surfaces such as 'cubby houses' and play equipment frequently used by young children.
- *External surfaces readily accessed by adults:* 0.4µg/cm² for lead
- *Soils:* 300mg/kg for lead; and 600mg/kg for nickel.

General principles

In cleaning external surfaces of homes and other premises, the same principles which are applied to internal areas, should be used.

The following items constitute external surfaces.

- Outdoor patio surfaces, paving and furniture
- The outside surfaces of buildings such as window ledges but does not include roofing (this is covered in Part B).
- Children's cubby houses and play equipment.
- Cleaning around objects such as rainwater tanks, gas cylinders etc
- Garages, carports and sheds etc.

Procedure

In cleaning external surfaces of homes and other premises, the same principles or procedures which are applied to internal surfaces, should be used. In other words, the cleaning procedure should be a combination HEPA vacuuming and wet cleaning as follows:

- a) Vacuum all surfaces using a HEPA vacuum system, particularly where accumulated dusts are present.
- b) All hard surfaces must then be wet cleaned to remove any remaining residues.
- c) Wet cleaning must start at the highest point in the area, cleaning all walls and working down so that the floor surfaces are cleaned last.
- d) Minimise dust dispersion during the cleaning operation.
- e) Contain all residues
- f) Dispose of all residues to comply with DEC requirements.

Soils and sand areas

The Project Manager will undertake a case by case assessment of soil and sand areas, such as children's sand pits. Remediation measures may be implemented at the discretion of the Project Manager such as replacement of soil or sand, providing a cover of surface mulch or turning the soil.

Validation of the cleaning process

The cleaning process must be immediately followed by validation sampling to ensure that the cleaning of external surfaces has been effective and cleanup guidelines have been achieved.

PART E. CLEANING INTERNAL SURFACES

Relevant cleanup guidelines

The specific cleanup guidelines relevant to Cleaning of Internal Surfaces are:

- *Internal surfaces readily accessed by young children:* 0.04µg/cm² for lead. This includes floors, window ledges and other internal surfaces.
- *Internal surfaces readily accessed by adults:* 0.4µg/cm² for lead

General principles

Every effort must be made to remove and contain the lead residues as part of the cleaning process.

All furniture must be moved so that any residues behind the furniture can be removed.

Where the material to be cleaned will not be damaged, wet cleaning is the most effective way of removing lead dust and this is the preferred method of cleaning. All hard surfaces must be wet cleaned (except in the case of some furniture items which may be damaged by wet cleaning)].

Water used for wet cleaning should contain an all purpose household detergent. The cleaning water and detergent must be changed regularly so that any residues are not reapplied onto the 'cleaned' surfaces.

Any cleaning method or 'appliance' which has the potential to disperse the residues must not be used.

Do not use 'appliances' such as

- feather dusters,
- vacuum cleaners without HEPA filters
- dry dusting cloths.
- brooms or dust pans.

Cleaning cloths must not be shaken at any time as this will cause residues to be dispersed.

All cleaning water must be disposed of appropriately. It is acceptable to dispose of this cleaning water in domestic drains, avoid spilling and splashing to surrounding areas. Cleaning cloths must be disposed of so that contained dust cannot escape.

All cleaning must be carried out in a systematic and thorough manner.

Procedure – Hard surfaces

- a) All hard surfaces must be wet cleaned.
- b) Cleaning must start at the highest point in the room, by wet wiping all walls and working down so that the floor is cleaned last.

- c) All hard floors must be HEPA vacuumed and then wet cleaned.
- d) Sponges, cloths and mop heads must be cleaned or replaced regularly to prevent the spread of residues.
- e) When wet cleaning, apply the water or cleaning solution by pouring or spraying so as to prevent contaminating the cleaning fluid.
- f) All surfaces should then be rinsed using clean water and a clean sponge, mop or cloth.
- g) Sponges, cloths and mop heads must be cleaned or replaced regularly to prevent the spread of residues.
- h) Where wet cleaning is not possible, it is essential that the method used captures the residues. Accordingly a HEPA vacuum must be used. In some circumstances wiping over the article (such as wooden furniture) with a clean cloth and then containing the residues within the cloth may be appropriate.
- i) The same procedure must be followed for all other hard surfaces (which will not be damaged by wet cleaning e.g. antique wooden finishes), HEPA vacuuming followed by wet cleaning. This applies to all hard furniture, including bench tops, table tops and chairs, coffee tables, book shelves, window sills, doors and handles and any other accessible horizontal and vertical surfaces. Special emphasis should be given to areas where dusts and residues can accumulate such as the top of cupboards, fridges, curtain rails, range hoods etc.

Procedure - Carpets and soft furnishings

- a) Carpets must be vacuumed thoroughly using a HEPA vacuum cleaner.
- b) Curtains and other soft furnishings such as lounge chairs must be HEPA vacuumed.
- c) For other forms of window treatments such as venetian blinds, vertical blinds or roman blinds, these must be cleaned by a combination of HEPA vacuuming and wet wiping as appropriate.

Validation of the cleaning process

The cleaning process must be immediately followed by validation sampling to ensure that the cleaning of internal surfaces has been effective and cleanup guidelines have been achieved.

Attachment 1

ESPERANCE CLEANUP AND RECOVERY PROJECT

Consent for Sampling and Cleaning Form

Name of owner or occupier:	
Property address:	
Telephone contact:	

- I have read and understand the purposes of this sampling and cleaning project.
- I acknowledge that I will receive a copy of the results of samples taken from my property.
- I understand that the results will be kept confidential, but that they may be used in a general manner which does not identify the results to my property.
- I agree/disagree* to the release of the results of sampling my property to the members of the ECRP Steering Committee. [Members have signed a Confidentiality Agreement]
- I understand that in the event of damage being done by the sampling or cleaning team, the damage will be made good by the insurers of the Government of Western Australia.
- I consent/do not consent* to the sampling team taking samples on my property in the week commencing 2009.
- I consent/do not consent* to cleaning being carried out on my property if the sampling results indicate that cleaning is required.
- I consent/do not consent* to ongoing monitoring of my property.

Signature of Owner/Occupier*Date.../.../.....

Esperance Cleanup and Recovery Project
 Unit 2B, 113 Dempster Street
 Esperance, WA 6450
 Telephone 9072 3900

*Please strike out the words which are not applicable.
 Attachment: ECRP Guidance Notes to Householders

Attachment 2

ESPERANCE CLEANUP AND RECOVERY PROJECT

Questionnaire and Checklist for Rainwater Tank Inspection

Date: _____	Year of House Construction: _____
Resident: _____	
Street Address: (Lot Number if known) _____	
Postal Address (if different from above): _____	
Phone Number: (H) _____	(AH) _____
Investigating officer: _____	Sample taken from: _____
Date when sample sent: _____	Sample ID _____

1 General Conditions	
1.1 Roof rainwater tank catchment type	Zincalume, / Colourbond, / Asbestos, / Tile / other
1.2 Roof material condition (as evident to the sampler)	Good / Average / Poor
1.3 Date of roof installation	
1.4 Approximate Area of Rainwater Tank Catchment	
1.5 Identifiable sources of possible lead or nickel contaminants ie Lead flashing tree overhangs	Yes <input type="checkbox"/> No <input type="checkbox"/> Please specify _____
1.6 Gutter Material	Zincalume / Colourbond / Plastic / Copper / other
1.7 Is there	
1.7.1 an installed first flush device	Yes <input type="checkbox"/> No <input type="checkbox"/>
1.7.2 Screen on inlet	Yes <input type="checkbox"/> No <input type="checkbox"/>
1.7.3 Opening on tank roof	Yes <input type="checkbox"/> No <input type="checkbox"/> (allow material to fall into tank)
1.8 What is the condition of the sampled rainwater tank? (rusted, leaking etc)	Good / Average/Poor
1.9 Type of rainwater tank	Zincalume, / Colourbond / Concrete / Plastic / Fibreglass (Please circle)
1.10 Date of Tank Installation	
1.11 Volume (Litres)	

2 Maintenance Activity - Roof	
2.1 Date of last roof cleaning activity	
2.2 What is the normal roof cleaning timeframe	Never, Irregular, Annual Biannual Quarterly Monthly
2.3 Who undertook this task	Self or family member <input type="checkbox"/> Contractor <input type="checkbox"/>
2.4 Was the whole rainwater tank catchment cleaned	Yes <input type="checkbox"/> No <input type="checkbox"/>
2.5 Describe cleaning activity	

3 Maintenance Activity - Gutter	
3.1 Date of last gutter cleaning activity	
3.2 What is the normal gutter cleaning timeframe	Never, Irregular, Annual Biannual Quarterly Monthly
3.3 Who undertook this task	Self or family member <input type="checkbox"/> Contractor <input type="checkbox"/>
3.4 Were all gutters feeding RWT cleaned	Yes <input type="checkbox"/> No <input type="checkbox"/>
3.5 Describe this cleaning activity	

4 Maintenance Activity - Tank	
4.1 Date of last rainwater tank cleanout	
4.2 What is the normal Tank cleaning timeframe	Never, Irregular, Annual Biannual Quarterly Monthly
4.3 Who undertook this task	Self/family member <input type="checkbox"/> Contractor <input type="checkbox"/>
4.4 Describe cleaning activity	
4.5 Date of last rainwater tank flushing	

5 What are the uses of the rainwater?

	Current	Past
Garden Irrigation (by hand or manual or automatic sprinkler)?	<input type="checkbox"/>	<input type="checkbox"/>
Est. consumption per day (l):		
Drinking water	<input type="checkbox"/>	<input type="checkbox"/>
Cooking?	<input type="checkbox"/>	<input type="checkbox"/>
Adult _____		
Irrigating vegetables?	<input type="checkbox"/>	<input type="checkbox"/>
Teen _____		

Filling the swimming pool?

Kiddie _____

For children to play in, such as sprinklers / wading pool?

Person bathing?

Washing pets?