ATTACHMENT 10

Monitoring on PM10 at Rock Art sites

Notes:

- This attachment includes the monitoring on PM10 at Rock Art sites between January 2015 and June 2015, attachment 07 of Compliance Report for Air Quality Management (2-250-329-8085-att06).

- For monitoring on PM10 at Rock Art sites from July 2015 to December 2015, refer to attachment 06 of Compliance Report for Air Quality Management (2-250-329-REP-TRE-8096-att06), available upon request.

ATTACHMENT 06

Air Quality Monitoring Report at CSIRO rock art sensitive receptors

INDEX

Table Index

Figure Index

ABBREVIATIONS

AS:	Australian Standards.
CEMP:	Construction Environmental Management Plan.
CSIRO:	Commonwealth Scientific and Industrial Research Organisation.
DEC:	Department of Environment Conservation.
LSA:	Lear Siegler Australasia Pty Ltd.
NSW:	New South Wales.
NZS:	New Zealand Standards.
PM10:	Particulate Matter up to 10 micrometers in size.
TSS:	Total Solids suspended.
UPS:	Uninterruptible power supply.
WA DEC:	Western Australian Department of Environment and Conservation.

1. INTRODUCTION

Yara Pilbara Nitrates Pty Ltd (YPNPL) is developing a Technical Ammonium Nitrate Production Facility (TANPF) with a production capacity of (circa) 350,000 TPA or 915 MTPD of Technical Ammonium Nitrate (TAN). Tecnicas Reunidas S.A. (TRSA) has been engaged in the detail Engineering, Procurement and Construction (EPC) phase of the TANPF.

A Construction Environmental Management Plan (CEMP) Doc. No. 2-250-329-PRO-TRE-0111 was developed as part of the Work Approval EPBC 2008/4546 by Australian Government Department of Sustainability, Environment, Water, Population and Communities (SEWPaC). CEMP was approved by SEWPaC on 22nd November 2012 (letter reference: 2012/08279).

The Construction Air Quality Management Plan (CAQMP) is included in the CEMP as attachment 01. The CAQMP was developed to fulfill the requirements of the Commonwealth Approval – Conditions 7a and 9 (EPBC 2008/4546).

This Report for Air Quality outlines the monitoring activities that have been carried out at CSIRO Rock art sensitive receptors, thus providing discussion and evidences of how compliance with Condition 9 has been achieved.

Refer also to Compliance Report for Air Quality Monitoring Report at CSIRO rock art sensitive receptors, 2-250-329-REP-TRE-8095.

2. LEGISLATIVE FRAMEWORK FOR AIR QUALITY MONITORING AT CSIRO ROCK ART SENSITIVE RECEPTORS

Condition 9 of the Commonwealth Approval (EPBC 2008/4546) states the following:

"*To protect the values of the Dampier Archipelago (including Burrup Peninsula) National Heritage Place, particularly the rock art sites, the person taking the action must undertake an air quality monitoring program. The air quality monitoring program must:*

a) Undertake air quality monitoring at three (3) sites. These sites being sites previously selected, designed, fenced off and used in the original Western Australian Department of Environment and Conservation (WA DEC)/ CSIRO air quality monitoring program.

- *Site 5 – Burrup Road site;*
- *Site 6 – Water tanks site; and*
- *Site 7 – Deep Gorge site.*

The air quality monitoring must be undertaken for a period of not less than 24 months beginning from the commencement of construction. The results of this monitoring will be used to establish baseline data on levels of:

- *Ammonia (NH_3);*

- *Nitrogen Oxides (NO_X);*
- *Sulphur Oxides (SO_X); and*
- *Total suspended particulates (TSP), including dust at those rock art sites.*

b) Ensure that the monitoring of air quality at rock art sites is undertaken by a suitably qualified person (Air Quality).

c) Ensure air quality readings during the twenty four (24) months of baseline monitoring are taken at least four (4) times in every 12 months.

d) Ensure that the baseline data established from the air quality monitoring is reported to the Department in writing within 12 months of the completion of construction or following twenty four (24) months of baseline monitoring (whichever finishes last). The report must include a map clearly showing the location of each rock art site being monitored.

e) Ensure air quality monitoring of the rock art monitoring sites (sites 5, 6 and 7) is continued for an additional period of five (5) years, following the establishment of baseline data and once operation has commenced, to record levels of NH_3, NO_X, SO_X and TSP, including dust.

f) Report the results of the five (5) years of monitoring following the establishment of baseline, as per condition 9(e) above, to the Department, in writing, within two (2) months of that year's monitoring having been completed."

3. EQUIPMENTS AND LOCATION REQUIREMENTS AT CSIRO ROCK ART SENSITIVE RECEPTORS

Air quality monitoring is being undertaken at three (3) sites. These sites were selected by Western Australian Department of Environment and Conservation (WA DEC)/ CSIRO air quality monitoring program.

- Site 5: Burrup Road site.
- Site 6: Water tanks site.
- Site 7: Deep Gorge site.

Following equipment has been installed in each site:

- One MIE ADR-1500 particulate monitor (PM10).
- One dust deposition gauge (TSS).
- One ADS Atmospheric Precipitation sampler.
- One tipping rain gauge.
- NH3, NOx, SOx diffusion tubes (duplicate collocated at each monitoring site).

A Minivol TAS for PM10 has been also installed at Water Tanks site in order to compare readings between MIE ADR-1500 and Minivol TAS.

Position of the sampling inlet of PM10 monitoring equipment and dust gauges considers the AS/ NZS 3580.1.1:2007.

Table 3-1 Positioning requirements of sampling inlet from AS/NZS 3580.1.1:2007

Pollutant	Height about ground to sampling inlet (m) for ground level based site	Other locating criteria for sampling inlet (minimum requirements)
PM_{10}	1–5	Clear sky angle 120° Unrestricted airflow of 270° around sample inlet or 180° if inlet is on the side of a building 10m from nearest object or dripline of trees that are higher than 2m below the height of the sample inlet No extraneous sources nearby >50m from road (for traffic ≤ 10,000 vehicles/ day)
Dust deposition	2 ± 0.2	≥ 5 m from source Clear sky angle 120 degrees Unrestricted airflow of 360 degrees around sample inlet 10 m from drip line of trees No extraneous sources

AS/ NZS 3580.14:2011 Meteorological monitoring for ambient air quality monitoring applications provides guidelines for sitting and installation of rain gauge (also known as a pluviometer). In general, objects should not be closer to the gauge than a distance of twice their height above the gauge orifice. The surface surrounding the precipitation gauge can be covered with short grass or gravel. The gauge should be mounted a minimum of 300 mm above the ground. The support, or base, of any gauge must be firmly anchored. All precipitation devices shall be installed such that the collection area is horizontal.

Figure 3-1 Site 5 Burrup Road

Figure 3-2 Site 6 Water tanks.

Figure 3-3 Deep gorge.

4. SITE RECORDS

Readings of MIE ADR-1500 particulate monitor (PM10) are downloaded at site office. (Available as per request). A data acquisition and reporting software (Envitas Air Resources Manager) provides automatic reports and remote data download through an internet connection in a deskop. Therefore, alarm has also been set up (30μg/m^3). Due to failures in the internet connection, data from MIE ADR-1500 particulate monitor have not been downloaded, despite equipment is still running.

Analysis of dust deposition gauge (TSS) (Appendix A), readings for Minivol TAS for PM10 (Appendix B), and collection of ADS Atmospheric Precipitation sampler/tipping rain gauge (Appendix C) are carried out by the personnel of the Laboratory of Yara Ammonia Plant. Two NH3, NOx, SOx diffusion tubes are collocated at each monitoring site. Result from laboratory have not been issued.

Site inspections on equipment are performed by the Laboratory of Yara Ammonia Plant team. Bi-monthly site inspection is carried out by the supplier Lear Siegler Australasia Pty Ltd (LSA) (Appendix D). Requirements and recommendations for monitoring equipment given by LSA and CSIRO are included in Attachment E.

5. RESULTS AND DISCUSSION

In order to comply with Commonwealth Approval – Conditions 9 (EPBC 2008/4546) following equipment has been installed in each CSIRO site sensitive receptor:

- One MIE ADR-1500 particulate monitor (PM10).
- One dust deposition gauge (TSS).
- One ADS Atmospheric Precipitation sampler.
- One tipping rain gauge.
- NH3, NOx, SOx diffusion tubes (duplicate collocated at each monitoring site).

In addition, one Minivol TAS for PM10 has also been installed at Water Tanks site.

Data obtained from MIE ADR-1500 particulate monitor (PM10) and Minivol TAS for PM10 are below set alarm (30μg/m^3). Analysis of diffusion tubes still on hold. At this stage, it is only possible to conclude that equipment installed is adequate for gather data for baseline study.

Refer to Compliance Report for Air Quality Monitoring Report at CSIRO rock art sensitive receptors, 2-250-329-REP-TRE-8095.

6. REFERENCES

- Australia Standard AS 3580.9.8 Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - PM10 continuous direct mass method using a tapered element oscillating microbalance analyser (TEOM).
- Australia Standard AS 3580.1.1 Methods for sampling and analysis of ambient air - Guide to siting air monitoring equipment.
- Australia Standard AS 3580.10.1. Methods for sampling and analysis of ambient air Method 10.1: Determination of particulate matter—Deposited matter—Gravimetric method.
- Australian Standard AS 3580.14-2011. Methods for sampling and analysis of ambient air. Part 14: Meteorological monitoring for ambient air quality monitoring applications.
- Construction Environmental Management Plan (CEMP) Doc. No. 2-250-329-PRO-TRE-0111.
- DEC NSW document Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales.
- Air Quality Monitoring Report at CSIRO rock art sensitive receptors, 2-250-329-REP-TRE-8095.

APPENDIX A: ANALYSIS OF DUST DEPOSITION GAUGE (TSS)

Date	Location	Volume of sample (mL)	TSS mg/L	Remarks
Jan 2015	M5-Burrup RD	100	365	
Jan 2015	M6-Water Tank	100	231	
Jan 2015	M7-Deep George	100	919	
Feb 2015	M5-Burrup RD	100	153	
Feb 2015	M6-Water Tank	100	264	
Feb 2014	M7-Deep George	100	203	
Mar 2015	M5-Burrup RD	100	----	
Mar 2015	M6-Water Tank	100	236	
Mar 2015	M7-Deep George	100	129	
Apr / May2015	M5-Burrup RD	100	----	Damaged property
Apr / May 2015	M6-Water Tank	100	----	Damaged property
Apr / May 2015	M7-Deep George	100	-----	Damaged property
June 2015	M5-Burrup RD	100	---	
June 2015	M6-Water Tank	100	47	
June 2015	M7-Deep George	100	21	

APPENDIX B: READINGS FOR MINIVOL TAS FOR PM10

SR NO	Date	Initial filter paper wt (µg)	Final filter paper wt (µg)	Particulate matter (µg/m^3)
1	12/09/13	886	890	0.60
2	17/09/13	895	898	0.45
3	23/09/13	901	903	0.30
4	29/09/13	904	909	0.75
5	5/10/13	894	897	0.46
6	11/10/13	904	905	0.15
7	17/10/13	890	893	0.46
8	23/10/13	892	902	1.52
9	29/10/13	898	900	0.46
10	4/11/13	912	913	0.15
12	16/11/13	896	902	0.92

APPENDIX C: COLLECTION OF ADS ATMOSPHERIC PRECIPITATION SAMPLER/TIPPING RAIN GAUGE

Site	Date	Rain Gauge mm	Initial bucket weight	Final bucket weight	Weight(g)
Water tank	March 2015	62	644.22	empty	0
Burrup road	March 2015	63	646.26	887,04	240,78
Deep Gorge	March 2015	61	642	empty	No rain
Water tank	August 2015	No rain gauge available.damaged	643.63	empty	--
Burrup road	August 2015	No rain gauge available.damaged	645.12	5220	4604.88
Deep Gorge	August 2015	No rain gauge available.damaged	641.53	5350	4708.47

APPENDIX D: BIMONTHLY SITE INSPECTION

Lear Siegler Australasia
environment and process solutions
ABN 36 099 046 376
www.learsiegler.com.au
Unit 5A / 2 Resolution Drive
Caringbah 2229 NSW Australia
Telephone : (02) 9531 5444
Fax : (02) 9531 5411
P.O. Box 2735 Taren Point NSW 2229

LSA

Booking No: SS30917
Order No:
Client: Yara Pilbara Nitrates Pty Ltd
Date: 11-mar-15
Tel:
Fax:
Email:
Pages:

DATE	11-mar-15	PERSONNEL	CY	LOCATION	Water Tank
MODEL	ADR1500	MFR S/N	115248965	LSA S/N	

Configuration:

Display AVG Time:	10 seconds	Flow Rate:	1,19 LPM
Logging:	☑ Enabled ☐ Disabled	Interval (h:m:s):	0:05:00
Inlet Type	☐ TSP ☐ Blue ☑ Red	RH Correction	☑ Enabled ☐ Disabled
Alarm	☐ Disabled ☑ Instantanous	☐ STEL Value:	0,03
Units:	☑ ug/m3 ☐ 1/Nm	Analog Output:	☐ Disabled ☑ Enables at : 1.00mg/m3
Date and Time:	Time: 10:05:29	Date: 11-mar-15	☐ Set

Calibration:

Parameter	Initial Offset	Display Reading	Reference	Calibrate	Final offset	Final Reading	Reference Model & S/N
Temperature	1	32.9 degC	28.8 degC	Yes	-1,3	30.9 degC	Tetracal 662
Pressure	-2	755 mmHg	755.5199 mmHg	Yes	-1,0	755 mmHg	Tetracal 662
Humidity	0	63,4		No			

Flow Calibration:

Point	Value	ADJ	Ref reading	Calibrate	Final Ref Read	Final ADJ
CAL 1	1,00	244	1,12	Yes	1,00	228
CAL 2	1,50	324	1,60	No	1,50	305
CAL 3	2,00	431	2,00	No	2,00	431
CAL 4	2,50	567	2,42	Yes	2,50	597
CAL 5	3,00	747	3,05	Yes	3,00	732
CAL 6	3,50	926	3,57	Yes	3,50	901
Flow Ref used:	Model:	Tetracal Flow meter		Serial number:	662	

The ADR-1500 has three different inlets to choose from Total Inlet, Red Cyclone, and Blue Cyclone.

- **Total Inlet** is a standard accessory for the ADR-1500 and is designed for use as a total aerosol mass measurement.
- **Red Cyclone** is an optional ACGIH-traceable cyclone that is used primarily for establishing an aerodynamic diameter 50% cut point between 4 to 10 micrometers.
- **Blue Cyclone** is an optional ACGIH-traceable cyclone that is used primarily for establishing an aerodynamic diameter 50% cut point between 1 to 4 micrometers.

Cut size	Blue Cyclone	Red Cyclone	Total Head	OH&S Classification
PM1	3.46 LPM	N/A	N/A	Respirable fraction
PM2.5	1.52 LPM	N/A	N/A	Respirable fraction
PM4	1.00 LPM	2.65 LPM	N/A	Thoracic fraction
PM10	N/A	1.19 LPM	N/A	Inhalable fraction
TSP	N/A	N/A	1 - 2 LPM	Total Suspended Particles

Engineer:	Charlie Yu	Engineer's Signature:		Date:	11-mar-15

APPENDIX E: REQUIREMENTS AND RECOMMENDATIONS FOR MONITORING EQUIPMENT GIVEN BY LSA AND CSIRO

CSIRO
Marine and Atmospheric Research

Passive Gas Samplers

Contacts:

Rob Gillett
rob.gillett@csiro.au
Mob: 0427 815 298
Work: 03 9239 4652

Choose an appropriate outdoor site for sampling

The following guidelines from AS2922 should be followed when choosing an outdoor site:

- Avoid sites that have restricted airflows in the vicinity of the sampling inlet, such as sites adjacent to buildings, trees, walls, etc.
- Avoid sites which may alter pollutant concentrations by adsorption or absorption, such as those near some building surfaces or near leafy vegetation (ie ozone is a reactive gas that reacts on most surfaces).
- Avoid sites where chemical interference with the pollutant being measured may occur (for NO_2 or SO_2, avoid cars; for NH_3, avoid fertilizer and animal urine/manure).
- Avoid sites where physical interference may produce atypical results
- Seek sites which are secure and have a low potential for vandalism
- Ground level sampling sites are appropriate in low or sparsely built-up areas. Rooftop sampling sites are acceptable for a number of purposes in moderate to high density areas (in terms of structures). Rooftop sampling sites should be clean and should not be affected by flue emissions or other local sources of pollutants.
- Local activities around a sampling site may change its suitability as a site, either temporarily or permanently (i.e. road works, bushfires, etc).

Using passive gas samplers at an outdoor site

- A sampler, shown in Figure 1, is supplied in an individually sealed polythene storage container. Samplers are usually exposed in pairs to assure reproducibility of results and to reduce data loss if a sampler suffers interference.

CSIRO Marine and Atmospheric Research
Aspendale Laboratories
107-121 Station Street Aspendale VIC 3195 Australia
Postal Address: PMB1 Aspendale VIC 3195 Australia
Tel: +61 3 9239 4400 Fax: +61 3 9239 4444 Web: www.cmar.csiro.au

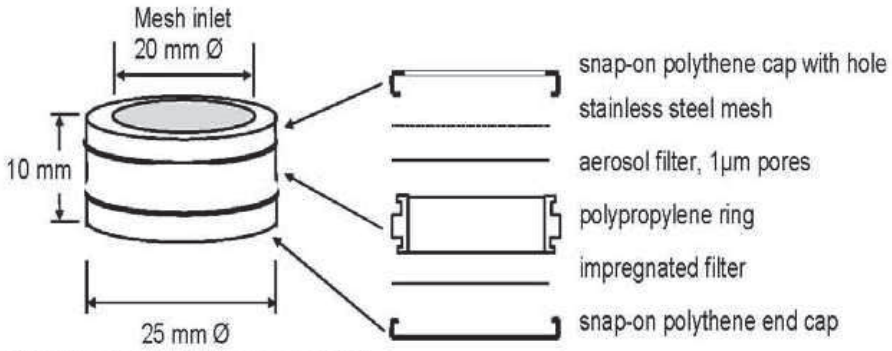


Figure 1. A passive gas assembly.

CSIRO
Marine and Atmospheric Research

- A star picket or wooden post at least 1.5 m high should be installed at the site and an anodized aluminium sample holder is screwed to the top. The holder, shown in Figure 2a and 2b, acts as a weather (rain) shield for the sampler. Up to 8 samplers can be installed in the in the two rails on the underside of the holder.

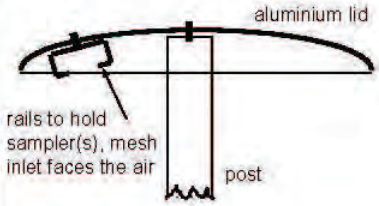


Figure 2. Passive gas weather shield.

Figures 2a and 2b. An anodized aluminium sample holder.

- To commence sampling, remove the passive sampler from the storage vial. Handle the sampler by holding the plastic barrel. **The sample end containing the mesh and/or filter is the inlet through which gases enter. Care should be taken to not touch this end. If the mesh and/or filter is accidentally pushed in during handling, do not use the sampler.**
- Unscrew the wing nut at end of the rail on sample holder. Remove screw. Slide sampler into rails so mesh inlet faces the air. Reattach screw and wing nut.

- Using the passive gas data sheet, record the date and time the sampler was taken out of vial and a description of the site.
- At the end of the exposure period, slide the passive sampler out of the rails and seal in a storage vial. Using the passive gas data sheet, record the date and time the sample was resealed in the vial and the serial number on the storage vial. Record any relevant observations. If using ammonia samplers, follow additional steps outlined on the next page. For exposed ammonia samples, replace the aerosol filter/mesh ring with a white cap once you return to your laboratory/office. The instructions are outlined in the following section.
- Using the address label supplied, return the data sheets, exposed samplers and field blanks to CSIRO Atmospheric Research for analysis. **Note: Comprised samples will not be analyzed.**

CSIRO Marine and Atmospheric Research
Aspendale Laboratories
107-121 Station Street Aspendale VIC 3195 Australia
Postal Address: PMB1 Aspendale VIC 3195 Australia
Tel: +61 3 9239 4400 Fax: +61 3 9239 4444 Web: www.cmar.csiro.au

Method for removing aerosol filter from exposed ammonia samplers

During storage and transport of exposed ammonia filters, ammonia may volatilise from aerosol collected on the filter at the sampler inlet, leading to erroneously high results. This is avoided by removing the aerosol filter cap with a clean plastic cap. The replacement instructions are as follows:

- Take the exposed ammonia samplers in their vials to a clean bench in an indoor work area that does not contain any obvious ammonia sources (e.g. cleaning products, etc).
- Wear the disposable gloves supplied.
- Lay out the clean sheet of aluminium foil supplied.
- Open the vial of one exposed sample and tap gently to remove.
- Gently prise off the mesh snap-on cap, which contains the aerosol filter using gloved hands. See Figures 3 and 4.

Figure 3. Lay out aluminium foil. Wear gloves. Prise the mesh cap off using gloved hands.

CSIRO
Marine and Atmospheric Research

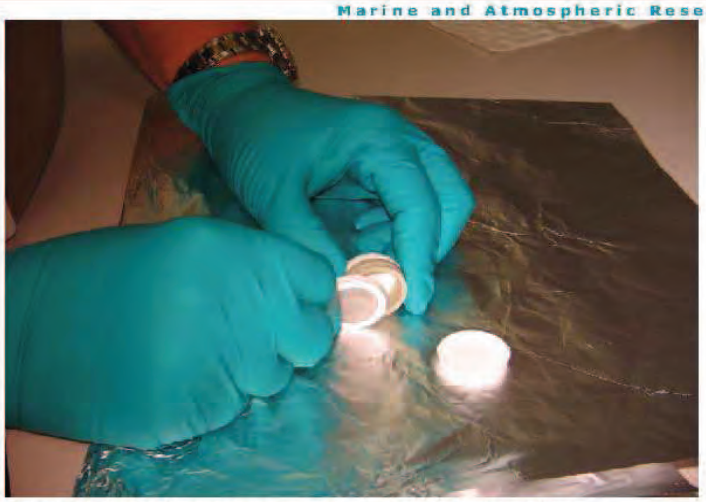


Figure 4. Remove the mesh cap, which contains the aerosol filter.

- Replace with a clean white plastic cap supplied. Push the cap so it snaps onto the ring. The sampler should now have closed plastic caps on both ends. See Figures 5 and 6.

Figure 5. Pick up clean cap and place on sample inlet.

CSIRO Marine and Atmospheric Research
Aspendale Laboratories
107-121 Station Street Aspendale VIC 3195 Australia
Postal Address: PMB1 Aspendale VIC 3195 Australia
Tel: +61 3 9239 4400 Fax: +61 3 9239 4444 Web: www.cmar.csiro.au

CSIRO

Marine and Atmospheric Research

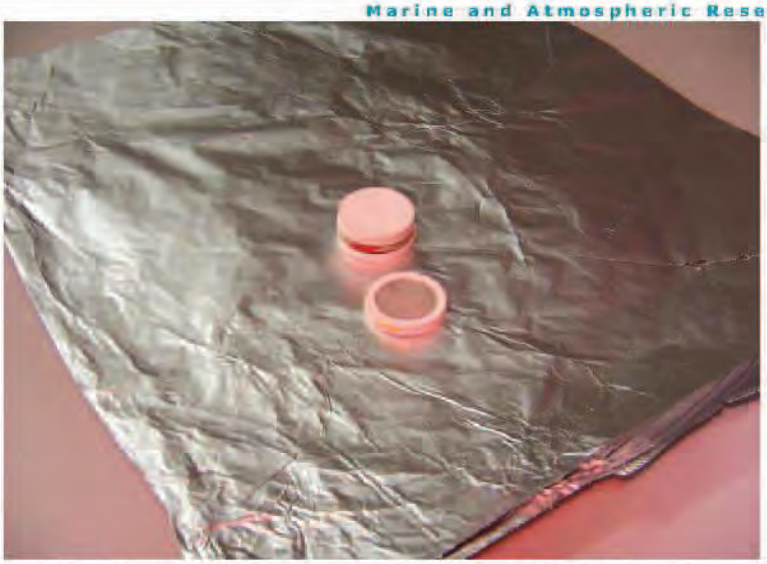


Figure 6. The sampler should now have closed plastic caps on both ends.

- Place the sampler back in its storage vial and seal it.
- Repeat the process for one sample at a time. This minimises the exposure time and ensures that each sampler is returned to the correctly-labelled storage vial.
- Place all the discarded mesh snap-on caps with aerosol filter into a plastic bag and seal the bag (to prevent outgassing during transport).
- Using the address label supplied, return the following items to CSIRO Atmospheric Research:
  - Data sheet(s)
  - Bag of exposed samplers
  - Bag of discarded mesh snap-on caps with aerosol filter
  - Bag of blank samplers.

CSIRO Marine and Atmospheric Research
Aspendale Laboratories
107-121 Station Street Aspendale VIC 3195 Australia
Postal Address: PMB1 Aspendale VIC 3195 Australia
Tel: +61 3 9239 4400 Fax: +61 3 9239 4444 Web: www.cmar.csiro.au

CSIRO

CSIRO Marine and Atmospheric Research

Passive Gas Sampler Record Sheet

Yara Pilbara Nitrates sulfur and nitrogen deposition study

Month:

Fill in on installation of sampler			Fill in on installation of sampler		
SITE No.	DATE & TIME ON	GAS TYPE	DATE & TIME OFF	VIAL SERIAL No.	COMMENTS
		NO_2 Black body			
		SO_2 Grey body			
		NH_3 Red dot			
		NO_2 Black body			
		SO_2 Grey body			
		NH_3 Red dot			
		NO_2 Black body			
		SO_2 Grey body			
		NH_3 Red dot			
		NO_2 Black body			
		SO_2 Grey body			
		NH_3 Red dot			
		NO_2 Black body			
		SO_2 Grey body			
		NH_3 Red dot			
		NO_2 Black body			
		SO_2 Grey body			
		NH_3 Red dot			

YARA PILBARA NITRATES NITROGEN AND SULFUR DEPOSITION STUDY INSTRUCTIONS

RAINWATER SAMPLING

Rainwater samples will be collected monthly using the N-CON ADS "wet-only" rainwater sampler. Some species, such as organic acids, ammonia and sulfate, can be consumed by bacteria so it is essential that thymol, a biocide, be added to the sample bottle before it is placed in the field.

It is important to measure the amount of rain that falls at each site. This will be done in two ways. The first is to measure the rainfall using a simple rain-gauge, which will be mounted near the sampler. The second is to carefully measure the amount of rainwater in the sampler bucket without contaminating it.

The sampler bottles should be permanently marked with a site number.

(Note this is just a suggestion for how to carry out the sampling; if you find a more efficient way that's fine. The main things we want to ensure is that we can trace the sample identification from collection to sample analysis and that the samples are not contaminated by hands or by the previous sample).

EQUIPMENT REQUIRED FOR EACH VISIT

1. 3 * 3.5 gallon container for rainwater samplers
2. Distilled water
3. Wash bottle
4. 1 * 100 ml bottles with 40mg thymol (1 per site)
5. Thymol
6. Thymol measuring spoon
7. New rainwater Log sheet and current month's log sheet.
8. Weighing scales
9. ADS User Manual

BEFORE VISITING SITES

Rinse out the 3.5 gallon containers with distilled water. Add the number of level scoops of thymol as specified in the Table below to the 3.5 gallon bottles.

month	Level Scoops of thymol to add to 3.5 gallon rainwater sampler bottle
January, February, March	3
April, May, June	2
July, August, September, October, November December	1

YARA PILBARA NITRATES NITROGEN AND SULFUR DEPOSITION STUDY INSTRUCTIONS

Weigh each sites 3.5 gallon container for each site, and record the weight on each sites new log sheet.

AT THE SITES

Remove the 3.5 gallon sample bucket from the rainwater sampler following the instructions in the Section 3.1 of the ADS Users Manual. Cap the bottle. Record the time off in the current months log sheet.

Install the new empty sample bucket (with thymol in it), make sure the site number is clearly marked on the bottle. Record the time on in the new log sheet.

Install the new empty bottle (with thymol in it), make sure the site number is clearly marked on the bottle. Record the time and date on in the new log sheet.

AFTER SITE VISIT

Remove the lid from the 3.5 gallon sample bucket with rainwater sample and weigh the bottle. Record the WEIGHT in the current month's rainwater log sheet.

CMAR will send two 100 ml bottles per sampling site which contain 40mg of thymol. During the higher rainfall months the rainwater samples may need to be collected more than once a month, CMAR will send a spare set of 100ml bottles which also contain 40mg of thymol.

Decant approx 100 ml of sample from the 3.5 gallon sample bucket into a 100ml bottle using the funnel. Rinse and dry the funnel before use. Label the bottle with ON and OFF dates, SITE ID and RW (to indicate the sample type). If the volume of rainwater is less than 100 ml, weigh the 100 ml bottle before and after the rainwater sample is decantered into it.

Label one 100ml bottle with ON and OFF dates and BLANK. This will be an empty bottle that will be flushed with Milli Q water at CMAR and analysed as a blank.

CSIRO Marine and Atmospheric Research

Rainwater Sampler Record Sheet

Yara Pilbara Nitrates nitrogen and sulfur deposition study.

Month:

Site Number	Rain Gauge (mm)	Rainwater Sampler Weight (g)	Date/Time On	Date/Time Off	Comments

Good day Rajan,

After the training course and our discussion in the car today here is condensed the monitoring activity for the three new sites:

1. MiniVol – dust monitoring, runs once every 6 days. The run days are same all over Australia, and the next run day is 24 August 2013 than 30 August 2013 and so on. The 47 mm filters to be used with the minivol have to be weighted before and after exposure the difference than has to be divided by the amount of air in 24 hours base on the 5l/min flow. All the calculation formulas are very well explained in the TAS MiniVol manual left with the Laboratory Staff. The filter weighting has to be done in a controlled environment for temperature and humidity (practically the whole set up including the microbalance has to be kept at same temperature and humidity).

Wet Precipitation Sampler – the buckets have to be primed as instructed by CSIRO and be exposed in the field for one month at the time. At the end of the month the buckets have to be changed with a fresh one and the exposed bucket have to be sent for analysis (CSIRO)

3. Dust Deposition Bottle – the bottle has to be primed with the same chemicals as for the Rain Water sampler and exposed in the field for one month. After one month the bottles have to be collected, new bottles installed and the exposed bottles have to be analysed for "Total solids". The mining industry standard calls for the results to be below 5miligrams/m2/month. If the resulta are exceeding this value, I recommend to ask a laboratory like ALS to perform an "Ash analysis" which will reveal only the mineral matter deposited over the month.

4. Gas analyser – supplied by CSIRO – exposure and analysis as required by CSIRO

5. Rain Gauge – used to measure the amount of rain over a period of time – I suppose over a month. When the bucket of the wet rain sampler is collected, read the amount of rain as indicated by the level in the little tank, record this figure than empty the tank and expose for another period of time.

APPENDIX F: READINGS MIE ADR-1500 PARTICULATE MONITOR (PM10)

AVALIABLE AS PER REQUEST IN YARA/TR OFFICE

ATTACHMENT 11

Water inventory for dust supression

Notes:

- This attachment is left blank because there are no water records for dust suppression.

ATTACHMENT 12

Air quality monitoring equipment at site boundary.

Table 1: Air Quality Monitoring Equipment located at Site Boundary.

Type of Monitoring	**Monitoring Location**	**Monitoring Frequency**	**Monitoring Equipment**	**Trigger Threshold for Additional Mitigation**
Construction Compliance Monitoring (During Construction for a Period of 31 months)				
PM_{10} ambient concentration	E1 - Eastern site boundary	Continuous	One TEOM (*AS 3580.9.8:2008)*	The trigger level is proposed to be set at three levels (Alert Level, Remedial Action Level and Extreme Action Level) to be protective of the overall 24-hour average PM_{10} criterion (50 µg/m^3).
	W1 – Western site boundary	Continuous	One TEOM (*AS 3580.9.8:2008)*	
Dust deposition	E1 - Eastern site boundary	Monthly	One Deposition gauge (*AS 3580.10.1: 2003*)	Total of 4 g/m^2/month, with no more than 2 g/m^2/month above baseline levels. Baseline levels are defined through baseline monitoring (detailed in OAQMP).
	W1 – Western site boundary	Monthly	One Deposition gauge (*AS 3580.10.1: 2003*)	
Weather Monitoring (Continuous During Construction Compliance Monitoring)				
Wind speed and direction	W1 – Western site boundary	Continuous	Anemometer	
Temperature		Continuous	Temperature sensor	
Rainfall rate		Monthly	Tipping rain gauge	

Table 2: Coordinates of monitoring locations at Site Boundary.

Monitoring location	North	East
W1 – Western site boundary	7719573	4776617
E1 - Eastern site boundary	7719390.6	478398.6

Table 3: Air Quality Monitoring Equipment located at CSIRO rock art sensitive receptors

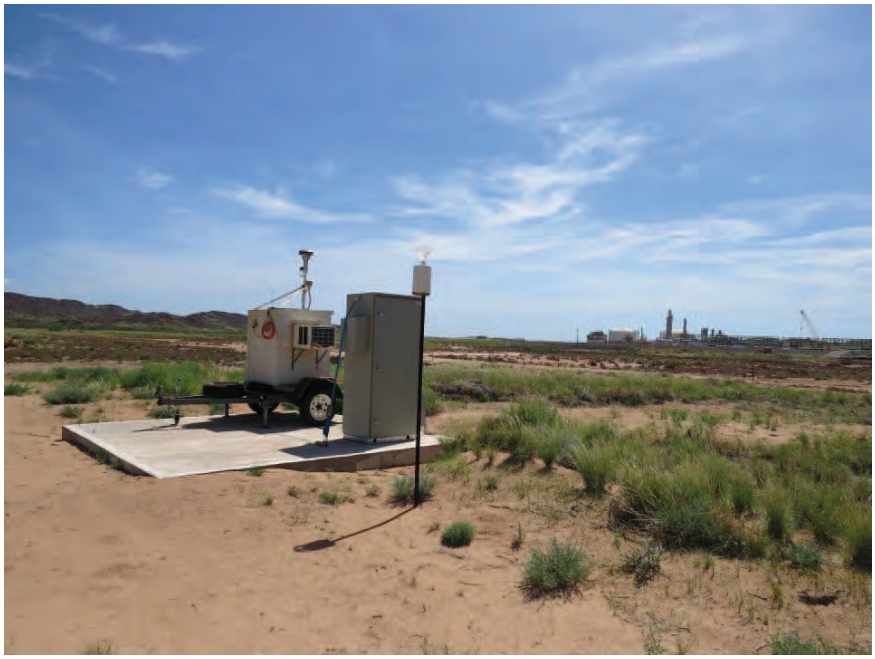
Type of Monitoring	**Monitoring Location**	**Monitoring Frequency**	**Monitoring Equipment**	**Trigger Threshold for Additional Mitigation**
Construction Compliance Monitoring: *During Construction for a Period of not less than 24 months beginning from the commencement of construction. Air quality readings during the twenty four (24) months of baseline monitoring are taken at least four (4) times in every 12 months.* *Air quality monitoring of the rock art monitoring sites (sites 5, 6 and 7) is continued for an additional period of five (5) years, following the establishment of baseline data and once operation has commenced.*				
PM_{10} ambient concentration	Site 5-Burrup road	Continuous	MIE ADR-1500 particulate monitor	The trigger level proposed is PM_{10} criterion (30 µg/m^3).
	Site 6-Water tanks	Continuous	MIE ADR-1500 particulate monitor	
	Site 7-Deep gorge	Continuous	MIE ADR-1500 particulate monitor	
PM_{10} ambient concentration	Site 6-Water tanks	Once every 6 days, 24 hours	Minivol TAS	
Dust deposition	Site 5-Burrup road	Monthly	One Deposition gauge (*AS 3580.10.1: 2003*)	Total of 4 g/m^2/month.
	Site 6-Water tanks	Monthly	One Deposition gauge (*AS 3580.10.1: 2003*)	
	Site 7-Deep gorge	Monthly	One Deposition gauge (*AS 3580.10.1: 2003*)	
Rainwater sampling	Site 5-Burrup road	Monthly	One ADS Atmospheric Precipitation sampler. One tipping rain gauge.	If there is more than 150 mm of rain expected during the month, the rainwater gauge and possibly the bucket will overflow. In that case the sites should be visited to record the amount of rain in the gauge.
	Site 6-Water tanks	Monthly	One ADS Atmospheric Precipitation sampler. One tipping rain gauge.	
	Site 7-Deep gorge	Monthly	One ADS Atmospheric Precipitation sampler. One tipping rain gauge.	
Passive Gas samplers: ammonia (NH_3), nitrogen oxides (NO_x) and sulphur oxides	Site 5-Burrup road	Monthly	Two passive gas samplers for ammonia (red dot), nitrogen oxides (black body) and sulphur oxides (grey body).	

(SO_x)	Site 6-Water tanks	Monthly	Two passive gas samplers for ammonia (red dot), nitrogen oxides (black body) and sulphur oxides (grey body).	
	Site 7-Deep gorge	Monthly	Two passive gas samplers for ammonia (red dot), nitrogen oxides (black body) and sulphur oxides (grey body).	

Table 4: Coordinates of monitoring locations at CSIRO rock art sensitive receptors

Monitoring location	North	East
Site 5-Burrup road	7719785.440	475960.020
Site 6-Water tanks	7720111.530	477700.810
Site 7-Deep gorge	7718030.620	477984.200

Picture 1: E1 - Eastern site boundary.



Picture 2: E1 - Eastern site boundary.

Picture 3: W1 - Western site boundary.

Picture 4: W1 - Western site boundary.

ATTACHMENT 13

Air quality monitoring equipment at Rock Art sites.

Picture 1.1: Site 5-Burrup road

Picture 1.2: Site 5-Burrup road

Picture 2.1: Site 6-Water tanks.

Picture 2.2: Site 6-Water tanks.

Picture 3.1: Site 7-Deep George

Picture 3.2 Site 7-Deep George

ATTACHMENT 14

WEED MAPPING REPORT

Notes:

- This attachment includes the weed mapping report develop between January 2015 and June 2015, attachment 04 of Compliance Report for Weeds Management (2-250-329-8093-att04).

- For weed mapping report from July 2015 to December 2015, refer to attachment 04 of Compliance Report for Weeds Management (2-250-329-REP-TRE-8104 att04), available upon request.

ATTACHMENT 04

WEED MAPPING REPORT

TABLE OF CONTENTS

ABBREVIATIONS

CEMP:	Construction Environmental Management Plan.
CWTH:	Commonwealth.
DEC:	Department of Environment and Conservation.
DRF:	Declared Rare Flora.
EPA:	Environmental Protection Authority.
EPBC:	Environment Protection and Biodiversity Conservation Act 1999.
JHA:	Job Hazard Analysis.
MSDS:	Material Safety Data Sheet.
TAN:	Technical Ammonium Nitrate.
TEC:	Threatened Ecological Communities.
TRSA:	Tecnicas Reunidas S.A.
WA:	Western Australia.

1. GENERAL INFORMATION

Técnicas Reunidas (TR) understands the importance of protecting the unique biota of the Burrup Peninsular. A Construction Environmental Management Plan (CEMP) has been established to address the potential environmental issues associated with the construction of the TAN Burrup Project (the project) and to make sure that they are compliant with the appropriate environmental legislation. In addition, a Biosecurity Management Plan and Site Plan for Department of agriculture actions for the modules shipments have been also developed and implemented.

Prevention is the best weed management tool. Direct control has to be part of integrated management of an area.

Managing the site to prevent and control weed invasion requires:

- Identification of the priority weeds in the system and controlling them first
- Dedication and monitoring to ensure quick action is taken to tackle the weed before it becomes a problem
- Focus on the invaded ecosystem rather than the invader. Surrounding activities that may be encouraging the spread of weeds such as the use of weed infested fill for construction or nutrient runoff.
- Education. People need to be aware of how their actions and presence at a site may impact on the natural environment by the introduction or spread of weeds.

2. LEGISLATION

Flora and weeds are governed under Commonwealth (Cwth) and Western Australian State (WA) legislation. Table 1 outlines the legislation relating to each aspect of the work required under the Construction Environment Management Plan: Attachment 10, (Técnicas Reunidas 2012).

Table 1: Relevant Legislation

Legislation	Application
FLORA	
Environment Protection and Biodiversity Conservation Act 1999 (CWTH)	Assesses the conservation significance of fauna and flora species and forms the framework for significant species protection at the Commonwealth level. Provides for the protection of matters of National Environmental Significance.
Environmental Protection Act 1986 (WA)	State environmental impact assessment and Ministerial approval process.
WEEDS	
Biological Control Act 1985 (CWTH)	Under which a weed may be declared a target for biological control, or a weed control agent may be identified.
Environment Protection and Biodiversity Conservation Act 1999 (CWTH)	Protection on environmental matters of national significance. The EPBC Act also regulates the import and export of plants.
The Quarantine Act 1908 (CWTH)	Enables the Australian Quarantine and Inspection Service to physically prevent the introduction of weeds through the inspection of incoming luggage, cargo, mail, animals and plants and their products. It also provides inspection and certification for a range of exports.
Biological Control Act 1985 (CWTH)	Under which a weed may be declared a target for biological control, or a weed control agent may be identified.
Environment Protection and Biodiversity Conservation Act 1999 (CWTH)	Protection on environmental matters of national significance. The EPBC Act also regulates the import and export of plants.

3. BACKGROUND INFORMATION

3.1. VEGETATION MAPPING

Vegetation in the TAN Burrup survey area has previously been mapped by Outback Ecology in April 2009. Of the vegetation types previously mapped in the survey area, Coastal Flats, Saline Inlet and Supratidal Flats are the vegetation types associated with the areas of remnant vegetation (Outback 2009).

3.2. PREVIOUSLY RECORDED WEED SPECIES

Three species of flora, Cenchrus ciliaris (Buffel Grass), Aerva javanica (Kapok Bush), and Vachellia farnesiana, have previously been recorded within the project area.

Buffel Grass was side spread throughout the project area and still occurs within the uncleared vegetation within the project area. The native vegetation that has been cleared can be found in. The *Vachellia farnesiana* was recorded in the north-western section of the project area. This area has now been cleared and it is likely that this species has been removed from site.

3.3. POTENTIALLY OCCURRING WEED SPECIES

None of the introduced flora species recorded in the project area are listed as Declared Weeds under the *Agricultural and Related Resource Protection Act 1976*. However, they are listed under the *Environmental Weed Strategy* for Western Australia (DEC, 1993), as having a 'High' rating.

4. WEED MONITORING AND MITIGATION MEAURES REPORTING

4.1. Weed Monitoring (January – December 2013)

On the 25th and 26th of May 2013 the TAN Burrup Project Area was traversed to develop the baseline weed survey and the weed species were mapped. Of the three species identified as occurring in the project area prior to clearing, only two, *Cenchrus ciliaris* (Buffel Grass) and *Aerva javanica* (Kapok Bush) (Figure 4.1-1 and Figure 4.1-2, respectively, were encountered during the survey).

Figure 4.1-1 Buffel Grass (Cenchrus ciliaris) with some clumps of Sppinifex (*Triodia sp.*)

Figure 4.1-2 Kabok Bush (*Aerva javanica*)

On 11th December 2013, after fumigation campaigns carried out in July and October 2013, an updated weed survey map was developed, thus identifying the occurrence of weed species in the remnant vegetation on the TANPF Project have been mapped in Figure 4.1-3: Weed Control Map July and October 2013.

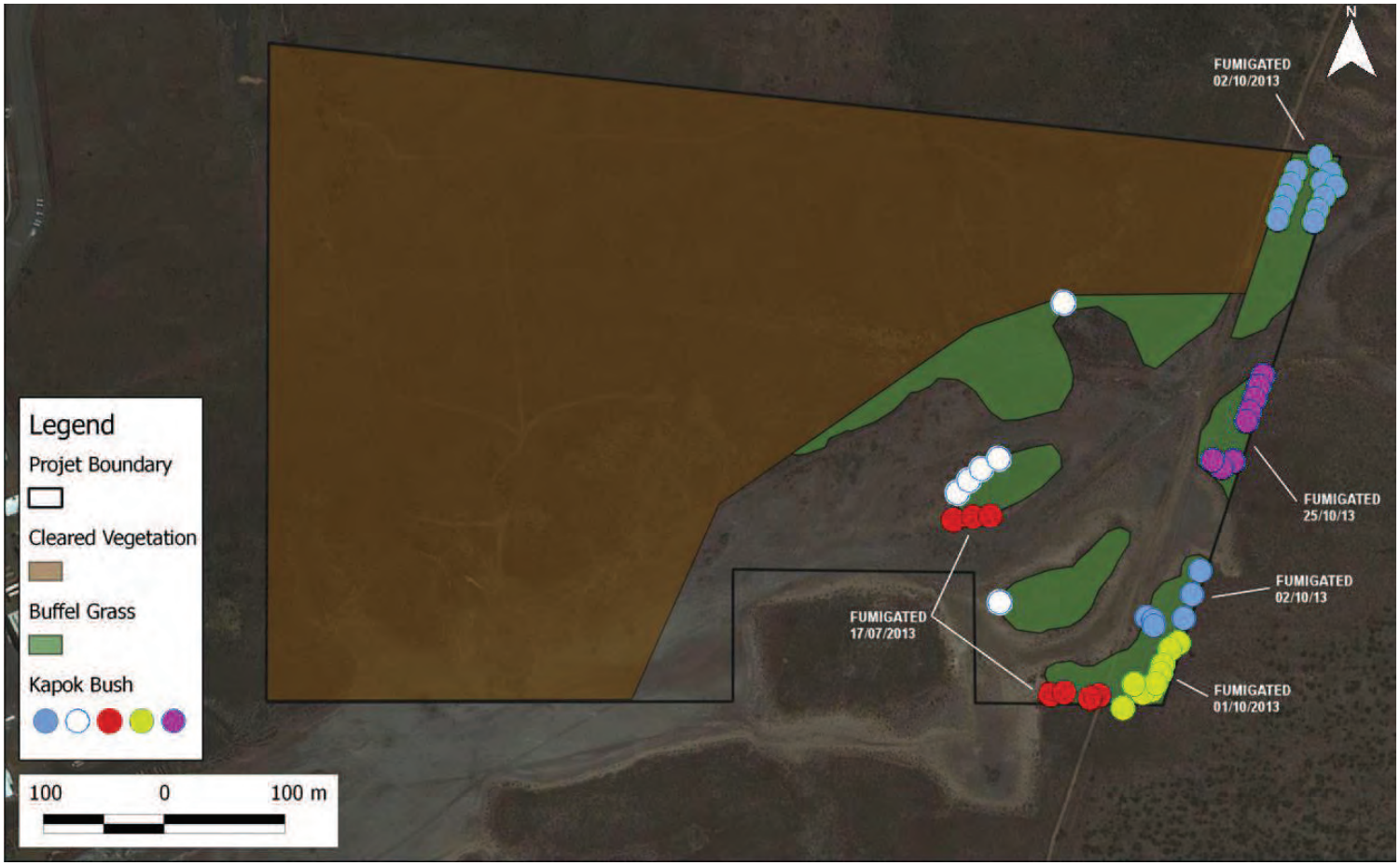


Figure 4.1-3 Weed Control Map July and October 2013.

4.2. WEED MONITORING (JANUARY – DECEMBER 2014)

On the 1st December and 15 of December the TAN Burrup Project Area was traversed to update the baseline weed survey. Of the species identified previously occurring in the project area prior to clearing, *Cenchrus ciliaris* (Buffel Grass) and *Aerva javanica* (Kapok Bush) are found to be spreading out within the TANPF. Birdwood grass has also been identified close to the fence. (Figure 4.1-1 and Figure 4.1-2, respectively, were encountered during the survey). Refer to Figure 4.3-1 Weed Control Map 15th of December 2014.

The inspections results are that re-occurrence of same weed species around the Temporary Site Facilities (around main office building) and along the fence mapped have occurred.

Figure 4.2-1 Kabok Bush (*Aerva javanica*), *Cenchrus ciliaris* (Buffel Grass) and Birdwood grass

4.3. WEED MONITORING (JANUARY – JUNE 2015)

On the 1st of January and 30th of June 2015 the TAN Burrup Project Area was traversed to update the baseline weed survey.

Due to the increasing areas infested by KAPOK during the last period, it has been decided to take mitigation control by February 2015. Physical/manual control by means of hand pulling has been chosen to control the weeds as it is the most environmentally friendly and labour intensive method of weed control. The key to hand pulling is to remove the entire plant, ensuring propagules are not left behind to prosper.

Hand

The inspections results are that re-occurrence of same weed species around the Temporary Site Facilities (around main office building) and along the fence mapped have occurred.

Figure 4.3.1

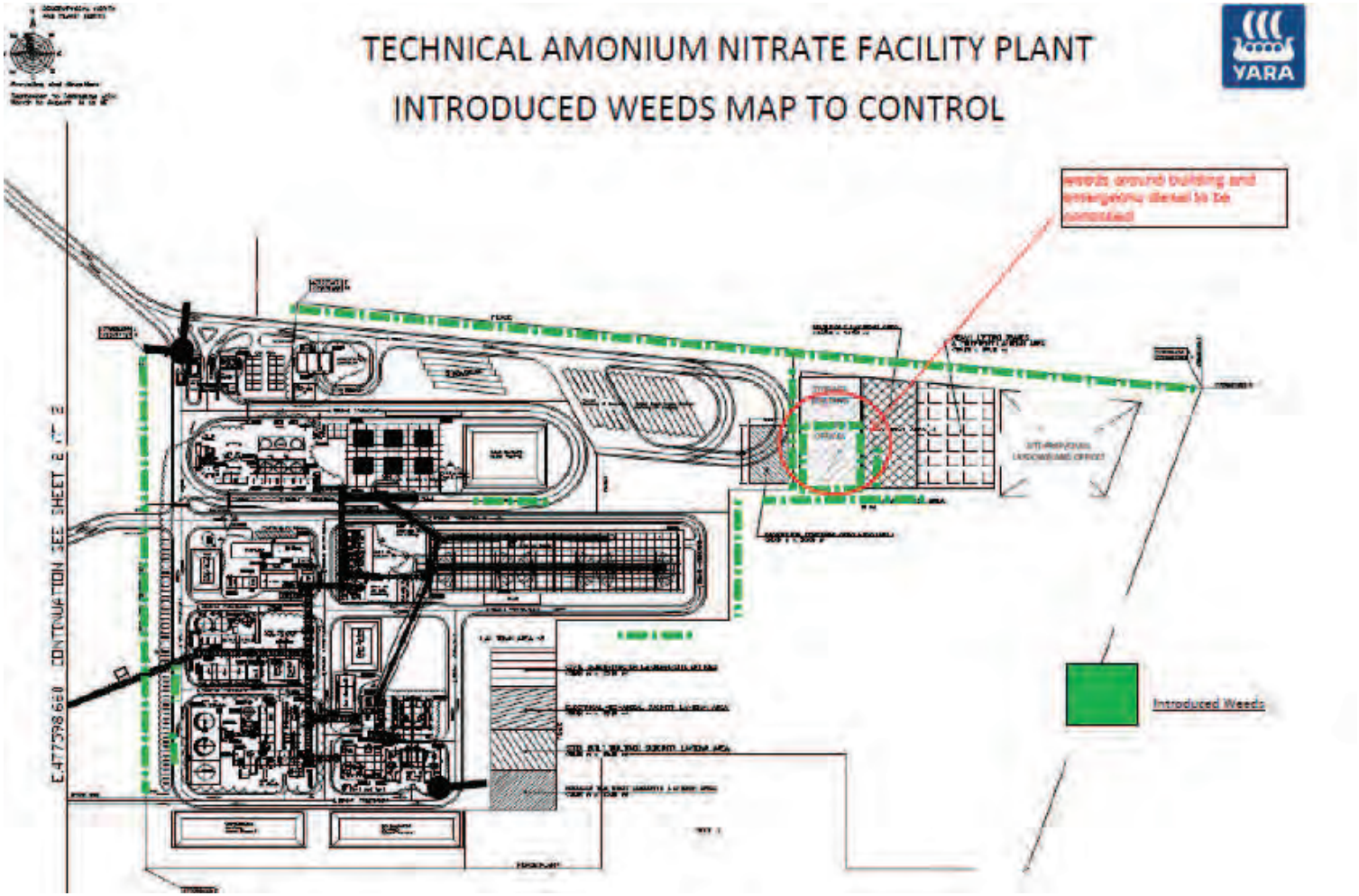
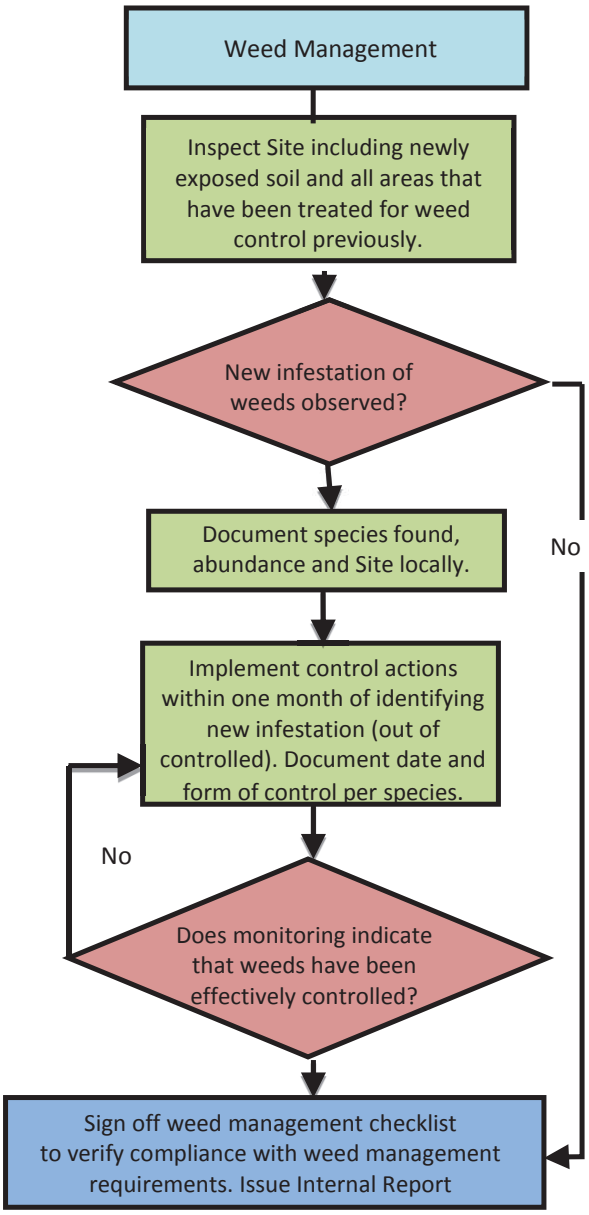


Figure 4.3-1 Weed Control Map December 2014/2015

5. CONTINGENCY RESPONSE

The following contingency plan (Figure 5-1) has been be implemented by the EO in any event of weed discovery within the fenced Site out of control. The TRSA Site Manager has provided all necessary resources, with all Site team members to cooperate as required.

Figure 5-1 Weed Management Contingency Plan



6. DISSCUSSION

During the throughout TANPF development, Buffel Grass is observed to be spread over the remnant vegetation on the site. Its occurrence is restricted to the sandy areas which support the vegetation previously mapped as Coastal Flats (Ecologia 2009). Little penetration of Buffel Grass occurs into the areas mapped as Saline Inlet and Supratidal Flats, as these areas are more saline. Buffel Grass was also identified as being widespread throughout the Coastal Flats vegetation type outside of the project boundary.

By May 2013 and by December 2013, it was observed that the areas infested by Kapok Bush was increasing and becoming denser with a wide distribution and environmental impacts thus starting to be uncontrolled in the Temporary Construction Facility (TCF) and the south fence (figure 1).

Chemical control by means of herbicides was determined to be sprayed to eradicate the weeds and control. There are four key types of herbicides: residual, contact, translocated, and selective.

Residual — These herbicides remain active in the soil and are absorbed into the plant by the roots. They are not recommended for areas to be planted or direct seeded. An example is Ronstar®.

Contact — These herbicides only kill the plant material they come into contact with. Not effective for plants with underground propagules such as bulbs, rhizomes or stems. An example is steam, Basta®.

Translocated — The most commonly used herbicide, this chemical is translocated into the roots of the plant killing the above and below ground parts. An example is Roundup ® or glyphosate).

Selective — Examples of selective herbicides are Verdict® and Fusilade®. They are very useful especially for targeting grasses in native vegetation. Low concentrations of some of the hormone-based herbicides containing 2,4-D amide, for example Ally® and Brushoff® can also be safely sprayed amongst native vegetation without killing it. The key coastal weeds these herbicides target are Bridal Creeper and Pelargonium. As a precaution, native vegetation, especially seedlings, should be guarded from direct spray.

Following Allpest recommendations, the translocated type herbicide glyphosate and residual herbicide have been sprayed in the infested areas by KAPOK. Fumigation campaigns have been carried out by Allpest in July 2013 (Appendix C) and October 2013 (Appendix D).

Refer to glyphosate Material Safety Data Sheet and Job Hazard Analysis under appendix A and Appendix B, respectively.

From June 2014 - December 2014, KAPOK BUSH infestations and some traces of BUFFEL GRASS have been identified in the Temporary Construction Facility (TCF), septic tank area and diesel generator area, both serving the Temporary Main Office. In additional along the fence, it was observed that some weeds outside the fence are starting to spread to the inner plant of the fence and monitoring will be prioritise in this areas for the following six months.

Due to the increasing areas infested by KAPOK, it has been decided to take mitigation control by February 2015. Physical/manual control by means of hand pulling has been chosen to control the weeds as it is the most environmentally friendly and labour intensive method of weed control. The key to hand pulling is to remove the entire plant, ensuring propagules are not left behind to prosper.

Hand

Due to Buffel Grass being widespread outside of the project area, control of this species in the remnant vegetation is unachievable. This is mainly due to the dispersal of this species' seeds being by wind. However, as the Kapok occurs only in isolated clumps the management of this species within the TAN Burrup Project Area is a lot more feasible. It is recommended to keep spraying of individuals in order to remove this specie from within the project area.

Continued vigilance in the monitoring of equipment for weeds as it is brought onto site will further help stop weed species being introduced to the site and minimise their spread.

This report has been prepared as a record of the occurrence and distribution of weed species in the TANPF Project area during the TANPF development.

7. REFERENCES

Astron Environmental Pty Ltd (Astron) (2001). *Flora Vegetation Survey of the Proposed Ammonia Plant*. Unpublished report prepared for Sinclair Knight Merz on behalf of the Burrup Fertilisers Pty Ltd.

Biosecurity Management Plan, 20Cube.

BOM (2013) *Bureau of Meteorology.* http://www.bom.gov.au site accessed March 2013

Commonwealth of Australia (2012) *Environmental Protection and Biodiversity Act 1999.*Author, Canberra.

Department of Environment and Conservation (2012) *Environmental Protection Act 1986.* Author, Perth

Department of Environment and Conservation (2012) *Wildlife Conservation Act 1950.* Author, Perth

Department of Environment and Conservation (2013) *NatureMap.* Website accessed in May 2013. http://naturemap.dec.wa.gov.au/default.aspx

Environmental Protection Authority (EPA) (2001) *Guidance for the Assessment of Environmental Factors: Guidance Statement for the protection of tropical arid zone mangroves along the Pilbara coastline No. 1.*

Environmental Protection Agency (2004) *Guidance for the Assessment of Environmental Factors: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia. No 51.*

Environmental Protection Agency (2005) *Guidance for the Assessment of Environmental Factors: Separation Distances between Industrial and Sensitive Land Uses. No 3.*

ERM (2010) *Technical Ammonium Nitrate Production Facility: Public Environmental Review for Burrup Nitrates Pty Ltd.* Unpublished document for Burrup Nitrates Pty Ltd.

Outback Ecology (2009) *Proposed Technical Ammonium Nitrate Production Facility Site, Burrup Peninsula.* Unpublished report for Burrup Nitrates.

Site Plan for Department of agriculture actions for the modules shipments, Tecnicas Reunidas, October 2013.

Tecnicas Reunidas (2012) *Construction Environmental Management Plan*, Doc. No. 2-250-329-PRO-TRG-0111.Rev.03

APPENDIX A: MATERIAL SAFETY DATA SHEETS (MSDS) FOR CHEMICALS USED FOR FUMIGATION

MATERIAL SAFETY DATA SHEET

Accensi Pty Ltd	Date Issued: 23 April 2010
Narangba, Qld 4504	Fax (07) 3897 2022
Phone: (07) 3897 2000	Product Code: GLYAC36BL
www.accensi.com.au	

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Glyphosate 360

COMPANY IDENTIFICATION:
Accensi Pty Ltd
60 -76 Potassium Street
Narangba, Queensland 4504

USE: Non selective control of perennial and annual weeds in certain crops.

2. COMPOSITION / INFORMATION ON INGREDIENTS:

Ingredients	CAS Reg. No.	Conc.
Glyphosate, present as 1:1 isopropylamine salt	1071-83-6	360g/L
Water	7732-18-5	HIGH
Other ingredients determined non-hazardous.		LOW

Proportion (% weight per weight): VHIGH >60, HIGH 30-60, MED 10-29, LOW 1-9, VLOW <1

3. HAZARDOUS IDENTIFICATIONS:

- Not classified as hazardous according to criteria of Worksafe Australia.

POTENTIAL HEALTH EFFECTS: This section includes possible adverse effects, which could occur if this material is not handled in the recommended manner.

EYE: May be an eye irritant.

SKIN: Contact with skin may result in irritation.

INGESTION: No adverse effects expected, however, large amounts may cause nausea and vomiting.

INHALATION: Breathing in mists or aerosols may produce respiratory irritation.

SYSTEMIC (other target organ): According to studies on animals Glyphosate caused no changes in blood, kidneys or liver. The studies were conducted at doses up to 500 mg/kg

CANCER INFORMATION: The EPA has stated that there is sufficient evidence to conclude that Glyphosate is not carcinogenic in humans.

TERATOLOGY (Birth defects): No effects noted.

REPRODUCTIVE EFFECTS: It is unlikely that the compound would produce any reproductive effects in humans.

MUTAGENICITY: This compound poses little mutagenic risk to humans.

4. FIRST AID:

If poisoning occurs, immediately contact a doctor or **Poisons Information Centre (telephone 13 11 26)**, and follow the advice given. Show this Material Safety Data Sheet to a doctor.

EYE: Rinse immediately with plenty of water for at least 15 minutes, holding eye open and taking care to rinse under eyelids as well. If irritation persist seek medical attention.

SKIN: Wash off skin immediately with soap and plenty of water. Remove all contaminated clothing and shoes. Seek medical advice if irritation persists. Launder contaminated clothing before re-use.

INGESTION: Wash out mouth with water. Do not induce vomiting. Keep patient at rest and seek medical advice.

INHALATION: Remove victim to fresh air. Seek medical advice if symptoms are experienced.

NOTE TO PHYSICIAN / FIRST AIDERS: Treat Symptomatically. Note the nature of this product.

5. FIRE FIGHTING MEASURES:

FLASH POINT: Not flammable

EXTINGUISHING MEDIA: Use media suited to burning material.

FIRE AND EXPLOSION HAZARDS: Decomposition products are toxic and corrosive. There is little or no chance of an explosion form this product if involved in a fire.

FIRE-FIGHTING EQUIPMENT: Wear full protective clothing including face mask, face shield and gauntlets.

Page 1 of 3

MATERIAL SAFETY DATA SHEET

Accensi Pty Ltd	Date Issued: 23 April 2010
Narangba, Qld 4504	Fax (07) 3897 2022
Phone: (07) 3897 2000	Product Code: GLYAC36BL
www.accensi.com.au	

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS:
In case of spills it is important to take all steps necessary to:

- Avoid eye and skin contact.
- Avoid contamination of waterways.

1. Keep all bystanders away.
2. Wear full-length clothing and PVC gloves.
3. Reposition any leaking containers so as to minimise further leakage.
4. Dam and absorb spill with an absorbent material (e.g. sand or soil).
5. Shovel the absorbed spill into drums and top with hydrated lime.
6. Disposal of the absorbent material will depend on the extent of the spill.
   - For quantities up to 50L of product bury in a secure land fill site.
   - For quantities greater than 50L seek advice from the manufacturer before attempting disposal. Contain in a secure location until disposal method is established.
7. Decontaminate spill area with hydrate lime scattered over the spill prior to rinsing off with water.

7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Store in a cool dry place away from direct sunlight. Store away from food and food stuffs for animal or human consumption. Store in its original container well sealed.

8. EXPOSURE CONTROL / PERSONAL PROTECTION:

EXPOSURE GUIDELINES: Exposure values at the TWA (Time Weighted Average) means the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. A time weight average (TWA) concentration for an 8 hour day, and 5 day week has not been established by Worksafe Australia for any of the ingredients in this product. There is a blanket recommendation of 10mg/m^3 for inspirable dusts or mists when limits have not otherwise been established.

ENGINEERING CONTROLS: In industrial situations, concentration values below the TWA value should be maintained. Values may be reduced by process modification, use of local exhaust ventilation, capturing substances at the source, or other methods. If you believe air borne concentrations of mists, dusts or vapours are high, you are advised to modify the process or environment to reduce the problem.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS: Avoid skin and eye contact and inhalation of vapour. Wear overalls, eye protection and impervious gloves. Use adequate ventilation. Eye washing and shower facilities available.

EYE / FACE PROTECTION: Face and eye protection should be worn. For help in selecting suitable equipment consult AS 1336 and AS/NZS 1337.

SKIN PROTECTION: Wear chemical resistant PVC or nitrile gloves. Wear cotton overalls and washable cotton hat. Wear boots. For help in selecting suitable gloves consult AS 2161 For help in selecting suitable clothing consult AS 2919. For help in selecting boots consult AS/NZS 2210

RESPIRATORY PROTECTION: Use in well-ventilated area. For help in selecting suitable equipment consult AS/NZS 1715.

APPLICATIONS AND ALL OTHER HANDLERS: After handling this product always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE: Yellow coloured viscous liquid.
ODOUR: Mild amine odour.
SOLUBILITY IN WATER: Completely soluble in water.
SPECIFIC GRAVITY: 1.162
BOILING POINT: About 100^{0}C, 100kPa
CORROSIVENESS: Not corrosive

10. STABILITY AND REACTIVITY

STABILITY: Stable under normal conditions. React with oxidising agents.

INCOMPATIBILITY: Avoid strong oxidising agents.

HAZARDOUS DECOMPOSITION PRODUCTS: This product is unlikely to spontaneously decompose.

HAZARDOUS POLYMERIZATION: This product is unlikely to spontaneously polymerise.

MATERIAL SAFETY DATA SHEET

Accensi Pty Ltd	Date Issued: 23 April 2010
Narangba, Qld 4504	Fax (07) 3897 2022
Phone: (07) 3897 2000	Product Code: GLYAC36BL
www.accensi.com.au	

11. TOXICOLOGICAL INFORMATION:

Glyphosate:
NOEL (No-observable-effects-level): 175mg/kg/day
ADI (Acceptable Daily Level): 0.03 mg/kg (EPA)
0.3 mg/kg/day (WHO)

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL DATA: Glyphosate is highly absorbed on most soils especially those with organic content. The compound is so strongly attracted to the soil that little is expected to leach from the applied area applied.

ECOTOXICOLOGY:
Glyphosate
Is only slightly toxic to wild birds.
Is practically non-toxic to fish.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: Dispose of empty, used containers by;

(a) Triple rinsing with water. Add the rinsings to the tank mix or dispose of rinsate in a disposal pit away from desirable plants and roots, and watercourses. On-site disposal of undiluted product is unacceptable.
(b) Breaking, crushing or puncturing the containers to prevent reuse.
(c) Disposing of in a local authority, bury landfill site that does not burn its refuse. If there is no local authority landfill readily available in your area, bury the containers under at least 50cm of soil at a licensed/approved disposal site. DO NOT burn empty containers or product.

14. TRANSPORT INFORMATION:

ROAD AND RAIL TRANSPORT:
Not classified as Dangerous Goods by the criteria of the Australian dangerous goods Code (ADG) for the transport by Road and Rail.

MARINE TRANSPORT:
Not classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods code (IMDG Code) for transport by sea.

AIR TRANSPORT:
Not classified as dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for the transport by air.

15. REGULATORY INFORMATION:

POISON SCHEDULE: S5

- Not classified a hazardous according to criteria of Worksafe Australia.

16. OTHER INFORMATION:

All information in this data sheet is provided in good faith and is believed to be correct. Each user should consider the information in this safety data sheet within the context of their particular application as Accensi Pty Ltd cannot anticipate or control conditions under which this product may be used. Accensi Pty Ltdl will not be responsible for any damages arising out of the use or reliance upon the information in this safety data sheet. No expressed or implied warranties are given other than those implied mandatory by Commonwealth, State or Territory legislation.

Please read all labels carefully before use.

Contact: **Emergency Services**
Ph: 000

Page 3 of 3

Nufarm

Safety Data Sheet

Page: 1 of 4

Infosafe No™ NU03Z Issue Date :June 2013 ISSUED by NUFARM

Product Name **SPRAY MARKER DYE**

Classified as hazardous

1. Identification

GHS Product Identifier	SPRAY MARKER DYE
Product Code	3346
Company Name	NUFARM AUSTRALIA LIMITED. (ABN 80 004 377 780)
Address	103-105 Pipe Road Laverton North Victoria 3026 Australia
Telephone/Fax Number	Tel: +61 3 9282-1000 Fax: +61 3 9282-1001
Emergency phone number	1800 033 498 (24hr Australia)
Recommended use of the chemical and restrictions on use	Liquid marking dye and foam marker colouring agent.
Other Information	This MSDS describes, to the best of our knowledge, the properties of the concentrated product. The physical properties and some of the assessments do not apply to the properties of the product once it has been diluted for application. Acute health effects of the diluted product are likely to be much less severe.

2. Hazard Identification

GHS classification of the substance/mixture	Acute Toxicity - Oral: Category 3 Eye Damage/Irritation: Category 1
Signal Word (s)	DANGER
Hazard Statement (s)	Harmful if swallowed. Causes serious eye damage.
General Precautionary Statement (s)	If medical advice is needed, have product container or label at hand. Keep out of reach of children. Read label before use.
Pictogram (s)	Corrosion, Skull and crossbones

Precautionary statement – Prevention	Wash hands and exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection.
Precautionary statement – Response	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.
Other Information	Poisons Schedule : Not Scheduled

3. Composition/information on ingredients

Chemical Characterization	Liquid		
Ingredients	**Name**	**CAS**	**Proportion**
	Rhodamine B	81-88-9	150 g/L
	Other non hazardous ingredients		0-30 %
	Diethylene glycol	111-46-6	60-90 %

4. First-aid measures

Inhalation	Remove affected person to fresh air until recovered. If symptoms develop or

Nufarm

Safety Data Sheet

Page: 2 of 4

Infosafe No™ NU03Z Issue Date : June 2013 ISSUED by NUFARM

Product Name **SPRAY MARKER DYE**

Classified as hazardous

persist, seek medical advice.

Ingestion Rinse mouth and then drink plenty of water.
If swallowed do NOT induce vomiting; seek medical advice immediately and show this container or label or contact the Poisons Information Centre on 13 11 26 (Aust). Make every effort to prevent vomit from entering the lungs by careful placement of the patient.

Skin Wash affected areas thoroughly with soap and water.
Remove contaminated clothing and launder before re-use.
If irritation persists, seek medical advice.

Eye contact If in eyes, hold eyelids open and wash with copious amounts of water for at least 15 minutes.

First Aid Facilities If poisoning occurs, contact a doctor or the Poisons Information Centre (Australia) on 13 11 26.

Advice to Doctor Treat symptomatically.
Gastric lavage with medicinal charcoal in water is recommended.

5. Fire-fighting measures

Suitable extinguishing media Water fog, foam, carbon dioxide or dry chemical.
Avoid using large volumes of water which would spread the product.

Hazards from Combustion Products If involved in a fire, it will emit oxides of carbon, oxides of nitrogen and possibly traces of hydrogen chloride.

Special Protective Equipment for fire fighters Breathable air apparatus may have to be worn if material is involved in fires especially in confined spaces.

6. Accidental release measures

Spills & Disposal Contain spill and absorb with clay, sand, soil or proprietary absorbent (such as vermiculite).
Collect spilled material and waste in sealable open-top type containers for disposal.
On-site disposal of concentrate is not acceptable.

Personal Protection For appropriate personal protective equipment (PPE), refer Section 8.

Clean-up Methods - Large Spillages If large liquid spills occur, attempt to recover as much spilt material from sumps and bunded areas, as possible, before absorbing remaining material into vermiculite or other absorbent.

Environmental Precautions Use earthen bunds or absorbent bunding to prevent spreading of spillage.
Prevent from entering drains, waterways or sewers.

7. Handling and storage

Precautions for Safe Handling Spray marker dye is coloured and will strongly stain skin and clothing. If skin has been exposed to the product, thorough washing with soap and water will remove any excess product. The colour on the skin is not deep and will naturally disappear over a few days.

Conditions for safe storage, including any incompatabilities Store in the closed, original container in a cool, well ventilated area.
Do not store for prolonged periods in direct sunlight.

Other Information Always read the label and any attached leaflet before use.

8. Exposure controls/personal protection

Occupational exposure limit values Safe Work Australia has set the following exposure standard for diethylene glycol : TLV (TWA) 100 mg/m3, STEL -.

Appropriate engineering controls Handle in well ventilated areas, generally natural ventilation is adequate.

Personal Protective Equipment It is good practice to wear suitable personal protective equipment (PPE).
When opening the container, preparing spray and using the prepared spray wear cotton overalls buttoned to the neck and wrist and a washable hat, elbow-length PVC gloves and goggles.

Hygiene Measures After use and before eating, drinking or smoking, wash hands, arms and face thoroughly with soap and water.
After each day's use, wash contaminated clothing and safety equipment.

Nufarm

Safety Data Sheet

Page: 3 of 4

Infosafe No™ NU03Z Issue Date : June 2013 ISSUED by NUFARM

Product Name **SPRAY MARKER DYE**

Classified as hazardous

9. Physical and chemical properties

Form	Liquid
Appearance	Deep red liquid.
Melting Point	<0°C
Boiling Point	>240°C
Solubility in Water	Soluble in water.
Specific Gravity	0.945
pH	3.7 - 4.0 (1% solution)
Vapour Pressure	0.0013 kPa @ 20°C (diethylene glycol)
Volatile Component	None
Partition Coefficient: n-octanol/water	Kow Log P is 1.95 for Rhodamine B
Flash Point	>96°C
Flammability	Combustible

10. Stability and reactivity

Hazardous Decomposition Products	Avoid contact with aluminium, alumin alloys, copper rich alloys and neoprene.
Possibility of hazardous reactions	Violent reactions between spray marker dye and oxidising agents are possible.
Hazardous Polymerization	Hazardous polymerisation is not possible.

11. Toxicological Information

Acute Toxicity - Oral	LD50 (rat) 400 - 2000 mg/kg for Rhodamine B
Ingestion	Possible symptoms of exposure include: nausea, vomiting and central nervous system depression.
Inhalation	May cause irritation to mucous membranes and respiratory tract. The components of the product are of low volatility and no adverse effects are expected from handling the concentrate. Breathing vapour can result in headaches and nausea.
Skin	Prolonged contact with the concentrate may cause irritation. Prolonged contact with the concentrate can cause defatting of the skin and may result in dermatitis. This product will stain the skin which may persist for some time.
Eye	Prolonged contact with the concentrate may cause damage to the eye.
Carcinogenicity	Rhodamine B has been assessed in animals and some data exists that Rhodamine B is a substance which causes some concern for humans owing to possible carcinogenic effects from long term exposure, but in respect of which the available information is not adequate for making a satisfactory assessment. Rhodamine B has been included on US EPA List 4B. List 4B contains substances for which the US EPA has sufficient information to reasonably conclude that the current use pattern in pesticide products will not adversely affect public health or the environment.
Serious eye damage/irritation	The product is an eye irritant.
Skin corrosion/irritation	Mild skin irritant.

12. Ecological information

Other Precautions	Do not contaminate dams, waterways or sewers with this product.
Acute Toxicity - Fish	LC50 (96hr) for fish is 10 - 100 mg/l for Rhodamine B

Nufarm

Safety Data Sheet

Infosafe No™ NU03Z Issue Date : June 2013 ISSUED by NUFARM

Product Name **SPRAY MARKER DYE**

Classified as hazardous

13. Disposal considerations

Product Disposal

On site disposal of the concentrated product is not acceptable.

Ideally, the product should be used for its intended purpose. If there is a need to dispose of the product, approach local authorities who hold periodic collections of unwanted chemicals (ChemClear®).

Container Disposal

Do not use this container for any other purpose.

drumMUSTER is the national program for the collection and recycling of empty, cleaned, non returnable crop production and on-farm animal health chemical containers. If the label on your container carries the drumMUSTER symbol, triple rinse the container, ring your local Council, and offer the container for collection in the program.

Triple or preferably pressure rinse containers before disposal. Add rinsings to the spray tank.

If recycling, replace cap and return clean containers to recycler or designated collection point.

If not recycling, puncture or shred and bury containers in local authority landfill.

If no landfill is available, bury the containers below 500mm in a disposal pit specifically marked and set up for this purpose clear of waterways, desirable vegetation and tree roots.

Empty containers and product should not be burnt.

14. Transport information

Transport Information

It is good practice not to transport agricultural chemical products with food, food related materials and animal feedstuffs.

Storage and Transport

Considered non dangerous for transport by the Australian Code for the Transport of Dangerous Goods by Road and Rail.

15. Regulatory information

Poisons Schedule

Not Scheduled

National and or International Regulatory Information

Rhodamine B has been included on US EPA List 4B. List 4B contains substances for which the US EPA has sufficient information to reasonably conclude that the current use pattern in pesticide products will not adversely affect public health or the environment.

Other Information

This product is registered with the Australian Pesticides and Veterinary Medicines Authority (APVMA). APVMA product number: 50498.

16. Other Information

Date of preparation or last revision of SDS

Revised 12/06/2013.
This SDS replaces document dated June 2008.

Contact Person/Point

Normal Hours: Mrs Kathleen Marsh Phone: +61 3 9282 1000
After Hours: Shift Supervisor Phone: 1800 033 498

Revisions Highlighted

The MSDS was reviewed. Minor changes were made to the information.
Now issued in the GHS format.

...End Of MSDS...

Print Date: 12/06/2013

APPENDIX B: JOB HAZARD ANALYSIS (JHA) FOLLOWED BY TECHNICIAN DURING FUMIGATION

JOB HAZARD ANALYSIS

Date 15/07/2013 JHA Title RESIDUAL / SPRAY TREATMENTS FOR CONTAINERS ,WEEDS,YARDS,PLANT,VESSELS

Specific Job Location DAMPIER / KARRATHA Specific Task RESIDUAL TREATMENT JHA Ref# NWR713a

Originator Garry Althaus Employer ALLPEST Permit # (if applicable)

THE 6 STEPS TO COMPILING A QUALITY JHA ARE:

STEP 1 – PLANNING & PREPARATION

- Where practical, JHAs are to be developed and handwritten at the job site. JHAs may be electronically written, if the process of electronic JHAs is approved by KJV Area Const. Manager.
- Worksite inspection shall be conducted prior to developing JHA.
- Work team representative/s shall be involved in the development of the JHA.
- Refer to Hazid Worksheets, Work Method Statements, other relevant JHAs and relevant incident learning's when compiling the JHA.
- Consider People, Processes and Organisation when developing your JHA.
- Environmental impacts are to be identified and adequately addressed.
- All personnel participating in the JHA must have completed Company approved JHA training.
- JHA Leaders must be assessed as "Competent" and authorised to perform their assigned roles and/or activities or own action controls.
- All plant and equipment is to be the most appropriate for the tasks to be undertaken, and in good working condition.
- Emergency planning and communication requirements are to be documented.
- Confirm any hazardous materials (chemical) are approved for site using CHEMALERT to confirm authorisation.

STEP 2 – ASSESSING THE RISKS ASSOCIATED WITH THE JOB

- Break the job down into a sequence of specific steps in Part C.
- Identify the potential hazards (energy sources) and link them to the Mechanisms of Injury for each job step. Use Part A and other risk assessment references as a prompt.
- Use the Risk Score Calculator (Part B) to calculate the inherent risk of hazards without controls implemented.
- Identify controls for each step to reduce the risks to As Low As Reasonably Practicable (ALARP). Other applicable risk assessments (i.e. HAZID Worksheets) can be used as a guide. The Hierarchy of Control shall be applied:
  a) **Eliminate** - totally remove the hazard or source of energy
  b) **Substitute** - the Hazard/Energy with something less Hazardous
  c) **Isolate** - isolate the Hazard/Energy
  d) **Engineer** - use engineering controls to physically separate the person(s) from the Hazard
  e) **Administrative** - use administrative controls such as procedures, training, signage
  f) **PPE** - use Personal Protective Equipment as a last line of defence
- Use the Risk Score Calculator to assess the residual risk after appropriate controls are identified. **NOTE**: Work teams cannot proceed where residual risks remain HIGH.
- Identify personnel to own (and be responsible for) each JHA risk management action.
- Complete the Manual Handling Assessment Checklist highlighting all manual handling aspects of the job. Details of high risk manual handling activities may also be described in the particular job step involved.
- All personnel involved in the activity must sign on daily to demonstrate understanding of the hazards identified for the activity and the controls required.

STEP 3 – JHA APPROVAL

- The Work Team Supervisor and On Site Line Manager / delegate are to review and approve all JHAs (Part D).

STEP 4 – JHA CHANGES AND REVIEWS

- JHAs will be reviewed as a minimum weekly. JHA reviews will be facilitated by the Work Team Supervisor and recorded in Part E.
- Minor work changes to a JHA may be made adding details into Part C with approvals in Part E "JHA Amendments / Reviews".
- Major changes in the work activity, work conditions, controls or lessons learned will require the JHA to be re-written or updated by the workgroup supervisor.
- JHA's are valid for the duration of the permit or a maximum of 14 days (if a permit is not required) after which time it will need to be re-written.
- It is mandatory that all reviews and changes to any JHA are fully documented, approved and signed by the Work Team Supervisor and On Site Line Manager (or delegate) in Part E "JHA Amendments / Reviews".

STEP 5 – DOCUMENT MANAGEMENT

- Each JHA must be allocated a reference number and logged into a JHA Register which is maintained by the employer.
- Active JHAs are to remain at the job location (with supporting documentation attached)
- Once the work is complete, the JHA is to be reviewed to capture lessons learned, retired and archived with associated closed-out permits by the employer.

STEP 6 – ACCOUNTABILITY

- All personnel that sign onto a JHA are accountable to ensure controls are implemented and followed within their sphere of influence.

JOB HAZARD ANALYSIS

PART A: IDENTIFY HAZARDS (ENERGY SOURCES) / THREATS FOR THE JOB STEPS

Gravity
- ☒ Fall from height /climbing
- ☒ Uneven ground/same level fall
- ☐ Suspended in harness
- ☐ Dropped objects (Loads/Tools/Waste
- ☐ Anchor point/lifting equipment (chains/slings/harness)
- ☐ Roof/Walkway/Platform/Handrails
- ☐ Scaffolding Collapse/Positioning
- ☐ Cave–In
- ☐ Shifting Loads/Materials
- ☐ Converging/Sloping/Slippery Floors
- ☒ Inadequate/Restricted Entry & Exit

Motion
- ☐ Foreign body in eye
- ☐ Muscular overexertion/manual handling
- ☐ Body position
- ☐ Line of fire
  - Hands/fingers/feet/legs
  - Body position
  - Shifting and swinging loads
- ☒ Moving Vehicles/Plant
- ☒ Congested Work Area
- ☐ Excavation Equipment
- ☐ Equipment/Crane Overloading
- ☐ Road conditions
- ☐ Anchoring / deck lines / ropes

Mechanical
- ☐ Exposed Rotating Machinery
- ☐ Equipment under tension e.g. springs
- ☐ Equipment Failure (Brakes, lights, pumps, valvs and tools),
- ☐ Exposed drive belts/conveyors

Electrical
- ☐ Portable electrical equipment
- ☐ Underground/buried electrical cables
- ☐ Overhead power lines
- ☐ Exposed Energized systems
- ☐ Lighting and batteries
- ☐ Unguarded or exposed electrical equipment
- ☐ Compressors and transformer
- ☐ Static Electricity

Pressure (High/Low)
- ☐ Cylinders/Tanks/Vessels
- ☐ Exposed piping
- ☐ Underground piping
- ☐ Pneumatic/Hydraulic
- ☐ Hoses

Consider Mechanism of injury linked to energy sources:
MOI is a combination of the energy source and the potential effect on the body. It defines the circumstance(s) or energy(s) that can cause an injury:
- Struck by.....(Motion, Mechanical)
- Transport/Motor Vehicle Crash.....(Motion)
- Caught in or in between.....(Motion)
- Falls from height.....(Gravity)
- Exposure to.....(Electrical, Chemical, Radiation, Pressure, Sound, Temperature)
- Explosion and Fire.....(Temperature, Chemical)
- Contact with.....(Motion, Biological, Mechanical, Chemical)

Temperature
- ☐ Hot/Cold Surfaces
- ☐ Ignition Sources (Process/Tools/Vehicles)
- ☐ Flammable/Combustible material (incl vegetation)
- ☐ Friction (Ignition Source)
- ☒ Heat stress and hot work
- ☐ Exposure to extreme weather conditions (wind, rain, fog)
- ☐ Steam

Chemical
- ☐ Depleted oxygen
- ☐ Toxic gases/carcinogens
- ☐ Piping/tanks containing chemicals
- ☒ Chemical transfer activities
- ☐ Corrosives
- ☐ Gasses (Oxigen, Carbon Monoxide/Dioxide/Hydrogen Sulphide/Amonia)
- ☐ Pyrophoric materials (ignites in Oxygen)
- ☐ Potential for trapped gases (Pockets of gas)
- ☒ Unapproved chemical Contamination dust, chemicals, sediment, effluent non segregated waste

Biological
- ☐ Insect/Animal bites or stings
- ☐ Bacteria
- ☐ Blood Bourne Pathogens
- ☐ Viruses
- ☐ Contaminated Water
- ☐ Hygiene concerns
- ☐ Vapours/Dust/Fumes/Exhausts
- ☐ Airborne fibers/particulates e.g. Asbestos
- ☐ Flammable vapours/materials

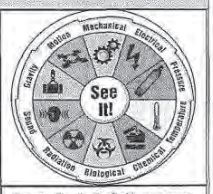
Radiation
- ☐ Lightning
- ☐ Welding Arc
- ☐ X-Ray (Sources)
- ☒ Exposure to UV e.g. Sun
- ☐ Lasers
- ☐ Radiation gauges

Sound
- ☒ Impact Noise
- ☐ Equipment Noise e.g. Grinding, Chipping, Engines
- ☐ High-Pressure release
- ☐ Vibration
- ☐ Sirens and alarms

Other
- ☐ Human Factors (Fatigue, Lapses in focus)
- ☐ Difficult Communications
- ☒ Lone Worker

Ecological
- ☐ Fauna attractants (light, food)
- ☐ Fauna entrapment
- ☐ Soil contamination
- ☒ Spill/Chemical to water
- ☐ Equipment dropped to water
- ☐ Windblown litter
- ☐ Spread of weeds

Environmental Considerations:
- Uncontrolled release of chemicals
- Unauthorised clearing of vegetation
- Impact to Fauna from entrapment in pipes, trenches, sumps, pits
- Impact to Fauna from artificial lighting
- Waste Management



Can you See it - Don't skip an energy source in the hazard identification process. All sources need consideration and always start with GRAVITY

High Risk Activities

The Risk Level, prior to controls, is HIGH:
- ☐ Working at Heights
- ☒ Operating Plant & Equipment
- ☐ Rigging & Lifting Operations
- ☐ Vehicle Movement and Transportation
- ☐ Excavation & Trenching
- ☐ Working with Energized Equip
- ☐ Working in Confined Spaces
- ☒ Marine Working on, over, or close to Water/ diving
- ☐ Storage & Handling of HAZMAT
- ☒ Working in Heat
- ☐ SIMOPS

Assess potential by asking:
- What types of energy am I exposed to?
- How can the energy harm me?
- How much energy could harm me?
- What is there in place to protect me?
- Are those barriers sufficient to protect me?

JOB HAZARD ANALYSIS

Part B - JHA RISK SCORE CALCULATOR

Control measures are intended to either eliminate the risk of the job (task) or reduce it to ALARP. Using the Risk Score Calculator, each task in a JHA is assessed for the Inherent Risk (calculated prior to controls being implemented) and Residual Risk (calculated after controls are implemented).

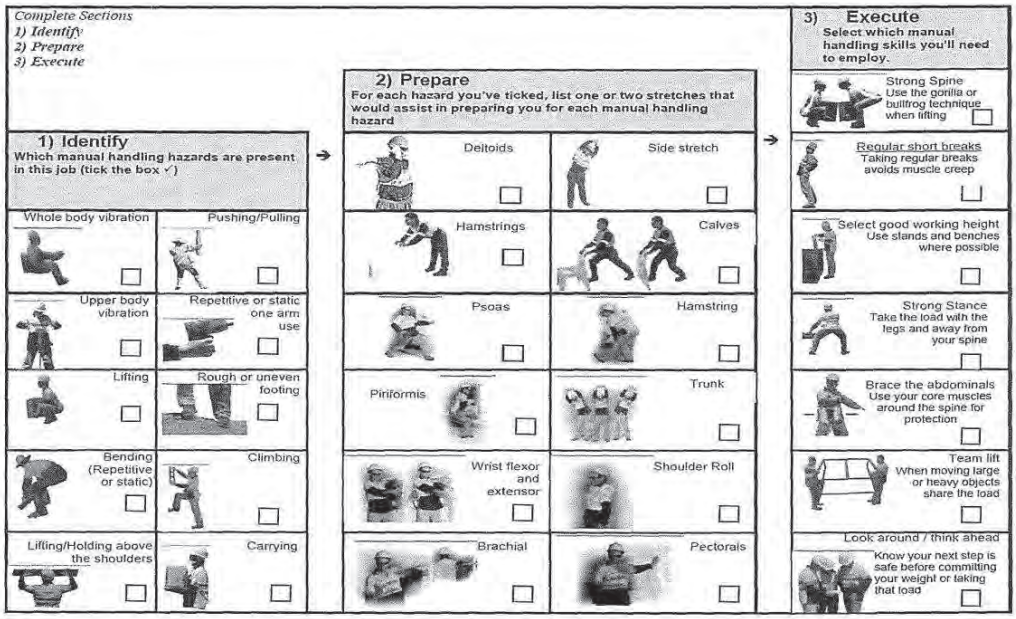
The matrix is used to score the likelihood of a potential consequence occurring. This leads to a risk ranking code of Very Low, Low, Medium or High (VL, L, M or H).

Risk Score Calculator

Potential Severity by Category				Likelihood of Occurrence		
Level	Personal Injury	Environment	Cost of Incident	Improbable (Not known to have happened)	Occasional (Annual Occurrence)	Frequent (Weekly Occurrence)
1	First Aid	Minor Impact	< $100,000	VL	L	M
2	LTI / Recordable Injury	Medium Impact	$100,000 / $500,000	L	M	H
3	Fatality/Permanent Disability/ Multiple Recordable Injuries	Major Impact	>$500,000	M	H	H

Code	Meaning
VL	Proceed with due care.
L	Proceed with due care, additional controls should be implemented (if practical).
M	The task should only proceed once additional controls have been considered and discussed with the Work Team Supervisor and On-site Line Manager (or delegate).
H	**Do Not proceed.** Task must be redefined or further hierarchy of control measures must be in place to reduce the residual risk.

JOB HAZARD ANALYSIS



JOB HAZARD ANALYSIS

PART C: RISK RATING AND IDENTIFICATION OF CONTROLS

#	MAJOR STEPS OF JOB / TASKS (Sequence of Events)	HAZARD & THREAT IDENTIFIED IN PART A	Initial Risk Level (Prior to Controls)	CONTROL MEASURES TO MAKE JOB SAFER	Current Risk Level (with controls)	CONTROL TO BE ACTIONED BY:
EXAMPLES ONLY	Job Steps	Gravity – Fall from height	H	• Inspect area prior to work to ensure all areas are barricaded • Barricade area below, post signage and control access • Ensure work platforms and handrails are in good condition • Ensure scaffolding/lifting equipment has been inspected and tagged	L	*Name*
		Gravity - Workers below struck by falling objects/tools	H	• Equipment or tools to be lowered or raised to ground secured in an appropriate device (barricades might be required) • All tools to be attached to lanyards to prevent them falling and kept in a tool bag when not in use • Helmets to be worn with Chin straps	L	Name
		Motion – Hand struck by tool	M	• Use tools that separate hand from impact zone • Maintain focus on activity and select correct hand tool • Ensure hands are not in the line of fire (pinch points)	VL	Name
		Motion – Muscular over exertion	M	• Use mechanical lifting device • Warm up and stretching • Team lifts	L	*Name*
		Motion – Struck by vehicle	H	• Segregate workers from traffic by redirecting traffic • Provide solid barricades between traffic and pedestrians • Use traffic controllers to direct traffic	L	*Name*
		Mechanical – Struck by moving machinery parts	M	• Ensure equipment is isolated, locked and tagged in accordance with the PTW System • Use trained and competent personnel wearing correct PPE	L	*Name*
		Electrical - Contact with energised electrical cables	H	• Ensure all live electrical cables are isolated, locked, tagged and tested utilising PTW System • Use trained and competent personnel	L	*Name*
		Electrical - Impact to fauna from artificial lighting	M	• Use only lighting equipment as approved in the Lighting Management Plan • Ensure unnecessary lights are switched off	VL	*Name*
		Temperature – Exposure to high ambient air temp and humidity	H	• Reduce exposure time • Provide portable shade / hat brims / umbrellas • Ensure individuals are well hydrated, monitor urine, use spot cooling (ice vest/ neck ties/helmet insert) devices	L	*Name*
		Chemical – Exposure to chemical fumes	H	• Use only Chemalert approved chemicals • Review and use in accordance with MSDS	L	*Name*

JOB HAZARD ANALYSIS

#	MAJOR STEPS OF JOB / TASKS (Sequence of Events)	HAZARD & THREAT IDENTIFIED IN PART A	Risk Level (Prior to Controls)	CONTROL MEASURES TO MAKE JOB SAFER	Residual Risk Level	CONTROL TO BE ACTIONED BY:
1	MOBILISATION OF VEHICLES INTO WORK AREA & MOVEMENT OF PERSONNEL BY FOOT	**MOTION** – STRUCK BY VEHICLE	M	• MAINTAIN AWARENESS WHILST DRIVING • DRIVE TO SPEED LIMITS AT ALL TIMES • UTILISE FLASHING BEACON • MAINTAIN RADIO COMMUNICATION • SITE INDUCTED PERSONNEL	L	all technicians
		MOTION- CONGESTED WORK AREA	M	• MAINTAIN AWARENESS WHILST DRIVING • DRIVE TO SPEED LIMITS AT ALL TIMES • UTILISE FLASHING BEACON	L	all technicians
2	BOARDING VESSEL BARGES, USE OF GANGWAY	**HIGH RISK ACTIVITIES** - MARINE WORKING ON, OVER, OR CLOSE TO WATER/ DIVING	H	• BE AWARE OF SURROUNDINGS • ADVISE CAPTAIN OF YOUR VISIT • KEEP COMMUNICATIONS OPEN • WEAR APPROPRIATE PPE	L	All Technicians
		HIGH RISK ACTIVITIES - WORKING IN HEAT	H	• TAKE PLENTY OF REST PERIODS • DRINK WATER ENSURE SUNSCREEN PROTECTION	L	All Technicians
		OTHER – LONE WORKER	H	• SPOTTER AS REQUIRED	L	All Technicians
3	ESTABLISH PERIMETER	**OTHER** - TECHNICIAN BEING STRUCK BY VEHICLE OR OTHER MACHINES IN USE DUE TO SIMULTANEOUS OPERATIONS IN THE AREA UNAUTHORIZED PERSONNEL IN AREA	H	• ESTABLISH THE EXCLUSION ZONE USING WARNING SIGNS & CONES • CONES AND SIGNS NOT TO BE TOUCHED BY UNAUTHORIZED PERSONNEL • NON ESSENTIAL PERSONNEL ARE REMOVED FROM AREA	VL	All Technicians

JOB HAZARD ANALYSIS

#	MAJOR STEPS OF JOB / TASKS (SEQUENCE OF EVENTS)	HAZARD & THREAT IDENTIFIED IN PART A	RISK LEVEL (PRIOR TO CONTROLS)	CONTROL MEASURES TO MAKE JOB SAFER	RESIDUAL RISK LEVEL	CONTROL TO BE ACTIONED BY:
4	MIX CHEMICALS	**MOTION** – MUSCULAR OVER EXERTION	M	• USE MECHANICAL LIFTING DEVICE • WARM UP AND STRETCHING • TEAM LIFTS	VL	All Technicians
		ECOLOGICAL - SPILL/CHEMICAL TO WATER	M	• ENSURE SPILLS ARE CONTAINED IMMEDIATELY.. • SPILL KIT IS TO BE ON VEHICLE AT ALL TIMES	L	All Technicians
		GRAVITY – FALL FROM HEIGHT	H	• USE ONLY APPROVED PLATFORM LADDER	L	All Technicians
5	STARTING PUMP MOTORS	**HIGH RISK ACTIVITIES** – OPERATING PLANT & EQUIPMENT		• SITE INDUCTED TRAINED PERSONNEL	VL	All Technicians
		MOTION – MUSCULAR OVER EXERTION	M	• USE MECHANICAL LIFTING DEVICE • WARM UP AND STRETCHING	VL	All Technicians
		ECOLOGICAL - SPILL/CHEMICAL	M	• ENSURE HOSES TIGHT CHECK EQUIPMENT • ENSURE SPILLS ARE CONTAINED IMMEDIATELY.. • SPILL KIT IS TO BE ON VEHICLE AT ALL TIMES	VL	All Technicians
6	PUTTING ON BACK PACK / ULV	**ECOLOGICAL** - SPILL/CHEMICAL	H	• ENSURE HOSES TIGHT CHECK EQUIPMENT • ENSURE SPILLS ARE CONTAINED • SPILL KIT IS TO BE ON VEHICLE AT ALL TIMES • ENSURE NO CHEMICAL ON BACKPACK • WIPE DRY NO LEAKS CHECK SEALS	VL	All Technicians

JOB HAZARD ANALYSIS

	MAJOR STEPS OF JOB / TASKS (Sequence of Events)	HAZARD & THREAT IDENTIFIED IN PART A	Risk Level (Prior to Controls)	CONTROL MEASURES TO MAKE JOB SAFER	Residual Risk Level	CONTROL TO BE ACTIONED BY:
		MOTION – MUSCULAR OVER EXERTION	M	• USE MECHANICAL LIFTING DEVICE • WARM UP AND STRETCHING • TEAM LIFTS	VL	All Technicians
7	APPLICATION OF RESIDUAL CHEMICAL TO ALL AREAS	**ECOLOGICAL** - SPILL/CHEMICAL TO WATER SPRAY DRIFT	M	• COMPETENT & TRAINED OPERATOR • ASSESS SIZE OF EXCLUSION ZONE ACCORDING TO NEARBY OPERATIONS & WIND DIRECTION & STRENGTH. MONITOR AND ADJUST AS REQUIRED • USE WARNING SIGNS & CONES • ADVISE PERSONNEL OF INTENTIONS TO SPRAY • NON ESSENTIAL PERSONNEL ARE REMOVED FROM AREA • MOVE EXCLUSION ZONE AS REQUIRED	L	All Technicians
		HIGH RISK ACTIVITIES - WORKING IN HEAT	H	• TAKE PLENTY OF REST PERIODS • DRINK WATER ENSURE SUNSCREEN PROTECTION	L	All Technicians
		CHEMICAL – EXPOSURE TO CHEMICAL / FUMES	H	• USE ONLY CHEMALERT APPROVED CHEMICALS • REVIEW AND USE IN ACCORDANCE WITH MSDS	L	All Technicians
		RADIATION - EXPOSURE TO UV E.G. SUN	H	• SUNSCREEN AND FACE / HEAD COVERINGS AS REQUIRED	L	All Technicians
		OTHER – OVERSPRAY ONTO PLANT SEATING ECT	M	• ADJUST SPRAY ACCORDING TO WIND	L	All Technicians

JOB HAZARD ANALYSIS

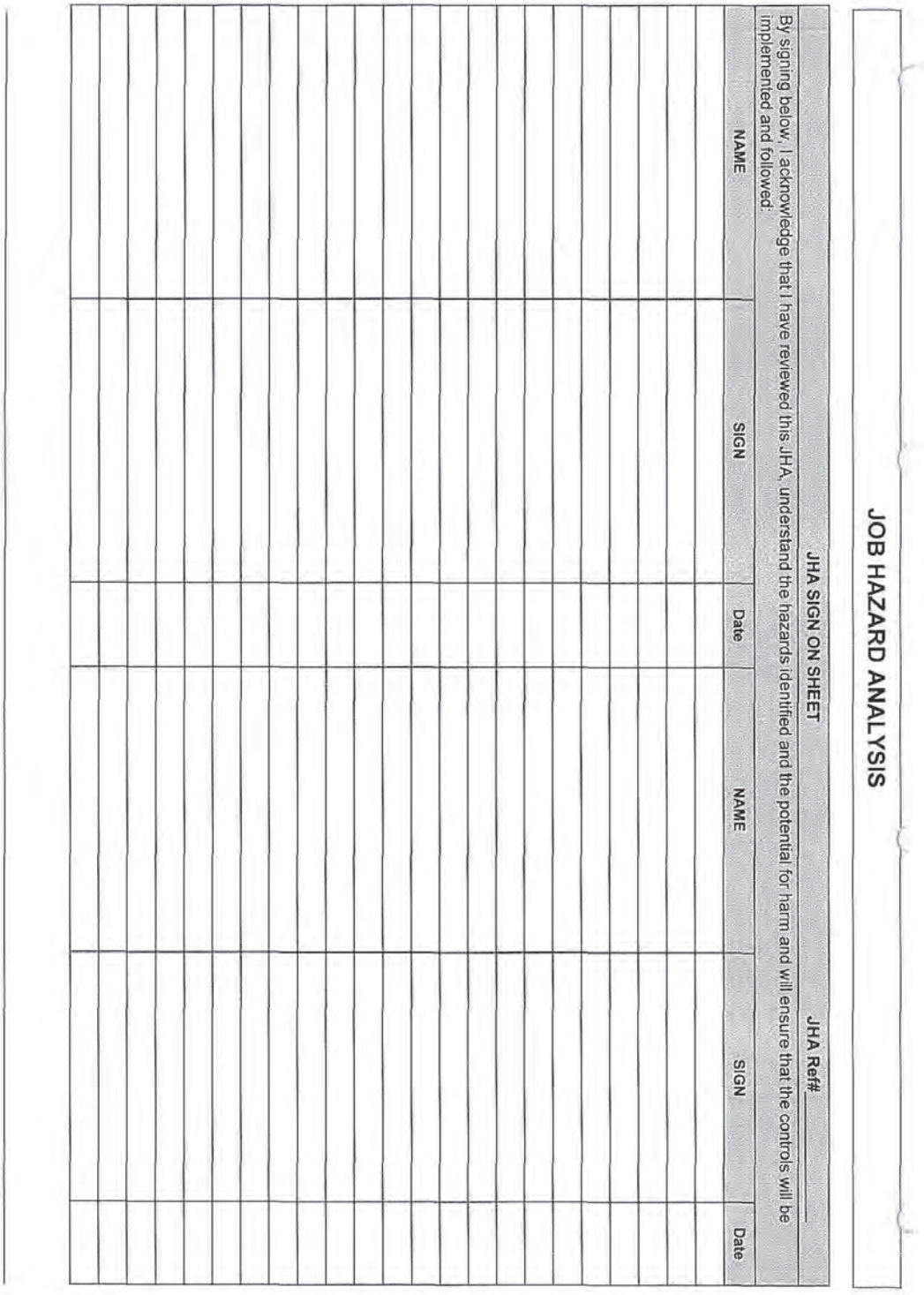
	MAJOR STEPS OF JOB / TASKS (Sequence of Events)	HAZARD & THREAT IDENTIFIED IN PART A	Risk Level (Prior to Controls)	CONTROL MEASURES TO MAKE JOB SAFER	Residual Risk Level	CONTROL TO BE ACTIONED BY:
8	DEMOBILISATION OF EQUIPMENT & VEHICLE FROM WORK AREA INCLUDING VESSEL	**HIGH RISK ACTIVITIES** - MARINE WORKING ON, OVER, OR CLOSE TO WATER/ DIVING	H	• BE AWARE OF SURROUNDINGS • ADVISE CAPTAIN OF YOUR VISIT • KEEP COMMUNICATIONS OPEN • WEAR APPROPRIATE PPE	L	All Technicians
		MOTION – STRUCK BY VEHICLE	M	• MAINTAIN AWARENESS WHILST DRIVING • DRIVE TO SPEED LIMITS AT ALL TIMES • UTILISE FLASHING BEACON • MAINTAIN RADIO COMMUNICATION • SITE INDUCTED PERSONNEL	L	All Technicians
		MOTION- CONGESTED WORK AREA	M	• MAINTAIN AWARENESS WHILST DRIVING • DRIVE TO SPEED LIMITS AT ALL TIMES • UTILISE FLASHING BEACON	L	All Technicians

JOB HAZARD ANALYSIS

JHA SIGN ON SHEET JHA Ref#_____

By signing below, I acknowledge that I have reviewed this JHA, understand the hazards identified and the potential for harm and will ensure that the controls will be implemented and followed:

NAME	SIGN	Date	NAME	SIGN	Date
JAMES CRAM		16-7-13			
JAMES CRAM		1-10-13			
JAMES CRAM		2-10-13			



	EMERGENCY RESPONSE CONTACTS OTHER LOCATIONS
	Gavin Patterson 0437515205 Garry Althaus 0408949721

PART D: APPROVALS – By signing below, I acknowledge that I have contributed to the development of this JHA and have reviewed the Hazid Worksheet and Work Method Statement (as applicable) to ensure the necessary hazards and controls are included.

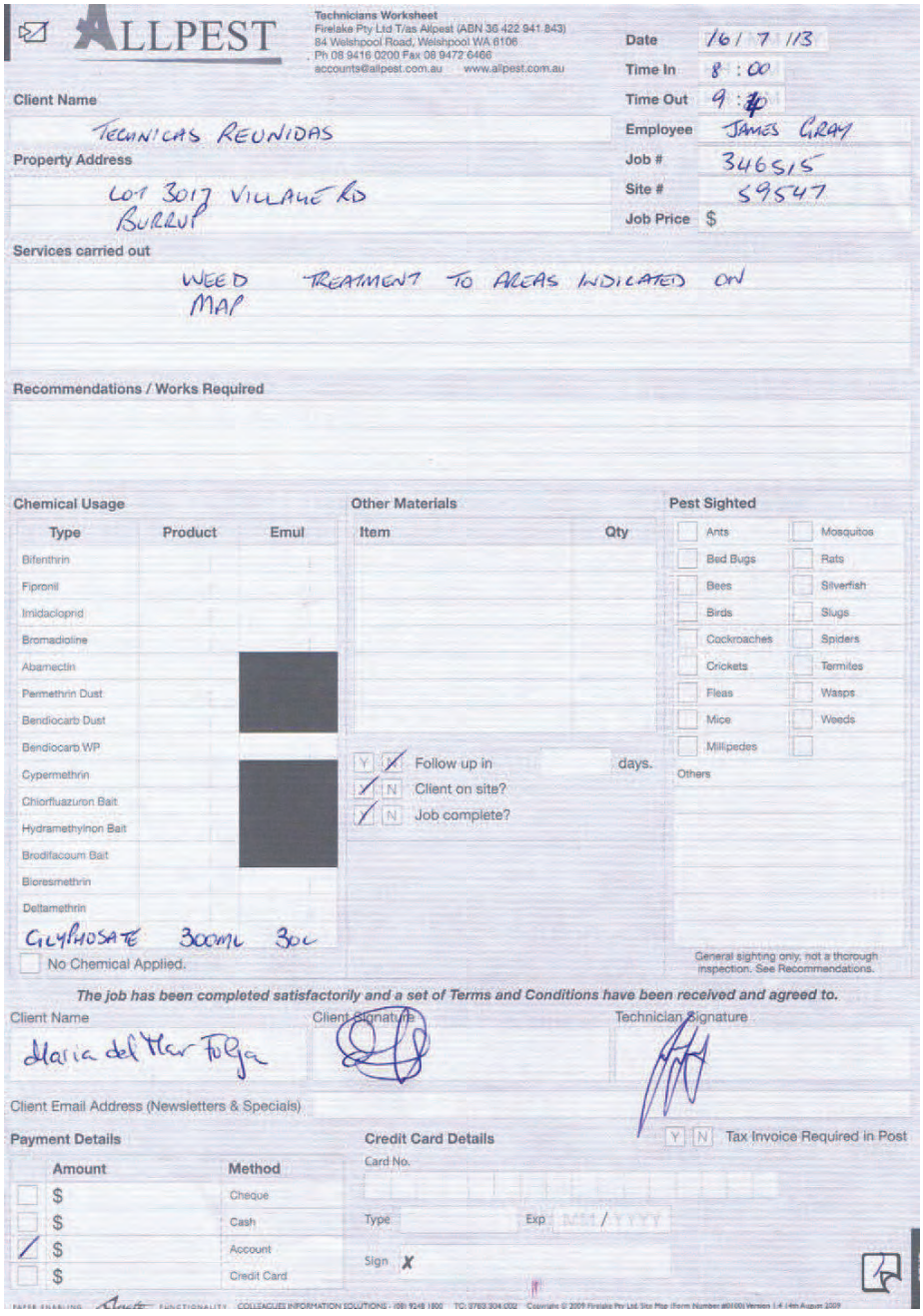
TEAM MEMBER	NAME	SIGNATURE	DATE	TEAM MEMBER	NAME	SIGNATURE	DATE
JHA Team Leader	Garry Althaus		15/07/2013	JHA Team Member			
JHA Team Member	JAMES GRAY		15-7-2013	JHA Team Member			
JHA Team Member				JHA Team Member			
JHA Team Member				JHA Team Member			
JHA Team Member				JHA Team Member			
JHA Team Member				JHA Team Member			
JHA Team Member				JHA Team Member			
JHA Team Member				JHA Team Member			
JHA Team Member				JHA Team Member			
JHA Team Member				JHA Team Member			
JHA Team Member				JHA Team Member			

WORK TEAM SUPERVISOR	Garry Althaus		15/07/2013	ON SITE LINE MANAGER (OR DELEGATE)			
Record of Changes in Supervisory Position / Responsibility							
WORK TEAM SUPERVISOR				ON SITE LINE MANAGER (OR DELEGATE)			

PART E: JHA AMENDMENTS / REVIEWS (Reviewed at least Weekly)

TYPE OF AMENDMENT OR REVIEW (√)TICK			REVIEW FINDINGS AND AMENDED REFERENCE	DATE	WORK TEAM SUPERVISOR (NAME) (RESPONSIBLE TO CAPTURE LESSONS LEARNED)	WORK TEAM SUPERVISOR (SIGNATURE)	ON SITE LINE MANAGER (OR DELEGATE) (NAME)	ON SITE LINE MANAGER (OR DELEGATE) (SIGNATURE)
Key Change	New Hazard	Review						
Key Change	New Hazard	Review						
Key Change	New Hazard	Review						
Key Change	New Hazard	Review						

APPENDIX C: FUMIGATION CARRIED OUT ON 16TH JULY 2013 (TECHNICIAN WORKSHEETS, PICTURES)



ALLPEST

Technicians Worksheet
Firelake Pty Ltd T/as Allpest (ABN 36 422 941 843)
84 Welshpool Road, Welshpool WA 6106
Ph 08 9416 0200 Fax 08 9472 6466
accounts@allpest.com.au www.allpest.com.au

Date 16/7/13
Time In 8:00
Time Out 9:30
Employee JAMES GRAY
Job # 346515
Site # 59547
Job Price $

Client Name: TECHNICAS REUNIDAS

Property Address: LOT 3017 VILLAGE RD BURRUP

Services carried out: WEED TREATMENT TO AREAS INDICATED ON MAP

Recommendations / Works Required

Chemical Usage

Type	Product	Emul
Bifenthrin		
Fipronil		
Imidacloprid		
Bromadioline		
Abamectin		
Permethrin Dust		
Bendiocarb Dust		
Bendiocarb WP		
Cypermethrin		
Chlorfluazuron Bait		
Hydramethylnon Bait		
Brodifacoum Bait		
Bioresmethrin		
Deltamethrin		
GLYPHOSATE	300ML	30L

No Chemical Applied.

Other Materials

Item	Qty

Y / N Follow up in days.
Y / N Client on site?
Y / N Job complete?

Pest Sighted

Ants, Bed Bugs, Bees, Birds, Cockroaches, Crickets, Fleas, Mice, Millipedes, Mosquitos, Rats, Silverfish, Slugs, Spiders, Termites, Wasps, Weeds

Others

General sighting only, not a thorough inspection. See Recommendations.

The job has been completed satisfactorily and a set of Terms and Conditions have been received and agreed to.

Client Name: Maria del Mar Folga

Client Signature

Technician Signature

Client Email Address (Newsletters & Specials)

Payment Details

Amount	Method
$	Cheque
$	Cash
$	Account
$	Credit Card

Credit Card Details
Card No.
Type Exp MM / YYYY
Sign X

Y / N Tax Invoice Required in Post

TERMS AND CONDITIONS OF ALLPEST W.A. TREATMENT SERVICES

In this Contract:
"Building" means the building or buildings referred to in the Treatment Recommendations Form, signed or agreed to by Allpest W.A. and by the client.
"Contract" means this contract between Allpest W.A. and the client for the Treatment Service in which these terms and conditions are incorporated.
"Pests" means those pests listed in the Pest Treatment Recommendation Form and/or the Quotation Agreement Form.
"Site" means all of the land, the Buildings and all other structures and improvements on the land at the address of the property referred to in the Treatment Recommendations form.
"Pest Treatment Recommendations Form" means the form signed or agreed to by Allpest W.A. and by the client in which the treatment of Pests is recommended by Allpest W.A. and accepted by the client.
"Treatment Service" means the service or services to be provided by Allpest W.A. in accordance with the Pest Treatment Recommendation Form, and in accordance with the Contract.

1. **Termite Treatment: Existing Buildings**
To treat current infestations of subterranean termites in existing Buildings on the Site, the Treatment Service will be carried out by Allpest W.A. to methods detailed in the Australian Standards Code 3660-1 1995 less any exclusions as agreed to by the client.

2. **Pre-treatment of Termites: Buildings under Construction**
Soil pre-treatment for the protection of subterranean termites to Buildings under construction will be carried out to methods detailed in the Australian Standards Code AS 3660-1 1995 less any exclusions as agreed to by the client.

3. **Client's Responsibility Prior to Service:**
It is the client's responsibility to:
(a) **(Vacate Site)**: ensure the Site is vacated prior to the Treatment Service being carried out;
(b) **(Remove Animals)**: ensure that all live animals, birds, fish or other pets are removed from the Site or are covered to ensure they are not adversely affected by the Treatment Service;
(c) **(Identify Structures)**: accurately mark on any structure to be drilled as part of the Treatment Service the location of all water pipes, electrical cables, conduits or air conditioning ducts; (Allpest W.A. will not reimburse costs or be held responsible for any damage occasioned to these structures unless accurately marked); and
(d) **(Access)**: ensure that Allpest W.A. and its service personnel, employees, contractors and agents have full and free access to the Site, and if access is restricted for treatment and/or inspection the service period may be altered to a nil service period.

4. **Client Acknowledgements**
The client acknowledges by signing this Contract
(a) **(Limitations and Hidden Infestations)**: due to the structure and the design of the Building it is not possible to apply effective chemical barriers and treatments to all areas of the Building. Pests may therefore exist and be concealed in areas (both above and below ground level) which cannot reasonably be visually or physically accessed, inspected or treated, this may result in less than full inspection and complete treatment for termites and other Pests. As a consequence this may result in less than total eradication of termites and other Pests in the Building (or below the soil under or around the Building) and enable termites and other Pests to gain or regain access to the Building following treatment.
(b) **(Existing Damage)**: it is possible for existing termite damage, or other damage caused by other Pests, to exist in
(i) timbers inaccessible to visual examination in the Buildings and elsewhere at the Site, and
(ii) areas inaccessible to visual examination in the Buildings and elsewhere at the Site;
before, during, and after, any period of treatment under a Treatment Service and accordingly this may result in less than a full and complete treatment of Pests in those areas; and
(c) **(Chemicals)**: that chemicals listed in this Contract as "Non-Permanent" chemicals and used in the Treatment Service are not capable of completely eradicating the Pests in the Buildings or on the Site.

Accordingly, the client acknowledges that, for the purpose of this Contract and section 74(2) of the Trade Practices Act 1974 (Cth) and section 40(2) of the Fair Trading Act 1987 (W.A.), that Allpest W.A.:
(i) is not required to kill or to control every Pest in the Buildings or on the Site, but that Allpest W.A. is instead required to treat the Pests exercising due care and skill in accordance with methods detailed in the applicable Australian Standards Code; and the Treatment Schedule as agreed to with the client.
(ii) it is not possible to kill every subterranean termite by using the chemicals 'Chlorpyrifos' 'Bifenthrin' and/or 'Arsenic Trioxide' or any other termite control chemicals which may be used under State or Federal Government Pesticide regulations and accordingly further treatment may be required and further damage from future re-infestation of these pests may occur and
(iii) if any chemicals recommended for use in the Contract are listed as "Non-Permant" chemicals, those chemicals are not capable of eradicating every Pest, and accordingly further treatment may be required, and damage from future re-infestation of those Pests may occur.

5. **Allpest W.A. Liability**
5.1 The client agrees that Allpest W.A., its employees, agents and contractors shall not be responsible, or in any way liable:
(a) **(Prior to Treatment)**: to repair or to replace or to rectify any damage to any part of the Buildings or the contents of the Buildings where such repair, replacement or rectification is caused by, arises out of, or otherwise occurs in consequence of, any infestation or re-infestation of Pests which occurred before or after the commencement of any Treatment Service;
(b) **(Injury to Persons)**: for any injury to any person, or for any costs and expenses arising in any way out of, injury to any person (whether or not a trespasser) on the Site where that injury is occasioned in consequence of any infestation of Pests on the Site before or after the commencement of any Treatment Service.
5.2 **(During and After Treatment)**: Subject only to sections 68 and 68A of the Trade Practices Act 1974 (Cth) and sections 34 and 35 of the Fair Trading Act 1987 (W.A.) the client agrees that, in addition to condition 5.1 Allpest W.A., its employees, agents and contractors shall not be responsible, or in any way liable, for any damage, repair, replacement, cost or injury sustained, incurred or which in any way arises out of:
(a) any infestation concealed in areas inaccessible to visual inspection in the Buildings or elsewhere at the Site;
(b) any infestation or re-infestation of Pests on the Site after the date on which the Pest Treatment Recommendations Form is signed or agreed to by the client if after that date:
(i) **(Failure to Notify)**: the client does not notify Allpest W.A. in writing, and within seven (7) days of becoming aware of, any such infestation or re-infestation on any part of the Site;
(ii) **(Infested Timbers Introduced)**: the client introduces timber infested with any Pests or other pests or stores timber or objects containing timber inside or underneath, or within one metre of, the Buildings.
(iii) **(Building Alterations)**: the client alters or constructs additions to the Buildings;
(iv) **(Disturbances)**: areas which have previously been treated by Allpest W.A. are disturbed by the construction of garden beds, lawns, sleepers, paths, footpaths, patios or driveways which adjoin, or are built within one metre of, the Building; and/or
(v) **(Other Treatment)**: another company other than Allpest W.A. carries out pest management or pest control to the Buildings or the Site.

6. **Cancellation by Client**
If the client purports to cancel or to otherwise not proceed with this Contract prior to Allpest W.A. commencing the Treatment Service, the client acknowledges that it is consequently in breach of an essential term of this Contract, and agrees:
(a) **(Forfeiture of Deposit)**: that the deposit (if any) paid by the client under the Contract shall be immediately forfeited to Allpest W.A.;
(b) **(Legal and Debt Collection Costs)**: to pay all legal costs, and all debt collection fees, and all disbursements, incurred in consequence of the client's breach of this Contract, or otherwise incurred in respect of the recovery of, or the attempted recovery of, the costs and expenses referred to in paragraph (b), in each case on an indemnity basis; and
(c) **(Pay Expenses)**: to pay, in addition to the amount of the deposit forfeited to Allpest W.A. all other costs and expenses however incurred by Allpest W.A. in consequence of the client's breach of this Contract.

7. The client acknowledges that any outstanding monies due and payable to Allpest W.A and which are not paid within 7 days of being due is consequently a breach of an essential term of this agreement and agrees to pay for all legal costs, and all debt collection fees, and all costs and expenses subsequently incurred in consequence of the clients breach of this contract, or otherwise incurred in respect of the recovery of, or the intended recovery of, the costs and expenses referred to in this clause, in each case on an indemnity basis. The client agrees to pay interest on all monies outstanding for 7 days after the due date for payment at the rate of 16% per annum from the due date for payment up to the actual date of payment.

8. The client acknowledges that non payment of any outstanding monies due to Allpest W.A. under this agreement will void any agreed further service benefits offered to the client under the terms of this agreement. Further service benefits at no charge to the client will not be restored until all outstanding monies due under the agreement are paid in full. General Provisions

9. Offer and Acceptance
Offer
The offer in this Contract may only be made by Allpest W.A. signing the offer under seal, or by one of Allpest W.A.'s expressly authorised representatives signing that offer on behalf of Allpest W.A.
Acceptance of Offer
The offer in this Contract shall be accepted by the client if:
(a) it is signed by, or on behalf of, the client; or
(b) it is verbally accepted by, or on behalf of, the client

10. Amendment by Allpest W.A. to Printed Terms:
No representative or agent of Allpest W.A. has the authority to change or to delete all or any part of the terms or conditions contained in this Contract.

11. Where the property changes ownership, this agreement immediately becomes null and void. The new owner may apply to Allpest W.A. for the service to be transferred into the new owners name which will be provided entirety at the discretion of Allpest W.A.

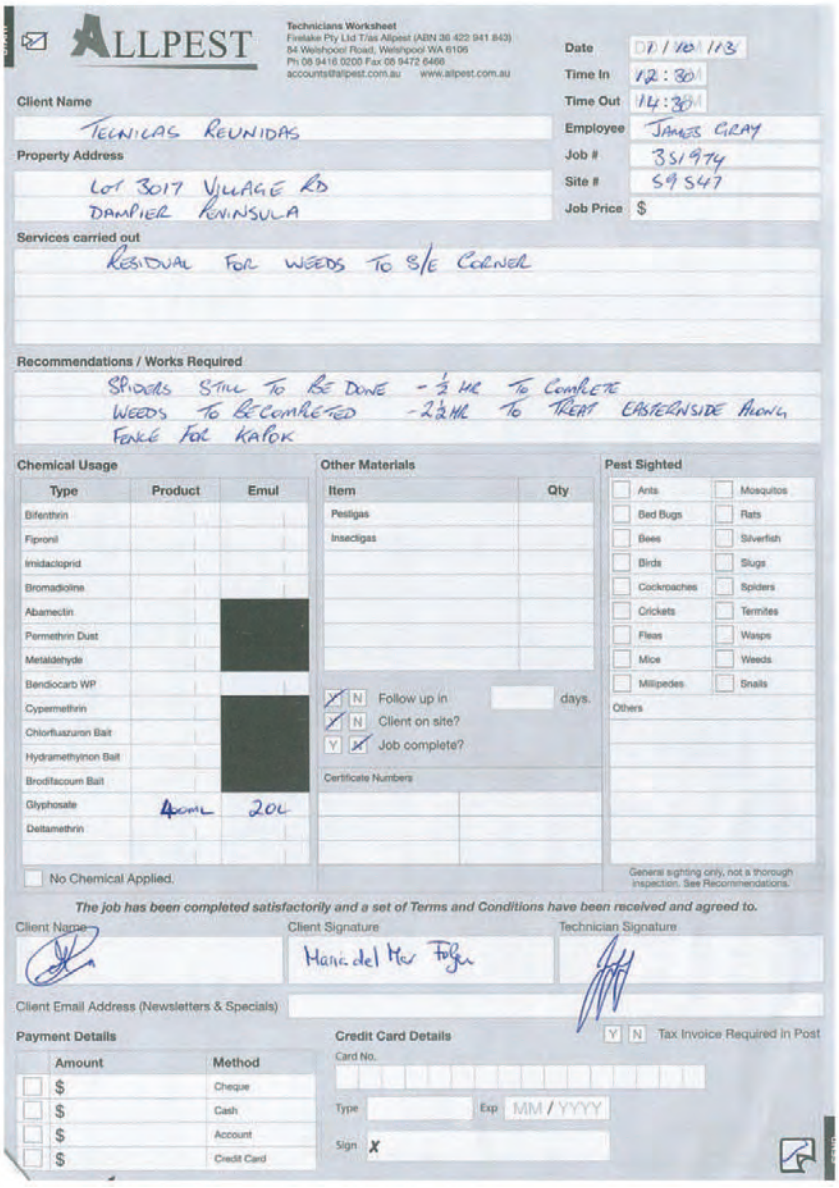
12. **Terminations**
Allpest W.A. or the client may terminate this contract at any time for any reason whatsoever by giving written notice of termination to the other party.

Please note as per condition 5.1 and 5.2 Allpest W.A. accept no responsibility for damage caused by pests or termite infestation or re-infestation that is incurred prior to or after the treatment service to the property

Please note as per condition 5.1 and 5.2 Allpest accept no responsibility for damage caused by pests or termite infestation or re-infestation that is incurred prior to or after the treatment service to the property.

pictures on 16th july 2013	
	
	

APPENDIX D: FUMIGATION CARRIED OUT ON 1ST, 2ND AND 25TH OCTOBER 2013 (TECHNICIAN WORKSHEETS, PICTURES)



ALLPEST

Technicians Worksheet
Firelake Pty Ltd T/as Allpest (ABN 36 422 941 843)
84 Welshpool Road, Welshpool WA 6106
Ph 08 9416 0200 Fax 08 9472 6466
accounts@allpest.com.au www.allpest.com.au

Date 01/10/13
Time In 12:30
Time Out 14:30
Employee JAMES GRAY
Job # 351974
Site # 59547
Job Price $

Client Name: TECNICAS REUNIDAS
Property Address: LOT 3017 VILLAGE RD DAMPIER PENINSULA

Services carried out: RESIDUAL FOR WEEDS TO S/E CORNER

Recommendations / Works Required:
SPIDERS STILL TO BE DONE - ½ HR TO COMPLETE
WEEDS TO BE COMPLETED - 2½ HR TO TREAT EASTERN SIDE ALONG FENCE FOR KALOK

Chemical Usage

Type	Product	Emul
Bifenthrin		
Fipronil		
Imidacloprid		
Bromadiolina		
Abamectin		[redacted]
Permethrin Dust		
Metaldehyde		
Bendiocarb WP		
Cypermethrin		[redacted]
Chlorfluazuron Bait		
Hydramethylnon Bait		
Brodifacoum Bait		
Glyphosate	4 20L	
Deltamethrin		

No Chemical Applied.

Other Materials

Item	Qty
Pestigas	
Insectigas	

[N] Follow up in ____ days.
[N] Client on site?
[Y] [X] Job complete?

Certificate Numbers

Pest Sighted
Ants, Mosquitos, Bed Bugs, Rats, Bees, Silverfish, Birds, Slugs, Cockroaches, Spiders, Crickets, Termites, Fleas, Wasps, Mice, Weeds, Millipedes, Snails
Others

General sighting only, not a thorough inspection. See Recommendations.

The job has been completed satisfactorily and a set of Terms and Conditions have been received and agreed to.

Client Name
Client Signature: Maria del Mar Fogu
Technician Signature
Client Email Address (Newsletters & Specials)

Payment Details

Amount	Method
$	Cheque
$	Cash
$	Account
$	Credit Card

Credit Card Details
Card No.
Type Exp MM / YYYY
Sign X

[Y] [N] Tax Invoice Required in Post

TERMS AND CONDITIONS OF ALLPEST W.A. TREATMENT SERVICES

In this Contract:
"Building" means the building or buildings referred to in the Treatment Recommendations Form, signed or agreed to by Allpest W.A. and by the client.
"Contract" means this contract between Allpest W.A. and the client for the Treatment Service in which these terms and conditions are incorporated.
"Pests" means those pests listed in the Pest Treatment Recommendation Form and/or the Quotation Agreement Form.
"Site" means all of the land, the Buildings and all other structures and improvements on the land at the address of the property referred to in the Treatment Recommendations form.
"Pest Treatment Recommendations Form" means the form signed or agreed to by Allpest W.A. and by the client in which the treatment of Pests is recommended by Allpest W.A. and accepted by the client.
"Treatment Service" means the service or services to be provided by Allpest W.A. in accordance with the Pest Treatment Recommendation Form, and in accordance with the Contract.

1. **Termite Treatment: Existing Buildings**
To treat current infestations of subterranean termites in existing Buildings on the Site, the Treatment Service will be carried out by Allpest W.A. to methods detailed in the Australian Standards Code 3660-1 1995 less any exclusions as agreed to by the client.

2. **Pre-treatment of Termites: Buildings under Construction**
Soil pre-treatment for the protection of subterranean termites to Buildings under construction will be carried out to methods detailed in the Australian Standards Code AS 3660-1 1995 less any exclusions as agreed to by the client.

3. **Client's Responsibility Prior to Service:**
It is the client's responsibility to:
(a) **(Vacate Site)**: ensure the Site is vacated prior to the Treatment Service being carried out;
(b) **(Remove Animals)**: ensure that all live animals, birds, fish or other pets are removed from the Site or are covered to ensure they are not adversely affected by the Treatment Service;
(c) **(Identify Structures)**: accurately mark on any structure to be drilled as part of the Treatment Service the location of all water pipes, electrical cables, conduits or air conditioning ducts; (Allpest W.A. will not reimburse costs or be held responsible for any damage occasioned to these structures unless accurately marked); and
(d) **(Access)**: ensure that Allpest W.A. and its service personnel, employees, contractors and agents have full and free access to the Site, and if access is restricted for treatment and/or inspection the service period may be altered to a nil service period.

4. **Client Acknowledgements**
The client acknowledges by signing this Contract
(a) **(Limitations and Hidden Infestations)**: due to the structure and the design of the Building it is not possible to apply effective chemical barriers and treatments to all areas of the Building. Pests may therefore exist and be concealed in areas (both above and below ground level) which cannot reasonably be visually or physically accessed, inspected or treated, this may result in less than full inspection and complete treatment for termites and other Pests. As a consequence this may result in less than total eradication of termites and other Pests in the Building (or below the soil under or around the Building) and enable termites and other Pests to gain or regain access to the Building following treatment.
(b) **(Existing Damage)**: it is possible for existing termite damage, or other damage caused by other Pests, to exist in
(i) timbers inaccessible to visual examination in the Buildings and elsewhere at the Site, and
(ii) areas inaccessible to visual examination in the Buildings and elsewhere at the Site:
before, during, and after, any period of treatment under a Treatment Service and accordingly this may result in less than a full and complete treatment of Pests in those areas; and
(c) **(Chemicals)**: that chemicals listed in this Contract as "Non-Permanent' chemicals and used in the Treatment Service are not capable of completely eradicating the Pests in the Buildings or on the Site.

Accordingly, the client acknowledges that, for the purpose of this Contract and section 74(2) of the Trade Practices Act 1974 (Cth) and section 40(2) of the Fair Trading Act 1987 (W.A.), that Allpest W.A.:
(i) is not required to kill or to control every Pest in the Buildings or on the Site, but that Allpest W.A. is instead required to treat the Pests exercising due care and skill in accordance with methods detailed in the applicable Australian Standards Code; and the Treatment Schedule as agreed to with the client.
(ii) it is not possible to kill every subterranean termite by using the chemicals 'Chlorpyrifos' 'Bifenthrin' and/or 'Arsenic Trioxide' or any other termite control chemicals which may be used under State or Federal Government Pesticide regulations and accordingly further treatment may be required and further damage from future re-infestation of these pests may occur and
(iii) if any chemicals recommended for use in the Contract are listed as "Non-Permant" chemicals, those chemicals are not capable of eradicating every Pest, and accordingly further treatment may be required, and damage from future re-infestation of those Pests may occur.

5. **Allpest W.A. Liability**
5.1 The client agrees that Allpest W.A., its employees, agents and contractors shall not be responsible, or in any way liable:
(a) **(Prior to Treatment)**: to repair or to replace or to rectify any damage to any part of the Buildings or the contents of the Buildings where such repair, replacement or rectification is caused by, arises out of, or otherwise occurs in consequence of, any infestation or re-infestation of Pests which occurred before or after the commencement of any Treatment Service;
(b) **(Injury to Persons)**: for any injury to any person, or for any costs and expenses arising in any way out of, injury to any person (whether or not a trespasser) on the Site where that injury is occasioned in consequence of any infestation of Pests on the Site before or after the commencement of any Treatment Service.
5.2 **(During and After Treatment)**: Subject only to sections 68 and 68A of the Trade Practices Act 1974 (Cth) and sections 34 and 35 of the Fair Trading Act 1987 (W.A.) the client agrees that, in addition to condition 5.1 Allpest W.A., its employees, agents and contractors shall not be responsible, or in any way liable, for any damage, repair, replacement, cost or injury sustained, incurred or which in any way arises out of:
(a) any infestation concealed in areas inaccessible to visual inspection in the Buildings or elsewhere at the Site;
(b) any infestation or re-infestation of Pests on the Site after the date on which the Pest Treatment Recommendations Form is signed or agreed to by the client if after that date:
(i) **(Failure to Notify)**: the client does not notify Allpest W.A. in writing, and within seven (7) days of becoming aware of, any such infestation or re-infestation on any part of the Site;
(ii) **(Infested Timbers Introduced)**: the client introduces timber infested with any Pests or other pests or stores timber or objects containing timber inside or underneath, or within one metre of, the Buildings.
(iii) **(Building Alterations)**: the client alters or constructs additions to the Buildings;
(iv) **(Disturbances)**: areas which have previously been treated by Allpest W.A. are disturbed by the construction of garden beds, lawns, sleepers, paths, footpaths, patios or driveways which adjoin, or are built within one metre of, the Building; and/or
(v) **(Other Treatment)**: another company other than Allpest W.A. carries out pest management or pest control to the Buildings or the Site.

6. **Cancellation by Client**
If the client purports to cancel or to otherwise not proceed with this Contract prior to Allpest W.A. commencing the Treatment Service, the client acknowledges that it is consequently in breach of an essential term of this Contract, and agrees:
(a) **(Forfeiture of Deposit)**: that the deposit (if any) paid by the client under the Contract shall be immediately forfeited to Allpest W.A.;
(b) **(Legal and Debt Collection Costs)**: to pay all legal costs, and all debt collection fees, and all disbursements, incurred in consequence of the client's breach of this Contract, or otherwise incurred in respect of the recovery of, or the attempted recovery of, the costs and expenses referred to in paragraph (b), in each case on an indemnity basis; and
(c) **(Pay Expenses)**: to pay, in addition to the amount of the deposit forfeited to Allpest W.A. all other costs and expenses however incurred by Allpest W.A. in consequence of the client's breach of this Contract.

7. The client acknowledges that any outstanding monies due and payable to Allpest W.A and which are not paid within 7 days of being due is consequently a breach of an essential term of this agreement and agrees to pay for all legal costs, and all debt collection fees, and all costs and expenses subsequently incurred in consequence of the clients breach of this contract, or otherwise incurred in respect of the recovery of, or the intended recovery of, the costs and expenses referred to in this clause, in each case on an indemnity basis. The client agrees to pay interest on all monies outstanding for 7 days after the due date for payment at the rate of 18% per annum from the due date for payment up to the actual date of payment.

8. The client acknowledges that non payment of any outstanding monies due to Allpest W.A. under this agreement will void any agreed further service benefits offered to the client under the terms of this agreement. Further service benefits at no charge to the client will not be restored until all outstanding monies due under the agreement are paid in full. General Provisions

9. Offer and Acceptance
Offer
The offer in this Contract may only be made by Allpest W.A. signing the offer under seal, or by one of Allpest W.A.'s expressly authorised representatives signing that offer on behalf of Allpest W.A.
Acceptance of Offer
The offer in this Contract shall be accepted by the client if:
(a) it is signed by, or on behalf of, the client; or
(b) it is verbally accepted by, or on behalf of, the client

10. Amendment by Allpest W.A. to Printed Terms:
No representative or agent of Allpest W.A. has the authority to change or to delete all or any part of the terms or conditions contained in this Contract.

11. Where the property changes ownership, this agreement immediately becomes null and void. The new owner may apply to Allpest W.A. for the service to be transferred into the new owners name which will be provided entirely at the discretion of Allpest W.A.

12. **Terminations**
Allpest W.A. or the client may terminate this contract at any time for any reason whatsoever by giving written notice of termination to the other party.
Please note as per condition 5.1 and 5.2 Allpest W.A. accept no responsibility for damage caused by pests or termite infestation or re-infestation that is incurred prior to or after the treatment service to the property

Please note as per condition 5.1 and 5.2 Allpest accept no responsibility for damage caused by pests or termite infestation or re-infestation that is incurred prior to or after the treatment service to the property.

ALLPEST

Technicians Worksheet
Firelake Pty Ltd T/as Allpest (ABN 36 422 941 843)
84 Welshpool Road, Welshpool WA 6106
Ph 08 9416 0200 Fax 08 9472 6466
accounts@allpest.com.au www.allpest.com.au

Date: 22 / 10 / 13
Time In: 8 : 30
Time Out: 14 : 30
Employee: JAMES GRAY
Job #: 351974
Site #: 59547
Job Price: $

Client Name
TECNICAS REUNIDAS

Property Address
LOT 3017 VILLAGE RD
DAMPIER PENINSULA

Services carried out
TREATMENT FOR WEEDS ALONG INTERNAL FENCELINE ON EASTERN PERIMETER FOR KAPOK.

Recommendations / Works Required
AVOID CONTACT WITH TREATED WEEDS. 48 HRS

Chemical Usage

Type	Product	Emul
Bifenthrin		
Fipronil		
Imidacloprid		
Bromadioline		
Abamectin		
Permethrin Dust		
Metaldehyde		
Bendiocarb WP		
Cypermethrin		
Chlorfluazuron Bait		
Hydramethylnon Bait		
Brodifacoum Bait		
Glyphosate	1.2L	60L
Deltamethrin		
DYE		300ML

☐ No Chemical Applied.

Other Materials

Item	Qty
Pestigas	
Insectigas	

Y ☒N Follow up in ____ days.
☒Y N Client on site?
☒Y N Job complete?

Certificate Numbers

Pest Sighted

☐ Ants	☐ Mosquitos
☐ Bed Bugs	☐ Rats
☐ Bees	☐ Silverfish
☐ Birds	☐ Slugs
☐ Cockroaches	☐ Spiders
☐ Crickets	☐ Termites
☐ Fleas	☐ Wasps
☐ Mice	☐ Weeds
☐ Millipedes	☐ Snails

Others

General sighting only, not a thorough inspection. See Recommendations.

The job has been completed satisfactorily and a set of Terms and Conditions have been received and agreed to.

Client Name: Max Folgan
Client Signature: [signature]
Technician Signature: [signature]

Client Email Address (Newsletters & Specials)

Y N Tax Invoice Required in Post

Payment Details

	Amount	Method
☐	$	Cheque
☐	$	Cash
☒	$	Account
☐	$	Credit Card

Credit Card Details
Card No.
Type Exp MM / YYYY
Sign ✗

PAPER ENABLING Anoto FUNCTIONALITY COLLEAGUES INFORMATION SOLUTIONS - (08) 9248 1800 TC: 3783.304.003 Copyright © 2009 Firelake Pty Ltd Site Map (Form Number 80100) Version 1.4 14th August 2009

TERMS AND CONDITIONS OF ALLPEST W.A. TREATMENT SERVICES

In this Contract:
"Building" means the building or buildings referred to in the Treatment Recommendations Form, signed or agreed to by Allpest W.A. and by the client.
"Contract" means this contract between Allpest W.A. and the client for the Treatment Service in which these terms and conditions are incorporated.
"Pests" means those pests listed in the Pest Treatment Recommendation Form and/or the Quotation Agreement Form.
"Site" means all of the land, the Buildings and all other structures and improvements on the land at the address of the property referred to in the Treatment Recommendations form.
"Pest Treatment Recommendations Form" means the form signed or agreed to by Allpest W.A. and by the client in which the treatment of Pests is recommended by Allpest W.A. and accepted by the client.
"Treatment Service" means the service or services to be provided by Allpest W.A. in accordance with the Pest Treatment Recommendation Form, and in accordance with the Contract.

1. **Termite Treatment: Existing Buildings**
To treat current infestations of subterranean termites in existing Buildings on the Site, the Treatment Service will be carried out by Allpest W.A. to methods detailed in the Australian Standards Code 3660-1 1995 less any exclusions as agreed to by the client.

2. **Pre-treatment of Termites: Buildings under Construction**
Soil pre-treatment for the protection of subterranean termites to Buildings under construction will be carried out to methods detailed in the Australian Standards Code AS 3660-1 1995 less any exclusions as agreed to by the client.

3. **Client's Responsibility Prior to Service:**
It is the client's responsibility to:
(a) **(Vacate Site)**: ensure the Site is vacated prior to the Treatment Service being carried out;
(b) **(Remove Animals)**: ensure that all live animals, birds, fish or other pets are removed from the Site or are covered to ensure they are not adversely affected by the Treatment Service;
(c) **(Identify Structures)**: accurately mark on any structure to be drilled as part of the Treatment Service the location of all water pipes, electrical cables, conduits or air conditioning ducts: (Allpest W.A. will not reimburse costs or be held responsible for any damage occasioned to these structures unless accurately marked); and
(d) **(Access)**: ensure that Allpest W.A. and its service personnel, employees, contractors and agents have full and free access to the Site, and if access is restricted for treatment and/or inspection the service period may be altered to a nil service period.

4. **Client Acknowledgements**
The client acknowledges by signing this Contract
(a) **(Limitations and Hidden Infestations)**: due to the structure and the design of the Building it is not possible to apply effective chemical barriers and treatments to all areas of the Building. Pests may therefore exist and be concealed in areas (both above and below ground level) which cannot reasonably be visually or physically accessed, inspected or treated, this may result in less than full inspection and complete treatment for termites and other Pests. As a consequence this may result in less than total eradication of termites and other Pests in the Building (or below the soil under or around the Building) and enable termites and other Pests to gain or regain access to the Building following treatment.
(b) **(Existing Damage)**: it is possible for existing termite damage, or other damage caused by other Pests, to exist in
(i) timbers inaccessible to visual examination in the Buildings and elsewhere at the Site, and
(ii) areas inaccessible to visual examination in the Buildings and elsewhere at the Site:
before, during, and after, any period of treatment under a Treatment Service and accordingly this may result in less than a full and complete treatment of Pests in those areas; and
(c) **(Chemicals)**: that chemicals listed in this Contract as "Non-Permanent" chemicals and used in the Treatment Service are not capable of completely eradicating the Pests in the Buildings or on the Site.

Accordingly, the client acknowledges that, for the purpose of this Contract and section 74(2) of the Trade Practices Act 1974 (Cth) and section 40(2) of the Fair Trading Act 1987 (W.A.), that Allpest W.A.:
(i) is not required to kill or to control every Pest in the Buildings or on the Site, but that Allpest W.A. is instead required to treat the Pests exercising due care and skill in accordance with methods detailed in the applicable Australian Standards Code, and the Treatment Schedule as agreed to with the client.
(ii) it is not possible to kill every subterranean termite by using the chemicals 'Chlorpyrifos' 'Bifenthrin' and/or 'Arsenic Trioxide' or any other termite control chemicals which may be used under State or Federal Government Pesticide regulations and accordingly further treatment may be required and further damage from future re-infestation of these pests may occur and
(iii) if any chemicals recommended for use in the Contract are listed as "Non-Permanent" chemicals, those chemicals are not capable of eradicating every Pest, and accordingly further treatment may be required, and damage from future re-infestation of those Pests may occur.

5. **Allpest W.A. Liability**
5.1 The client agrees that Allpest W.A., its employees, agents and contractors shall not be responsible, or in any way liable:
(a) **(Prior to Treatment)**: to repair or to replace or to rectify any damage to any part of the Buildings or the contents of the Buildings where such repair, replacement or rectification is caused by, arises out of, or otherwise occurs in consequence of, any infestation or re-infestation of Pests which occurred before or after the commencement of any Treatment Service;
(b) **(Injury to Persons)**: for any injury to any person, or for any costs and expenses arising in any way out of, injury to any person (whether or not a trespasser) on the Site where that injury is occasioned in consequence of any infestation of Pests on the Site before or after the commencement of any Treatment Service.
5.2 **(During and After Treatment)**: Subject only to sections 68 and 68A of the Trade Practices Act 1974 (Cth) and sections 34 and 35 of the Fair Trading Act 1987 (W.A.) the client agrees that, in addition to condition 5.1 Allpest W.A., its employees, agents and contractors shall not be responsible, or in any way liable, for any damage, repair, replacement, cost or injury sustained, incurred or which in any way arises out of:
(a) any infestation concealed in areas inaccessible to visual inspection in the Buildings or elsewhere at the Site;
(b) any infestation or re-infestation of Pests on the Site after the date on which the Pest Treatment Recommendations Form is signed or agreed to by the client if after that date:
(i) **(Failure to Notify)**: the client does not notify Allpest W.A. in writing, and within seven (7) days of becoming aware of, any such infestation or re-infestation on any part of the Site;
(ii) **(Infested Timbers Introduced)**: the client introduces timber infested with any Pests or other pests or stores timber or objects containing timber inside or underneath, or within one metre of, the Buildings;
(iii) **(Building Alterations)**: the client alters or constructs additions to the Buildings;
(iv) **(Disturbances)**: areas which have previously been treated by Allpest W.A. are disturbed by the construction of garden beds, lawns, sleepers, paths, footpaths, patios or driveways which adjoin, or are built within one metre of, the Building; and/or
(v) **(Other Treatment)**: another company other than Allpest W.A. carries out pest management or pest control to the Buildings or the Site.

6. **Cancellation by Client**
If the client purports to cancel or to otherwise not proceed with this Contract prior to Allpest W.A. commencing the Treatment Service, the client acknowledges that it is consequently in breach of an essential term of this Contract, and agrees:
(a) **(Forfeiture of Deposit)**: that the deposit (if any) paid by the client under the Contract shall be immediately forfeited to Allpest W.A.;
(b) **(Legal and Debt Collection Costs)**: to pay all legal costs, and all debt collection fees, and all disbursements, incurred in consequence of the client's breach of this Contract, or otherwise incurred in respect of the recovery of, or the attempted recovery of, the costs and expenses referred to in paragraph (b), in each case on an indemnity basis; and
(c) **(Pay Expenses)**: to pay, in addition to the amount of the deposit forfeited to Allpest W.A. all other costs and expenses however incurred by Allpest W.A. in consequence of the client's breach of this Contract.

7. The client acknowledges that any outstanding monies due and payable to Allpest W.A and which are not paid within 7 days of being due is consequently a breach of an essential term of this agreement and agrees to pay for all legal costs, and all debt collection fees, and all costs and expenses subsequently incurred in consequence of the clients breach of this contract, or otherwise incurred in respect of the recovery of, or the intended recovery of, the costs and expenses referred to in this clause, in each case on an indemnity basis. The client agrees to pay interest on all monies outstanding for 7 days after the due date for payment at the rate of 16% per annum from the due date for payment up to the actual date of payment.

8. The client acknowledges that non payment of any outstanding monies due to Allpest W.A. under this agreement will void any agreed further service benefits offered to the client under the terms of this agreement. Further service benefits at no charge to the client will not be restored until all outstanding monies due under the agreement are paid in full. General Provisions

9. Offer and Acceptance
Offer
The offer in this Contract may only be made by Allpest W.A. signing the offer under seal, or by one of Allpest W.A.'s expressly authorised representatives signing that offer on behalf of Allpest W.A.
Acceptance of Offer
The offer in this Contract shall be accepted by the client if:
(a) it is signed by, or on behalf of, the client; or
(b) it is verbally accepted by, or on behalf of, the client

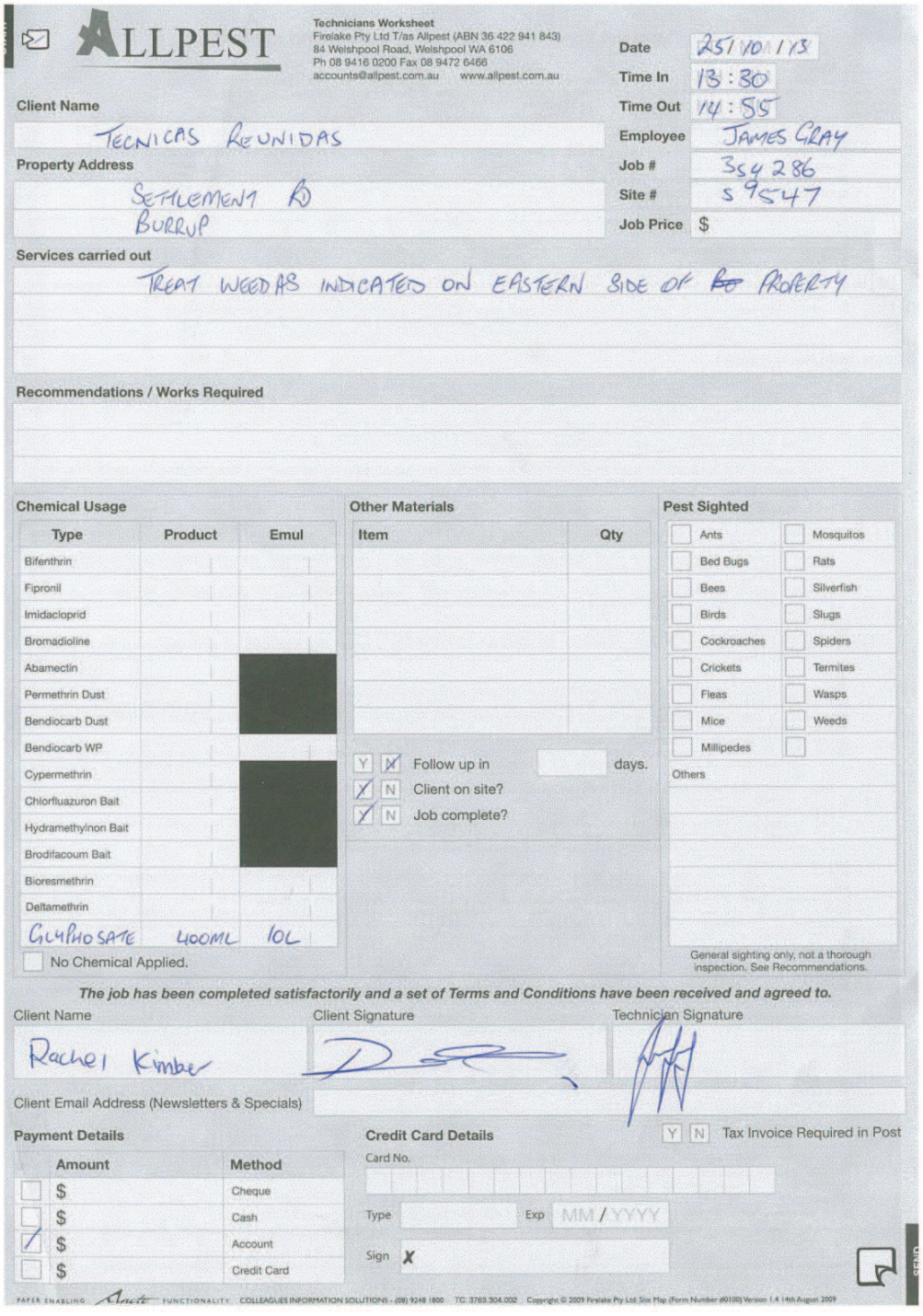
10. Amendment by Allpest W.A. to Printed Terms:
No representative or agent of Allpest W.A. has the authority to change or to delete all or any part of the terms or conditions contained in this Contract.

11. Where the property changes ownership, this agreement immediately becomes null and void. The new owner may apply to Allpest W.A. for the service to be transferred into the new owners name which will be provided entirety at the discretion of Allpest W.A.

12. **Terminations**
Allpest W.A. or the client may terminate this contract at any time for any reason whatsoever by giving written notice of termination to the other party.

Please note as per condition 5.1 and 5.2 Allpest W.A. accept no responsibility for damage caused by pests or termite infestation or re-infestation that is incurred prior to or after the treatment service to the property

Please note as per condition 5.1 and 5.2 Allpest accept no responsibility for damage caused by pests or termite infestation or re-infestation that is incurred prior to or after the treatment service to the property.



ALLPEST

Technicians Worksheet
Firelake Pty Ltd T/as Allpest (ABN 36 422 941 843)
84 Welshpool Road, Welshpool WA 6106
Ph 08 9416 0200 Fax 08 9472 6466
accounts@allpest.com.au www.allpest.com.au

Date 25/10/13
Time In 13:30
Time Out 14:55
Employee JAMES GRAY
Job # 354286
Site # S9547
Job Price $

Client Name: TECNICAS REUNIDAS

Property Address: SETTLEMENT RD BURRUP

Services carried out: TREAT WEEDS AS INDICATED ON EASTERN SIDE OF ~~RD~~ PROPERTY

Recommendations / Works Required

Chemical Usage

Type	Product	Emul
Bifenthrin		
Fipronil		
Imidacloprid		
Bromadioline		
Abamectin		[redacted]
Permethrin Dust		
Bendiocarb Dust		
Bendiocarb WP		
Cypermethrin		[redacted]
Chlorfluazuron Bait		
Hydramethylnon Bait		
Brodifacoum Bait		
Bioresmethrin		
Deltamethrin		
GLYPHOSATE	400ML	10L

☐ No Chemical Applied.

Other Materials

Item	Qty

Y ☒ Follow up in ____ days.
☒ N Client on site?
☒ N Job complete?

Pest Sighted

☐ Ants	☐ Mosquitos
☐ Bed Bugs	☐ Rats
☐ Bees	☐ Silverfish
☐ Birds	☐ Slugs
☐ Cockroaches	☐ Spiders
☐ Crickets	☐ Termites
☐ Fleas	☐ Wasps
☐ Mice	☐ Weeds
☐ Millipedes	☐

Others

General sighting only, not a thorough inspection. See Recommendations.

The job has been completed satisfactorily and a set of Terms and Conditions have been received and agreed to.

Client Name: Rachel Kimber
Client Signature
Technician Signature
Client Email Address (Newsletters & Specials)

Payment Details

	Amount	Method
☐	$	Cheque
☐	$	Cash
☑	$	Account
☐	$	Credit Card

Credit Card Details
Card No.
Type Exp MM / YYYY
Sign ✗

Y N Tax Invoice Required in Post

PAPER ENABLING FUNCTIONALITY COLLEAGUES INFORMATION SOLUTIONS - (08) 9248 1800 TC: 3763.304.002 Copyright © 2009 Firelake Pty Ltd Site Map (Form Number #0100) Version 1.4 14th August 2009

SEND

TERMS AND CONDITIONS OF ALLPEST W.A. TREATMENT SERVICES

In this Contract:
"Building" means the building or buildings referred to in the Treatment Recommendations Form, signed or agreed to by Allpest W.A. and by the client.
"Contract" means this contract between Allpest W.A. and the client for the Treatment Service in which these terms and conditions are incorporated.
"Pests" means those pests listed in the Pest Treatment Recommendation Form and/or the Quotation Agreement Form.
"Site" means all of the land, the Buildings and all other structures and improvements on the land at the address of the property referred to in the Treatment Recommendations form.
"Pest Treatment Recommendations Form" means the form signed or agreed to by Allpest W.A. and by the client in which the treatment of Pests is recommended by Allpest W.A. and accepted by the client.
"Treatment Service" means the service or services to be provided by Allpest W.A. in accordance with the Pest Treatment Recommendation Form, and in accordance with the Contract.

1. **Termite Treatment: Existing Buildings**
To treat current infestations of subterranean termites in existing Buildings on the Site, the Treatment Service will be carried out by Allpest W.A. to methods detailed in the Australian Standards Code 3660-1 1995 less any exclusions as agreed to by the client.

2. **Pre-treatment of Termites: Buildings under Construction**
Soil pre-treatment for the protection of subterranean termites to Buildings under construction will be carried out to methods detailed in the Australian Standards Code AS 3660-1 1995 less any exclusions as agreed to by the client.

3. **Client's Responsibility Prior to Service:**
It is the client's responsibility to:
(a) **(Vacate Site)**: ensure the Site is vacated prior to the Treatment Service being carried out.
(b) **(Remove Animals)**: ensure that all live animals, birds, fish or other pets are removed from the Site or are covered to ensure they are not adversely affected by the Treatment Service;
(c) **(Identify Structures)**: accurately mark on any structure to be drilled as part of the Treatment Service the location of all water pipes, electrical cables, conduits or air conditioning ducts; (Allpest W.A. will not reimburse costs or be held responsible for any damage occasioned to these structures unless accurately marked); and
(d) **(Access)**: ensure that Allpest W.A. and its service personnel, employees, contractors and agents have full and free access to the Site, and if access is restricted for treatment and/or inspection the service period may be altered to a nil service period.

4. **Client Acknowledgements**
The client acknowledges by signing this Contract
(a) **(Limitations and Hidden Infestations)**: due to the structure and the design of the Building it is not possible to apply effective chemical barriers and treatments to all areas of the Building. Pests may therefore exist and be concealed in areas (both above and below ground level) which cannot reasonably be visually or physically accessed, inspected or treated. This may result in less than full inspection and complete treatment for termites and other Pests. As a consequence this may result in less than total eradication of termites and other Pests in the Building (or below the soil under or around the Building) and enable termites and other Pests to gain or regain access to the Building following treatment.
(b) **(Existing Damage)**: it is possible for existing termite damage, or other damage caused by other Pests, to exist in
(i) timbers inaccessible to visual examination in the Buildings and elsewhere at the Site, and
(ii) areas inaccessible to visual examination in the Buildings and elsewhere at the Site;
before, during, and after, any period of treatment under a Treatment Service and accordingly this may result in less than a full and complete treatment of Pests in those areas; and
(c) **(Chemicals)**: that chemicals listed in this Contract as "Non-Permanent" chemicals and used in the Treatment Service are not capable of completely eradicating the Pests in the Buildings or on the Site.

Accordingly, the client acknowledges that, for the purpose of this Contract and section 74(2) of the Trade Practices Act 1974 (Cth) and section 40(2) of the Fair Trading Act 1987 (W.A.), that Allpest W.A.:
(i) is not required to kill or to control every Pest in the Buildings or on the Site, but that Allpest W.A. is instead required to treat the Pests exercising due care and skill in accordance with methods detailed in the applicable Australian Standards Code; and the Treatment Schedule as agreed to with the client.
(ii) it is not possible to kill every subterranean termite by using the chemicals 'Chlorpyrifos' 'Bifenthrin' and/or 'Arsenic Trioxide' or any other termite control chemicals which may be used under State or Federal Government Pesticide regulations and accordingly further treatment may be required and further damage from future re-infestation of these pests may occur and
(iii) if any chemicals recommended for use in the Contract are listed as "Non-Permant" chemicals, those chemicals are not capable of eradicating every Pest, and accordingly further treatment may be required, and damage from future re-infestation of those Pests may occur.

5. **Allpest W.A. Liability**
5.1 The client agrees that Allpest W.A., its employees, agents and contractors shall not be responsible, or in any way liable:
(a) **(Prior to Treatment)**: to repair or to replace or to rectify any damage to any part of the Buildings or the contents of the Buildings where such repair, replacement or rectification is caused by, arises out of, or otherwise occurs in consequence of, any infestation or re-infestation of Pests which occurred before or after the commencement of any Treatment Service;
(b) **(Injury to Persons)**: for any injury to any person, or for any costs and expenses arising in any way out of, injury to any person (whether or not a trespasser) on the Site where that injury is occasioned in consequence of any infestation of Pests on the Site before or after the commencement of any Treatment Service.
5.2 **(During and After Treatment)**: Subject only to sections 68 and 68A of the Trade Practices Act 1974 (Cth) and sections 34 and 35 of the Fair Trading Act 1987 (W.A.) the client agrees that, in addition to condition 5.1 Allpest W.A., its employees, agents and contractors shall not be responsible, or in any way liable, for any damage, repair, replacement, cost or injury sustained, incurred or which in any way arises out of:
(a) any infestation concealed in areas inaccessible to visual inspection in the Buildings or elsewhere at the Site;
(b) any infestation or re-infestation of Pests on the Site after the date on which the Pest Treatment Recommendations Form is signed or agreed to by the client if after that date;
(i) **(Failure to Notify)**: the client does not notify Allpest W.A. in writing, and within seven (7) days of becoming aware of, any such infeststion or re-infestation on any part of the Site;
(ii) **(Infested Timbers Introduced)**: the client introduces timber infested with any Pests or other pests or stores timber or objects containing timber inside or underneath, or within one metre of, the Buildings.
(iii) **(Building Alterations)**: the client alters or constructs additions to the Buildings;
(iv) **(Disturbances)**: areas which have previously been treated by Allpest W.A. are disturbed by the construction of garden beds, lawns, sleepers, paths, footpaths, patios or driveways which adjoin, or are built within one metre of, the Building; and/or
(v) **(Other Treatment)**: another company other than Allpest W.A. carries out pest management or pest control to the Buildings or the Site.

6. **Cancellation by Client**
If the client purports to cancel or to otherwise not proceed with this Contract prior to Allpest W.A. commencing the Treatment Service, the client acknowledges that it is consequently in breach of an essential term of this Contract, and agrees:
(a) **(Forfeiture of Deposit)**: that the deposit (if any) paid by the client under the Contract shall be immediately forfeited to Allpest W.A.;
(b) **(Legal and Debt Collection Costs)**: to pay all legal costs, and all debt collection fees, and all disbursements, incurred in consequence of the client's breach of this Contract, or otherwise incurred in respect of the recovery of, or the attempted recovery of, the costs and expenses referred to in paragraph (b), in each case on an indemnity basis; and
(c) **(Pay Expenses)**: to pay, in addition to the amount of the deposit forfeited to Allpest W.A. all other costs and expenses however incurred by Allpest W.A. in consequence of the client's breach of this Contract.

7. The client acknowledges that any outstanding monies due and payable to Allpest W.A and which are not paid within 7 days of being due is consequently a breach of an essential term of this agreement and agrees to pay for all legal costs, and all debt collection fees, and all costs and expenses subsequently incurred in consequence of the clients breach of this contract, or otherwise incurred in respect of the recovery of, or the intended recovery of, the costs and expenses referred to in this clause, in each case on an indemnity basis. The client agrees to pay interest on all monies outstanding for 7 days after the due date for payment at the rate of 16% per annum from the due date for payment up to the actual date of payment.

8. The client acknowledges that non payment of any outstanding monies due to Allpest W.A. under this agreement will void any agreed further service benefits offered to the client under the terms of this agreement. Further service benefits at no charge to the client will not be restored until all outstanding monies due under the agreement are paid in full. General Provisions

9. Offer and Acceptance
Offer
The offer in this Contract may only be made by Allpest W.A. signing the offer under seal, or by one of Allpest W.A.'s expressly authorised representatives signing that offer on behalf of Allpest W.A.
Acceptance of Offer
The offer in this Contract shall be accepted by the client if:
(a) it is signed by, or on behalf of, the client; or
(b) it is verbally accepted by, or on behalf of, the client

10. Amendment by Allpest W.A. to Printed Terms.
No representative or agent of Allpest W.A. has the authority to change or to delete all or any part of the terms or conditions contained in this Contract.

11. Where the property changes ownership, this agreement immediately becomes null and void. The new owner may apply to Allpest W.A. for the service to be transferred into the new owners name which will be provided entirety at the discretion of Allpest W.A.

12. Terminations
Allpest W.A. or the client may terminate this contract at any time for any reason whatsoever by giving written notice of termination to the other party.
Please note as per condition 5.1 and 5.2 Allpest W.A. accept no responsibility for damage caused by pests or termite infestation or re-infestation that is incurred prior to or after the treatment service to the property.

Please note as per condition 5.1 and 5.2 Allpest accept no responsibility for damage caused by pests or termite infestation or re-infestation that is incurred prior to or after the treatment service to the property.

PICTURES 1ST OCTOBER 2013

PICTURES 25TH OCTOBER 2013

ATTACHMENT 15

Vehicle/Plant & Mobile Equipment Access Form.

Vehicle Hygiene and Weed inspection Form.

	TAN BURRUP PROJECT	02080	
YARA	SITE SECURITY PLAN	PAGE 1 OF 2	TECNICAS REUNIDAS
	2-250-329-PRO-TRE-0112-tmp03	REV.: 00	

VEHICLE/PLANT & MOBILE EQUIPMENT ACCESS FORM

COMPANY:	DATE:
VEHICLE/ MACHINE MAKE:	ASSET N°:
MACHINE TYPE:	REGO:

HYGIENE INSPECTION:	YES	N/A
WEED AND SEED CERTIFICATION ATTACHED?	☐	☐

PLANT AND EQUIPMENT INSPECTION	YES	N/A
Side and Headlights (high and low beam) working correctly?	☐	☐
Tail and Brake Lights working correctly?	☐	☐
Reversing Lights and warning device working correctly?	☐	☐
Indicators working correctly?	☐	☐
Horn working correctly?	☐	☐
Vehicle Brakes working correctly?	☐	☐
Park Brake working correctly?	☐	☐
Seat Belts in good repair and working correctly?	☐	☐
Wipers serviceable?	☐	☐
Tyres (including spare) correctly inflated and sufficient tread?	☐	☐
Vehicle Panels, windows and mirrors clean and free of damage?	☐	☐
Fire Extinguisher secure, serviceable and correctly tagged?	☐	☐
Deluge system ~ serviceable and correctly tagged?	☐	☐
First Aid Kit fully stocked?	☐	☐
Windscreen washer reservoir correct level?	☐	☐
Vehicle Jack, wheel brace and associated tools correct?	☐	☐
Operator Service manual in the vehicle?	☐	☐
Battery isolation functions correctly?	☐	☐
Vehicle cabin free of tools and litter?	☐	☐
High lights fitted and functioning?	☐	☐
Flashing beacon clean, good repair and working?	☐	☐
2-way radio fitted in the LV and functioning	☐	☐
Slew warning device	☐	☐
Hydraulic systems - hose secured and free of leaks.	☐	☐
Attachments - blades and buckets secure.	☐	☐
Attachments - forks, booms, work boxes ~ load chart and SWL marked.	☐	☐
Positive lockout on quick hitch couplings.	☐	☐

VEHICLE/PLANT & MOBILE EQUIPMENT ACCESS FORM

PLANT AND EQUIPMENT INSPECTION	YES	N/A
All controls functional and labelled.	☐	☐
Emergency labels clear and clean.	☐	☐
ROPS / FOPS structure sound and appropriate.	☐	☐
Clearance warning signs in articulation areas	☐	☐
All engine and attachment rotating / moving parts guarded.	☐	☐
Access ladders and service platforms serviceable	☐	☐
Hand rail fitted – fall protection during prestart check and maintenance	☐	☐

PLANT/EQUIPMENT INSPECTION BY

Name: _____ Signature: _____

Contractor HSE Representative Approval: _____

	TAN BURRUP PROJECT	02080	
YARA	SITE SECURITY PLAN	PAGE 1 OF 1	TECNICAS REUNIDAS
	2-250-329-PRO-TRE-0112-tmp04	REV.: 00	

Vehicle Hygiene and Weed Inspection Form

SECTION 1 – VEHICLE AND COMPANY DETAILS

Person wanting to bring vehicle/equipment to site

Vehicle Description	
Name *(of person requesting inspection)*:	Company/Position:
Proposed date to commence using equipment:	Date:
Vehicle Type and Registration:	Equipment Owner:
Previous Location/ Details of known weeds:	Current Location:
Project Work Area:	

SECTION 2 - INSPECTION

HSE Manager or Delegate

Inspection Checklist	Yes	No	Comments
Is the exterior free of soil or mud?			
Is the exterior free of vegetative debris (twigs, leaves, seeds etc)?			
Has the vehicle been high pressured cleaned or disinfected prior to arrival on-site?			
Is the exterior free of animals and insects?			
Are there any oil leaks on hoses or hydraulic joins?			
Is the interior free from soil, dust and dirt?			
Is the interior free of vegetative debris (twigs, leaves, seeds etc)?			
Is the interior free of animals and insects?			

SECTION 3 – FURTHER ACTION REQUIRED PRIOR APPROVAL

HSE Manager or Delegate

Action	Responsibility	Action Completed

SECTION 4 - APPROVAL

Completion of this section renders the vehicle/equipment suitable for use on the site.

HSE Manager or Delegate

Name –HSE Manager or delegate:	Name – Company Rep:
Company:	Contractor:
Signature:	Signature:
Date:	Date:

ATTACHMENT 16

Licenses 17. Training certificates.

Department of Environment and Conservation
Our environment, our future

DEPARTMENT OF ENVIRONMENT AND CONSERVATION

Enquiries: 17 DICK PERRY AVE, KENSINGTON, WESTERN AUSTRALIA
Telephone: 08 9334 0333
Facsimile: 08 9334 0242

Correspondence: **Locked Bag 30**
Bentley Delivery Centre WA 6983

PAGE NO. 1
RR001400

RECEIPT NO. AMOUNT
$0.00

WILDLIFE CONSERVATION (REPTILES & AMPHIBIANS) REGS 2002
REGULATION 17
REPTILE REMOVALIST'S LICENCE

THE LICENSEE MAY, SUBJECT TO THE CONDITIONS BELOW, CAPTURE AND REMOVE FROM, IN OR NEAR ANY RESIDENTIAL PREMISES OR OTHER PREMISES FREQUENTED BY PEOPLE, ANY REPTILES OR AMPHIBIANS THAT ARE LIKELY TO SUFFER HARM IF NOT REMOVED AND ANY VENOMOUS SNAKES OR OTHER REPTILES PERCEIVED TO POSE A THREAT.

DIRECTOR GENERAL

CONDITIONS

1. THE LICENSEE SHALL COMPLY WITH THE PROVISIONS OF THE WILDLIFE CONSERVATION ACT 1950, WILDLIFE CONSERVATION REGULATIONS 1970 AND WILDLIFE CONSERVATION (REPTILE AND AMPHIBIAN KEEPING) REGULATIONS 2002 AND ANY NOTICES AND SCHEDULES IN FORCE UNDER THIS ACT AND THESE REGULATIONS.
2. ALL FAUNA CAPTURED UNDER THE AUTHORITY OF THIS LICENCE SHALL BE RELEASED IN THE WILD WITHIN THEIR NATURAL RANGE AND AWAY FROM BUILT-UP AREAS OR HUMAN HABITATION, WITH 72 HOURS OF CAPTURE.
3. NO FAUNA OR THEIR PROGENY SHALL BE RELEASED IN ANY AREA WHERE IT DOES NOT NATURALLY OCCUR, NOR SHALL ANY FAUNA TAKEN BE HANDED OVER TO ANY OTHER PERSON OR AUTHORITY WITHOUT PRIOR WRITTEN APPROVAL FROM THE DIRECTOR GENERAL. FURTHER, THE REMAINS OF ANY DECEASED FAUNA SHALL NOT BE DISPOSED OF IN SUCH A MANNER AS TO BE LIKELY TO CONFUSE THE KNOWN NATURAL OR PRESENT DAY DISTRIBUTION OF THE SPECIES.
4. ANY SPECIMENS TAKEN UNDER AUTHORITY OF THIS LICENCE, CONSIDERED BY THE LICENSEE TO BE OF PARTICULAR INTEREST OR VALUE TO THE W.A.MUSEUM, MAY BE LODGED WITH THAT ESTABLISHMENT, PROVIDED THIS IS DONE WITHIN 72 HOURS OF THE CAPTURE OF THAT SPECIMEN.
5. IF A CAPTURED REPTILE IS ILL OR HAS BEEN INJURED AND IN THE OPINION OF THE LICENSEE IT WOULD BE UNLIKELY TO SURVIVE IF RELEASED INTO THE WILD, THE LICENSEE MAY DELIVER THE REPTILE TO A WILDLIFE OFFICER OR HE/SHE MAY KEEP IT TEMPORARILY IN ACCORDANCE WITH REG 28A OF THE WILDLIFE CONSERVATION REGS 1970, PROVIDED THAT THE LICENSEE NOTIFIES A WILDLIFE OFFICER WITHIN 24 HOURS OF THE CAPTURE OF THE REPTILE AND ENTERS THE NOTIFICATION DETAILS ON THE RETURN FORM AT THE TIME OF NOTIFICATION.
6. THE LICENSEE SHALL MAINTAIN RETURNS OF FAUNA TAKEN UNDER THIS LICENCE AND SHALL SUBMIT THESE RETURNS WITHIN 15 DAYS OF THE END OF EACH 6 MONTH PERIOD (ENDING 31 MARCH AND 30 SEPTEMBER EACH CALENDER YEAR) TO THE DIRECTOR GENERAL OF DEC ON THE FORMS PROVIDED. FAILURE TO COMPLETE ALL FIELDS OF THE RETURN IN FULL SHALL CONSTITUTE A BREACH OF LICENCE CONDITIONS.
7. WITHIN 24 HOURS OF THE TIME OF CAPTURE OF ANY FAUNA, THE LICENSEE MUST ENTER ON THE RETURN FORM THE SPECIES OF EACH SPECIMEN OF FAUNA CAPTURED, THE DATE AND PLACE OF CAPTURE OF EACH SPECIMEN AND THE DATE AND PLACE OF RELEASE OF EACH SPECIMEN, OR THE DATE IT WAS HANDED TO A WILDLIFE OFFICER OR TO THE W.A. MUSEUM.
8. THIS LICENCE MUST BE CARRIED BY THE LICENSEE OR AUTHORISED AGENT AT ALL TIMES WHEN ENGAGED IN THE TAKING OF FAUNA OR WHEN TRANSPORTING FAUNA TAKEN UNDER THIS LICENCE FOR THE PURPOSE OF PROVING THEIR AUTHORITY TO TAKE, POSSESS OR RELEASE REPTILES IF QUESTIONED AS TO THEIR RIGHT TO DO SO BY A WILDLIFE OFFICER, ANY OTHER STATE OR LOCAL GOVERNMENT EMPLOYEE OR ANY MEMBER OF THE PUBLIC.

Department of Environment and Conservation
Our environment, our future

DEPARTMENT OF ENVIRONMENT AND CONSERVATION

Enquiries: 17 DICK PERRY AVE, KENSINGTON, WESTERN AUSTRALIA
Telephone: 08 9334 0333
Facsimile: 08 9334 0242

Correspondence: Locked Bag 30
Bentley Delivery Centre WA 6983

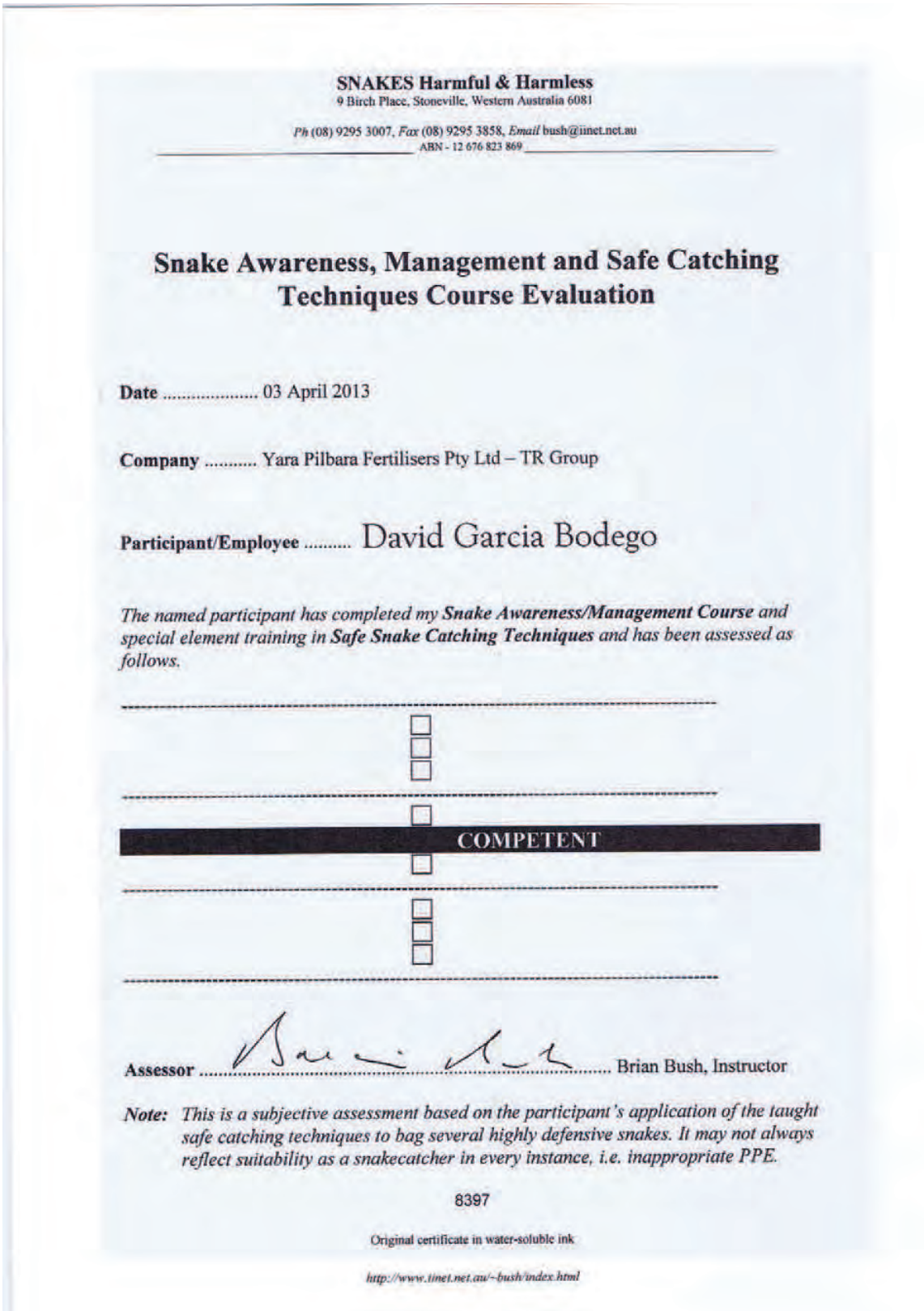
PAGE 2
NO. RR001400

DATE OF ISSUE 14/05/2013
VALID FROM 14/05/2013
DATE OF EXPIRY 13/05/2016

LICENSING OFFICER

(MARIA DEL MAR)

LICENSEE: MS M FOLGAR VALLEJO
ADDRESS UNIT 21, 200 BROCKMAN STREET
KARRATHA WA 6714



SNAKES Harmful & Harmless
9 Birch Place, Stoneville, Western Australia 6081

Ph (08) 9295 3007, *Fax* (08) 9295 3858, *Email* bush@iinet.net.au
ABN - 12 676 823 869

Snake Awareness, Management and Safe Catching Techniques Course Evaluation

Date ..... 03 April 2013

Company ..... Yara Pilbara Fertilisers Pty Ltd – TR Group

Participant/Employee ..... David Garcia Bodego

*The named participant has completed my **Snake Awareness/Management Course** and special element training in **Safe Snake Catching Techniques** and has been assessed as follows.*

☐
☐
☐

☐

COMPETENT

☐

☐
☐
☐

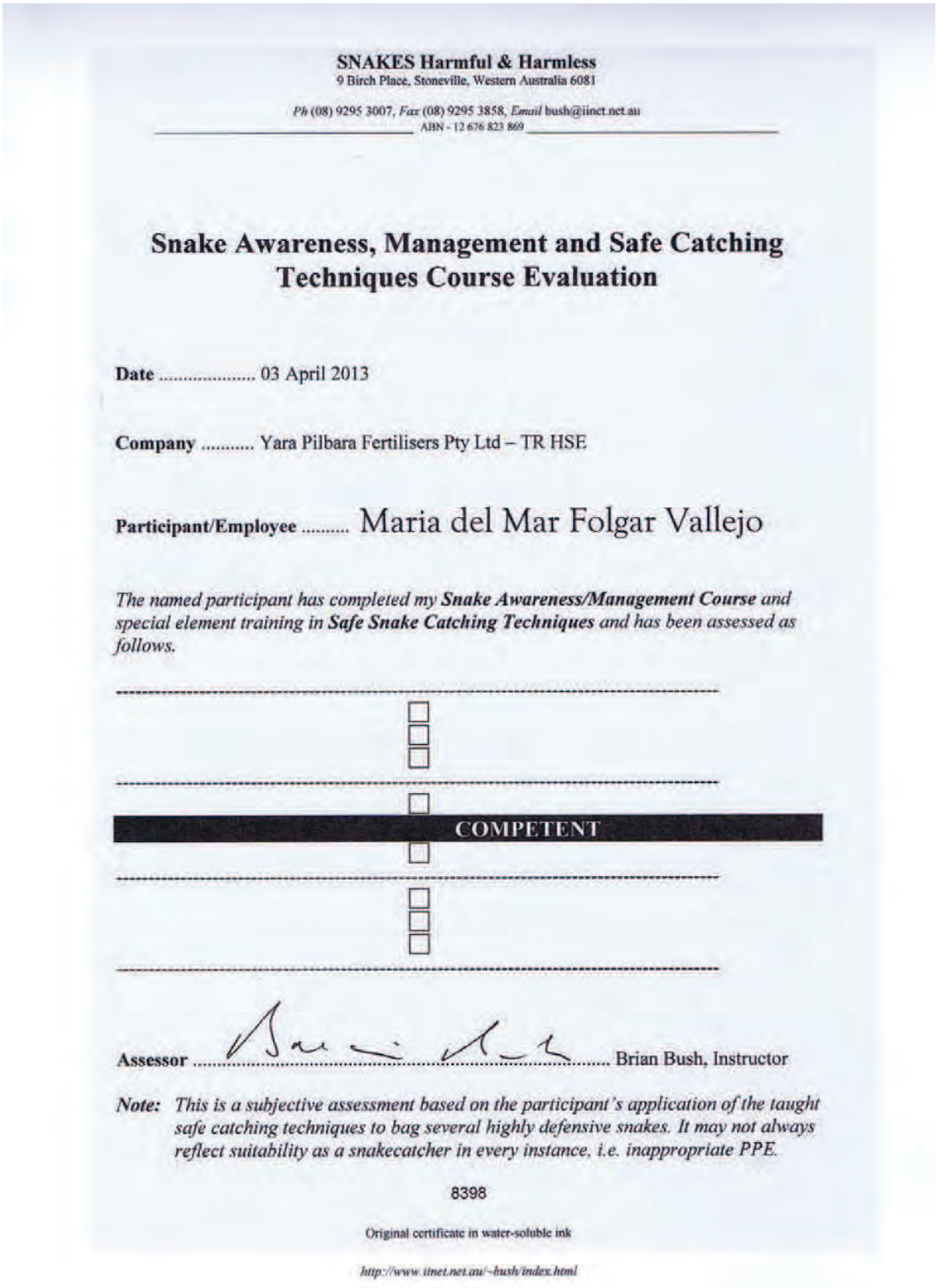
Assessor ..... Brian Bush, Instructor

Note: *This is a subjective assessment based on the participant's application of the taught safe catching techniques to bag several highly defensive snakes. It may not always reflect suitability as a snakecatcher in every instance, i.e. inappropriate PPE.*

8397

Original certificate in water-soluble ink

http://www.iinet.net.au/~bush/index.html



SNAKES Harmful & Harmless
9 Birch Place, Stoneville, Western Australia 6081

Ph (08) 9295 3007, *Fax* (08) 9295 3858, *Email* bush@iinet.net.au
ABN - 12 676 823 869

Snake Awareness, Management and Safe Catching Techniques Course Evaluation

Date ..... 03 April 2013

Company ..... Yara Pilbara Fertilisers Pty Ltd – TR HSE

Participant/Employee ..... Maria del Mar Folgar Vallejo

*The named participant has completed my **Snake Awareness/Management Course** and special element training in **Safe Snake Catching Techniques** and has been assessed as follows.*

☐
☐
☐

☐

COMPETENT

☐

☐
☐
☐

Assessor ..... Brian Bush, Instructor

Note: *This is a subjective assessment based on the participant's application of the taught safe catching techniques to bag several highly defensive snakes. It may not always reflect suitability as a snakecatcher in every instance, i.e. inappropriate PPE.*

8398

Original certificate in water-soluble ink

http://www.iinet.net.au/~bush/index.html

Certificate of Achievement

SNAKE HANDLING COURSE

Tani Gore

Has been awarded this certificate for successfully completing the above course.
Subjects included: Observations of reptile behaviours, safe practices of reptile removal, protective clothing and equipment, first aid treatment for snakebite and reptile relocation priorities.

Date: 17th April 2013 Signed:

Bob Cooper Snake Rescue & Relocation Pty Ltd

www.SnakeRnR.com

SNAKE R&R TRAINING

Safe outdoor adventures without wanton destruction of our environment

ATTACHMENT 17

Habitat Report

Notes:

- This attachment includes the habitat report develop between January 2015 and June 2015, attachment 01 of Compliance Report for Terrestrial Fauna Management (2-250-329-8091-att01).

- For habitat report from July 2015 to December 2015, refer to attachment 01 of Compliance Report for Terrestrial Fauna Management (2-250-329-REP-TRE-8102-att01), available upon request.

ATTACHMENT 01

Habitat Report

TABLE OF CONTENTS

ABBREVIATIONS

CEMP:	Construction Environmental Management Plan.
CTFMP:	Construction Terrestrial Fauna Management Plan.
CWTH:	Commonwealth.
DEC:	Department of Environment and Conservation.
EPA:	Environmental Protection Authority.
EPBC:	Environment Protection and Biodiversity Conservation Act 1999.
TAN:	Technical Ammonium Nitrate.
TRSA:	Tecnicas Reunidas S.A.
SEWPaC:	Australian Government Department of Sustainability, Environment, Water, Population and Communities.
WA:	Western Australia.

1 GENERAL INFORMATION

Tecnicas Reunidas S.A. (TRSA) understands the importance of protecting the unique biota of the Burrup Peninsular. A Construction Environmental Management Plan (CEMP) has been established to address the potential environmental issues associated with the construction of the TAN Burrup Project (the project) and to make sure that they are compliant with the appropriate environmental legislation.

As part of TRSA's commitment to their Construction Environmental Management Plan, fauna considered to have the potential to suffer harm if not removed from the work site and any fauna that may be perceived to pose a threat to the safety of persons within the workplace, is to be removed to a suitable location. This report aims to identify the fauna habitats located within the immediate vicinity and the fauna groups that are likely to utilise these habitats.

1.1 LEGISLATION

Fauna is governed under Commonwealth (CWTH) and Western Australian State (WA) legislation. Table 1 outlines the legislation relating to each aspect of the work required under the Construction Terrestrial Fauna Management Plan (CTFMP), which is the attachment 8 of the Construction Environment Management Plan.

Table 1: Relevant Legislation

Legislation	Application
FAUNA	
Environment Protection and Biodiversity Conservation Act 1999 (CWTH)	Assesses the conservation significance of fauna species and forms the framework for significant species protection at the Commonwealth level. Provides for the protection of matters of National Environmental Significance.
Wildlife Conservation Act 1950 (WA)	Assesses the conservation significance of fauna species and forms the framework for significant species protection at the State level.
Environmental Protection Act 1986 (WA)	State environmental impact assessment and Ministerial approval process.

1.2 LICENSING

All native fauna and flora are protected by state law under the Wildlife Conservation Act 1950 and are administered by the Department of Environment and Conservation (DEC). To collect, relocate and interfere with native flora and fauna the appropriate licenses are needed from the DEC.

During the site preparation face of the project, for the relocation of fauna a Regulation 17 License is necessary, which allows the holder to take fauna for education or public purposes (fauna relocation and/or education). The license number for TAN Burrup Project is TF006088. This license expires on 18/02/2014.

2 FAUNA HABITATS

Five types of fauna habitat were identified within the vicinity of the TAN Burrup Project. These habitats are; Rock Piles, Grasslands, Intertidal, Supratidal, and Mangroves and have been mapped in Figure 1.

YARA	Drawn: Mike Brown	TAN Burrup Project
		Habitat Map
	Author: Mike Brown	FIGURE No: 01
		2080
		REV 00
		TECNICAS REUNIDAS

2.1 ROCK PILES

This habitat type consists of large basalt boulders. These boulder piles create a large number of crevices and cavities for native fauna to utilise for shelter. Common groups of animals that may be utilising this habitat type include: bats, small terrestrial mammals and reptile species. The Rock Pile habitat type is a unique habitat which occurs on the Burrup Peninsula and the areas surrounding Karratha.

Figure 1: Rock Pile Habitat Type

2.2 GRASSLANDS

The Grassland habitat type is a common habitat found throughout the Pilbara regions. It is primarily made up of *Triodia sp.* of grasses which create an insulated microhabitat for fauna to utilise. This habitat type is used by small ground dwelling mammals, a variety of reptile species like skins and dragons, as well as food and foraging areas for birds and larger mammals.

Figure 2: Grasslands Habitat Type

2.3 INTERTIDAL

The Intertidal habitat is the area which is intermittently inundated by water due to tidal variations. There is very little vegetation presents within this habitat type, with *Tecticornia sp.* often present on the margins of the habitat. Intertidal habitat is unique as it is often utilised by Migratory shorebirds which are protected under the *EPBC Act 1999*.

Figure 3: Intertidal Habitat Type

2.4 SUPRATIDAL

The Supratidal habitat is the area directly above the high tide marks on the shoreline. This area is characterised by the *Tecticornia sp.* which occurs throughout the habitat. This habitat is marginally utilised by Migrator waders and shorebirds infringing from the Intertidal areas as well as some of the smaller skinks and larger mammals as they move about foraging for food.

Figure 4: Supratidal Habitat Type

2.5 MANGROVE

The Mangrove is a unique habitat type that occupies the intertidal zones between the shoreline and ocean. They are characterised by the vegetation that consist of solely Mangrove species, which supports a unique diversity of animals. Mangrove provide a home for birds like the Collared Kingfisher and the Little North-western Mastiff Bat, which predominantly use only Mangrove habitat. The intrinsic value of mangroves within the Pilbara are also recognised by the Environmental Protection Authority (EPA) in Western Australia, which has a Guidance Statement (EPA 2001) addressing the management of potential impacts on this habitat type.

Figure 5: Mangrove Habitat Type

3 FAUNA SPECIES AND THERE HABITAT UTILISATION

3.1 AMPHIBIANS

Only two species of amphibian are likely to occur in the project area. These are the Sheep Frog and the Little Red Tree Frog. Both of these species prefer humid or moist locations in which they are protected from drying out. The amphibians and their associated habitats can be found listed in Table 2.

Table 2: Amphibian Habitat Utilisation

Family	Genus	Species	Common Name	Rock Pile	Grassland	Intertidal	Supratidal	Mangroves
HYLIDAE	*Cyclorana*	*maini*	Sheep Frog	✓	✓			
	Litoria	*rubella*	Little Red Tree Frog	✓	✓			

3.2 REPTILES

Fifty one species of reptile potentially occur within the general vicinity of the project area. All species listed utilise either the Rock Pile or Grassland habitat types.

Table 3 list the reptile species and their associated habitats. Identification between the different species of reptiles may be difficult at times and I quick identification of an individual by a more experienced person may not be practical. When there is doubt regarding the species of a reptile, relocation to areas that have several potential habitat types is desired.

Table 3: Reptile Habitat Utilisation

Family	Genus	Species	Common Name	Rock Pile	Grassland	Intertidal	Supratidal	Mangroves
AGAMIDAE	*Ctenophorus*	*caudicinctus*		✓	✓			
	Ctenophorus	*isolepis*		✓	✓			
DIPLODACTYLIDAE	*Crenadactylus*	*ocellatus*		✓	✓			
	Diplodactylus	*conspicillatus*	Fat-tailed Gecko	✓	✓			
	Diplodactylus	*galaxias*	Northern Pilbara Beak-faced Gecko	✓	✓			
	Lucasium	*stenodactylum*		✓	✓			
	Oedura	*marmorata*	Marbled Velvet Gecko	✓				
	Strophurus	*ciliaris*			✓			
	Strophurus	*elderi*			✓			
	Strophurus	*jeanae*			✓			
	Strophurus	*wellingtonae*			✓			
GEKKONIDAE	*Gehyra*	*pilbara*			✓			
	Gehyra	*punctata*		✓				
	Gehyra	*variegata*		✓	✓			
	**Hemidactylus*	*frenatus*	Asian House Gecko					
	Heteronotia	*binoei*	Bynoe's Gecko	✓	✓			
PYGOPODIDAE	*Delma*	*pax*		✓	✓			
	Delma	*tincta*		✓	✓			
	Lialis	*burtonis*		✓	✓			
SCINCIDAE	*Carlia*	*triacantha*		✓	✓			
	Cryptoblepharus	*buchananii*		✓	✓			

Family	Genus	Species	Common Name	Rock Pile	Grassland	Intertidal	Supratidal	Mangroves
	Cryptoblepharus	*ustulatus*		✓	✓			
	Ctenotus	*pantherinus*		✓	✓			
	Ctenotus	*rubicundus*		✓	✓			
	Ctenotus	*saxatilis*		✓	✓			
	Ctenotus	*serventyi*		✓	✓			
	Cyclodomorphus	*melanops*		✓	✓			
	Egernia	*pilbarensis*	Pilbara Skink	✓	✓			
	Lerista	*bipes*			✓			
	Lerista	*clara*			✓			
	Lerista	*jacksoni*			✓			
	Lerista	*muelleri*			✓			
	Menetia	*greyii*			✓			
	Menetia	*surda*			✓			
	Morethia	*ruficauda*		✓	✓			
	Notoscincus	*ornatus*		✓	✓			
VARANIDAE	*Varanus*	*eremius*	Pygmy Desert Monitor		✓			
	Varanus	*pilbarensis*	Pilbara Rock Monitor	✓				
TYPHLOPIDAE	*Ramphotyphlops*	*ammodytes*			✓			
	Ramphotyphlops	*australis*			✓			
	Ramphotyphlops	*grypus*			✓			
BOIDAE	*Antaresia*	*perthensis*	Pygmy Python	✓	✓			
	Antaresia	*stimsoni*		✓	✓			
	Aspidites	*melanocephalus*	Black-headed Python	✓	✓			
	Liasis	*olivaceus subsp. barroni*	Pilbara Olive Python	✓				

Family	Genus	Species	Common Name	Rock Pile	Grassland	Intertidal	Supratidal	Mangroves
ELAPIDAE	*Acanthophis*	*wellsi*	Pilbara Death Adder		✓			
	Demansia	*rufescens*	Rufous Whipsnake		✓			
	Furina	*ornata*	Moon Snake		✓			
	Pseudechis	*australis*	Mulga Snake		✓			
	Pseudonaja	*mengdeni*	Western Brown Snake, Gwardar		✓			
	Suta	*punctata*	Spotted Snake	✓	✓			

3.3 MAMMALS

Twenty species of mammal have the potential to occur within the project area. The majority of these species utilise the Grassland habitat, with some preferring the Rock Piles. The exception to this is the Western Little Free-tailed Bat, which roost exclusively within Mangrove habitat. Caution should be taken if any bat species is found on site do to zoonotic viruses. When handling, make sure that suitable Personnel Protective Equipment is used. These species should be taken to the Vet or the DEC as they are most likely injured. Mammal species and the habitats they are associated with can be found in

Table 4.

Table 4: Mammal Habitat Utilisation

Family	Genus	Species	Common Name	Rock Pile	Grassland	Intertidal	Supratidal	Mangroves
DASYURIDAE	*Dasykaluta*	*rosamondae*	Little Red Kaluta	✓	✓			
	Dasyurus	*hallucatus*	Northern Quoll	✓				
	Ningaui	*timealeyi*	Pilbara Ningaui		✓			
	Pseudantechinus	*roryi*	Rory's Pseudantechinus	✓				
	Pseudantechinus	*woolleyae*	Woolley's Pseudantechinus	✓				
MACROPODIDAE	*Macropus*	*robustus*	Euro	✓	✓			
	Macropus	*rufus*	Red Kangaroo		✓			
	Petrogale	*rothschildi*	Rothschild's Rock-wallaby	✓				
MEGADERMATIDAE	*Macroderma*	*gigas*	Ghost Bat	C	C	C	C	C
EMBALLONURIDAE	*Taphozous*	*georgianus*	Common Sheathtail-bat	C	C	C	C	C
MOLOSSIDAE	*Mormopterus*	*loriae cobourgiana*	Western Little Free-tailed Bat	C	C	C	C	✓
MURIDAE	*Mus*	*musculus*	House Mouse	E	E	E	E	E

Family	Genus	Species	Common Name	Rock Pile	Grassland	Intertidal	Supratidal	Mangroves
	Pseudomys	*chapmani*	Western Pebble-mound Mouse		✓			
	Pseudomys	*delicatulus*	Delicate Mouse		✓			
	Pseudomys	*hermannsburgensis*	Sandy Inland Mouse		✓			
	Rattus	*rattus*	Black Rat	E	E	E	E	E
	Rattus	*tunneyi*	Pale Field-rat		✓			
	Zyzomys	*argurus*	Common Rock-rat	✓				
CANIDAE	*Vulpes*	*vulpes*	Red Fox	E	E	E	E	E
FELIDAE	*Felis*	*catus*	Cat	E	E	E	E	E

KEY: C = Contact a wildlife carer, DEC, or local vet. Precautions need to be taken when handling these species.

E = Introduced species, contact the local vet for euthanization.

3.4 BIRDS

Eighty six species of birds have the potential to occur in the project area. As these species are highly mobile, it is unlikely that they will need to be relocated unless injured. The bird species also utilise the Intertidal, Supratidal and Mangrove habitat types more than the other animal groups and can be readily observed in these habitats. Any bird species caught or trapped within the project area should be taken to the appropriate authorities as it is likely that they are injured. Due to the small size of the project area and the highly mobile nature of birds, they have not been listed with their associated habitats. However, shore bird species considered to be Migratory under the EPBC Act 1999, utilise habitats like the Intertidal and Supratidal habitats. Mangrove habitat is used by a lesser extent by these birds, however it is used by some species that are only found in this habitat type.

4 REFERENCES

Astron Environmental Pty Ltd (Astron) (2001). *Flora Vegetation Survey of the Proposed Ammonia Plant*. Unpublished report prepared for Sinclair Knight Merz on behalf of the Burrup Fertilisers Pty Ltd.

BOM (2013) *Bureau of Meteorology.* http://www.bom.gov.au site accessed March 2013

Commonwealth of Australia (2012) *Environmental Protection and Biodiversity Act 1999.*Author, Canberra.

Department of Environment and Conservation (2012) *Environmental Protection Act 1986.* Author, Perth

Department of Environment and Conservation (2012) *Wildlife Conservation Act 1950.* Author, Perth

Environmental Protection Authority (EPA) (2001) *Guidance for the Assessment of Environmental Factors: Guidance Statement for the protection of tropical arid zone mangroves along the Pilbara coastline No. 1.*

Environmental Protection Agency (2004) *Guidance for the Assessment of Environmental Factors: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia. No 51.*

Environmental Protection Agency (2005) *Guidance for the Assessment of Environmental Factors: Separation Distances between Industrial and Sensitive Land Uses. No 3.*

ERM (2010) *Technical Ammonium Nitrate Production Facility: Public Environmental Review for Burrup Nitrates Pty Ltd.* Unpublished document for Burrup Nitrates Pty Ltd.

Outback Ecology (2009) *Proposed Technical Ammonium Nitrate Production Facility Site, Burrup Peninsula.* Unpublished report for Burrup Nitrates.

Técnicas Reunidas (2012) *Construction Environmental Management Plan*, Doc. No. 2-250-329-PRO-TRG-0111.

ATTACHMENT 18

Site Clearing Report

Notes:

- This attachment includes the declared rare flora and priority flora survey for Unit 60 and main access road habitat report develop between January 2015 and June 2015, attachment 01 of Compliance Report for Terrestrial Vegetation and Flora Management (2-250-329-8092-att01).

- For site clearing report from July 2015 to December 2015, refer to attachment 01 of Compliance Report for Terrestrial Vegetation and Flora Management (2-250-329-REP-TRE-8103-att01), available upon request.

ATTACHMENT 01

Site Clearing Report

TABLE OF CONTENTS

ABBREVIATIONS

CEMP:	Construction Environmental Management Plan.
CTFMP:	Construction Terrestrial Fauna Management Plan.
CTVFMP:	Construction Terrestrial Vegetation and Flora Management Plan.
CWTH:	Commonwealth.
DEC:	Department of Environment and Conservation.
EPA:	Environmental Protection Authority.
EPBC:	Environment Protection and Biodiversity Conservation Act 1999.
HSE:	Health, Safety and Environment.
TAN:	Technical Ammonium Nitrate.
TRSA:	Tecnicas Reunidas S.A.
SEWPaC:	Australian Government Department of Sustainability, Environment, Water, Population and Communities.
TEC:	Threatened ecological communities.
WA:	Western Australia.
WDMP:	Weed Management Plan.

1 GENERAL INFORMATION

Técnicas Reunidas S.A. (TRSA) understands the importance of protecting the unique biota of the Burrup Peninsular. A Construction Environmental Management Plan (CEMP) has been established to address the potential environmental issues associated with the construction of the TAN Burrup Project (the project) and to make sure that they are compliant with the appropriate environmental legislation.

This report has been prepared as an account of the fauna, flora and weeds recorded during the clearing process of the TAN Burrup Project. Clearing occurred during January 2013 with all fauna encountered recorded by HSE team present on site during this time.

1.1 LEGISLATION

Fauna, flora and weeds are governed under Commonwealth (CWTH) and Western Australian State (WA) legislation. Table 1 outlines the legislation relating to each aspect of the work required under the Construction Terrestrial Fauna Management Plan (CTFMP), Construction Terrestrial Vegetation and Flora Management Plan (CTVFMP), and Weed Management Plan (WDMP) are the attachments 8, 9 and 10 of CEMP.

Table 1: Relevant Legislation

Legislation	Application
FAUNA AND FLORA	
Environment Protection and Biodiversity Conservation Act 1999 (CWTH)	Assesses the conservation significance of fauna and flora species and forms the framework for significant species protection at the Commonwealth level. Provides for the protection of matters of National Environmental Significance.
Wildlife Conservation Act 1950 (WA)	Assesses the conservation significance of fauna species and forms the framework for significant species protection at the State level.
Environmental Protection Act 1986 (WA)	State environmental impact assessment and Ministerial approval process.
WEEDS	
Biological Control Act 1985 (CWTH)	Under which a weed may be declared a target for biological control, or a weed control agent may be identified.
Environment Protection and Biodiversity Conservation Act 1999 (CWTH)	Protection on environmental matters of national significance. The EPBC Act also regulates the import and export of plants.
The Quarantine Act 1908 (CWTH)	Enables the Australian Quarantine and Inspection Service to physically prevent the introduction of weeds through the inspection of incoming luggage, cargo, mail, animals and plants and their products. It also provides inspection and certification for a range of exports.

Biological Control Act 1985 (CWTH)	Under which a weed may be declared a target for biological control, or a weed control agent may be identified.
Environment Protection and Biodiversity Conservation Act 1999 (CWTH)	Protection on environmental matters of national significance. The EPBC Act also regulates the import and export of plants.

1.2 LICENSING

All native fauna and are protected by state law under the Wildlife Conservation Act 1950 and are administered by the Department of Environment and Conservation (DEC). To collect, relocate and interfere with native flora and fauna the appropriate licenses are needed from the DEC.

2 FAUNA

2.1 POTENTIALLY OCCURRING FAUNA

A search of the Department of Environment and Conservation's NatureMap Database, as well as literature of surveys previously undertaken on the Burrup, was performed. A list of these species and whether they have been recorded within the TAN Burrup Project Area can be found in Attachment 01: Potentially occurring fauna.

2.2 CONSERVATION SIGNIFICANT FAUNA SPECIES

All fauna that potentially occurs within the project area and are considered to be of Conservation Significance can be found within

Table **2**.

Table 2: Conservation Significant Fauna

Family	Genus	Species	Common Name	Conservation Code	Recorded
REPTILES					
BOIDAE	*Liasis*	*olivaceus subsp. barroni*	Pilbara Olive Python	T	
MAMMALS					
DASYURIDAE	*Dasyurus*	*hallucatus*	Northern Quoll	T	

Family	Genus	Species	Common Name	Conservation Code	Recorded
MACROPODIDAE	*Macroderma*	*gigas*	Ghost Bat	P4	
MURIDAE	*Pseudomys*	*chapmani*	Western Pebble-mound Mouse	P4	
BIRDS					
ACCIPITRIDAE	*Haliaeetus*	*leucogaster*	White-bellied Sea-Eagle	IA	
FALCONIDAE	*Falco*	*peregrinus*	Peregrine Falcon	S	
SCOLOPACIDAE	*Limosa*	*lapponica*	Bar-tailed Godwit	IA	
	Numenius	*phaeopus*	Whimbrel	IA	
	Tringa	*brevipes*	Grey-tailed Tattler	IA	
	Tringa	*nebularia*	Common Greenshank	IA	✓
	Tringa	*stagnatilis*	Marsh Sandpiper	IA	
	Tringa	*hypoleucos*	Common Sandpiper	IA	✓
	Tringa	*cinereus*	Terek Sandpiper	IA	
	Arenaria	*interpres*	Ruddy Turnstone	IA	
	Calidris	*alba*	Sanderling	IA	
	Calidris	*ferruginea*	Curlew Sandpiper	IA	
	Calidris	*ruficollis*	Red-necked Stint	IA	
	Calidris	*tenuirostris*	Great Knot	IA	
BURHINIDAE	*Burhinus*	*grallarius*	Bush Stone-curlew	P4	
CHARADRIIDAE	*Pluvialis*	*squatarola*	Grey Plover	IA	
	Charadrius	*leschenaultii*	Greater Sand Plover	IA	
LARIDAE	*Anous*	*stolidus*	Common Noddy	IA	
MEROPIDAE	*Merops*	*ornatus*	Rainbow Bee-eater	IA	✓

Conservation Status

T- Rare or likely to become extinct
X- Presumed Extinct
IA- Protected Under International Agreement
S- Other Specially Protected Fauna
P1- Priority 1
P2- Priority 2
P3- Priority 3
P4- Priority 4
P5- Priority 5

2.3 RECORDED SPECIES

Fauna recorded during the clearing process can be found in Table 3 This fauna was identified through photographs taken during the clearing process and from descriptions given by TAN Burrup personnel. Any animals where there was doubt regarding its identification, due to either poor photography or a non-specific description, have been omitted.

Table 3: Fauna Species Recorded During Clearing

Family	Genus	Species	Common Name	Conservation Code	Recorded
REPTILES					
AGAMIDAE	*Ctenophorus*	*caudicinctus*			✓
SCINCIDAE	*Ctenotus*	*saxatilis*			✓
ELAPIDAE	*Pseudonaja*	*mengdeni*	Western Brown Snake, Gwardar		✓
MAMMALS					
MACROPODIDAE	*Macropus*	*robustus*	Euro		✓
	Macropus	*Rufus*	Red Kangaroo		✓
BIRDS					
ACCIPITRIDAE	*Haliastur*	*indus*	Brahminy Kite		✓
FALCONIDAE	*Falco*	*cenchroides*	Australian Kestrel		✓
RECURVIROSTRIDAE	*Himantopus*	*himantopus*	Black-winged Stilt		✓
PSITTACIDAE	*Cacatua*	*sanguinea*	Little Corella		✓

Conservation Status

T- Rare or likely to become extinct
X- Presumed Extinct
IA- Protected Under International Agreement
S- Other Specially Protected Fauna
P1- Priority 1
P2- Priority 2
P3- Priority 3
P4- Priority 4
P5- Priority 5

3 FLORA AND WEEDS

3.1 POTENTIALLY OCCURRING FLORA

A review of previous surveys undertaken on the Burrup Peninsular and a search of the DEC's Threatened and Priority Flora Database (Naturemap 2013) identified 198 species of flora previously recorded. Of these previously recorded species, seven are listed as priority and for and introduced species. A full list of species can be found in Attachment 02: Potentially occurring Flora.

3.2 PREVIOUSLY RECORDED FLORA

No Declare Rare Flora, as defined under the *Wildlife Conservation Act 1950,* has previously been recorded on the Burrup Peninsular. Seven species are listed as Priority by the DEC. Six are Priority 3 – Poorly Known Taxa, and one Priority 4 – Rare, Near Threatened and other taxa in need of monitoring.

Table 4: Conservation Significant Flora

Genus	Species	Conservation Significance	Previously Recorded on Site
Acacia	*glaucocaesia*	P3	
Eragrostis	*surreyana*	P3	
Rhynchosia	*bungarensis*	P4	
Schoenus	*punctatus*	P3	
Stackhousia	*clementii*	P3	
Terminalia	*supranitifolia*	P3	
Vigna	*sp. rockpiles* (R. Butcher et al. RB 1400)	P3	

A review of past surveys for the Burrup Peninsular identifies *Terminalia supranitifolia* (P3) as having been recorded on a site adjacent to the project area by Astron (2001). This species has been recorded in rocky areas of basalt rocks. Habitat in which the species was previously recorded does not occur within this site.

3.3 THREATENED ECOLOGICAL COMMUNITIES

The DEC database search listed no Threatened Ecological Communities (TEC) as occurring within the project area.

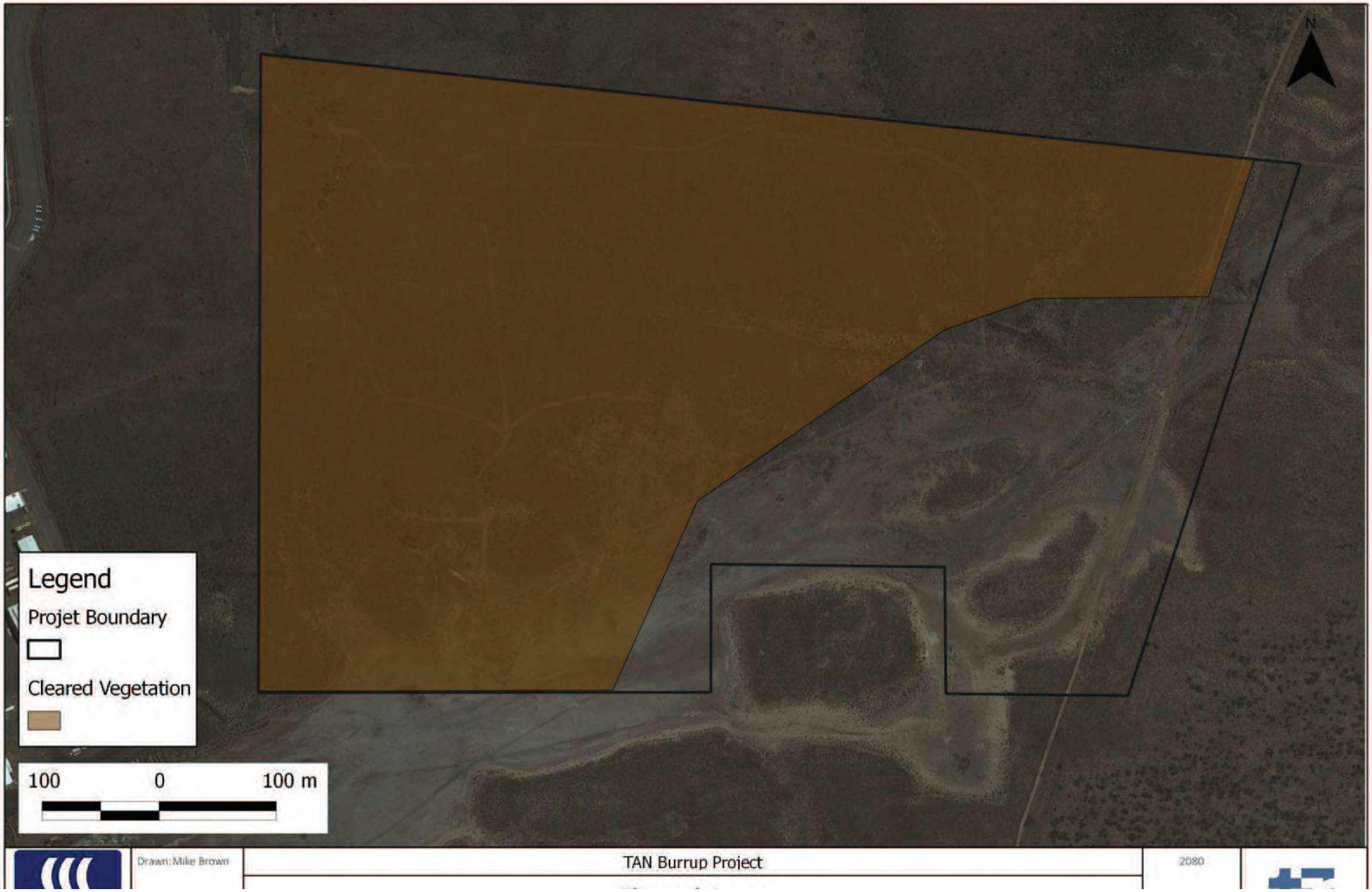
3.4 INTRODUCED FLORA SPECIES

Three species of flora, *Cenchrus ciliaris* (Buffel Grass), *Aerva javanica* (Kapok Bush), and *Vachellia farnesiana*, have previously been recorded within the project area.

Buffel Grass was side spread throughout the project area and still occurs within the uncleared vegetation within the project area. The *Vachellia farnesiana* was recorded in the north-western section of the project area. This area has now been cleared and it is likely that this species has been removed from site. The area from which the Kapok Bush was recorded is unknown.

3.5 POTENTIALLY OCCURRING WEED SPECIES

None of the introduced flora species recorded in the project area are listed as Declared Weeds under the *Agricultural and Related Resource Protection Act 1976*. However, they are listed under the *Environmental Weed Strategy* for Western Australia (DEC, 1993), as having a 'High' rating.


N
Legend
Projet Boundary
Cleared Vegetation
100 0 100 m
Drawn: Mike Brown
TAN Burrup Project
2080

4 REFERENCES

Astron Environmental Pty Ltd (Astron) (2001). *Flora Vegetation Survey of the Proposed Ammonia Plant*. Unpublished report prepared for Sinclair Knight Merz on behalf of the Burrup Fertilisers Pty Ltd.

BOM (2013) *Bureau of Meteorology.* http://www.bom.gov.au site accessed March 2013

Commonwealth of Australia (2012) *Environmental Protection and Biodiversity Act 1999.*Author, Canberra.

Department of Environment and Conservation (2012) *Environmental Protection Act 1986.* Author, Perth

Department of Environment and Conservation (2012) *Wildlife Conservation Act 1950.* Author, Perth

Department of Environment and Conservation (2013) *NatureMap.* Website accessed in May 2013. http://naturemap.dec.wa.gov.au/default.aspx

Environmental Protection Authority (EPA) (2001) *Guidance for the Assessment of Environmental Factors: Guidance Statement for the protection of tropical arid zone mangroves along the Pilbara coastline No. 1.*

Environmental Protection Agency (2004) *Guidance for the Assessment of Environmental Factors: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia. No 51.*

Environmental Protection Agency (2005) *Guidance for the Assessment of Environmental Factors: Separation Distances between Industrial and Sensitive Land Uses. No 3.*

ERM (2010) *Technical Ammonium Nitrate Production Facility: Public Environmental Review for Burrup Nitrates Pty Ltd.* Unpublished document for Burrup Nitrates Pty Ltd.

Outback Ecology (2009) *Proposed Technical Ammonium Nitrate Production Facility Site, Burrup Peninsula.* Unpublished report for Burrup Nitrates.

Técnicas Reunidas (2012) *Construction Environmental Management Plan*, Doc. No. 2-250-329-PRO-TRG-0111.

.

ATTACHMENT 01: POTENTIALLY OCCURRING FAUNA

ATTACHMENT 01A : Potentially Occurring Amphibians

Family	Genus	Species	Common Name	Conservation Code	Recorded
HYLIDAE	*Cyclorana*	*maini*	Sheep Frog		
	Litoria	*rubella*	Little Red Tree Frog		

ATTACHMENT 01B: Potentially Occurring Reptiles

Family	Genus	Species	Common Name	Conservation Status	Recorded
AGAMIDAE	*Ctenophorus*	*caudicinctus*			✓
	Ctenophorus	*isolepis*			
DIPLODACTYLIDAE	*Crenadactylus*	*ocellatus*			
	Diplodactylus	*conspicillatus*	Fat-tailed Gecko		
	Diplodactylus	*galaxias*	Northern Pilbara Beak-faced Gecko		
	Lucasium	*stenodactylum*			
	Oedura	*marmorata*	Marbled Velvet Gecko		
	Strophurus	*ciliaris*			
	Strophurus	*elderi*			
	Strophurus	*jeanae*			
	Strophurus	*wellingtonae*			
GEKKONIDAE	*Gehyra*	*pilbara*			
	Gehyra	*punctata*			
	Gehyra	*variegata*			
	Hemidactylus	*frenatus*	Asian House Gecko		
	Heteronotia	*binoei*	Bynoe's Gecko		✓
PYGOPODIDAE	*Delma*	*pax*			
	Delma	*tincta*			
	Lialis	*burtonis*			
SCINCIDAE	*Carlia*	*triacantha*			
	Cryptoblepharus	*buchananii*			

Family	Genus	Species	Common Name	Conservation Status	Recorded
	Cryptoblepharus	*ustulatus*			
	Ctenotus	*pantherinus*			
	Ctenotus	*rubicundus*			
	Ctenotus	*saxatilis*			✓
	Ctenotus	*serventyi*			
	Cyclodomorphus	*melanops*			
	Egernia	*pilbarensis*	Pilbara Skink		
	Lerista	*bipes*			
	Lerista	*clara*			
	Lerista	*jacksoni*			
	Lerista	*muelleri*			
	Menetia	*greyii*			
	Menetia	*surda*			
	Morethia	*ruficauda*			
	Notoscincus	*ornatus*			
VARANIDAE	*Varanus*	*eremius*	Pygmy Desert Monitor		
	Varanus	*pilbarensis*	Pilbara Rock Monitor		
TYPHLOPIDAE	*Ramphotyphlops*	*ammodytes*			
	Ramphotyphlops	*australis*			
	Ramphotyphlops	*grypus*			
BOIDAE	*Antaresia*	*perthensis*	Pygmy Python		
	Antaresia	*stimsoni*			
	Aspidites	*melanocephalus*	Black-headed Python		

Family	Genus	Species	Common Name	Conservation Status	Recorded
	Liasis	*olivaceus subsp. barroni*	Pilbara Olive Python	T	
ELAPIDAE	*Acanthophis*	*wellsi*	Pilbara Death Adder		
	Demansia	*rufescens*	Rufous Whipsnake		
	Furina	*ornata*	Moon Snake		
	Pseudechis	*australis*	Mulga Snake		
	Pseudonaja	*mengdeni*	Western Brown Snake, Gwardar		✓
	Suta	*punctata*	Spotted Snake		

ATTACHMENT 01C: Potentially Occurring Mammal Species

Family	Genus	Species	Common Name	Conservation Status	Recorded
DASYURIDAE	*Dasykaluta*	*rosamondae*	Little Red Kaluta		
	Dasyurus	*hallucatus*	Northern Quoll	T	
	Ningaui	*timealeyi*	Pilbara Ningaui		
	Pseudantechinus	*roryi*	Rory's Pseudantechinus		
	Pseudantechinus	*woolleyae*	Woolley's Pseudantechinus		
MACROPODIDAE	*Macropus*	*robustus*	Euro		✓
	Macropus	*rufus*	Red Kangaroo		✓
	Petrogale	*rothschildi*	Rothschild's Rock-wallaby		
MEGADERMATIDAE	*Macroderma*	*gigas*	Ghost Bat	P4	
EMBALLONURIDAE	*Taphozous*	*georgianus*	Common Sheathtail-bat		
MURIDAE	*Mus*	*musculus*	House Mouse		✓

	Pseudomys	*chapmani*	Western Pebble-mound Mouse, Ngadji	P4	
	Pseudomys	*delicatulus*	Delicate Mouse		
	Pseudomys	*hermannsburgensis*	Sandy Inland Mouse		
	Rattus	*rattus*	Black Rat		
	Rattus	*tunneyi*	Pale Field-rat		
	Zyzomys	*argurus*	Common Rock-rat		
CANIDAE	*Vulpes*	*vulpes*	Red Fox		
FELIDAE	*Felis*	*catus*	Cat		

ATTACHMENT 01D: Potentially Occurring Bird Species

Family	Genus	Species	Common Name	Conservation Significance	Recorded
PHALACROCORACIDAE	*Phalacrocorax*	*varius*	Pied Cormorant		
PELECANIDAE	*Pelecanus*	*conspicillatus*	Australian Pelican		
ARDEIDAE	*Ardea*	*garzetta*	Little Egret		✓
	Ardea	*novaehollandiae*	White-faced Heron		✓
	Nycticorax	*caledonicus*	Nankeen Night Heron		✓
ACCIPITRIDAE	*Pandion*	*haliaetus*	Osprey		✓
	Milvus	*migrans*	Black Kite		
	Haliastur	*sphenurus*	Whistling Kite		
	Haliastur	*indus*	Brahminy Kite		
	Aquila	*morphnoides*	Little Eagle		✓
	Haliaeetus	*leucogaster*	White-bellied Sea-Eagle	IA	
FALCONIDAE	*Falco*	*berigora*	Brown Falcon		
	Falco	*cenchroides*	Australian Kestrel		
	Falco	*longipennis*	Australian Hobby		
	Falco	*peregrinus*	Peregrine Falcon	S	
RALLIDAE	*Gallirallus*	*philippensis*			
TURNICIDAE	*Turnix*	*velox*	Little Button-quail		
SCOLOPACIDAE	*Limosa*	*lapponica*	Bar-tailed Godwit	IA	
	Numenius	*phaeopus*	Whimbrel	IA	
	Tringa	*brevipes*	Grey-tailed Tattler	IA	
	Tringa	*nebularia*	Common Greenshank	IA	✓

Family	Genus	Species	Common Name	Conservation Significance	Recorded
	Tringa	*stagnatilis*	Marsh Sandpiper	IA	
	Tringa	*hypoleucos*	Common Sandpiper	IA	✓
	Tringa	*cinereus*	Terek Sandpiper	IA	
	Arenaria	*interpres*	Ruddy Turnstone	IA	
	Calidris	*alba*	Sanderling	IA	
	Calidris	*ferruginea*	Curlew Sandpiper	IA	
	Calidris	*ruficollis*	Red-necked Stint	IA	
	Calidris	*tenuirostris*	Great Knot	IA	
BURHINIDAE	*Burhinus*	*grallarius*	Bush Stone-curlew	P4	
HAEMATOPODIDAE	*Haematopus*	*longirostris*	Pied Oystercatcher		
	Haematopus	*fuliginosus*	Sooty Oystercatcher		
RECURVIROSTRIDAE	*Himantopus*	*himantopus*	Black-winged Stilt		✓
CHARADRIIDAE	*Vanellus*	*tricolor*	Banded Lapwing		
	Pluvialis	*squatarola*	Grey Plover	IA	
	Charadrius	*ruficapillus*	Red-capped Plover		✓
	Charadrius	*leschenaultii*	Greater Sand Plover	IA	
LARIDAE	*Larus*	*novaehollandiae*	Silver Gull		✓
	Sterna	*caspia*	Caspian Tern		✓
	Anous	*stolidus*	Common Noddy	IA	
COLUMBIDAE	*Columba*	*livia*	Domestic Pigeon		
	Ocyphaps	*lophotes*	Crested Pigeon		
	Phaps	*chalcoptera*	Common Bronze-wing Pigeon		✓
	Geophaps	*plumifera*	Spinifex Pigeon		✓

Family	Genus	Species	Common Name	Conservation Significance	Recorded
	Geopelia	*cuneata*	Diamond Dove		✓
	Geopelia	*humeralis*	Bar-shouldered Dove		
	Geopelia	*striata*	Peaceful Dove		
PSITTACIDAE	*Cacatua*	*sanguinea*	Little Corella		
	Melopsittacus	*undulatus*	Budgerigar		
CUCULIDAE	*Cuculus*	*pallidus*	Pallid Cuckoo		
CENTROPODIDAE	*Centropus*	*phasianinus*	Pheasant Coucal		
STRIGIDAE	*Ninox*	*novaeseelandiae*	Boobook Owl		
PODARGIDAE	*Podargus*	*strigoides*			
	Podargus	*strigoides*	Tawny Frogmouth		
AEGOTHELIDAE	*Aegotheles*	*cristatus*	Australian Owlet-nightjar		
HALCYONIDAE	*Todiramphus*	*chloris*	Collared Kingfisher		
	Todiramphus	*sanctus*	Sacred Kingfisher		
MEROPIDAE	*Merops*	*ornatus*	Rainbow Bee-eater	IA	✓
PITTIDAE	*Pitta*	*moluccensis*	Blue-winged Pitta		
MALURIDAE	*Malurus*	*leucopterus*	White-winged Fairy-wren		
	Malurus	*lamberti*	Variegated Fairy-wren		✓
PARDALOTIDAE	*Pardalotus*	*striatus*	Striated Pardalote		
ACANTHIZIDAE	*Gerygone*	*tenebrosa*	Dusky Gerygone		
MELIPHAGIDAE	*Lichmera*	*indistincta*	ubsp. indistinct		
	Lichmera	*indistincta*	Brown Honeyeater		
	Lichenostomus	*penicillatus*	White-plumed Honeyeater		
	Lichenostomus	*virescens*	Singing Honeyeater		✓

Family	Genus	Species	Common Name	Conservation Significance	Recorded
	Manorina	*flavigula*	Yellow-throated Miner		
	Epthianura	*tricolor*	Crimson Chat		
PACHYCEPHALIDAE	*Pachycephala*	*lanioides*	White-breasted Whistler		
	Pachycephala	*melanura*	ubsp. melanur		
DICRURIDAE	*Rhipidura*	*phasiana*	Mangrove Grey Fantail		
	Rhipidura	*leucophrys*	Willie Wagtail		
	Grallina	*cyanoleuca*	Magpie-lark		✓
CAMPEPHAGIDAE	*Coracina*	*novaehollandiae*	Black-faced Cuckoo-shrike		✓
ARTAMIDAE	*Artamus*	*minor*	Little Woodswallow		
	Artamus	*cinereus*	Black-faced Woodswallow		✓
	Artamus	*leucorynchus*	White-breasted Woodswallow		
CRACTICIDAE	*Cracticus*	*nigrogularis*	Pied Butcherbird		
HIRUNDINIDAE	*Hirundo*	*neoxena*	Welcome Swallow		✓
ZOSTEROPIDAE	*Zosterops*	*luteus*	Yellow White-eye		
SYLVIIDAE	*Megalurus*	*timoriensis*	Tawny Grassbird		✓
PASSERIDAE	*Passer*	*montanus*	Eurasian Tree Sparrow		
	Passer	*domesticus*	House Sparrow		
ESTRILDIDAE	*Taeniopygia*	*guttata*	Zebra Finch		
	Emblema	*pictum*	Painted Finch		

ATTACHMENT 02: POTENTIALLY OCCURRING FLORA

ATTACHMENT 02: Potentially Occurring Flora

Genus	Species	Common Name	Conservation Significance	Previously Recorded on Site
Abutilon	*fraseri*	Lantern Bush		
Abutilon	*lepidum*			
Acacia	*ancistrocarpa*	Fitzroy Wattle		
Acacia	*arida*			
Acacia	*bivenosa*			
Acacia	*colei*			
Acacia	*coriacea*	Wirewood		
Acacia	*glaucocaesia*		**P3**	
Acacia	*gregorii*	Gregory's Wattle		
Acacia	*inaequilatera*	Baderi		
Acacia	*orthocarpa*	Needleleaf Wattle		
Acacia	*pyrifolia*			
Acacia	*pyrifolia*	Ranji Bush		
Acacia	*sphaerostachya*			
Acacia	*trachycarpa*	Minni Ritchi		
Acacia	*xiphophylla*			
Acetabularia	*calyculus*			
Acetosa	*vesicaria*			
Adriana	*tomentosa*			

Genus	Species	Common Name	Conservation Significance	Previously Recorded on Site
Aegialitis	*annulata*	Club Mangrove		
Aegiceras	*corniculatum*	River Mangrove		
Aerva	*javanica*	Kapok Bush		
Alectryon	*oleifolius*			
Alternanthera	*nana*	Hairy Joyweed		
Amaranthus	*undulatus*			
Ammannia	*baccifera*			
Angianthus	*milnei*	Cone-spike Angianthus		
Aristida	*contorta*	Bunched Kerosene Grass		
Aristida	*latifolia*	Feathertop Wiregrass		
Avicennia	*marina*	White Mangrove		
Boerhavia	*coccinea*	Tar Vine		
Boerhavia	*gardneri*			
Bonamia	*media*			
Bonamia	*sp. Dampier* (A.A. Mitchell PRP 217)			
Boodlea	*composita*			
Brachychiton	*acuminatus*			
Bridelia	*tomentosa*			
Bruguiera	*exaristata*	Ribbed Mangrove		
Cajanus	*cinereus*			
Cajanus	*pubescens*			

Genus	Species	Common Name	Conservation Significance	Previously Recorded on Site
Capparis	*spinosa var. nummularia*	Coastal Caper		
Cassytha	*capillaris*			
Caulerpa	*racemosa*			
Caulerpa	*sertularioides*			
Ceriops	*australis*			
Cheilanthes	*contigua*			
Chrysopogon	*fallax*	Golden Beard Grass		
Cleome	*viscosa*	Tickweed		
Clerodendrum	*tomentosum*			
Codonocarpus	*cotinifolius*	Native Poplar		
Commelina	*ensifolia*	Wandering Jew		
Corchorus	*elachocarpus*			
Corchorus	*incanus*			
Corchorus	*trilocularis*			
Corchorus	*walcottii*	Woolly Corchorus		
Corymbia	*hamersleyana*			
Corymbia	*opaca*			
Crotalaria	*cunninghamii*	Green Birdflower		
Crotalaria	*novae-hollandiae*	New Holland Rattlepod		
Cucumis	*maderaspatanus*			
Cymbopogon	*ambiguus*	Scentgrass		

Genus	Species	Common Name	Conservation Significance	Previously Recorded on Site
Cynanchum	*floribundum*	Dumara Bush		
Cyperus	*bifax*	Downs Nutgrass		
Cyperus	*bulbosus*	Bush Onion		
Cyperus	*vaginatus*	Stiffleaf Sedge		
Dactyloctenium	*radulans*	Button Grass		
Dichrostachys	*spicata*	Pied Piper Bush		
Dictyosphaeria	*cavernosa*			
Digitaria	*ctenantha*	Comb Finger Grass		
Dysphania	*plantaginella*			
Ehretia	*saligna var. saligna*			
Eleocharis	*geniculata*			
Enchylaena	*tomentosa*	Barrier Saltbush		
Enneapogon	*caerulescens*	Limestone Grass		
Enneapogon	*lindleyanus*	Wiry Nineawn		
Eragrostis	*surreyana*		P3	
Eremophila	*longifolia*	Berrigan		
Eriachne	*obtusa*	Northern Wandarrie Grass		
Eriachne	*tenuiculmis*			
Eucalyptus	*prominens*			
Eucalyptus	*victrix*			
Euphorbia	*alsiniflora*	Namana		

Genus	Species	Common Name	Conservation Significance	Previously Recorded on Site
Euphorbia	*australis*	Namana		
Euphorbia	*careyi*			
Euphorbia	*tannensis*	Desert Spurge		
Evolvulus	*alsinoides var. villosicalyx*			
Ficus	*aculeata var. indecora Ranji*			
Ficus	*brachypoda*			
Ficus	*virens*	Albayi		
Fimbristylis	*dichotoma*	Eight Day Grass		
Flaveria	*trinervia*	Speedy Weed		
Flueggea	*virosa subsp. melanthesoides*	Dogwood		
Gomphrena	*cunninghamii*			
Goodenia	*lamprosperma*			
Goodenia	*tenuiloba*			
Grevillea	*pyramidalis*			
Hakea	*lorea*			
Halimeda	*discoidea*			
Halodule	*uninervis*			
Halophila	*decipiens*			
Helichrysum	*luteoalbum*	Jersey Cudweed		
Heliotropium	*curassavicum*	Smooth Heliotrope		
Heliotropium	*tenuifolium*	Mamukata		

Genus	Species	Common Name	Conservation Significance	Previously Recorded on Site
Hibiscus	*leptocladus*			
Hibiscus	*sturtii*	Sturt's Hibiscus		
Hybanthus	*aurantiacus*			
Indigofera	*colutea*	Sticky Indigo		
Indigofera	*linifolia*			
Indigofera	*monophylla*			
Ipomoea	*costata*	Rock Morning Glory		
Ipomoea	*muelleri*	Poison Morning Glory		
Ipomoea	*pes-caprae*			
Jasminum	*didymum*	Desert Jasmine		
Lawrencia	*viridigrisea*			
Lepidium	*pedicellosum*			
Lepidium	*pholidogynum*			
Mollugo	*molluginea*			
Muellerolimon	*salicorniaceum*			
Myoporum	*montanum*	Native Myrtle		
Najas	*tenuifolia*	Water Nymph		
Neobassia	*astrocarpa*			
Panicum	*decompositum*	Native Millet		
Paspalidium	*tabulatum*			
Pittosporum	*phillyreoides*	Weeping Pittosporum		

Genus	Species	Common Name	Conservation Significance	Previously Recorded on Site
Pluchea	*dentex*			
Pluchea	*rubelliflora*			
Pluchea	*sp. B Kimberley Flora* (K.F. Kenneally 9526A)			
Polycarpaea	*longiflora*			
Portulaca	*conspicua*			
Pterocaulon	*sphacelatum Apple Bush*			
Pterocaulon	*sphaeranthoides*			
Ptilotus	*astrolasius*			
Ptilotus	*auriculifolius*			
Ptilotus	*gomphrenoides*			
Ptilotus	*polystachyus*	Prince of Wales Feather		
Ptilotus	*villosiflorus*			
Rhagodia	*eremaea*	Thorny Saltbush		
Rhagodia	*preissii*			
Rhizophora	*stylosa*	Spotted-leaved Red Mangrove		
Rhodanthe	*margarethae*			
Rhynchosia	*australis*	Rhynchosia		
Rhynchosia	*bungarensis*		P4	
Rhynchosia	*minima*	Rhynchosia		
Scaevola	*acacioides*			
Scaevola	*cunninghamii*			

Genus	Species	Common Name	Conservation Significance	Previously Recorded on Site
Scaevola	*spinescens*	Currant Bush		
Schoenoplectus	*subulatus*			
Schoenus	*punctatus*		P3	
Sclerolaena	*uniflora*	Two-spined Saltbush		
Senna	*artemisioides*			
Senna	*glutinosa*			
Senna	*notabilis*			
Sesbania	*cannabina*	Sesbania Pea		
Sida	*cardiophylla*			
Sida	*fibulifera*	Silver Sida		
Sida	*sp. Pilbara* (A.A. Mitchell PRP 1543)			
Solanum	*horridum*			
Solanum	*lasiophyllum*	Flannel Bush		
Solanum	*phlomoides*			
Solidago	*canadensis*	Goldenrod		
Spinifex	*longifolius*	Beach Spinifex		
Sporobolus	*australasicus*	Fairy Grass		
Stackhousia	*clementii*		P3	
Stemodia	*grossa*	Marsh Stemodia		
Stemodia	*kingii*			
Streptoglossa	*decurrens*			

Genus	Species	Common Name	Conservation Significance	Previously Recorded on Site
Streptoglossa	*liatroides*			
Stylidium	*fluminense*			
Swainsona	*formosa*			
Swainsona	*pterostylis*			
Tecticornia	*halocnemoides*	Shrubby Samphire		
Tecticornia	*indica*			
Tecticornia	*pterygosperma*			
Tephrosia	*clementii*			
Tephrosia	*leptoclada*			
Tephrosia	*rosea*	Flinders River Poison		
Tephrosia	*rosea var. clementii*			
Tephrosia	*sp. B Kimberley Flora* (C.A. Gardner 7300)			
Tephrosia	*sp. Pilbara* (A.L. Payne PRP 1393)			
Tephrosia	*supina*			
Terminalia	*canescens Joolal*			
Terminalia	*supranitifolia*		P3	
Themeda	*sp. Mt Barricade* (M.E. Trudgen 2471)			
Themeda	*triandra*			
Tinospora	*smilacina*	Snakevine		
Trachymene	*oleracea*			
Trianthema	*turgidifolia*			

Genus	Species	Common Name	Conservation Significance	Previously Recorded on Site
Tribulus	*occidentalis*	Perennial Caltrop		
Trichodesma	*zeylanicum*	Camel Bush		
Triodia	*angusta*			
Triodia	*epactia*			
Triodia	*schinzii*			
Triodia	*wiseana*	Limestone Spinifex		
Triumfetta	*appendiculata*			
Triumfetta	*clementii*			
Udotea	*glaucescens*			
Vigna	*sp. rockpiles* (R. Butcher et al. RB 1400)		P3	
Whiteochloa	*airoides*			

* Introduced Species

ATTACHMENT 03: PLATES

Figure 1: *Ctenophorus caudicinctus*

Figure 2: Little Correla

Figure 3: ***Ctenotus sp.***

Figure 4: ***Macropus rufus***

Figure 5: ***Varanus gouldii***

ATTACHMENT 19

Fauna Shelters

Example of Fauna Shelter

ATTACHMENT 20

Groundwater Monitoring Well Relocation

Environmental Resources Management Australia

6th Floor,
172 St. Georges Terrace
Perth WA 6000

PO Box 7338
Cloisters Square WA 6850

Telephone +61 8 9321 5200
Facsimile +61 8 9321 5262

www.erm.com

12 February, 2014

Kim Taylor
General Manager
Office of the Environmental Protection Authority
The Atrium Level 8
168 St Georges Terrace
Perth, Western Australia 6000

Our Reference: 0220651

OEPA Reference: CA01-2013-0018

Dear Mr Taylor,

RE: GROUNDWATER MONITORING WELL RE-LOCATION

1. INTRODUCTION

Environmental Resources Management Australia Pty Ltd (ERM) was engaged by Yara Pilbara Nitrates Pty Ltd (YPNPL) to support them in addressing environmental non-compliances (NC) highlighted in the OEPA's letter dated 15 January 2014. This letter specifically responds to the request for:

'Details of the design, construction and location of the bores installed to replace groundwater monitoring bores MW1 and MW4 and the reasons and rationale for replacing the bores…'

The OEPA require action by 14 February 2014 to resolve the NC. This letter sets out the information required together with *Annexes A* and *B* which provide location details and the *'Monitoring Well Installation'* report issued by GHD respectively.

2. PROJECT APPRECIATION

The site (including temporary laydown areas) occupies approximately 35 ha of land in the north-western section of Lot 3017. Lot 3017 totals approximately 49 ha and is located within the Burrup Industrial Estate (BIE). The existing ammonia fertiliser plant is situated adjacent to the western boundary of Lot 3017.

The civil works for the TANPF have now been completed and construction works commenced. The Project is on target for commissioning in Q1 2015. During civil works activities, 2 of the 5 groundwater monitoring bores (MW1 and MW4) installed by ERM to periodically monitor groundwater conditions under Condition 8-4 of Ministerial Statement No. 870 were damaged and have been replaced.

3. REPLACEMENT WELL INSTALLATION

3.1 INTRODUCTION

Figure 1 of *Annex B* (p4) has been marked up to show the approximate original location of wells MW1 and MW4 in relation the proposed TANPF layout. MW1 was originally located in the vicinity of proposed site road no. 3 to the north west of the TANPF, and MW4 within the proposed Nitric Acid plant to the south west of the TANPF. As a result, YPNPL sought to find viable relocation sites for the wells.

3.2 NEW LOCATIONS

New representative well locations were selected by ERM in consultation with YPNPL (*Annex A* and *Figure 1* of *Annex B)*. The well positions were relocated in consideration of updated proposed TANPF layout, intending to fulfil the same purpose as the original positioned wells while being located in locations protected from construction activities.

A location for replacement MW1 was chosen to the north west of the original well location, just within the fenced site boundary. A location for replacement MW4 was chosen to the south east and immediately down gradient of the original well location between Contaminated Surface Water Storage Ponds 4 and 5, as close to the fence line as practicable.

The location of the current wells in relation to the original locations is also shown in *Annex A*. *Table 1* of *Annex B (*p3) provides the coordinates of the relocated wells MW1 and MW4.

It is noted that the replacement wells were drilled as near to the original locations as possible but do differ in terms of elevations.

3.3 REASONS AND RATIONALE FOR REPLACING THE BORES

The reasons for relocation as stated in the previous section are related to the proposed layout of the TANPF. The Project's Construction Water Quality Management Plan (reference 2-250-329-PRO-TRE-0118) prepared for YPNPL's principal contractor noted that *'Existing groundwater monitoring well locations shall be retained where possible, however, it is noted that several locations are present within the building footprint. Groundwater monitoring wells present within the building footprint will be decommissioned in accordance with relevant WA guidelines and internationally recognised industry standards at the commencement of construction.'*

To avoid interference with construction activities and proposed operations, the wells have been relocated to representative sites with respect of location and the likely interception of analytes as related to particular parts of the facility.

ERM consider that the locations of the replacement wells are representative of the original well locations on the following basis:

- MW 1 is positioned at an up hydraulic gradient location near the northern perimeter of the Site to continue to monitor background groundwater quality; and

- MW 4 is installed adjacent to potential sources of contamination in Contaminated Surface Water Ponds 4 and 5 and down hydraulic and topographic gradient of the Site to enable the evaluation of any potential impacts in relation to water quality contamination as a result of construction activities.

It is noted that the contaminated water pond design has changed from a single membrane to a double membrane design with a leak detection system between the membranes. A leak would trigger action to replace the membranes. The risk of a leak from the ponds to groundwater is therefore considered low.

3.4 CONSTRUCTION

Section 2 of *Annex B* provides details of the well installation methodology. In summary, the replacement wells were redrilled on Saturday 7 September 2013 using an airlift method (to remove introduced fluids) in accordance with:

- Water Quality Protection Note 30: Groundwater Monitoring Bores, Department of Water, Government of Western Australia; and

- Minimum Construction Requirements for Water Bores in Australia, February 2012, Third Edition.

3.5 DESIGN

The replacement wells were constructed with 50 mm Class 18 PVC casing and a lockable protective casing extending approximately 700 mm above ground level. *Appendix A* of *Annex B* to this report provides well logs which detail the design of the wells. The design of the replacement wells is considered consistent with the objectives of the original well design in terms of intercepting groundwater analytes/ contaminants.

It is noted that the drilling and installation of replacement wells MW1 and MW4, has resulted in a variation of well depth. The deeper screens in the replacement wells could potentially lead to variation in groundwater chemistry where sampled as compared with the original MW1 and MW4 wells. This is due to different part of the aquifer is being sampled (i.e. the deeper in the bedrock profile and closer to the tidal flats the likelihood of higher salinity). Should future sampling show consistent concentrations representative of natural background conditions in these replacement wells that are outside of the current trigger limits, there may be a need to review and propose revised trigger levels.

4. SUMMARY

Overall, the replacements wells MW1 and MW4 are considered fit for purpose in continued groundwater monitoring in accordance with Condition 8-4 of Ministerial Statement No. 870 given the relative locations of the well in relation to the objectives of groundwater construction monitoring. While there are minor variations in the design of the wells when compared to the original installations, it is considered that these differences will only affect the interception of natural groundwater chemistry in the monitoring process, and will not affect the effectiveness of the wells in monitoring potential contaminants connected with the construction and operation of the TANPF.

Should you require any clarification please contact the undersigned.

Yours sincerely,
for Environmental Resources Management Australia Pty Ltd

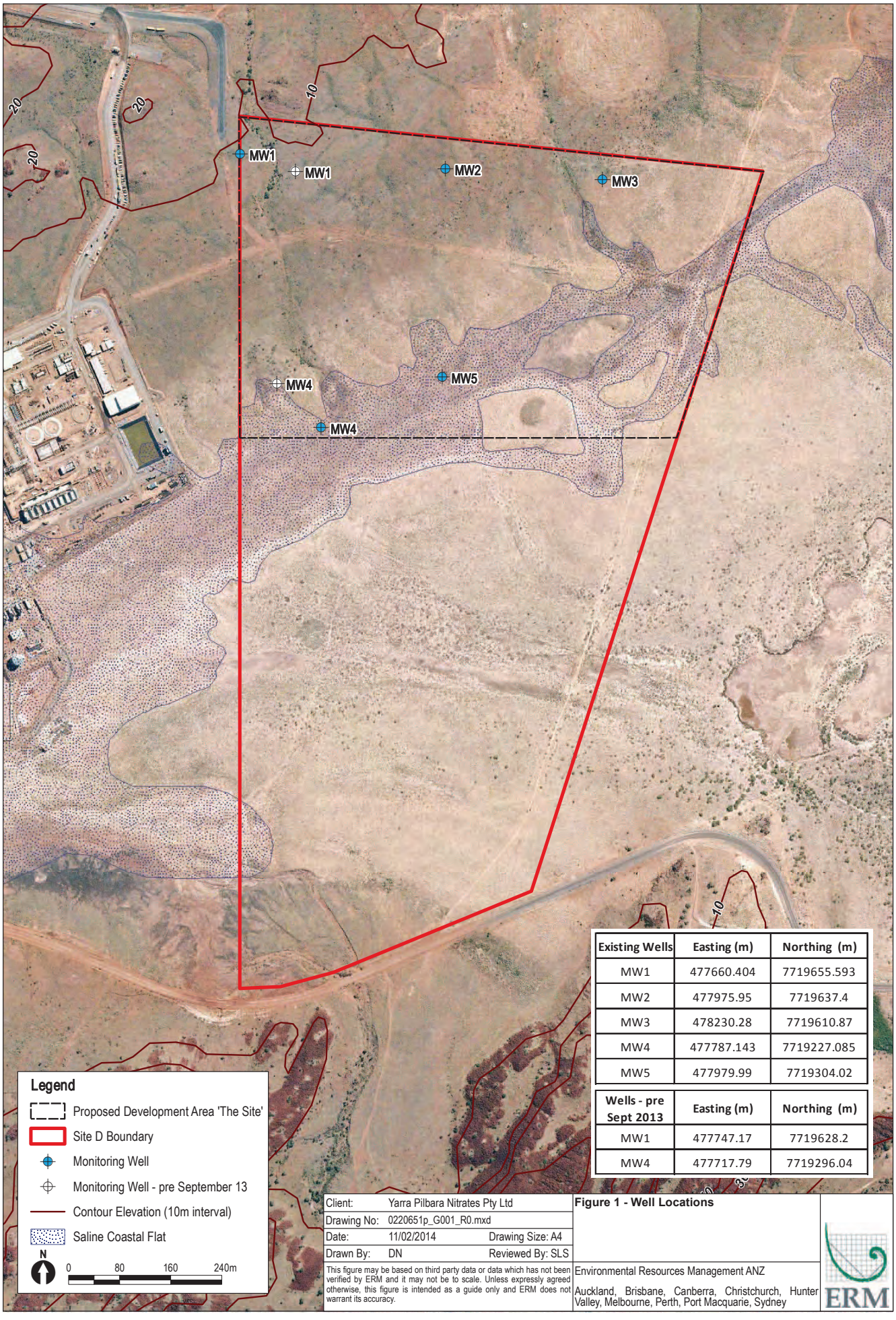
Sean Scaife
Project Manager

Paul Myers-Allen
Partner

Attachments:
Annex A – Well Locations
Annex B – Monitoring Well Installation report (GHD, 2013)

Annex A

WELL LOCATIONS



Existing Wells	Easting (m)	Northing (m)
MW1	477660.404	7719655.593
MW2	477975.95	7719637.4
MW3	478230.28	7719610.87
MW4	477787.143	7719227.085
MW5	477979.99	7719304.02

Wells - pre Sept 2013	Easting (m)	Northing (m)
MW1	477747.17	7719628.2
MW4	477717.79	7719296.04

Client:	Yarra Pilbara Nitrates Pty Ltd	
Drawing No:	0220651p_G001_R0.mxd	
Date:	11/02/2014	Drawing Size: A4
Drawn By:	DN	Reviewed By: SLS

This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

Figure 1 - Well Locations

Environmental Resources Management ANZ

Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

ERM

Annex B

MONITORING WELL INSTALLATION REPORT

Tecnicas Reunidas

TAN Burrup Project

Monitoring Well Installation

September 2013

Table of contents

Table index

Figure index

Appendices

1. Introduction

This report describes the installation of two (2) monitoring wells on the Technical Ammonium Nitrate (TAN) production site, to replace existing wells that had been destroyed during facility construction.

1.1 Background

Yara Pilbara Nitrates Pty Ltd (YPNPL) formerly Burrup Nitrates Pty Ltd (BNPL) is joint venture between Yara, Orica and Apache. YPNPL is developing a Technical Ammonium Nitrate (TAN) production facility on the Yara Pilbara Peninsula near Karratha in the Shire of Roebourne, Western Australia. When completed, the TAN will be owned by YPNPL, operated by Yara International ASA and marketed by Orica Limited.

The TAN production facility will be located adjacent to the existing ammonia plant in the Burrup industrial estate is operated by Yara Fertilisers Pty Ltd, and will include:

- Process plants;
- Utilities area;
- Storages for finished product; and,
- Several buildings including a workshop, central control room, laboratory, safety and security gatehouse, administration office and staff amenities.
- Regulatory approval has been requested for Site D within King Bay/Hearson Cove Industrial Precinct on the Burrup Peninsula, approximately 13km northwest of Karratha Western Australia (WA) and construction commenced in 2012 with the TAN expected to be fully commissioned by the last quarter of 2014.

1.2 Assumptions and Limitations

This report: has been prepared by GHD for Tecnicas Reunidas and *may only be used and relied on by Tecnicas Reunidas for the purpose agreed between GHD and the Tecnicas Reunidas as set out Section 1 of this report.*

GHD otherwise disclaims responsibility to any person other than Tecnicas Reunidas arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

2. Monitoring Well Installation

Monitoring wells MW1 and MW4 were installed by Envirotech Drilling with a Comacchio MC405 rotary drill rig by Rotary Air Blast (RAB) and down hole hammer, on Saturday 7th September 2013. The well locations are presented in Figure 1 and installation details are summarised on Table 1.

Table 1 Installation Summary

Well Number	Easting[1]	Northing[1]	Screen interval (mbgl)	Groundwater Intersection (mbgl)
MW1	477660	7719655	7.5 – 16.5	10
MW2	477787	7719227	7.5 – 13.5	8.25

[1] GDA94 MGA zone 50

Both wells were constructed with 50 mm Class 18 PVC casing, screened across the interpreted water table (groundwater intersection), and completed with lockable protective casing extending approximately 700 mm above ground level. Well construction and lithology encountered is presented in Appendix A and photographs are presented in Appendix B.

The wells were developed by airlift methods to remove introduced fluids. The development yields were low, with the southern bore, MW4, yielding approximately 0.1 L/s. The development yield of MW1 was lower and intermittent. The low yields are attributable to the low conductivity of the lithology encountered, which largely comprised clayey materials and rock (granophyre). Consequently, it was not possible to measure yields or water quality parameters during drilling.

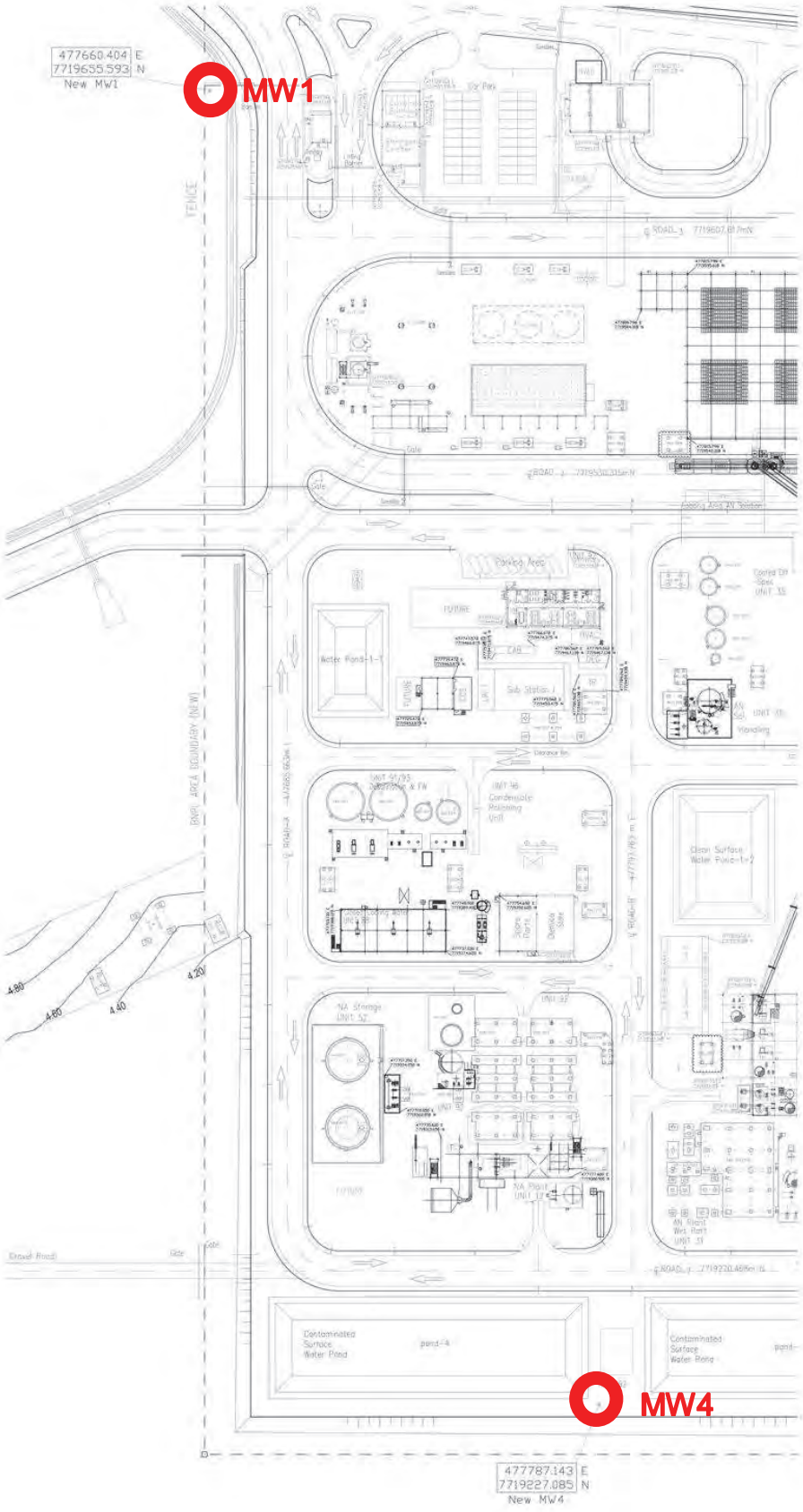


Figure 1 Well Locations

3. Conclusion

While the low yield of the wells during and after construction is a consequence of the lithology encountered, these wells will be suitable for groundwater level and quality monitoring purposes.

Appendix A – Well Logs

BOREHOLE LOG

HYDROGEOLOGICAL

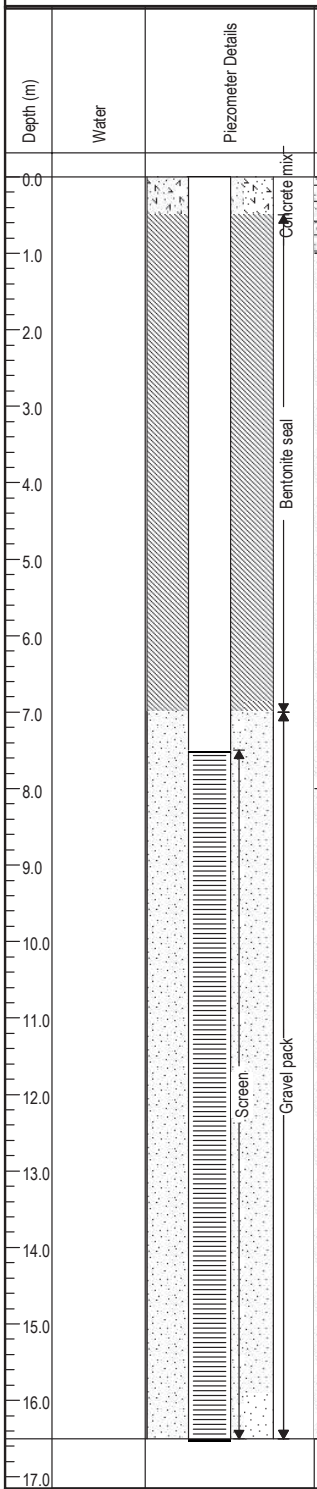
Bore No.: MW1
Page: 1 of 1

Client: YPNPL
Project: Monitoring Well Installation Tan Burrup
Project No.: 6129922
Location: Burrup Peninsula
Date Drilled: 7/09/2013 **to:** 7/09/2013

Drill Co: EnviroTech
Driller: RF
Rig Type: Hydraulic Hammer
Total Depth (m): 16.5
Diameter (mm): 90

Easting: 477660
Northing: 7719655
Grid Ref: GDA94_MGA_zone_50
Collar RL: **Elevation:** 0
Logged by: S Fernando **Checked by:**

Casing: CL18 50mm PVC **Screen:** CL18 50mm PVC **Screen Slot Size (mm):** 0.5mm



LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	COMMENTS/ ENVIRONMENTAL CONDITIONS	Elevation / Depth (m)
Ground Surface:		0.00
Clayey SAND Clayey sand. Grey with some fine to medium gravel fragments.		0.00 -1.00
GRANOPHYRE Rock. Recovered as fine to medium grey sandy particles.		1.00 -8.00
GRANOPHYRE Rock. Recovered as fine grey particles.	Water added due to dust	8.00 -16.50
		16.50

NOTES:

GHD Soil Classifications: The GHD Soil Classification is based on Australian Standards AS 1726-1993. This log is not intended for geotechnical purposes.

Drilling Abbreviations:

RW(x)	Rotary Wash	PSC(x)	Percussion Simultanous Casing
RT(x)	Rotary Triple Tube	AS	Augering - Solid Flight
PC(x)	Percussion Cable Tool	AH	Augering - Hollow Flight
PD(x)	Percussion Down Hole	H	Hand Augering

Where "x" is flushing medium: (W) Water, (M) Mud, (A) Air, (F) Foam.

Moisture Abbreviations:
D Dry
M Moist
W Wet

Consistency:

Granular Soils		**Cohesive Soils**	
(VL) Very Loose	(D) Dense	(VS) Very Soft	(ST) Stiff
(L) Loose	(VD) Very Dense	(S) Soft	(VST) Very Stiff
(MD) Medium Dense		(F) Firm	(H) Hard

BOREHOLE LOG

HYDROGEOLOGICAL

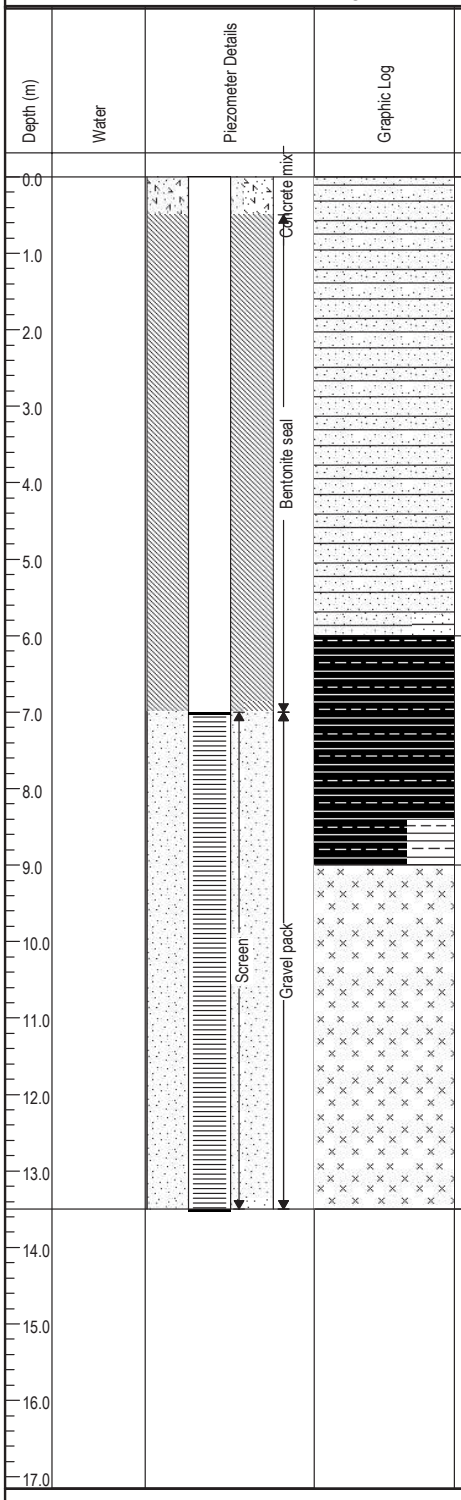
Bore No.: MW4
Page: 1 of 1

Client: YPNPL
Project: Monitoring Well Installation Tan Burrup
Project No.: 6129922
Location: Burrup Peninsula
Date Drilled: 7/09/2013 **to:** 7/09/2013

Drill Co: EnviroTech
Driller: RF
Rig Type: Hydraulic Hammer
Total Depth (m): 13.5
Diameter (mm): 90

Easting: 477787
Northing: 7719227
Grid Ref: GDA94_MGA_zone_50
Collar RL: **Elevation:** 0
Logged by: S Fernando **Checked by:**

Casing: CL18 50mm PVC **Screen:** CL18 50mm PVC **Screen Slot Size (mm):** 0.5mm



LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	COMMENTS/ ENVIRONMENTAL CONDITIONS	Elevation / Depth (m)
Ground Surface:		0.00
Clayey SAND Clayey sand. Red/brown with mid-size gravel.		0.00
		-6.00
Silty CLAY Silty Clay. Red brown with some sand. Minor cobbles.		6.00
	Becoming moist	-9.00
GRANOPHYRE Rock. Recovered as fine/sandy grey particles.		9.00
		-13.50
		13.50

NOTES:

GHD Soil Classifications: The GHD Soil Classification is based on Australian Standards AS 1726-1993. This log is not intended for geotechnical purposes.

Drilling Abbreviations:

RW(x)	Rotary Wash	PSC(x)	Percussion Simultanous Casing
RT(x)	Rotary Triple Tube	AS	Augering - Solid Flight
PC(x)	Percussion Cable Tool	AH	Augering - Hollow Flight
PD(x)	Percussion Down Hole	H	Hand Augering

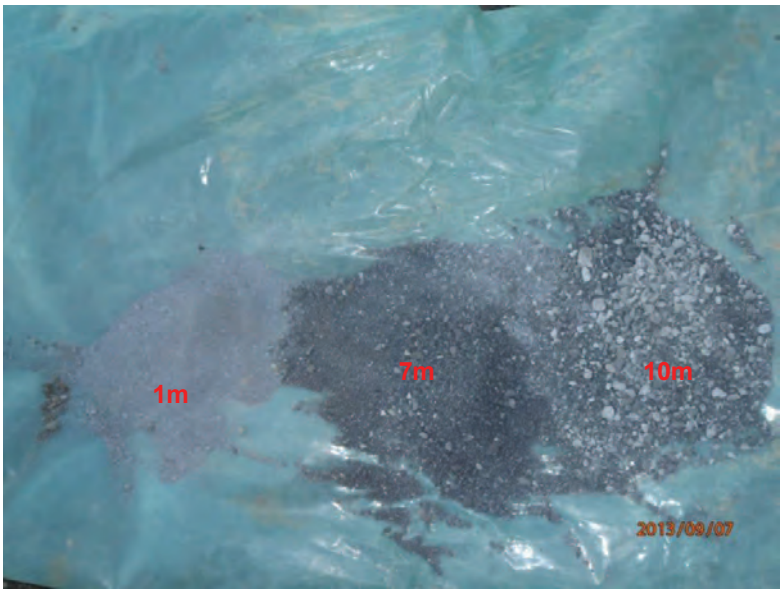
Where "x" is flushing medium: (W) Water, (M) Mud, (A) Air, (F) Foam.

Moisture Abbreviations:
D Dry
M Moist
W Wet

Consistency:

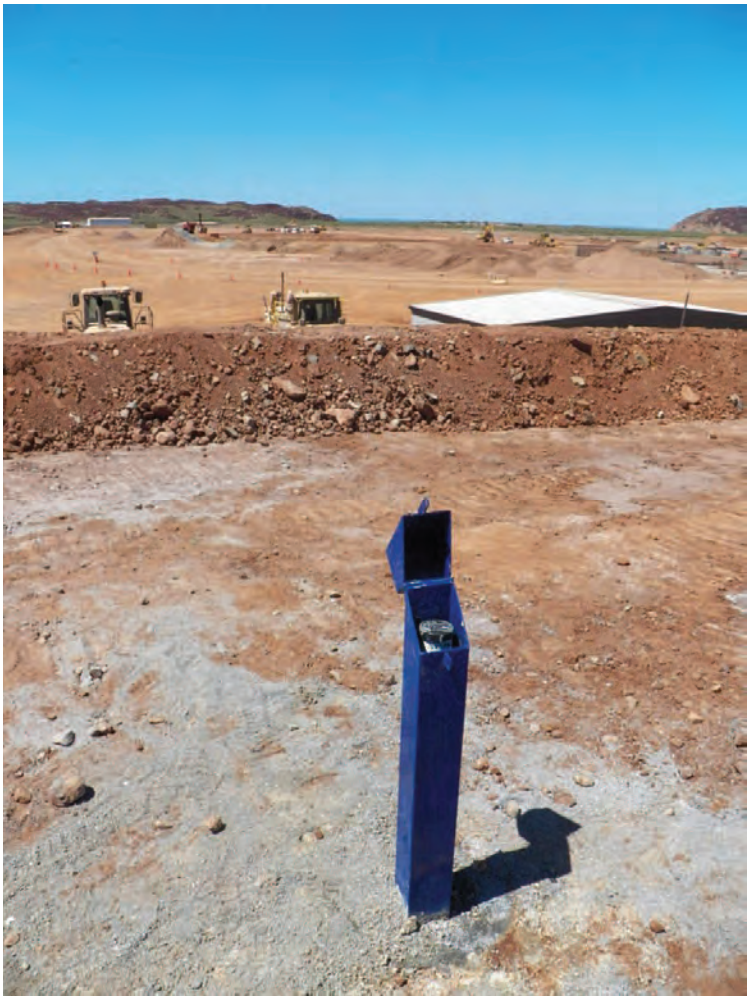
Granular Soils		**Cohesive Soils**	
(VL) Very Loose	(D) Dense	(VS) Very Soft	(ST) Stiff
(L) Loose	(VD) Very Dense	(S) Soft	(VST) Very Stiff
(MD) Medium Dense		(F) Firm	(H) Hard

Appendix B – Site photographs

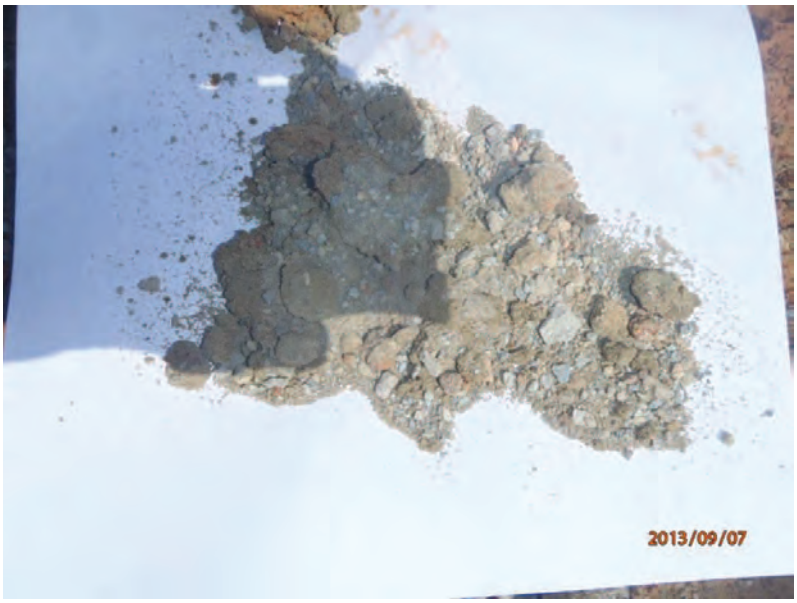


MW1

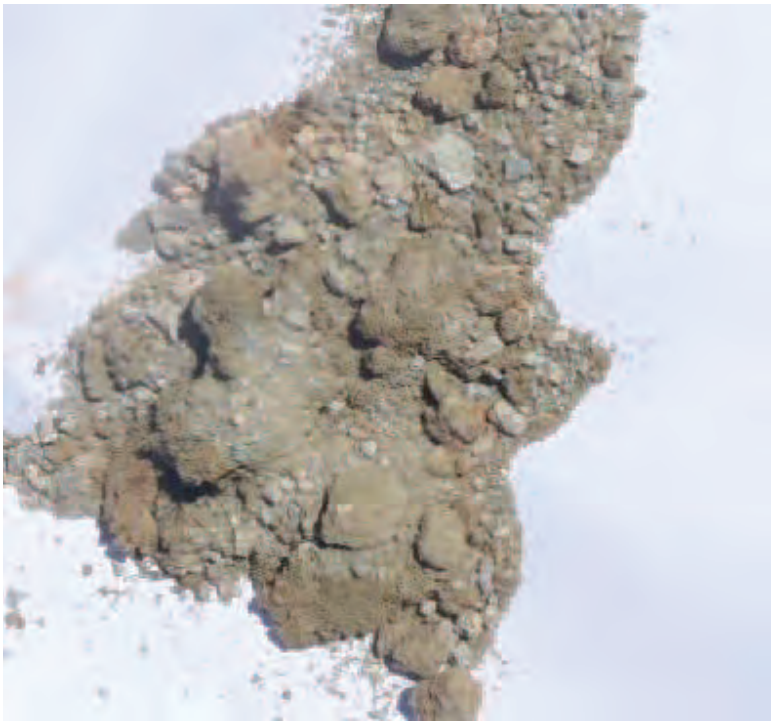
From 1 metre depth, the lithology encountered in MW1 was rock (granophyre). The photograph above shows 3 samples from depths of 1, 7, and 10 metres.


MW1

MW1



MW4 1 metres


MW4 2 metres

MW4 3 metres

MW4 5 metres

MW4 6 metres

MW4 9 metres

MW4 12 metres

MW4 13 metres


MW4

MW4

GHD

GHD House, 239 Adelaide Tce. Perth, WA 6004
P.O. Box 3106, Perth WA 6832
T: 61 8 6222 8222 F: 61 8 6222 8555 E: permail@ghd.com.au

\\ghdnet\ghd\AU\Perth\Projects\61\29922\WP\135708.docx

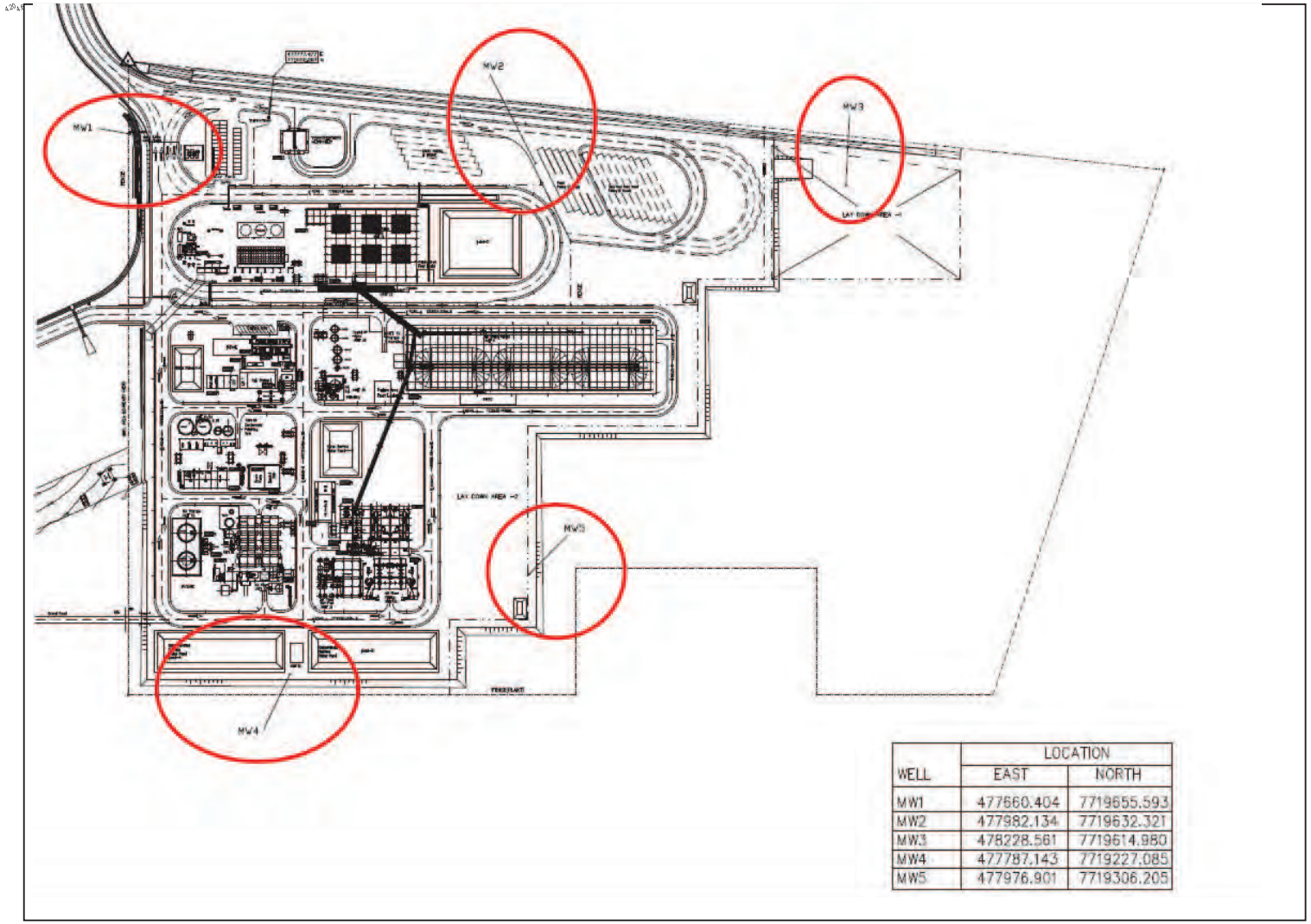
Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
1	S Fernando	C Kraut		N Dawe		11/09/2013

www.ghd.com

ATTACHMENT 21

Ground Monitoring Wells Final Locations.



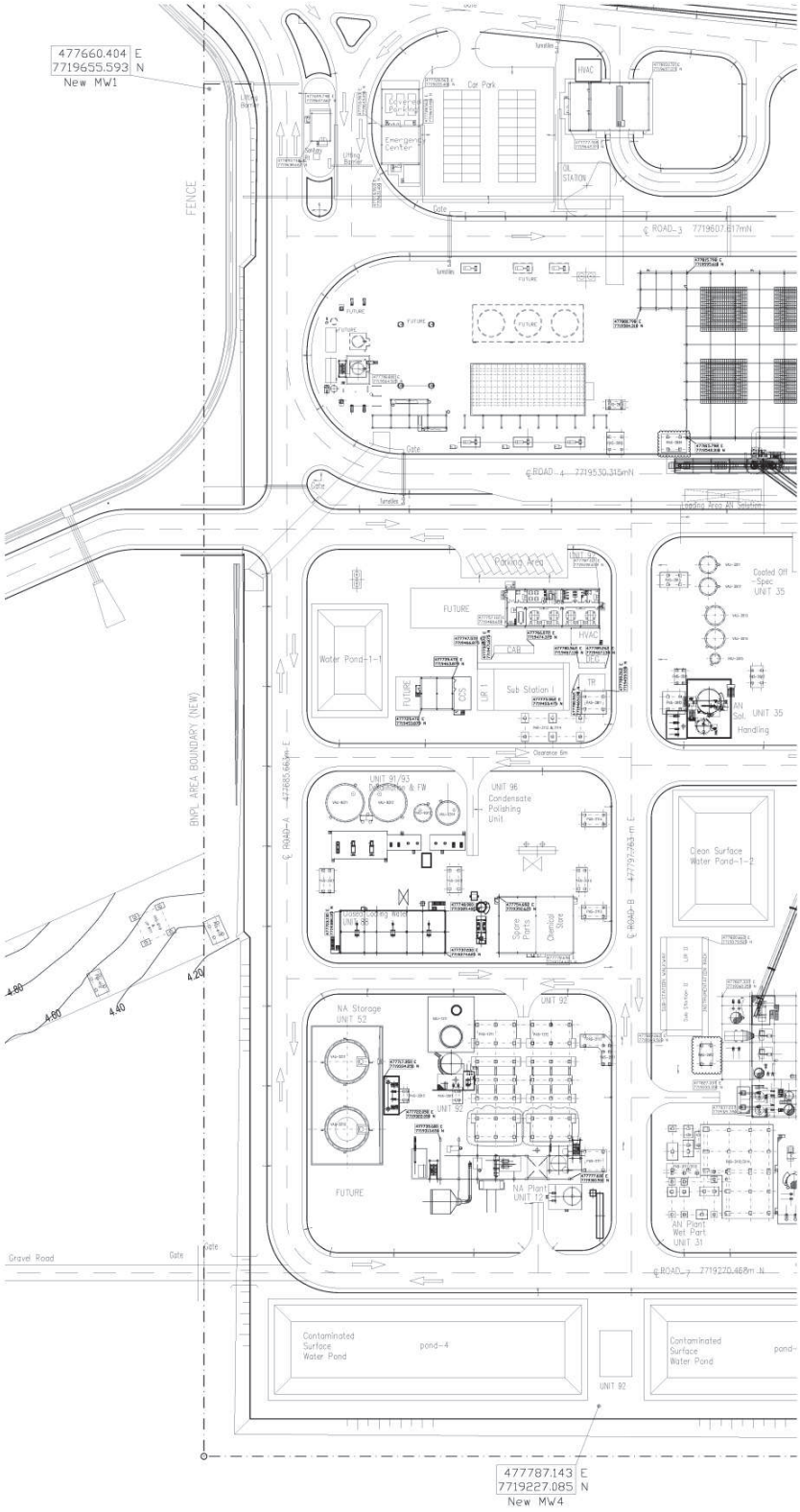
WELL	LOCATION	
	EAST	NORTH
MW1	477660.404	7719655.593
MW2	477982.134	7719632.321
MW3	478228.561	7719614.980
MW4	477787.143	7719227.085
MW5	477976.901	7719306.205

ATTACHMENT 22

New Groundwater wells to replace MW1 and MW4.

New MW1

New MW4



ATTACHMENT 23

Groundwater Quality Monitoring.

25th May, 2015

Mark Rust
Senior Environmental Officer
Office of the Environmental Protection Authority
Locked Bag 10, East Perth
WA - 6892

Attention: **Mark Rust**

Sub: Report to OEPA for groundwater monitoring result as per Conditions 8-4 of Ministerial Statement No. 870 for month of April,15.

Dear Mark Rust,

Condition 8-4 of Ministerial Statement No. 870 requires YPNPL to sample/monitor all groundwater bores every six months as per Condition 8-3 on a biannual basis. The condition sets a trigger value of 10% above the baseline contaminant concentrations as established based on the 2011 data. In accordance with Condition 8-5 of Ministerial Statement No. 870, YPNPL are required to report findings to the CEO of the OEPA within 7 days of the exceedance being identified.

This letter is intended to inform OEPA on the outcomes of the latest groundwater monitoring event (GME) which was undertaken by ERM on behalf of YPNPL at the five existing bores on 29-30.04.2015, using the consistent sampling methodology applied for the last GMEs (i.e. peristaltic low –flow).

In general the results of the recent GME display similar conditions to those documented in the previous GMEs and there were few exceedances of the trigger values in April 2015 and in most cases these are considered to be reflective of a natural variability rather than a result of site related potential contamination sources as a result of ongoing construction activities. More specific, in April 2015 reactive phosphorus, manganese, total alkalinity and sulphate were detected at concentrations slightly above trigger values and in a conservative approach implied exceedances were considered for alkalinity as hydroxide and manganese. Due to high salinity of water in samples from MW4 and MW5 the detection limit for specific parameters had to be raised (dilution required) by the laboratory. The details of the exceedances are outlined below:

Reactive Phosphorus as P

- Exceedance at MW1 – 0.014 mg/L compared to the maximum acceptable baseline value of 0.011 mg/L. Historical results have been below the maximum acceptable baseline value with concentrations between <0.002 and 0.018 mg/L, with a previous exceedance of 0.018 mg/L in Oct 2014 .
- Exceedance at MW3 – 0.02 mg/L compared to the maximum acceptable baseline value of 0.011 mg/L Historical results have been below the maximum acceptable baseline value with concentrations between <0.001 and 0.021 mg/L, with a previous exceedance of 0.021 mg/L in Oct 2014 .
- Exceedance at MW5 – 0.016 mg/L compared to the maximum acceptable baseline value of 0.011 mg/L. Historical results have been in general below the maximum acceptable

Yara Pilbara Nitrates Pty Ltd
Level 5, 182 St. Georges Terrace
Perth WA 6000
Australia
+61 8 9327 8100
Facsimile
+61 8 9327 8199
ABN Number
33127391422

baseline value with concentrations between 0.002 and 0.014 mg/L and two previous exceedances: 0.014mg/L in Apr 2013 and 0.013 mg/L in Oct 2014.

Manganese (Filtered)

- Exceedance at MW4, 3.29mg/L compared to the maximum acceptable baseline value of 0.242 mg/L Historical results have been generally below the maximum acceptable baseline value with concentrations between 0.0029 and 0.277 mg/L, with a previous exceedance of 0.277 mg/L in Oct 2013.

Sulfate as SO4

- Exceedance (marginal) at MW4, 5960 mg/L compared to the maximum acceptable baseline value of 5720 mg/L. Historical results have been in general below the maximum acceptable baseline value with concentrations between 280 and 3540 mg/L.

Total alkalinity

- Exceedance (marginal) at MW3, 570 mg/L compared to the maximum acceptable baseline value of 561 mg/L. Historical results have been in general below the maximum acceptable baseline value with concentrations between 400 and 560 mg/L.

Aluminium (filtered)

- Implied exceedance (in a conservative approach) as unable to verify results at MW4 as the detection limit of 0.025 mg/L is higher compared to the maximum acceptable baseline value of 0.0209 mg/L. Historical results have been similar with concentrations between <0.005 and 0.031 mg/L and implied exceedances of the trigger value in Mar 2013, and exceedances in Apr 2013, Oct 2013 an Oct 2014. It should be noted that in April 2015, the detection limit at this sample for the analysis for the metals was raised by the laboratory due to very high salinity.

Alkalinity (hydroxide) as CaCO3

- Implied exceedance (in a conservative approach) as unable to screen results at all wells (MW1, MW2, MW3, MW4 and MW5) for this analyte as the detection limit of 1000 mg/L is higher compared to the maximum acceptable baseline value of 693 mg/L. Total alkalinity concentration is below the maximum acceptable baseline in four of five wells (except MW3).

In general other analytes were at concentrations similar to those recorded in the previous monitoring events. The quality conditions at one particular well (MW4) appear to be different to previously documented levels for some parameters with an increase in concentration of up to three times in April 2015 compared to Oct 2014 for salinity, total dissolved solids, hardness, magnesium, calcium, sodium. This change could be related to hypersaline waters and likely precipitation on well screen. These compounds/elements are not listed as trigger parameters in the Construction Environmental Management Plan.

In conclusion, the GME April 2015 results continue to support the fact that the observed variability in the groundwater chemistry with no clear trends suggests the results depict a combination of natural variability in groundwater chemistry and off site contributions as opposed to increasing concentrations of analytes associated with site activities. None of the analytes observed exceeding the trigger levels are regarded as directly attributed to current on site activities.

The full GME report is in preparation by ERM and if required by the OEPA this can be provided as further reference to the above stated facts.

Yara Pilbara Nitrates Pty Ltd
Level 5, 182 St. Georges Terrace
Perth WA 6000
Australia
+61 8 9327 8100
Facsimile
+61 8 9327 8199
ABN Number
33127391422

Attached to this letter is the summary table showing the April 2014 groundwater monitoring results as well as well as the historical monitoring data, to enable a review of the variability of the discussed parameters over time since 2011.

Yours sincerely,
Yara Pilbara Nitrates Pty. Ltd.

Rajan Sinha
Technical Services & Business Development Manager

Attachment: Full groundwater monitoring results

Yara Pilbara Nitrates Pty Ltd
Level 5, 182 St. Georges Terrace
Perth WA 6000
Australia
+61 8 9327 8100
Facsimile
+61 8 9327 8199
ABN Number
33127391422

ERM

Table 1. Groundwater Gauging Results and Field Parameters
YPNPL April 2015
0220651

Well ID	Gauging Date	Coord. Easting (MGA94)	Coord. Northing (MGA94)	Depth of Well (mbTOC)	Depth to Water (mbTOC)	Depth to Water (mAHD)*	DO (mg/L)	EC (mScm-1)	pH	Eh (mV)	TEMP (°C)	TDS (mg/L)	Method of sampling	Purge Volume (L)	Comments
Trigger value									**6.0-8.4**			**143000**			
MW1**	11-Oct-12	477747.17	7719628.2	8.72			3.78	2.30	7.09	149.60	29.8	1495	Bailer	19.0	Slightly turbid, pale grey, becoming turbid at 15L, slight light brown. Dry purged sampled upon recovery
	6-Mar-13	477747.17	7719628.2	8.74			1.82	2.66	7.26	78.50	30.7	1729	Bailer	22.5	Slighl cloudy no odour,
	17-Apr-14	477747.17	7719628.2	8.74			0.58	1.56	6.71	2.69	32.4	1016	Low flow peristaltic pump	4.0	
	17-Oct-13	477660.51	7719656.72	17.40	6.440	4.400	0.30	1.74	5.60	81.40	31.2	1131	Low flow peristaltic pump	3.5	Clear, colourless no odour
	9-Apr-14	477660.51	7719656.72	17.56	5.861	4.979	0.64	1.88	7.13	40.20	32.6	1222	Low flow peristaltic pump	2.5	Clear, no odour
	29-Oct-14	477660.51	7719656.72	17.40	6.297	4.543	1.01	2.05	7.44	-6.30	32.1	1333	Low flow peristaltic pump	1.7	Clear, no odour, the drawdown was higher than 10 cm at a flow rate of 150 ml/min
	30-Apr-15	477660.51	7719656.72	17.35	6.260	4.580	0.30	1.96	7.31	-20.40	30.2	1274	Low flow peristaltic pump	3.5	Clear, no odour
MW2	11-Oct-12	477982.18	7719632.25	8.20	4.481		2.22	4.29	7.12	142.50	29.2	2789	Bailer	24.0	Turbid, pale brown, no odour, moderate recharge, good yield
	6-Mar-13	477982.18	7719632.25	8.20	4.432		1.65	4.21	7.28	37.90	32.0	2737	Bailer	21.0	Turbid, slightly brown no odour
	17-Apr-14	477982.18	7719632.25	8.21	4.600		3.44	4.69	6.90	101.00	32.2	3049	Bailer	33.0	
	17-Oct-13	477982.18	7719632.25	8.19	5.800		1.17	3.51	5.34	158.60	29.9	2282	Low flow peristaltic pump	3.0	Clear, colourless no odour
	9-Apr-14	477982.18	7719632.25	8.21	3.906		0.49	3.10	6.98	66.90	34.7	2015	Low flow peristaltic pump	3.0	Clear, no odour
	29-Oct-14	477982.18	7719632.25	8.20	4.145		0.90	3.31	7.14	4.80	30.1	2148	Low flow peristaltic pump	1.7	Clear, no odour, good recharge, low drawdown
	30-Apr-15	477982.18	7719632.25	6.80	2.772	2.698	0.45	3.48	7.19	32.10	31.3	2262	Low flow peristaltic pump	4.0	Clear, no odour, good recharge, low drawdown
MW3	11-Oct-12	478228.57	7719614.88	8.17	2.867	1.983	2.88	14.05	7.47	75.30	28.0	9133	Bailer	44.0	Slightly turbid, grey becoming pale brown, moderate recharge
	6-Mar-13	478228.57	7719614.88	7.18	2.801	2.049	1.49	20.90	7.32	33.20	31.1	13585	Bailer	24.0	Turbid, Pale brown, no odour
	17-Apr-14	478228.57	7719614.88	8.19	3.010	1.840	1.78	17.95	7.19	27.50	31.9		Bailer	33.0	
	17-Oct-13	478228.57	7719614.88	8.17	2.020	2.830	1.75	14.70	6.17	145.90	29.3	9555	Low flow peristaltic pump	3.5	Clear, colourless no odour
	9-Apr-14	478228.57	7719614.88	8.12	2.446	2.404	1.67	16.08	7.50	73.10	29.3	10452	Low flow peristaltic pump	3.5	Clear, no odour
	29-Oct-14	478228.57	7719614.88	8.12	2.577	2.273	6.16	14.15	7.97	11.90	30.3	9198	Low flow peristaltic pump	2.3	Clear, no odour, good recharge, low drawdown
	29-Apr-15	478228.57	7719614.88	8.18	2.854	1.996	0.33	12.74	7.36	-6.50	31.6	8281	Low flow peristaltic pump	3.0	Clear, no odour, good recharge, low drawdown
MW4**	11-Oct-12	47717.79	7719296.04	4.64	1.519		2.06	126.60	7.66	123.20	28.7	82290	Bailer	24.0	Highly turbid, silty, orange, no odour, fast recharge
	6-Mar-13	47717.79	7719296.04	7.21	3.949		-	-	-	-	-	-	-	-	Unable to be sampled due to curve in PVC Pipe extension
	17-Apr-14	47717.79	7719296.04	7.35	4.070		0.13	67.40	7.17	15.72	33.9	43810	Low flow peristaltic pump	2.5	Turbid, red brown
	17-Oct-13	477794.2	7719237.25	14.40	3.820	2.480	1.99	124.40	4.32	135.00	31.0	80860	Low flow peristaltic pump	4.5	Clear, colourless no odour
	9-Apr-14	477794.2	7719237.25	14.53	3.840	2.460	1.30	118.10	6.99	62.90	33.0	76765	Low flow peristaltic pump	3.0	Clear, no odour
	29-Oct-14	477794.2	7719237.25	13.96	4.265	2.035	3.56	68.90	7.15	41.80	31.5	44785	Low flow peristaltic pump	2.0	clear, no odour, good reacharge, well head partially damaged
	30-Apr-15	477794.2	7719237.25	13.94	4.220	2.080	0.07	168.20	6.81	11.40	30.1	109330	Low flow peristaltic pump	6.0	slghtly cloudy, some supended solids, no odour, good recharge
MW5	11-Oct-12	477976.98	7719306.26	5.01	1.054	5.636	1.73	145.70	6.90	193.20	29.3	94705	Bailer	24.0	Slightly turbid, pale brown, no odour, recharge becoming turbid, red-brown
	6-Mar-13	25-Aug-08	7719306.26	5.07	0.905	5.785	0.99	141.20	6.84	135.90	34.3	91780	Bailer	24.0	Turbid, cream to pale colour, no odour
	17-Apr-14	25-Aug-08	7719306.26	5.97	2.020	4.670	2.24	147.30	6.77	210.70	34.4	95745	Bailer	33.0	
	17-Oct-13	25-Aug-08	7719306.26	8.95	4.530	2.160	0.51	104.00	6.21	125.60	30.3	67600	Low flow peristaltic pump	5.5	Clear, no odour
	9-Apr-14	477976.98	7719306.26	9.01	4.415	2.275	1.03	70.80	7.08	69.20	32.0	46020	Low flow peristaltic pump	2.5	Clear, no odour
	28-Oct-14	477976.98	7719306.26	9.00	4.505	2.185	0.78	69.70	7.24	46.00	31.6	45305	Low flow peristaltic pump	1.1	clear, no odour, good recharge
	29-Apr-15	477976.98	7719306.26	9.00	4.470	2.220	0.17	44.78	7.25	-20.30	30.0	29107	Low flow peristaltic pump	3.0	slightly cloudy, some solids in suspension, no doour, good recharge

Notes:
**MW1 and MW4 Were Replaced in September 2013
* Calculations based on data from April 2015 survey (Handley surveyors)

		BTEX								PAH	TPH											
		Benzene	Ethylbenzene	Toluene	Total BTEX	Xylene (m & p)	Xylene (o)	Xylene Total	C6-C10 less BTEX (F1)	Naphthalene	C10-C16	C16-C34	C34-C40	F2-NAPHTHALENE	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C10 - C40 (Sum of total)	C6-C10
		µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
EQL		1	2	2	0.001	2	2	2	0.02	5	0.1	0.1	0.1	0.1	20	50	100	50	50	100	0.02
Trigger Values (Max Baseline + 10%)																					
LocCode	**Sampled_Date-Time**																				
MW1	30/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	<40	<50	<200	<200	<450	-	-
	17/10/2013	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02
	9/04/2014	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02
	30/10/2014	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02
	30/04/2015	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02
MW2	30/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	<40	<50	<200	<200	<450	-	-
	17/10/2013	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02
	9/04/2014	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02
	29/10/2014	<1	<2	<2	<0.002	<2	<2	<2	<0.03	<6	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.03
	30/04/2015	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02
MW3	30/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	<40	<50	<200	<200	<450	-	-
	17/10/2013	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02
	9/04/2014	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02
	29/10/2014	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02
	29/04/2015	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02
MW4	30/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	<40	<50	<200	<200	<450	-	-
	17/10/2013	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02
	9/04/2014	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02
	30/10/2014	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02
	30/04/2015	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02
MW5	30/04/2011	-	-	-	-	-	-	-	-	-	-	-	-	-	<40	81	<200	<200	281	-	-
	17/10/2013	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02
	9/04/2014	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02
	30/10/2014	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02
	29/04/2015	<1	<2	<2	<0.001	<2	<2	<2	<0.02	<5	<0.1	<0.1	<0.1	<0.1	<20	<50	<100	<50	<50	<100	<0.02

		Inorganics																							
		Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Carbonate as CaCO3)	Alkalinity(Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Ammonia as N	Anions Total	Cations Total	Chloride	Fluoride	Hydrogen sulfide	Ionic Balance	Kjeldahl Nitrogen Total	Nitrate (as N)	Nitrite (as N)	Nitrite (as NO2-)	Nitrogen (Total Oxidised)	Nitrogen (Total)	Reactive Phosphorus as P	Sodium (Filtered)	Sulphate as SO4	Sulphide	TDS	Hardness as CaCO3 (Filtered)	TSS
		mg/L	mg/L	µg/L	mg/L	µg/L	meq/L	meq/L	mg/L	mg/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL		1	1	1000	1	5	0.01	0.01	1	0.1	0.5	-100	0.05	0.002	0.002	0.05	0.002	50	0.001	0.5	1	0.1	10	1	5
Trigger Values (Max Baseline + 10%)*				693	561	40	-	-	95,700	1.65	N/A	-	2.97	9.67	N/A	-	3.63	5610	0.011	62,700	5720	N/A	143,000	20,900	2090
LocCode	**Sampled_Date-Time**																								
MW1	30/04/2011	-	-	-	350	38	-	-	780	-	<0.5	-	-	1.7	<0.005	-	1.7	2500	<0.002	350	170	-	2000	-	-
	20/09/2011	-	-	-	320	18	-	-	710	0.4	-	-6	0.28	-	-	-	3.1	3400	0.008	300	150	<0.5	-	-	180
	27/02/2012	-	-	-	300	<5	-	-	670	0.5	-	-	0.17	2	<0.005	<0.05	2	2100	<0.002	340	140	<0.5	-	-	220
	11/10/2012	-	-	-	300	53	-	-	600	0.4	-	1	0.49	1.1	<0.005	<0.05	1.1	1500	0.003	290	100	<0.5	-	-	520
	6/03/2013	-	-	-	300	15	-	-	570	0.5	<0.5	-	0.14	1.9	0.025	0.08	1.9	2000	0.003	280	100	<0.5	-	-	2900
	17/04/2013	-	-	-	290	<5	-	-	560	0.4	-	-	0.15	2.2	0.022	0.07	2.2	2400	0.004	270	120	<0.5	-	-	16
	17/10/2013	367	<1	<1000	367	32	17.2	17.5	300	0.8	-	0.87	0.15	0.086	<0.002	-	0.086	240	0.007	265	-	<0.1	940	284	25
	9/04/2014	358	<1	<1000	358	114	18.1	17.3	345	0.8	-	2.42	0.49	1.6	0.004	-	1.6	2090	0.006	267	59	<0.1	995	270	<5
	30/10/2014	361	<1	<1000	361	<5	19.1	17.1	366	0.6	-	5.42	2.46	0.162	<0.002	-	0.162	2620	0.018	226	75	<0.1	981	352	<5
	30/04/2015	**272**	**<1**	**<1000**	**272**	**31**	**18.5**	**18.8**	**374**	**0.6**	**<0.1**	**0.79**	**0.72**	**2.24**	**0.079**	**-**	**2.32**	**3040**	**0.014**	**258**	**119**	**<0.1**	**1010**	**366**	**<5**
MW2	30/04/2011	-	-	-	280	200	-	-	930	-	<0.5	-	-	3.3	<0.005	-	3.3	3900	0.004	570	170	-	2000	-	-
	20/09/2011	-	-	-	290	<5	-	-	1200	0.6	-	-3	0.2	-	-	-	1.2	1400	0.004	610	210	<0.5	-	-	190
	27/02/2012	-	-	-	300	30	-	-	1400	0.7	-	-	0.26	0.62	<0.005	<0.05	0.62	880	<0.002	1000	220	<0.5	-	-	84
	11/10/2012	-	-	-	370	<5	-	-	1300	0.5	-	-5	0.51	0.63	<0.005	<0.05	0.63	1100	<0.002	600	180	<0.5	-	-	440
	6/03/2013	-	-	-	360	<5	-	-	1000	0.6	<0.5	-	0.1	0.6	<0.005	<0.05	0.6	700	<0.002	580	170	<0.5	-	-	320
	17/10/2013	281	<1		281	<5	31.7	34.4	811	0.6	-	3.95	0.42	2.28	<0.002	-	2.28	2700	0.003	507	-	<0.1	2040	593	10
	17/04/2013	-	-	<1000	340	<5	-	-	1100	0.6	-	-	0.21	0.51	<0.005	<0.05	0.51	720	0.003	610	200	<0.5	-	-	290
	9/04/2014	250	<1	<1000	250	<5	28.4	28.8	730	0.8	-	0.7	<0.05	4.94	0.007	-	4.95	4960	0.007	463	135	<0.1	1550	412	<5
	29/10/2014	276	<1	<1000	276	<5	30.1	27	771	0.6	-	5.54	0.23	2.49	<0.002	-	2.49	2720	0.01	376	138	<0.1	1650	508	<5
	30/04/2015	**304**	**<1**	**<1000**	**304**	**17**	**30.8**	**32.2**	**758**	**0.6**	**<0.1**	**2.16**	**0.8**	**3.55**	**<0.002**	**-**	**3.55**	**4350**	**0.008**	**487**	**163**	**<0.1**	**1720**	**529**	**<5**
MW3	30/04/2011	-	-	-	400	54	-	-	5400	-	<0.5	-	-	1.9	<0.005	-	1.9	2600	0.003	3400	800	-	9800	-	-
	20/09/2011	-	-	-	450	57	-	-	3700	1.4	-	2	0.18	-	-	-	0.033	220	0.006	2500	810	<0.5	-	-	280
	27/02/2012	-	-	-	460	<5	-	-	4000	1.5	-	-	0.29	0.32	<0.005	<0.05	0.32	610	<0.002	3200	940	<0.5	-	-	230
	11/10/2012	-	-	-	540	12	-	-	4200	<0.1	-	3	0.22	0.12	<0.005	<0.05	0.12	330	0.003	2800	710	<0.5	-	-	270
	6/03/2013	-	-	-	470	<5	-	-	5900	1.4	<0.5	-	0.16	0.26	<0.005	<0.05	0.26	420	0.003	3500	670	<0.5	-	-	180
	17/04/2013	-	-	-	560	770	-	-	28,000	1	-	-	1.5	0.031	<0.005	<0.05	0.031	1500	0.006	8000	1400	<0.5	-	-	470
	17/10/2013	479	<1	<1000	479	<5	111	121	3140	1.6	-	4.37	<0.05	0.611	0.002	-	0.613	530	<0.001	2180	-	<0.1	7280	1180	54
	9/04/2014	466	<1	<1000	466	<5	164	164	5000	1.7	-	0.14	0.35	0.464	0.029	-	0.493	840	0.009	3050	647	<0.1	9050	1440	6
	29/10/2014	533	<1	<1000	533	<5	120	112	3480	1.4	-	3.6	0.22	0.175	<0.002	-	0.175	400	0.021	2060	537	<0.1	6520	977	<5
	29/04/2015	**570**	**<1**	**<1000**	**570**	**19**	**128**	**124**	**3780**	**1.3**	**<0.1**	**1.64**	**0.88**	**2.37**	**0.008**	**-**	**2.38**	**3260**	**0.02**	**2300**	**475**	**<0.1**	**7020**	**1040**	**<5**
MW4	30/04/2011	-	-	-	510	740	-	-	3900	-	<0.5	-	-	0.82	<0.005	-	0.82	2100	0.008	2700	350	-	6700	-	-
	21/09/2011	-	-	-	370	18	-	-	2500	0.7	-	1	0.31	-	-	-	0.24	540	0.009	1800	280	<0.5	-	-	670
	28/02/2012	-	-	-	390	<5	-	-	3200	0.6	-	-	0.59	0.17	<0.005	<0.05	0.17	760	0.007	2700	410	<0.5	-	-	1900
	11/10/2012	-	-	-	420	<5	-	-	3700	0.4	-	1	0.72	0.44	<0.005	<0.05	0.44	1200	0.007	2400	380	<0.5	-	-	2900
	17/04/2013	-	-	-	390	<5	-	-	4700	0.4	-	-	0.49	0.24	<0.005	<0.05	0.24	730	0.01	2600	440	<0.5	-	-	210
	17/10/2013	109	<1	<1000	109	877	2090	2390	69,800	0.3	-	6.66	0.71	2.89	<0.002	-	2.89	3600	<0.001	45,400	3540	<0.1	136,000	18,500	74
	9/04/2014	148	<1	<1000	148	14	1460	1620	49,000	0.4	-	5.39	3.8	4.07	<0.002	-	4.07	7870	<0.001	31,800	2290	<0.1	88,300	10,600	43
	29/10/2014	317	<1	<1000	317	<5	779	724	25,700	0.4	-	3.65	0.99	2.17	<0.002	-	2.17	3160	0.009	14,200	-	<0.1	41,000	4410	14
	30/04/2015	**118**	**<1**	**<1000**	**118**	**<5**	**2480**	**2680**	**83,600**	**0.2**	**<0.1**	**3.7**	**<0.05**	**0.441**	**<0.002**	**-**	**0.441**	**410**	**0.004**	**50,400**	**5960**	**<0.1**	**134,000**	**21700**	**201**
MW5	29/04/2015	-	-	-	370	56	-	-	87,000	-	<0.5	-	-	1.1	<0.005	-	1.1	5100	0.007	48,000	5200	-	130,000	-	-
	21/09/2011	-	-	-	210	47	-	-	87,000	0.3	-	0	2.7	-	-	-	0.02	2700	0.01	48,000	4100	<0.5	-	-	1100
	28/02/2012	-	-	-	150	<5	-	-	80,000	0.4	-	-	2.2	1.2	<0.005	<0.05	1.2	3400	0.006	57,000	4400	<0.5	-	-	1400
	11/10/2012	-	-	-	160	620	-	-	77,000	0.3	-	-4	0.72	1.1	<0.005	<0.05	1.1	1800	0.005	39,000	3500	<0.5	-	-	2600
	6/03/2013	-	-	-	170	1000	-	-	64,000	0.4	<0.5	-	2.1	1.3	<0.005	<0.05	1.3	3400	0.007	36,000	3800	<0.5	-	-	660
	17/04/2013	-	-	-	170	<5	-	-	58,000	0.4	-	-	1	1.6	<0.005	<0.05	1.6	2600	0.014	33,000	3300	<0.5	-	-	1600
	17/10/2013	207	<1	<1000	207	<5	1210	1340	40,500	0.6	-	5.06	0.17	3.29	<0.002	-	3.29	3460	0.005	25,700	-	<0.1	75,400	9860	63
	9/04/2014	275	<1	<1000	275	18	774	799	25,700	0.8	-	1.54	2.63	1.54	<0.002	-	1.54	4170	0.002	15,600	2110	<0.1	47,100	5040	78
	30/10/2014	351	<1	<1000	351	<5	623	584	20,500	0.6	-	3.22	0.32	1.02	<0.002	-	1.02	1340	0.013	11,600	1800	<0.1	33,200	3220	<5
	29/04/2015	**397**	**<1**	**<1000**	**397**	**20**	**499**	**531**	**16,300**	**0.6**	**<0.1**	**3.09**	**0.88**	**0.995**	**<0.002**	**-**	**0.995**	**1870**	**0.016**	**10,900**	**1510**	**<0.1**	**25,400**	**2260**	**154**

Legend
values shaded yellow indicate exceedance of trigger value
shaded blue indicated implied exceedance of trigger value
\- Trigger value not established

N/A Trigger value NA – Not Available. There are a number of metals for which results have shown concentrations below the laboratory detection limits (Arsenic, Cadmium, Copper, Chromium, Lead and Nickel), and so a reliable trigger level has not been able to be determined in the Constrcution Water Quality Management Plan.

* As listed in the Water Quality Management Plan, - part of the Construction Environmental Management Plan - 2-250-329-PRO-TRE-0111-att02

The values from the last GME April 2015 are highlighted in bold

		Metals																					
		Lead (Filtered)	Aluminium	Aluminium (Filtered)	Arsenic (Filtered)	Cadmium (Filtered)	Calcium (Filtered)	Chromium (hexavalent)	Chromium IV (Filtered)	Chromium (III+VI) (Filtered)	Chromium III (Filtered)	Copper (Filtered)	Iron	Iron (Filtered)	Magnesium (Filtered)	Manganese (Filtered)	Mercury	Nickel (Filtered)	Phosphorus	Potassium (Filtered)	Selenium (Filtered)	Silicon (Filtered)	Zinc (Filtered)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L
EQL		0.0001	0.005	0.001	0.0002	0.00005	0.2	0.002	0.001	0.0002	0.001	0.0005	0.005	0.002	0.1	0.0005	0.00005	0.0005	0.005	0.1	0.0002	20	0.001
Trigger Values (Max Baseline + 10		N/A	-	0.0209	N/A	N/A	1210	N/A	N/A	N/A	N/A	N/A	143	0.264	5170	0.242	0.0001	N/A	0.869	2310	-		0.052
LocCode	**Sampled_Date-Ti**																						
MW1	30/04/2011	<0.001	-	0.01	<0.001	<0.0001	200	<0.002	-	<0.001	-	-	-	0.008	63	0.17	<0.00005	-	0.06	10	<0.002	14,000	0.016
	20/09/2011	-	1.8	0.002	<0.001	<0.0001	170	-	-	<0.001	-	-	1.8	<0.005	54	0.046	-	<0.001	0.05	7.9	<0.002	13,000	0.027
	27/02/2012	-	3.6	0.002	<0.001	<0.0001	180	-	-	<0.001	-	-	4.2	<0.005	53	0.088	-	<0.001	0.08	7.7	<0.002	-	0.038
	11/10/2012	-	21	0.005	<0.001	<0.0001	170	-	-	<0.001	-	-	30	0.009	51	0.038	-	<0.001	10	8.6	<0.002	-	0.008
	6/03/2013	-	10	<0.005	<0.001	<0.0001	160	-	-	<0.001	-	-	14	<0.005	49	0.17	-	<0.001	<0.01	8.2	<0.002	15,000	0.01
	17/04/2013	<0.001	0.33	<0.005	<0.001	0.0004	160	-	-	<0.001	-	0.001	0.39	<0.005	49	0.087	-	<0.001	0.02	8.2	<0.002	16,000	0.01
	17/10/2013	<0.0001	0.38	0.006	0.0008	<0.00005	66	-	<0.001	<0.0002	<0.001	<0.0005	1.47	0.437	29	0.425	<0.0001	0.001	0.015	13	0.0005	14,800	0.005
	9/04/2014	<0.0001	0.06	<0.005	0.0008	<0.00005	57	-	<0.001	<0.0002	<0.001	<0.0005	0.57	0.43	31	0.272	<0.0001	<0.0005	0.049	10	0.001	17,500	<0.001
	30/10/2014	<0.0001	0.03	0.018	0.0006	<0.00005	88	-	<0.001	<0.0002	<0.001	<0.0005	0.33	0.052	32	0.204	<0.0001	0.0008	0.034	11	0.0006	17,100	0.009
	30/04/2015	**<0.0001**	**0.09**	**0.006**	**0.0004**	**<0.00005**	**92**	**<0.001**	**<0.001**	**<0.0002**	**<0.0001**	**0.0005**	**0.32**	**0.044**	**33**	**0.08**	**<0.0001**	**0.0007**	**0.046**	**9**	**0.001**	**18000**	**0.003**
MW2	30/04/2011	<0.001	-	0.005	<0.001	<0.0001	99	<0.002	-	<0.001	-	-	-	<0.005	66	<0.005 - 0.005	<0.00005	-	0.09	19	0.003	12,000	0.013
	20/09/2011	-	4.2	0.002	<0.001	<0.0001	150	-	-	<0.001	-	-	6	<0.005	98	0.001	-	<0.001	0.06	20	<0.002	11,000	0.021
	27/02/2012	-	3.6	0.005	<0.001	<0.0001	240	-	-	<0.001	-	-	4.6	0.24	140	0.22	-	<0.001	0.03	24	<0.002	-	0.047
	11/10/2012	-	9.2	0.002	<0.001	<0.0001	160	-	-	<0.001	-	-	12	<0.005	94	0.01	-	<0.001	0.17	21	<0.002	-	0.021
	6/03/2013	-	10	0.006	<0.001	<0.0001	150	-	-	<0.001	-	-	15	<0.005	87	0.012	-	<0.001	<0.01	21	<0.002	13,000	0.017
	17/10/2013	<0.0001	0.04	<0.005	<0.0002	<0.00005	112	-	<0.001	<0.0002	<0.001	<0.0005	0.06	<0.002	76	<0.0005	<0.0001	<0.0005	0.008	18	0.0031	10,600	<0.001
	17/04/2013	<0.001	3.5	<0.005	<0.001	0.0003	160	-	-	<0.001	-	<0.001	5.2	<0.005	100	0.012	-	<0.001	0.1	23	<0.002	13,000	0.012
	9/04/2014	<0.0001	0.02	<0.005	<0.0002	<0.00005	71	-	<0.001	<0.0002	<0.001	<0.0005	<0.05	<0.002	57	0.0009	<0.0001	<0.0005	0.032	17	0.0011	11,700	<0.001
	29/10/2014	<0.0001	0.01	0.017	<0.0002	<0.00005	98	-	<0.001	<0.0002	<0.001	<0.0005	<0.05	<0.002	64	0.0024	<0.0001	<0.0005	0.039	18	0.0016	10,800	0.006
	30/04/2015	**0.0001**	**0.1**	**<0.005**	**0.0002**	**<0.00005**	**103**	**<0.001**	**<0.002**	**<0.0002**	**<0.0001**	**0.0015**	**0.14**	**0.004**	**66**	**0.001**	**<0.0001**	**0.0005**	**0.019**	**18**	**0.0025**	**13,900**	**0.021**
MW3	30/04/2011	<0.005	-	0.013	<0.005	<0.0005	120	<0.002	-	<0.005	-	-	-	<0.025	300	0.02 - 0.022	<0.00005	-	0.16	130	<0.01	16,000	0.02
	20/09/2011	-	5.8	0.019	<0.005	<0.0005	85	-	-	<0.005	-	-	7.4	<0.025	210	0.014	-	<0.005	0.05	90	<0.01	15,000	0.047
	27/02/2012	-	6.5	0.005	<0.005	<0.0005	95	-	-	<0.005	-	-	6.8	<0.025	210	0.026	-	<0.005	0.05	120	<0.01	-	0.032
	11/10/2012	-	5	<0.01	<0.01	<0.001	100	-	-	<0.01	-	-	5.8	<0.05	260	0.027	-	<0.01	0.06	120	<0.02	-	0.031
	6/03/2013	-	5.8	<0.025	<0.005	<0.0005	130	-	-	<0.005	-	-	6.3	<0.025	340	0.018	-	<0.005	1.6	130	<0.01	17,000	<0.025
	17/04/2013	<0.01	14	0.072	<0.01	<0.001	350	-	-	<0.01	-	<0.01	21	0.52	910	1.7	-	<0.01	0.16	340	<0.02	14,000	<0.05
	17/10/2013	<0.0001	<0.01	0.021	0.0008	<0.00005	91	-	<0.001	<0.0002	<0.001	0.0005	<0.05	0.01	232	0.0038	<0.0001	0.0006	<0.005	97	0.0038	17,400	<0.001
	9/04/2014	<0.0001	0.02	<0.005	0.001	<0.00005	104	-	<0.001	<0.0002	<0.001	0.0017	<0.05	<0.002	286	0.0133	<0.0001	<0.0005	0.044	115	0.0035	16,600	<0.001
	29/10/2014	<0.0001	0.03	0.024	0.0014	<0.00005	68	-	<0.001	0.0004	<0.001	0.0014	<0.05	0.005	196	0.002	<0.0001	0.0012	0.038	100	0.0024	17,100	0.025
	29/04/2015	**<0.0001**	**0.03**	**<0.005**	**0.0009**	**<0.00005**	**75**	**<0.010**	**-**	**0.0003**	**0.0003**	**0.0006**	**<0.05**	**<0.002**	**208**	**0.0131**	**<0.0001**	**<0.0005**	**0.025**	**114**	**0.0032**	**19800**	**0.003**
MW4	30/04/2011	<0.005	-	<0.005	<0.005	<0.0005	39	<0.002	-	<0.005	-	-	-	<0.025	100	0.013 - 0.014	<0.00005	-	0.79	110	<0.01	8700	0.01
	21/09/2011	-	21	<0.005	<0.005	<0.0005	28	-	-	<0.005	-	-	31	<0.025	68	0.011	-	<0.005	0.14	69	<0.01	7500	0.029
	28/02/2012	-	82	<0.005	<0.005	<0.0005	49	-	-	<0.005	-	-	130	<0.025	96	0.033	-	<0.005	0.48	110	<0.01	-	0.047
	11/10/2012	-	65	<0.01	<0.01	<0.001	69	-	-	<0.01	-	-	130	<0.05	150	0.041	-	<0.01	0.54	110	<0.02	-	0.012
	17/04/2013	<0.005	4.4	0.031	<0.005	<0.0005	94	-	-	<0.005	-	<0.005	7.4	<0.025	190	0.12	-	<0.005	0.05	120	<0.01	11,000	<0.025
	17/10/2013	<0.001	1.33	<0.025	<0.0025	<0.001	972	-	<0.01	<0.0025	<0.02	0.005	1.63	<0.025	3900	0.277	<0.0001	0.0479	0.014	1640	<0.01	7380	<0.025
	9/04/2014	<0.001	0.17	<0.025		<0.001	598	-	<0.001	<0.0025	<0.001	<0.005	<0.5	0.034	2210	0.0029	<0.0001	0.035	<0.005	1200	<0.01	7400	0.042
	29/10/2014	<0.0004	0.66	0.013	0.0022	<0.0004	248	-	0.002	0.0018	<0.001	<0.002	1.02	0.019	921	0.0746	<0.0001	0.021	0.078	724	<0.004	5820	0.042
	30/04/2015	**<0.001**	**4.8**	**<0.025**	**<0.0025**	**<0.001**	**1120**	**<0.010**	**-**	**0.004**	**0.004**	**<0.005**	**6.76**	**<0.025**	**4590**	**3.29**	**<0.0001**	**0.037**	**<0.005**	**1970**	**<0.01**	**6670**	**<0.025**
MW5	29/04/2015	<0.05	-	<0.05	<0.05	<0.005	1000	0.01	-	<0.05	-	-	-	<0.25	4100	0.2 - 0.22	0.00011	-	0.11	1900	<0.1	4900	<0.05
	21/09/2011	-	11	<0.1	<0.1	<0.01	1100	-	-	<0.1	-	-	12	<0.5	4300	<0.1	-	<0.1	0.04	1700	<0.2	4600	<0.1
	28/02/2012	-	18	<0.1	<0.1	<0.01	1100	-	-	<0.1	-	-	25	<0.5	4700	<0.1	-	<0.1	0.21	2100	<0.2	-	<0.1
	11/10/2012	-	31	<0.05	<0.05	<0.005	970	-	-	<0.05	-	-	37	<0.25	3700	<0.05	-	<0.05	<0.01	1700	<0.1	-	<0.05
	6/03/2013	-	16	<0.25	<0.05	<0.005	770	-	-	<0.05	-	-	18	<0.25	3000	<0.05	-	<0.05	0.04	1500	<0.1	5900	<0.25
	17/04/2013	<0.05	33	0.3	<0.05	<0.005	740	-	-	<0.05	-	<0.05	44	<0.25	2900	<0.05	-	<0.05	0.16	1400	<0.1	6000	<0.25
	17/10/2013	<0.0004	0.74	<0.01	0.0013	<0.0004	599	-	<0.01	<0.01 - 0.012	<0.01	<0.002	0.8	<0.01	2030	0.0013	<0.0001	0.0073	0.011	988	<0.004	6060	<0.01
	9/04/2014	<0.0004	1.02	0.086	<0.001	<0.0004	303	-	<0.002	<0.01 - 0.007	<0.001	<0.002	1.13	0.015	1040	0.0026	<0.0001	0.0032	<0.005	767	<0.004	6940	0.017
	30/10/2014	<0.0002	<0.05	<0.005	0.0017	<0.0002	194	-	0.006	0.0065	<0.001	<0.001	<0.25	0.01	665	0.0016	<0.0001	0.0024	0.082	590	0.003	7040	<0.005
	29/04/2015	**<0.0002**	**3.61**	**<0.005**	**0.0008**	**<0.0002**	**139**	**<0.010**	**-**	**0.003**	**0.003**	**0.002**	**4.8**	**0.007**	**464**	**0.005**	**<0.0001**	**0.0018**	**0.023**	**467**	**<0.002**	**8290**	**0.02**

Legend

- Trigger value not established

N/A Trigger value NA – Not Available. There are a number of metals for which results have shown concentrations below the laboratory detection limits (Arsenic, Cadmium, Copper, Chromium, Lead and Nickel), and so a reliable trigger level has not been able to be determined in the Constrcution Water Quality Management Plan.

* As listed in the Water Quality Management Plan, - part of the Construction Environmental Management Plan - 2-250-329-PRO-TRE-0111-att02

The values from the last GME April 2015 are highlighted in bold

Field Duplicates (WATER)
Filter: SDG in('ALSE-Perth 01-May-15')

SDG	ALSE-Perth 01-May-15	ALSE-Perth 01-May-15	
Field_ID	MW4	DUP01	RPD
Sampled_Date-Time	30/04/2015 11:27	30/04/2015 11:27	

Chem_Group	ChemName	Units	EQL			
	Silicon as SiO2 (Filtered)	mg/l	0.1	14.3	15.5	8
	Sulfate as SO4 - Turbidimetric (Filtered)	mg/l	1	5960.0	5650.0	5
	Unionized Hydrogen Sulfide	mg/l	0.1	<0.1	<0.1	NA
BTEX	Benzene	µg/L	1	<1.0	<1.0	NA
	Ethylbenzene	µg/L	2	<2.0	<2.0	NA
	Toluene	µg/L	2	<2.0	<2.0	NA
	Total BTEX	mg/l	0.001	<0.001	<0.001	NA
	Xylene (m & p)	µg/L	2	<2.0	<2.0	NA
	Xylene (o)	µg/L	2	<2.0	<2.0	NA
	Xylene Total	µg/L	2	<2.0	<2.0	NA
	C6-C10 less BTEX (F1)	mg/l	0.02	<0.02	<0.02	NA
Inorganics	Alkalinity (Bicarbonate as CaCO3)	mg/l	1	118.0	118.0	0
	Alkalinity (Carbonate as CaCO3)	mg/l	1	<1.0	<1.0	NA
	Alkalinity (Hydroxide) as CaCO3	µg/l	1000	<1000.0	<1000.0	NA
	Alkalinity (total) as CaCO3	mg/l	1	118.0	118.0	0
	Ammonia as N	µg/l	5	<5.0	<5.0	NA
	Anions Total	meq/L	0.01	2480.0	2560.0	3
	Cations Total	meq/L	0.01	2680.0	2740.0	2
	Chloride	mg/l	1	83600.0	86600.0	4
	Fluoride	mg/l	0.1	0.2	0.2	0
	Kjeldahl Nitrogen Total	mg/l	0.05	<0.05	<0.05	NA
	Nitrate (as N)	mg/l	0.002	0.441	0.446	1
	Nitrite (as N)	mg/l	0.002	<0.002	<0.002	NA
	Nitrogen (Total Oxidised)	mg/l	0.002	0.441	0.446	1
	Nitrogen (Total)	µg/l	50	410.0	430.0	5
	Reactive Phosphorus as P	mg/l	0.001	0.004	0.004	0
	Sodium (Filtered)	mg/l	1	50400.0	51700.0	3
	Sulphide	mg/l	0.1	<0.1	<0.1	NA
	TDS	mg/l	10	134000.0	135000.0	1
	Hardness as CaCO3 (Filtered)	mg/l	1	21700.0	22200.0	2
	TSS	mg/l	5	201.0	210.0	4
Lead	Lead (Filtered)	mg/l	0.0002	<0.001	<0.001	NA
Metals	Aluminium (Filtered)	mg/l	0.005	<0.025	<0.025	NA
	Aluminium	mg/l	0.01	4.8	5.24	9
	Arsenic (Filtered)	mg/l	0.0005	<0.0025	<0.0025	NA
	Cadmium (Filtered)	mg/l	0.0001	<0.001	<0.001	NA
	Calcium (Filtered)	mg/l	1	1120.0	1150.0	3
	Chromium (hexavalent) (Filtered)	mg/l	0.001	<0.01	<0.01	NA
	Chromium (III+VI) (Filtered)	mg/l	0.0005	0.004	0.0045	12
	Chromium (Trivalent)	mg/l	0.001	<0.01	<0.01	NA
	Copper (Filtered)	mg/l	0.001	<0.005	<0.005	NA
	Iron (Filtered)	mg/l	0.005	<0.025	<0.025	NA
	Iron	mg/l	0.05	6.76	6.6	2
	Magnesium (Filtered)	mg/l	1	4590.0	4690.0	2
	Manganese (Filtered)	mg/l	0.0005	3.29	3.37	2
	Mercury	mg/l	0.0001	<0.0001	<0.0001	NA
	Nickel (Filtered)	mg/l	0.0005	0.037	0.0386	4
	Phosphorus	mg/l	0.005	<0.005	<0.005	NA
	Potassium (Filtered)	mg/l	1	1970.0	2030.0	3
	Selenium (Filtered)	mg/l	0.002	<0.01	<0.01	NA
	Silicon (Filtered)	µg/l	50	6670.0	7240.0	8
	Zinc (Filtered)	mg/l	0.005	<0.025	<0.025	0
PAH/Phenols	Naphthalene	µg/L	5	<5.0	<5.0	0
TPH	C10-C16	mg/l	0.1	<0.1	<0.1	0
	C16-C34	mg/l	0.1	<0.1	<0.1	0
	C34-C40	mg/l	0.1	<0.1	<0.1	0
	F2-NAPHTHALENE	mg/l	0.1	<0.1	<0.1	0
	C6 - C9	µg/L	20	<20.0	<20.0	0
	C10 - C14	µg/L	50	<50.0	<50.0	0
	C15 - C28	µg/L	100	<100.0	<100.0	0
	C29-C36	µg/L	50	<50.0	<50.0	0
	+C10 - C36 (Sum of total)	µg/L	50	<50.0	<50.0	0
	C10 - C40 (Sum of total)	µg/L	100	<100.0	<100.0	0
	C6-C10	mg/l	0.02	<0.02	<0.02	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 30 (1-10 x EQL); 30 (10-30 x EQL); 30 (> 30 x EQL))

NA- RPD cannot be calculated as both concentrations are below laboratory detection limits

Field Blanks (WATER)
Filter: SDG in('ALSE-Perth 01-May-15')

SDG	ALSE-Perth 01-May-15	ALSE-Perth 01-May-15
Field_ID	RIN01	Trip blank
Sampled_Date-Time	30/04/2015	30/04/2015
Sample_Type	Rinsate	Trip_B

Chem_Group	ChemName	Units	EQL		
	Sulfate as SO4 - Turbidimetric (Filtered)	mg/l	1	<1	
BTEX	Benzene	µg/L	1		<1
	Ethylbenzene	µg/L	2		<2
	Toluene	µg/L	2		<2
	Total BTEX	mg/l	0.001		<0.001
	Xylene (m & p)	µg/L	2		<2
	Xylene (o)	µg/L	2		<2
	Xylene Total	µg/L	2		<2
	C6-C10 less BTEX (F1)	mg/l	0.02		<0.02
PAH	Naphthalene	µg/L	5		<5
TPH	C6 - C9	µg/L	20		<20
	C6-C10	mg/l	0.02		<0.02
Inorganics	Alkalinity (Bicarbonate as CaCO3)	mg/l	1	<1	
	Alkalinity (Carbonate as CaCO3)	mg/l	1	<1	
	Alkalinity (Hydroxide) as CaCO3	µg/l	1000	<1000	
	Alkalinity (total) as CaCO3	mg/l	1	<1	
	Anions Total	meq/L	0.01	<0.01	
	Cations Total	meq/L	0.01	<0.01	
	Chloride	mg/l	1	<1	
	Fluoride	mg/l	0.1	<0.1	
	Sodium (Filtered)	mg/l	1	<1	
	Hardness as CaCO3 (Filtered)	mg/l	1	<1	
Metals	Lead (Filtered)	mg/l	0.0001	<0.0001	
	Aluminium (Filtered)	mg/l	0.005	<0.005	
	Arsenic (Filtered)	mg/l	0.0002	<0.0002	
	Cadmium (Filtered)	mg/l	0.00005	<0.00005	
	Calcium (Filtered)	mg/l	1	<1	
	Chromium (III+VI) (Filtered)	mg/l	0.0002	<0.0002	
	Copper (Filtered)	mg/l	0.0005	<0.0005	
	Iron (Filtered)	mg/l	0.002	<0.002	
	Magnesium (Filtered)	mg/l	1	<1	
	Manganese (Filtered)	mg/l	0.0005	<0.0005	
	Nickel (Filtered)	mg/l	0.0005	<0.0005	
	Potassium (Filtered)	mg/l	1	<1	
	Selenium (Filtered)	mg/l	0.0002	<0.0002	
	Zinc (Filtered)	mg/l	0.001	<0.001	

ATTACHMENT 24

DECOMMISSIONING ENVIRONMENTAL MANAGEMENT PLAN (DEMP)

MANUAL

Title:	DECOMMISSIONING ENVIRONMENTAL MANAGEMENT PLAN (DEMP) TAN BURRUP PROJECT	No. :	
		Rev. :	04
		Page :	1 of 25

Prepared by	:	Irene de la Guerra Sierra
Reviewed by	:	Finn Almas / Ulf Nylund / Robert Lam
Approved by	:	Rajan Sinha

CONTENTS

1 PURPOSE AND APPLICATION

Yara Pilbara Nitrates Pty Ltd (YPNPL) submitted a Development Application for the proposed Technical Ammonium Nitrate Production Facility (TANPF) at Shire of Roebourne. The implementation the proposal is subject to a set of conditions defined by the Environmental Protection Authority and set forth in Ministerial Statement 870 . One of them, Condition 10-1 (870:M10.1) refers to decommissioning as an overall phase of the TAN Burrup Project execution, requiring a management plan.

The Decommissioning Environmental Management Plan (DEMP) is a living document that:

- It will be periodically reviewed and revised throughout the decommissioning phase.
- It will be reissued prior to decommissioning phase.
- It can be reissued or at other intervals indicated by HES.

Future submissions will include a summary of the effectiveness of the mitigation measures over the previous 12 months.

The issue of closing down, dismantling and demolishing TANPF is an integral part of restructuring of YPNPL's business. The intention with this manual is to describe a best practice, project approach to the issue.

Information from several sources have therefore been combined and completed with good working practice into this manual. The document has, to a large extent, the form of a checklist. The document will be subject to changes and development to reflect the experience which will be gained.

More specific information will be found as enclosures to the document.

Site has been proposed and defined based different criteria including the minimization of the environmental disturbance. Level of the site has been studied to ensure minimal alterations to original level. The Site will be back to a level of an industrial zoned area Relevant items for the final landform at closure needs to be considered:

- The need to think long term.
- The need to integrate the closure plan into current operations.

It is therefore essential to begin with determining the desired geometry at closure taking into consideration:

- The management of runoff and long term erosion.
- The slope profile that will generate minimum erosion.

- The potential effects of differential settlement
- Isolation of chemically adverse material within the dump such that it is unlikely to be exposed by erosion and net infiltrated rainwater through the adverse material is minimized.

The decommissioning phase will last approximately four to six months with an average manning level of at least 20-30 persons. The number of persons involved in this activities is susceptible to be increased. Upon decommissioning the TANPF is not considered likely to have any significant hazardous wastes or contaminated lands. All wastes and contaminated material will be cleaned and removed in accordance with relevant legislation and the DEMP.

The Site will be brought back to a level of an industrial zoned area. The original landform has not been significantly altered for Site areas/sections that would potentially be differing significantly from original landform, restoration shall be considered.

In addition, equipment, buildings and other facilities will be removed. Decommissioning activities will involve the recovery of catalyst (platinum) from the heat exchangers and vessels in the NA plant.

Clean and contaminated surface water ponds will be emptied and cleaned (with all contaminated waste to be appropriately removed by an approved waste contractor), and all interconnections (piping) to the YPFPL site will be removed.

***Figure 1*.- TAN Burrup Production Process.**

This DEMP will indicate the mitigation measures to prevent, reduce and where possible prevent any significant adverse effects on the environment throughout the decommissioning of the Project. The decommissioning activity is divided into 3 phases as follows:

- Care and Maintenance Preparations; is the first phase of decommissioning. During this phase most of the plant and buildings on the site will be dismantled and cleared.

- Care and Maintenance; is the second phase of decommissioning, during which no significant dismantling will be carried out. The site will continue to be managed, monitored and maintained.

- Final Site Clearance; is the last phase. This involves the dismantling of the remaining structures on the site and the clearance of any residual to bring it back to a level of an industrial zone area.

Environmental topics to be considered as a minimum:

- Air Quality and Dust
- Archaeology and Cultural Heritage
- Ecology
- Geology, Hydrogeology and Soils
- Landscape and Visual
- Noise and Vibration
- Socio-Economic
- Surface Waters
- Traffic and Transport

2 INTRODUCTION

As a natural part of the life cycle of a fixed asset, it will have to be decommissioned and disposed of in a satisfactory manner when it is no longer feasible to operate it.

When a fixed asset comes to this stage, a project approach is going to be used. The reason for this is the uniqueness of the activities, taking into account amongst others the production processes, feed stock materials, buildings, equipment, location, local conditions and actual legislation.

Using the project approach will imply that three phases need to be considered; identification, planning and execution phase.

3 DEFINITIONS

COMPANY Yara Pilbara Nitrates Pty Ltd

CONTRACTOR Técnicas Reunidas S.A.

CONSTRUCTION Includes any preparatory work required to be undertaken including clearing vegetation, cut and fill activities, the erection of any on-site temporary structures and the use of equipment for the purpose of breaking the ground for buildings or infrastructure.

DECOMMISSIONING Planned shut-down or removal (partial or total) of a building, equipment, etc. from operation or usage.

DEMOLITION Controlled act of destroying a building, equipment, etc.

PROJECT TAN Burrup Project.

REHABILITATION Activities performed in order to return the site to pre-construction conditions

SITE 35 Ha area where construction works are going to be performed.

4 ABBREVIATIONS

DEMP Decommissioning Environmental Management Plan

HES Health Environment Safety

TAN Technical Ammonium Nitrate

TANPF Technical Ammonium Nitrate Production Facility

TR Técnicas Reunidas S.A.

YPNPL Yara Pilbara Nitrates Pty Ltd

5 IDENTIFICATION PHASE

This is the first, early phase when closing, dismantling, demolition and disposal of production facilities are considered. The purpose of this phase is to identify the scope of all activities on an overall level as a basis for a total estimate. The activities and their associated cost elements can be grouped as follows:

- Legal and contractual obligations towards redundant personnel (transfer, dismissal or early retirement or other social cost)

- Operation during the closing down period.:
  - Supervision
  - Utilities
  - Consumables

- Non fulfilment of contractual obligations to partners, covering.:
  - Feed stock
  - Energy import and export
  - Product and by-product delivery
  - Land lease and common infrastructure

- Preparations for dismantling and demolition of equipments, buildings, off-sites and utilities:

- Emptying and cleaning
- Disposal of waste products
- Disposal of catalyst, lubrication agents, contaminated or toxic material

- Dismantling and demolishing (above ground level):
  - Dismantling sellable or reusable equipment and materials
  - Preservation, storing and transportation of sellable or reusable equipment and materials
  - Demolishing and sorting of materials
  - Recycling and/or disposal of materials

- Dismantling and demolishing (below ground level):
  - Foundations
  - Piles
  - Sewage systems
  - Cables and pipelines
  - Recycling and/or disposal of materials

- Preparation for further use of the site:
  - Replacement of contaminated soil
  - Rerouting of common infrastructure (cables, pipe racks, underground installations)
  - Ground levelling and final preparation
  - Site cleaning

- Special HES – issues:
  - Radiation/radioactivity
  - Possible less known contamination from previous activities at site

- Project management cost, including engineering and procurement activities during the dismantling and demolition phase.

Due to the sensitivity of such early phase work, only few persons will be involved in this phase. However, these shall be familiar with the local conditions and situation in order to cover as many aspects as possible. In this phase the accuracy of the estimate and schedule for activities will be on the lower side.

6 PLANNING PHASE

When it has been decided that a YPNPL (or part of it) shall be closed, dismantled and demolished, the activities can be split in two main groups:

- One dealing with personnel, the transition period from operation to standstill and contracts/agreements.

- The other group deals with the activities to prepare for and carry out dismantling, demolition, disposal and preparations for future use of the site or actual area thereof.

This report will deal with the later.

6.1 Planning of dismantling, demolition, disposal and final preparation of the site

This is an important project phase because it will be the basis for a successful execution phase. It is to be compared to a pre-execution (main) study phase in a "normal" project. Competent personnel is essential, but especially when it comes to knowledge about the facility's history and the impact this may have on content of toxic, contaminated or polluting material in equipment, buildings and the ground.

The purpose of the study is to clarify all aspects relevant for estimating the cost and also to establish methods, philosophies and schedules for the execution phase. One aspect is also to optimise the cost by identifying the potential for income from sale of useful equipment and material, but also to reduce transportation, recycling and disposal cost e.g. by separation of material in contaminated and non-contaminated fractions.

6.1.1 Definition of the works

A clear description of the scope of work for the decommissioning and the objectives of it is an important basis also for this type of activities.

6.1.2 Execution and procurement strategy

This has to be developed in the planning phase. It will be dependent on the project's scope and objective, but also on available personnel at YPNPL being closed.

An important factor is to survey the market for demolishing and second hand equipment contractors in order to chose the most suitable contract format and contractors for the actual scope. A pre qualification is going to be made in order to short list contractors which can meet requirements to safety and which are able to deal properly with the environmental aspects of the works.

6.1.3 Organisation

Planning and execution of demolition work can be organised in two principal ways:

- Performed by operating / maintenance personnel from existing plant operations/maintenance personnel working in the established plant organisation
- Performed by personnel wholly or partly dedicated to the organisation for the demolition work

Selection between the two alternatives would normally be based on:

- Local knowledge of the plant
- Extent of demolition work
- Complexity of demolition work
- Current work load for operations personnel

Generally, small demolition work would be executed within an existing plant organisation, whilst larger and more complex demolition work would be executed by establishing a dedicated organisation.

For execution of big and complex demolition work by a dedicated organisation some important issues must be taken into account when organising the project team:

- Need for in-depth knowledge in the working team of plant history, available documentation, knowledge about previous production processes, etc.
- Capability of systematic planning and evaluation of all related costs and risks according to the general requirement of Yara i.e. capability of performing the works according to the same standards as for any other investment activities.
- Capability of utilising external contractors according to the same standards as for any other investment project i.e. focus and competence on competitive bidding processes, contractor qualifications and track records (safety), contract quality.
- Availability of personnel with proper technical competence as well as continuity in the team during this phase.
- Need for YPNPL to maintain and continuously update experience in demolition works.

The above requirements can be met by various project organisation models and utilisation of personnel.

An example is shown in Attachment 1.

6.1.4 Legislation and other requirements

An important basis for planning is to clarify:

- National and local legislation and requirements

Yara's best practices for closing down, dismantling, demolition and disposal of production plants Please refer to section 11 for minimum references that are going to be considered.

6.1.5 Dismantling

Conventional plant and buildings will be removed and demolished using standard construction industry methods.. The interior of buildings will be first removed and decontaminated if necessary prior to demolition of the buildings themselves. To facilitate this, large or heavy equipment are going to be cut or split into components or sub-component parts prior to their removal. It is expected that after removal *etc.* is complete, demolition will be carried out using conventional methods. All buildings will be demolished in their entirety, the structures including any cabling removed to ground level and the voids backfilled. Once removed, the footprints of buildings will be backfilled over. Any remaining below ground building structures (*e.g.* basements will be punctured to prevent 'ponding' (the accumulation of water).

Equipment and piping will be dismantled and removed and the metal recycled.

All suitable demolition material from buildings will be retained on-site to be used for the backfilled of deep voids.

Involving a professional second hand dealer and demolition contractor can help in this process.

Potential solid waste materials that will be created during decommissioning of the YPNPL are (but not limited to):

- Insulation.
- Cabling (copper will be recovered).
- Piping (to be recycled).
- Equipment (to be recycled).
- Concrete.
- Asphalt.
- Rubber (belt conveyors).
- Gaskets.
- Catalysts
- Buildings structures
- Prill tower skirts (fabric).
- Glass from windows.

Some instruments will contain radioactive substances and spent catalysts and other accumulated substances and these will be handled in accordance with relevant legislation and YPNPL's waste management plan previously defined.

It is expected that potential solid non-hazardous waste materials that are going to be created during decommissioning of the YPNPL are (but not limited to):

- Oil (from compressor and other equipment with lubrication).
- Sludge (from cleaning from ponds).

6.1.6 Demolition and disposal of material

The following need to be considered in connection with demolition of civil and structural material:

Definition of the scope of the demolition and disposal works.

- Mapping and analysis of all chemical, toxic and polluting material above and below ground, and the magnitude of such. It will be beneficial in this respect to:
  - Know the history of the facility throughout its lifetime

- How to handle the above in view of:
  - Legislation
  - Yara's directives and procedures

- A plan for approval of handling and disposal of chemical, toxic and polluting material.

- Documentation for structures, foundations, piles, pipe racks, conduits for cables, sewage and other underground installations.
- Possible methods for demolition.
- How to dispose of the waste material:
  - Unsorted.
  - Sorted as for instance as:
    - Clean concrete which can be crushed and recycled (backfill)steel and other metal scrap which can be recycled.
    - Reusable material (doors, windows, roof tiles etc.).
    - Polluted material for disposal in approved storage.
    - Polluted and toxic material for destruction.

- A plan for transport of waste material.

- Stability of concrete and steel structures during demolition:
  - Need for temporary support.
  - Permanent support if only parts of structures shall be removed.

- Replacement of contaminated soil.

- Termination and/or rerouting of connections to outside battery limit installations.

- Safety and health:
  - Personal protection, also against toxic material.
  - Fencing and entrance control to the site.

- A schedule for this activities according to the execution of the works
- Documentation of the site's status when the works have been completed.

6.1.7 Schedule

Experience shows that it is important to allow for enough time to plan, clean, dismantle and prepare the site before the execution of final demolition by contractor(s).

For schedule purposes it needs to take into account that experience shows that it often takes longer than one would assume to sell all sellable material and equipment.

A master schedule shall be based upon schedules for the different main activities, and milestones that is going to be given. This is useful for the interfaces with other parts of the site or plant.

6.1.8 Risks

This type of activities need careful evaluation of the risk and how to deal with each of the risk factors related to.:

- environment/pollution
- safety and health
- stability of structures during demolition
- schedule
- contracts
- cost
- income from sale of equipment

Risk reduction and risk avoidance must be evaluated.

7 EXECUTION PHASE

When budget and schedule have been approved for the dismantling and demolitionworks, a dedicated project team needs to be formed to execute and control the activities.

The team need to have competence to cover the following:

- Project management and project control
- Procurement (and sale for sellable equipment and material)
- Operational issues (documentation, history, temporary arrangements)
- Civil and structural
- HSE issues

The main tasks for the project team will be to execute the activities according to the plans, schedule and budget which have been prepared in the planning phase, or even improve compared to this.

An important issue in this phase is to control the risks. Risks in such activities are mainly related to:

- HSE
- Stability of structures
- Cost

Analysis, response to and control of these items are essential.

For HSE, specific plans and applicable procedures have to be established. Co-operation and communication with involved contractors is important in order to get an understanding of the issue and the response YPNPL has taken to reduce the risks. Follow up closely and implement corrective actions without hesitation.

During demolishing, stability of remaining structures has to be continuously assessed. Control of the risk has to be done by involving competent personnel.

The Site will be brought back to a level of an industrial zoned area. Specific control measures which will be used to guide the management of water resources, landforms, re-vegetation and infrastructure and support facilities during decommissioning. If a contamination issue is identified before or during the closure, specific closure actions will be included in the plan. In addition, equipment, buildings and other facilities will be removed. Surface water ponds will be emptied and cleaned (with any contaminated waste to be appropriately removed by an approved waste contractor). Interconnections (piping) with the YPFPL will be removed.

Decommissioning would entail similar noise sources to those expected during the construction of the plant, i.e. cranes, trucks for removal of material, and earthmoving equipment. Typical noise impacts would be as for the construction phase. Additional likely noise sources would include rock-breaker equipment to break up concrete foundations. No significant impact is expected at any sensitive receptor.

Emissions associated with decommissioning include equipment removal and site rehabilitation. Emissions will be controlled through the implementation of an environmental management plan. As such, emissions are anticipated to be small in magnitude.

Potential waste materials are going to be generated during decommissioning of the YPNPL. This will likely include grey water, waste oils and other and non-specified liquid wastes.

During construction and operation of the YPNPL is not expected to generate large volumes of solid waste. During decommissioning activities there will be significant quantities of solid waste..

All hazardous wastes will be managed by contractors who hold the appropriate Carrier's License, which will be checked for current validity before a contract is placed and implemented. The specific contractor used will depend on the type of waste requiring disposal. All records are auditable and will be checked regularly.

In general, the management of waste at YPNPL will aim to minimize the need to use landfill by reducing waste volumes wherever possible by following the hierarchy of waste management, i.e. reduce, reuse, and recycle. YPNPL follows the Environmental Protection Act 1986 principles for all waste arising and where waste is transferred, it is accompanied by a transfer note and a full written description of the wastes.

Scrap metal (e.g. steel and copper) and glass will be sent to an appropriate contractor for recycling. If it is not practicable to reuse or recycle any scrap materials they will be disposed of via approved routes.

Effluent will be disposed in accordance with YPNPL's discharge consents under the Water Resources Act. Discharges under these consents include cooling water, rain water and fully treated effluent from the site sewage treatment plant.

8 MITIGATION MEASURES

There are no specific changes to the mitigation measures that were submitted in the Environmental Statement and reported in the Construction Environmental Management Plan.

Mitigation measures already identified for the care and maintenance preparations & activities can be considered in Attachment 1.

9 STAKEHOLDERS ENGAGEMENT

Whilst decommissioning represents a new phase in the lifecycle of the site, YPNPL remains committed to engaging with stakeholders at all phases in the process. Regular meetings have been and will continue to be held with the Site Stakeholder Group as well as environmental agency, local authorities, etc. that will also be kept informed of activities at the site. Organizations will be also involved in the public consultation process for the Environmental Statement. As well as regular meetings with stakeholders, where appropriate, other interested parties will also be kept informed of specific decommissioning activities.

10 DOCUMENTATION

When a site has been cleared, a final documentation has to be prepared.
The main reason is to document towards Australian Authorities and future users of the site the status of the cleared site and how the toxic and contaminated materials have been disposed of and who presently has the responsibility for it.

Such documentation will consist on:

- Demolition Contract Evaluation Report
- Demolition Contract
- Lists/receipts from receiver of all demolition materials
- Final (as-built) layout drawings indicating remaining structures in the ground
- Final (as-built) layout drawings indicating any remaining contamination in the ground
- Final accounts, reports etc.

11 REFERENCES

AS 2601 – Demolition of Structures
PER – Public Environmental Review, January 2010.
Works Approval granted for YPNPL
Environmental Protection Act 1986
Environmental Protection (Noise) Regulations 1997
Environmental Protection and Biodiversity Conservation Act 1986
Waterways Conservation Act 1976
Soil and Land Conservation Act 1945
Environmental Protection (Controlled Waste) Regulations 2004
Wildlife Conservation Act 1950
Agricultural and Related Resources Protection Act 1976

Public Health Act 2005
Fisheries Act 1994Ministerial Statement 870
Aboriginal Heritage Act 1972
Work Health and Safety Act 1984
Closing down, dismantling, demolition and disposal of production plants – Yara Best Practices

12 ATTACHMENTS

Attachment 1: Mitigation measures.
Attachment 2: A possible organization chart for decommissioning activities.

ATTACHMENT 1

Environmental Impact	Mitigation measure	Action	Comments
Air quality & dust			
Dust Emissions (from on-site) Increase in site dust emissions due to construction, demolition and waste / materials handling operations, etc. which could impact on residential and industrial receptors.	The following best practice measures will be implemented as appropriate: On-site roads to be regularly cleaned of mud/dust deposits, including the use of re-circulating water wheel washers and road cleaners as appropriate; and sheeting of vehicles carrying potentially dusty loads; Minimization of unnecessary material and waste handling as far as practicable; Use of water sprays for external demolition activities as appropriate; Use of water sprays during outside in-fill operations; Avoidance of vehicular use of un-surfaced (soft) ground where possible and limits on vehicle speeds on such surfaces where it cannot be avoided; Use of water sprays during particularly windy or dry conditions; Use of water sprays to maintain damp surfaces during dry and windy weather (e.g. soil stockpiles, demolition rubble); or sheeting or seeding of surfaces of stockpiles of soil or other dusty materials; Sheeting or seeding of surfaces and/or use of wind fences; and Covering of containers and/or use of wind fences.	Routine control will be enforced through existing site procedures. Any additional requirements will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning working plans. The effectiveness of dust mitigation will be monitored. There are a variety of means of measuring dust deposition; directional monitoring will be used if possible. It is appropriate to initiate monitoring before works commence in order to determine the background contribution to which the site need to add. Arrangements will be discussed and agreed in advance with the local authority as necessary.	These mitigation measures primarily concern impacts on humans. However, their implementation will also offset possible impacts of dust deposition on sensitive habitats immediately adjacent to the site.
Dust Emissions (road side	As appropriate:	Routine control will be	These mitigation measures

from vehicles) Increase in dust at residential properties along traffic routes due to soiled vehicles or vehicles carrying dust loads.	Sheeting of lorries carrying dusty loads; and Provision of wheel and body washing where appropriate for, as a minimum, heavy goods vehicle leaving the site.	enforced through existing site procedures. Any additional requirements will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning working plans. These mitigation measures will be considered as part of the development of the Transport Management Plan.	primarily concern impacts on humans and aim to reduce the potential for complaints associated with fugitive dust.
Archaeology and Cultural Heritage			
No significant adverse environmental impacts identified arising from decommissioning activities			
Geology, Hydrogeology and Soils			
Inadvertent or uncontrolled disturbance or spreading of existing contaminated soils, including movement by windblown dust, entrainment in runoff, attachment to vehicles and/or inappropriate soil handling operations.	Desk studies and site investigation, if necessary, before works commence in order to determine the presence or absence of contamination, so that appropriate working practices can be adopted from the outset. Controlled access to or from known or potentially contaminated working areas as appropriate. Use of re-circulating wheel washers on HGVs leaving site as appropriate. Compliance with Pollution Prevention. Dust control measures. Measures under 'Inadvertent contamination of soils and/or groundwater arising from temporary storage of contaminated soils, wastes or materials.'	These mitigation measures will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning working plans.	Wheel washing addresses dust, ecology, surface waters and highways impacts also.
Mobilization of existing contamination by direct rainwater infiltration due to changes in ground cover or the creation of open excavations.	Investigation of contaminated soils prior to the removal of hard-standings or buildings/foundations with prior remediation if necessary. Excavation dewatering, if necessary, with monitoring	These mitigation measures will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning working plans.	Although the impact has been assessed as 'not significant' these mitigation measures are proposed because they constitute good practice.

	and appropriate management/disposal of any waters arising. □ Tenting of exposed areas or excavations, if necessary.		
□ Mobilization of existing contamination due to changes in water table levels and consequential changes to the groundwater flow regime (e.g. due to changes in ground covering and rainwater infiltration).	□ Desk studies and site investigation, if necessary, to determine groundwater levels, flows and characterize the full extent of any contamination (both in the saturated and unsaturated zones). □ Dewatering of affected areas, if necessary, to avoid mobilization of contaminants. Remediation shall be required if contamination is significant. □ Better constrain current baseline conditions for groundwater quality to provide suitable comparison to any future changes.	These mitigation measures will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning working plans.	
Creation of new contaminant migration pathways.	Production of risk assessments, method statements and contingency plans. □ Compliance with relevant guidelines. □ Production of risk assessments, method statements and contingency plans. □ Use of made ground that does not exceed average permeability of in-situ material to cause groundwater flow issues. □ Placement of flow barriers and monitoring of level and flow pattern impacts, as required.	□ Routine control will be enforced through existing site procedures. Any additional requirements will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning working plans.	
□ Inadvertent contamination of soils and/or groundwater arising from temporary storage of contaminated soils, wastes or materials.	□ Sampling and testing of soils, wastes and materials prior to storage as appropriate. □ Segregation as appropriate. □ Use of containment (e.g. membranes) to eliminate	□ Routine control will be enforced through existing site procedures. Any additional requirements will be considered as part of the environmental, health and safety justification produced as part of individual	

	cross-contamination, as appropriate. □ Management of rainwater run-off from storage areas for contaminated or potentially contaminated soil, wastes and materials	decommissioning working plans.	
□ Inadvertent effects on groundwater flow and quality due to infill of deep basements and the breaching of basement structures to prevent ponding.	□ Improved characterization of groundwater levels and flow direction prior to the start of decommissioning. □ Sampling and testing of potentially contaminated soils, wastes and materials prior to use as appropriate. □ Puncture all remaining services and foundations to reduce the likelihood of ponding.	□ These mitigation measures will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning working plans.	
Changes in soil and groundwater quality due to spills or leaks of substances.	□ Bunding of chemical and fuel storage according to Pollution Prevention Guidance. □ Appropriate protocols for chemicals and fuel handling, with trained staff only to operate facilities. □ Emergency spill response plan, including spill kits kept on site and trained staff available.	□ Routine control will be enforced through existing site procedures. Any additional requirements will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning plans.	
Landscape & Visual			
□ Light spill	□ Any new lighting to be installed on site will be directional lighting.	□ This mitigation will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning working plans.	□ The impact associated with any additional lighting on site has been assessed as 'not significant'. However, this mitigation measure is proposed as a measure of best practice, in order to contain the extent of illumination to those areas which are intended to be lit only.
□ Flora	Careful sitting and use of protective fencing where necessary.	□ This mitigation will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning working plans.	□ The impact associated with the construction of car parking or working areas has been assessed as 'not significant'. However, this mitigation measure is proposed as a measure of best practice in order to

			protect existing flora. Any damaged flora to be re-planted at the end of Care and Maintenance Preparations.
Noise & Vibration			
General changes to noise directly from the site and associated changes in traffic.	As appropriate: Use of equipment fitted with effective silencers where practicable; Appointment of a site contact to whom complaints/queries about construction/demolition activity can be directed - any complaints to be investigated and action taken where appropriate; Local neighbours informed of exceptional activities; No potentially significant external working outside of normal working hours without prior agreement with the local authority; and All construction activity to be undertaken in accordance with good practice for Noise and Vibration Control on Construction and Open Sites. This includes minimizing unnecessary reviving of engines, turning off machines when not required and routine maintenance of equipment.	These mitigation measures will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning working plans.	The use of noise barriers between particularly noisy activities and sensitive receptors shall be appropriate.
Socio economic			
Direct Employment Long-term loss of jobs	YPNPL will encourage its contractors to make use of local labour, equipment & services as far as practicable. YPNPL will attempt to re-deploy affected staff & support staff in re-training/re-skilling for decommissioning roles.	Contractors will be provided with a list of local companies known to be capable of involvement as sub-contractors in decommissioning works.	
Surface water			
The potential release of turbid and/or contaminated	Where necessary: Wetting down (e.g.	Where necessary: Wetting down (e.g.	Wheel washing addresses dust, ecology, geology etc.

water from decommissioning activities on the site.	excavation or construction/demolition areas) to prevent windblown spread of dust into locations where subsequent washing into surface water drains would be likely, and appropriate management of wastewater arising. □ On-site roads to be regularly kept free from mud/dust deposits, including the use of re-circulating water wheel washers and road cleaners as appropriate. □ Sheeting or seeding of any long term stockpiles of soil to reduce wash-off of suspended solids. □ Careful design and siting of spoil mounds as necessary to manage run-off, including use of low walls around such mounds if appropriate. □ See also measures under geology, hydrogeology and soils in relation to turbid and/or contaminated water entering the storm drainage system.	excavation or construction/demolition areas) to prevent windblown spread of dust into locations where subsequent washing into surface water drains would be likely, and appropriate management of wastewater arising. □ On-site roads to be regularly kept free from mud/dust deposits, including the use of re-circulating water wheel washers and road cleaners as appropriate. □ Sheeting or seeding of any long term stockpiles of soil to reduce wash-off of suspended solids. □ Careful design and siting of spoil mounds as necessary to manage run-off, including use of low walls around such mounds if appropriate. □ See also measures under geology, hydrogeology and soils in relation to turbid and/or contaminated water entering the storm drainage system.	and road impacts also.
Potential minor spills and leaks of substances.	□ Careful siting of concrete plant and fuel/chemical handling facilities according to Pollution Prevention standards. □ Bunding of chemical and fuel storage according to best practices. □ Oil separation facilities on the surface water drainage system at appropriate locations. □ Appropriate protocols for chemicals and fuel handling, with trained staff only to operate facilities. □ Emergency/spill response plan, including spill kits kept on site and trained staff available at all times.	□ Routine control will be enforced through existing site procedures. Any additional requirements will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning working plans.	

Traffic & Transport			
Impacts on safety on roads.	Promote collective transport & car sharing. Proper vehicle maintenance.	Development of an specific Transport Management Plan to encourage collective transport or car sharing.	
Environmental Impacts.	Promote collective transport & car sharing. Proper vehicle maintenance. Wheel washing as necessary.	These mitigation measures will be considered as part of the environmental, health and safety justification produced as part of individual decommissioning working plans. The mitigation measures will be considered as part of the development of the Transport Management Plan.	Wheel washing addresses dust, ecology, geology, etc. and surface waters impacts also can be motivated.
Environmental impact			
Additional mitigation measures (or any changes required to those measures listed above) for activities during final site clearance will be based on the technologies available at that time, decommissioning experience and any future environmental assessment deemed necessary. In particular, repeat ecology and traffic checking, the protected aboriginal heritage, flora, fauna and weed species, prior to final site clearance are proposed followed by a reconsideration of the appropriate mitigation measures.			

ATTACHMENT 2

This attachment must be read in connection with item6.1.3 in the plan.

The below organisation chart is an example designed to cover the following requirements:

- Need for in-depth knowledge in the project team of plant history, available documentation, knowledge about previous production processes etc.
- Capability of systematic planning and evaluation of all related costs and risks according to the general requirement of Yara i.e capability of performing the activities according to the same standards as for any other investment projects.
- Capability of utilising external contractors according to the same standards as for any other investment project i.e. focus and competence on competitive bidding processes, contractor qualifications and track records (safety), contract quality.
- Availability of personnel with proper technical competence as well as continuity in the project team during the works.
- Need for Yara to maintain and continuously update experience in demolition projects

and would be applicable for major demolition projects, where the demolition waste includes contaminated fractions and where the operations organisation is being dissolved as part of the restructuring/closing of current operations. The model is based on the condition that certain key personnel from operations is retained and not given new tasks until the demolition project has been completed.