POLLUTION ABATEMENT NOTICE
No. 2014/5

(Issued pursuant to section 77 of the *Waste Management and Pollution Control Act*)

Issued to:

Name:	Viva Energy Australia Limited (ACN 004 610 459)
Address:	8 Redfern Road, Hawthorn East, VIC 3123
Postal Address:	GPO Box 872, Melbourne VIC 3001

In relation to premises: Lot 5649, Town of Darwin also known as 38 McMinn Street, Darwin, Northern Territory.

Reason:

I, Dr William Freeland, delegate of the Northern Territory Environment Protection Authority (NT EPA) pursuant to the *Waste Management and Pollution Control Act* ("the Act"), believe on reasonable grounds that:

1. Viva Energy Australia Limited (formerly Shell Company of Australia Limited) is the owner or occupier of Lot 5649 Town of Darwin ("the premises");
2. The premises was subject to an environmental audit in accordance with the *National Environment Protection (Assessment of Contaminated Sites) Measure* resulting in the issuing of five (5) Statement of Environmental Audits (Zone A – Zone E) dated 4 August 2014 (Attachment 1);
3. The premises has been divided into five (5) development zones (Zone A – Zone E) that correspond to certain types of development that are acceptable in view of the remaining contamination. The zones are shown within the Site Management Plan – Development Zones and Restrictions figures (Attachment 2);
4. The audit concluded, amongst other things, that:

   4.1 The restrictions placed on development in each of the zones are precautionary, and it is possible that other development scenarios or land uses may be allowable either through the use of engineering controls, or if further more intensive sampling is undertaken that confirms that the residual contamination does not pose an unacceptable risk to the proposed land use;

   4.2 There are four plumes of dissolved groundwater contamination beneath the premises, three of which overlap in the northern section of the site;

   4.3 Plumes 1, 2 and 4 do not pose an unacceptable risk for residents and commercial workers for the various residential and commercial building scenarios that were modelled;

   4.4 Plume 3, located in the northern portion of the premises (centred around the former footprint of AST2), can give rise to concentrations of volatile contaminants that may exceed acceptable levels for residents living on the ground floor of a slab-on-ground residential building and to occupational workers working on a slab-on-ground commercial building; and

4.5 Minor groundwater impact has been observed beyond the premises to the north and northeast. Monitoring has shown that the impact is localised and restricted to an area close to the premises boundary, and is stable and not migrating towards Darwin Harbour.

Requirements

1. On and from the date of this notice you must adhere to the suitability of use and associated conditions relevant to each zone within the premises as follows:

   Zone A:

   1. All future development and maintenance works at the premises involving excavation, and disposal of soil and fill must be carried out in accordance with the Site Contamination Management Plan (SMP);
   2. All garden areas must be backfilled with at least 1.0 metre of clean fill/topsoil;
   3. Groundwater at the premises must be managed in accordance with the Groundwater Quality Management Plan (GQMP); and
   4. Groundwater must not be abstracted from the premises for uses other than clean-up or monitoring.

   Zone B:

   1. Buildings must be constructed above open ground level parking;
   2. No slab on ground construction shall occur;
   3. No basement car park construction shall occur;
   4. All future development and maintenance works at the premises involving excavation, and disposal of soil and fill must be carried out in accordance with the SMP;
   5. All garden areas must be backfilled with at least 1.0 metre of clean fill/topsoil;
   6. Groundwater at the premises must be managed in accordance with the GQMP; and
   7. Groundwater must not be abstracted from the premises for uses other than clean-up or monitoring.

   Zone C:

   1. All future development and maintenance works at the premises involving excavation, and disposal of soil and fill must be carried out in accordance with the SMP;
   2. All garden areas must be backfilled with at least 1.0 metre of clean fill/topsoil;
   3. Groundwater at the premises must be managed in accordance with the GQMP;
   4. Groundwater must not be abstracted from the premises for uses other than clean-up or monitoring; and

5. If a basement car park is proposed, it must include a moisture/vapour barrier beneath the basement slab to prevent water ingress during the wet season when the water table is high.

Zone D:

1. All future development and maintenance works at the premises involving excavation, and disposal of soil and fill must be carried out in accordance with the SMP;
2. Medium or high density residential development must be constructed above open ground level parking;
3. Larger scale commercial retail/office space development can be constructed as slab on ground or above open ground level parking;
4. Smaller scale commercial retail/office space development must be constructed above open ground level parking;
5. There must be no slab on ground construction for residential or small scale commercial retail/office development;
6. If a basement car park is proposed, it must include a moisture/vapour barrier beneath the basement slab to prevent water ingress during the wet season when the water table is high;
7. All garden areas must be backfilled with at least 1.0 metre of clean fill/topsoil;
8. Groundwater at the premises must be managed in accordance with the GQMP; and
9. Groundwater must not be abstracted from the premises for uses other than clean-up or monitoring.

Zone E:

1. There must be no construction of slab on ground habitable structures;
2. There must be no accessible gardens or soil;
3. There must be no swimming pool with enclosed change rooms/toilets or filter room;
4. All future development and maintenance works at the premises involving excavation, and disposal of soil and fill must be carried out in accordance with the SMP;
5. The soil must be covered by a minimum of 1.0 metre of clean soil or fill. The soil or fill must be maintained at all times or otherwise replaced with the equivalent material; and
6. Groundwater at the premises must be managed in accordance with the GQMP.

2. In relation to the adjacent lots, located at Barneson Street Road Reserve and Crown Land Lot 6663, that have residual groundwater impact, you must make formal written notification to the Department of Transport (DOT) and the Department of Land, Planning and the Environment (DLPE) informing

them of the status of the groundwater impact and include the statement of environmental audit and associated conditions. This must be completed by no later than 30 days from the date of this notice;

3. A copy of the notice to DOT and DLPE must be provided to the NT EPA, GPO Box 3675 Darwin NT 0801, no later than 40 days from the date of this notice;
4. Any proposed amendments to the SMP and GQMP (other than typographical changes or revisions to formatting or referencing must be:
   4.1 Reviewed by a qualified person pursuant to section 68 of the *Waste Management and Pollution Control Act*;
   4.2 The qualified person shall confirm in writing that the proposed amendments to the SMP and GQMP remain effective to ensure the protection of the environment and human health; and
   4.3 A copy of this review must be maintained and filed with the SMP and GQMP;
5. The notification process must be adhered to, as per the GQMP, to notify the Department of Lands, Planning and the Environment and the NT EPA of any changes in monitoring data that indicate contamination is migrating further outside the premises boundaries, increasing concentrations within the premises or any other changes that may indicate an increase in the potential for environmental harm or risk to human health.

Notice Issued By:

Dr William Freeland — 26/9/14 — 1425

Dr William Freeland	26/9/14	1425
	Date	**Time**

Chairperson
NT Environment Protection Authority

Important Notice

Failure to comply with this notice is an offence under section 80 of the *Waste Management and Pollution Control Act* and may incur significant penalties and/or other statutory action.

This notice takes effect on the date on which it is served upon you. Pursuant to section 108 of the *Waste Management and Pollution Control Act*, **you have the right to apply for a review of the decision to issue you with this Pollution Abatement Notice. If you intend to apply for a review, YOU MUST MAKE AN APPLICATION NOT LATER THAN 7 DAYS after the date you were served with this notice.** For information on how to lodge an application for review, contact the Northern Territory Environment Protection Authority, telephone 8924 4041.

Pursuant to section 112 of the *Waste Management and Pollution Control Act* the person issued with this notice must fulfil certain obligations before selling, leasing, sub-leasing, giving or exchanging land, premises, a vehicle or business which is the subject of this Notice.

Attachment 1: Statement of Environmental Audits – 4 August 2014

Statement of Environmental Audit Zone A

This Statement provides a summary of the findings of an Environmental Audit of Zone A of the property located at 38 McMinn Street, Darwin, Northern Territory in accordance with Section 47d of the *Waste Management and Pollution Control Act* (NT). The site is defined on Figure 1 in Statement - Attachment A.

Name of Auditor	Dr Peter Nadebaum
Term of appointment of Auditor	16 May 1990 to 25 September 2015
Date Audit requested	11 June 2010
Owners of the site	Shell Company of Australia Limited
Person requesting a Certificate	Peter Oxnam of Shell Company of Australia Limited (SCOA)
Planning Authority	Development Consent Authority
Title Information	Lot 5649, Town of Darwin
Area of the Site	23329 m²
Zoning	Central Business under the Northern Territory Planning Scheme
Address of the Site	McMinn Street, Darwin, Northern Territory
Current Occupier	Unoccupied
Site Assessor	URS Australia Pty Ltd (URS)
Audit Completion Date	4 August 2014

The audit has had regard to, amongst other things:

- The Waste Management and Pollution Control Act NT 1998.
- The National Environmental Protection Measure for Assessment of Site Contamination 1999 (NEPM, 1999).
- The NT Water Act 1992.
- Advice provided by the Northern Territory Environment Heritage & Arts Division, Department of Natural Resources Environment & the Arts (EHA/DNRETA).
- The general principles for undertaking audits, as outlined by Part IXD of the Victorian Environment Protection Act, 1970, and the associated policies and guidelines.

Summary of findings

The site was held as Crown land and unoccupied in its natural state until Shell purchased the site circa 1930 and commenced operation as the Shell Terminal in 1937. The site was established for bulk storage and handling of hydrocarbon products. Remediation of the Site has been undertaken to the extent practicable and to make the Site suitable for future development. The development and ongoing use of the Site is subject to certain conditions and the Site Contamination Management Plan (SMP) and Groundwater Quality Management Plan (GQMP) attached to this Statement of Environmental Audit.

The following information is relevant regarding the condition of the Site:

- All on site infrastructure potentially containing hydrocarbons including ASTs, USTs, loading gantries, valve exchanges and associated product delivery lines were decommissioned and removed from site in 2005/2006.

Soil

- Large portions of hydrocarbon impacted unconsolidated material in the lower site area were excavated (in Areas 2 and 3). Land farming of hydrocarbon contaminated soil was carried out to reduce the mass of hydrocarbon contamination in the impacted unconsolidated material through the central portion of the Site (Areas 2 and 3).
- During the Site works undertaken in 2011, fragments of suspected asbestos containing material were observed and in Area 1. This material was removed and validated. Visual inspection for ACM was undertaken across other areas of the site at the time of site surface vegetation removal and observation, and there was no evidence of fragments of asbestos containing material remaining at the site.
- Soil hydrocarbon impacts remain at the top of and within the bedrock in areas closely associated with former infrastructure across the Site. The risk posed by this residual contamination has been assessed, and it is concluded that the site is not suitable for unrestricted sensitive use, and restrictions on allowable building types have been defined in the SMP.
- The site has been divided into five (5) development zones (Zones A to E) that correspond to certain types of development that are acceptable in view of the remaining contamination. The zones are shown in Figure 1 of Statement Attachment A. It is noted:
  - The restrictions placed on development in each of the zones are precautionary, and it is possible that other development scenarios or land uses may be allowable either through the use of engineering controls, or if further more intensive sampling is undertaken that confirms that the residual contamination does not pose an unacceptable risk to the proposed land use. It is noted that natural degradation of the residual hydrocarbon contamination continues to occur, and it is possible that in the future the residual concentrations will not pose a risk to more sensitive uses.
  - If the use of engineering controls is proposed to reduce risks and allow other land uses, the proposed controls should be reviewed by an environmental auditor.
  - If further soil, soil vapour or groundwater sampling is undertaken to define the residual contamination, the results should be compared to the criteria listed in this report, or other risk-based criteria developed by an appropriately experienced and qualified specialist in risk assessment, and the conclusions reviewed and confirmed by an environmental auditor.
- With respect to below ground works, the assessment has concluded that the residual contamination does not pose an unacceptable risk to persons working above bedrock level. It is noted:
  - On a precautionary basis, the SMP outlines appropriate management controls that should be implemented, and appropriate occupational health and safety practices that should be followed. This includes appropriate personal protective equipment for workers engaged in excavation or entering confined spaces, and consideration of the need for protection of the public and environment from possible dust or vapour emissions.

- The SMP requires that, if works are proposed to be undertaken within bedrock, consideration be given to the engagement of an appropriately qualified and experienced environmental consultant to assess potential for contamination within bedrock fractures and zones of weathering.

- Hydrocarbon odours may be observed during excavations or construction in parts of the site previously impacted when the soil is disturbed (such as in the north-eastern corner of the site); however, it is expected that odorous material will be minor, limited in extent, and the odours will be transitory.

- This report included an assessment for the potential for UXO which found no evidence that explosive ordnance had impacted the site, and that the risk rating for the site was low, refer to Section 6.5.4. The work undertaken to assess contamination has included field surveys and extensive intrusive environmental investigations during 2006, 2008 and 2011, including broad scale excavation over areas of unconsolidated material and outcropping bedrock. This work did not identify material that would suggest that impact from EO or UXO is present.

Groundwater

- There are four plumes of dissolved phase groundwater contamination beneath the site, three of which overlap in the northern section of the site (Area 2).

- The TDS of the groundwater is low (<1000 mg/L) making it potentially suitable for all beneficial uses, however yield is low and the nature of the development and location of the site in the Darwin CBD (with reticulated water supply) means that uses such as agricultural/irrigation, primary contact recreation, potable and industrial uses are unlikely to occur. The auditor has been previously advised by the NT Government that these beneficial uses do not require protection within the Darwin CBD, and the auditor has assumed that these beneficial uses of groundwater are not relevant at the site.

- Plumes 1, 2 and 4 do not pose an unacceptable risk for residents and commercial workers for the various residential and commercial building scenarios that were modelled.

- Plume 3, located in the northern portion of the site (centred around the former footprint of AST2), can give rise to concentrations of volatile contaminants that may exceed acceptable levels for residents living on the ground floor of a slab-on- ground residential building and to occupational workers working in a slab-on-ground commercial building. Because of this, the development of the area of the site in the vicinity of MW07 and MW207 will be restricted and designated as open space. This area has been defined as Development **Zone E**.

  The auditor concludes that, with the restrictions on land use in this area as proposed by URS, volatile contamination in groundwater will not pose an unacceptable risk to residents or commercial workers.

- Minor groundwater impact has been observed offsite to the north and north east. Monitoring has shown that the impact is localised and restricted to an area close to the site boundary, and is stable and not migrating towards the Bay.

- The land down-gradient of the site to the north and north-east is vacant Crown Land and zoned Proposed Main Road. The auditor consulted with the relevant Government planning department to determine the potential for development of this land. The Department noted that it potentially could be developed for a range of uses, but is a natural drainage area. The auditor advised that localised contamination close to the boundary might require controls if development were to involve basements.

- In their letter dated 23 May 2014 (Appendix B), the NT EPA requested that "In relation to the adjacent lots, Barneson Street Road Reserve and Crown Land Lot 6663, that have residual groundwater impact, Shell make formal written notification to the Department of Transport and the Department of Land, Planning and the Environment informing them of the status of the groundwater impact and the statement of environmental audit and associated conditions".
- Consideration has been given as to whether further clean up should take place. It has been determined that clean up has been carried out to the extent practicable, and NT EPA has advised that it has reviewed the report and is in agreement with the proposed actions.
- As groundwater contamination remains at the site and further clean up of this contamination will be achieved through the process of monitored natural attenuation, ongoing groundwater monitoring will be required until it has been confirmed that the contamination is reducing and the risk is such that further monitoring is not necessary. A Groundwater Quality Management Plan (GQMP) has been prepared by URS and is attached as Appendix B of the SMP (attached as Statement Attachment B of this report).

A site contamination management plan (SMP) has been prepared to outline site management practices which will ensure residual contamination does not cause adverse impact on human health, the environment or otherwise affect the amenity of the site. The SMP includes guidance for future owners of the site including:

- Soil excavation and intrusive works.
- Groundwater abstraction and incidental contact.
- Property management activities.

The Groundwater Management Plan provides information on the requirements for ongoing monitoring of groundwater at the Site.

Note that this audit considers only contamination of the soil and groundwater by potentially hazardous substances, and does not consider or advise on geotechnical conditions, suitability of soil and fill for planting from the perspective of nutrient content and physical form, the possible presence of unexploded ordnance, and other aspects of the suitability of the land for development that are not related to hazardous substances.

Suitability of the site – Zone A

On the basis of the work undertaken, the auditor is of the opinion that the Site (Zone A) is suitable for the intended purpose, that being a development of high density residential and/or commercial retail/office space as outlined in the site contamination management plan (Attachment B) comprising:

- High density residential apartments and/or
- Commercial retail office space.
- Subject to the following conditions:
  1. All future development and maintenance works at the site involving excavation, and disposal of soil and fill shall be carried out in accordance with the Site Contamination Management Plan (Attachment B).
  2. All garden areas shall be backfilled with at least 1.0 metre of clean fill/topsoil.
  3. Groundwater at the site shall be managed in accordance with the Groundwater Management Plan (Attachment B).

4. Groundwater shall not be abstracted from the site for uses other than clean-up or monitoring

Other related information:

The reader should note that the SMP and GQMP are subject to review and will be updated as appropriate. The GQMP is expected to cover a minimum period of four years. After this time it may be reviewed and updated, and in this instance the SMP and GQMP attached to this statement may be superseded.

The limitations outlined in Section 1.7 of this report should be referred to.

DATED: 4 August 2014

SIGNED:

PETER NADEBAUM

Environmental Auditor (Appointed Pursuant to the Victorian Environmental Protection Act 1970) and recognised in the Northern Territory under section 68 of the *Waste Management and Pollution Control Act (NT)*.

Statement Attachment A:	Site Development Zones and restrictions
Statement Attachment B	Site Contamination Management Plan (SMP) – Current version as at 16/7/2014

Statement of Environmental Audit
Zone B

This Statement provides a summary of the findings of an Environmental Audit of Zone B of the property located at 38 McMinn Street, Darwin, Northern Territory in accordance with Section 47d of the *Waste Management and Pollution Control Act* (NT). The site is defined on Figure 1 in Statement Attachment A.

Name of Auditor	Dr Peter Nadebaum
Term of appointment of Auditor	16 May 1990 to 25 September 2015
Date Audit requested	11 June 2010
Owners of the site	Shell Company of Australia Limited
Person requesting a Certificate	Peter Oxnam of Shell Company of Australia Limited (SCOA)
Planning Authority	Development Consent Authority
Title Information	Lot 5649, Town of Darwin
Area of the Site	2231 m^2
Zoning	Central Business under the Northern Territory Planning Scheme
Address of the Site	McMinn Street, Darwin, Northern Territory
Current Occupier	Unoccupied
Site Assessor	URS Australia Pty Ltd (URS)
Audit Completion Date	4 August 2014

The audit has had regard to, amongst other things:

- The Waste Management and Pollution Control Act NT 1998.
- The National Environmental Protection Measure for Assessment of Site Contamination 1999 (NEPM, 1999).
- The NT Water Act 1992.
- Advice provided by the Northern Territory Environment Heritage & Arts Division, Department of Natural Resources Environment & the Arts (EHA/DNRETA).
- The general principles for undertaking audits, as outlined by Part IXD of the Victorian Environment Protection Act, 1970, and the associated policies and guidelines.

Summary of findings

The site was held as Crown land and unoccupied in its natural state until Shell purchased the site circa 1930 and commenced operation as the Shell Terminal in 1937. The site was established for bulk storage and handling of hydrocarbon products. Remediation of the Site has been undertaken to the extent practicable and to make the Site suitable for future development. The development and ongoing use of the Site is subject to certain conditions and the Site Contamination Management Plan (SMP) and Groundwater Quality Management Plan (GQMP) attached to this Statement of Environmental Audit.

The following information is relevant regarding the condition of the Site:

- All on site infrastructure potentially containing hydrocarbons including ASTs, USTs, loading gantries, valve exchanges and associated product delivery lines were decommissioned and removed from site in 2005/2006.

Soil

- Large portions of hydrocarbon impacted unconsolidated material in the lower site area were excavated (in Areas 2 and 3). Land farming of hydrocarbon contaminated soil was carried out to reduce the mass of hydrocarbon contamination in the impacted unconsolidated material through the central portion of the Site (Areas 2 and 3).
- During the Site works undertaken in 2011, fragments of suspected asbestos containing material were observed and in Area 1. This material was removed and validated. Visual inspection for ACM was undertaken across other areas of the site at the time of site surface vegetation removal and observation, and there was no evidence of fragments of asbestos containing material remaining at the site.
- Soil hydrocarbon impacts remain at the top of and within the bedrock in areas closely associated with former infrastructure across the Site. The risk posed by this residual contamination has been assessed, and it is concluded that the site is not suitable for unrestricted sensitive use, and restrictions on allowable building types have been defined in the SMP.
- The site has been divided into five (5) development zones (Zones A to E) that correspond to certain types of development that are acceptable in view of the remaining contamination. The zones are shown in Figure 1 of Statement Attachment A. It is noted:
  - The restrictions placed on development in each of the zones are precautionary, and it is possible that other development scenarios or land uses may be allowable either through the use of engineering controls, or if further more intensive sampling is undertaken that confirms that the residual contamination does not pose an unacceptable risk to the proposed land use. It is noted that natural degradation of the residual hydrocarbon contamination continues to occur, and it is possible that in the future the residual concentrations will not pose a risk to more sensitive uses.
  - If the use of engineering controls is proposed to reduce risks and allow other land uses, the proposed controls should be reviewed by an environmental auditor.
  - If further soil, soil vapour or groundwater sampling is undertaken to define the residual contamination, the results should be compared to the criteria listed in this report, or other risk-based criteria developed by an appropriately experienced and qualified specialist in risk assessment, and the conclusions reviewed and confirmed by an environmental auditor.
- With respect to below ground works, the assessment has concluded that the residual contamination does not pose an unacceptable risk to persons working above bedrock level. It is noted:
  - On a precautionary basis, the SMP outlines appropriate management controls that should be implemented, and appropriate occupational health and safety practices that should be followed. This includes appropriate personal protective equipment for workers engaged in excavation or entering confined spaces, and consideration of the need for protection of the public and environment from possible dust or vapour emissions.

- The SMP requires that, if works are proposed to be undertaken within bedrock, consideration be given to the engagement of an appropriately qualified and experienced environmental consultant to assess potential for contamination within bedrock fractures and zones of weathering.

- Hydrocarbon odours may be observed during excavations or construction in parts of the site previously impacted when the soil is disturbed (such as in the north-eastern corner of the site); however, it is expected that odorous material will be minor, limited in extent, and the odours will be transitory.

- This report included an assessment for the potential for UXO which found no evidence that explosive ordnance had impacted the site, and that the risk rating for the site was low, refer to Section 6.5.4. The work undertaken to assess contamination has included field surveys and extensive intrusive environmental investigations during 2006, 2008 and 2011, including broad scale excavation over areas of unconsolidated material and outcropping bedrock. This work did not identify material that would suggest that impact from EO or UXO is present.

Groundwater

- There are four plumes of dissolved phase groundwater contamination beneath the site, three of which overlap in the northern section of the site (Area 2).

- The TDS of the groundwater is low (<1000 mg/L) making it potentially suitable for all beneficial uses, however yield is low and the nature of the development and location of the site in the Darwin CBD (with reticulated water supply) means that uses such as agricultural/irrigation, primary contact recreation, potable and industrial uses are unlikely to occur. The auditor has been previously advised by the NT Government that these beneficial uses do not require protection within the Darwin CBD, and the auditor has assumed that these beneficial uses of groundwater are not relevant at the site.

- Plumes 1, 2 and 4 do not pose an unacceptable risk for residents and commercial workers for the various residential and commercial building scenarios that were modelled.

- Plume 3, located in the northern portion of the site (centred around the former footprint of AST2), can give rise to concentrations of volatile contaminants that may exceed acceptable levels for residents living on the ground floor of a slab-on- ground residential building and to occupational workers working in a slab-on-ground commercial building. Because of this, the development of the area of the site in the vicinity of MW07 and MW207 will be restricted and designated as open space. This area has been defined as Development **Zone E**.

  The auditor concludes that, with the restrictions on land use in this area as proposed by URS, volatile contamination in groundwater will not pose an unacceptable risk to residents or commercial workers.

- Minor groundwater impact has been observed offsite to the north and north east. Monitoring has shown that the impact is localised and restricted to an area close to the site boundary, and is stable and not migrating towards the Bay.

- The land down-gradient of the site to the north and north-east is vacant Crown Land and zoned Proposed Main Road. The auditor consulted with the relevant Government planning department to determine the potential for development of this land. The Department noted that it potentially could be developed for a range of uses, but is a natural drainage area. The auditor advised that localised contamination close to the boundary might require controls if development were to involve basements.

- In their letter dated 23 May 2014 (Appendix B), the NT EPA requested that "In relation to the adjacent lots, Barneson Street Road Reserve and Crown Land Lot 6663, that have residual groundwater impact, Shell make formal written notification to the Department of Transport and the Department of Land, Planning and the Environment informing them of the status of the groundwater impact and the statement of environmental audit and associated conditions".
- Consideration has been given as to whether further clean up should take place. It has been determined that clean up has been carried out to the extent practicable, and NT EPA has advised that it has reviewed the report and is in agreement with the proposed actions.
- As groundwater contamination remains at the site and further clean up of this contamination will be achieved through the process of monitored natural attenuation, ongoing groundwater monitoring will be required until it has been confirmed that the contamination is reducing and the risk is such that further monitoring is not necessary. A Groundwater Quality Management Plan (GQMP) has been prepared by URS and is attached as Appendix B of the SMP (attached as Attachment B of this report).

A site contamination management plan (SMP) has been prepared to outline site management practices which will ensure residual contamination does not cause adverse impact on human health, the environment or otherwise affect the amenity of the site. The SMP includes guidance for future owners of the site including:

- Soil excavation and intrusive works.
- Groundwater abstraction and incidental contact.
- Property management activities.

The Groundwater Management Plan provides information on the requirements for ongoing monitoring of groundwater at the Site.

Note that this audit considers only contamination of the soil and groundwater by potentially hazardous substances, and does not consider or advise on geotechnical conditions, suitability of soil and fill for planting from the perspective of nutrient content and physical form, the possible presence of unexploded ordnance, and other aspects of the suitability of the land for development that are not related to hazardous substances.

Suitability of the site – Zone B

On the basis of the work undertaken, the auditor is of the opinion that the Site (Zone B) is suitable for the intended purpose, that being a development of high density residential and/or commercial retail/office space as outlined in the site contamination management plan (Attachment B) comprising:

- High density residential apartments and/or
- Commercial retail office space.
- Subject to the following conditions:
  1. Buildings must be constructed above open ground level parking
  2. No slab on grade
  3. No basement car parks
  4. All future development and maintenance works at the site involving excavation, and disposal of soil and fill shall be carried out in accordance with the Site Contamination Management Plan (Attachment B).

5. All garden areas shall be backfilled with at least 1.0 metre of clean fill / topsoil
6. Groundwater at the site shall be managed in accordance with the Groundwater Management Plan (Attachment B).
7. Groundwater shall not be abstracted from the site for uses other than clean-up or monitoring

Other related information:

The reader should note that the SMP and GQMP are subject to review and will be updated as appropriate. The GQMP is expected to cover a minimum period of four years. After this time it may be reviewed and updated, and in this instance the SMP and GQMP attached to this statement may be superseded.

The limitations outlined in Section 1.7 of this report should be referred to.

DATED: 4 August 2014

SIGNED:

PETER NADEBAUM

Environmental Auditor (Appointed Pursuant to the Victorian Environmental Protection Act 1970) and recognised in the Northern Territory under section 68 of the *Waste Management and Pollution Control Act (NT)*.

Statement Attachment A:	Site Development Zones and restrictions
Statement Attachment B	Site Contamination Management Plan (SMP) – Current version as at 16/7/2014

Statement of Environmental Audit Zone C

This Statement provides a summary of the findings of an Environmental Audit of Zone C of the property located at 38 McMinn Street, Darwin, Northern Territory in accordance with Section 47d of the *Waste Management and Pollution Control Act* (NT). The site is defined on Figure 1 in Statement Attachment A.

Name of Auditor	Dr Peter Nadebaum
Term of appointment of Auditor	16 May 1990 to 25 September 2015
Date Audit requested	11 June 2010
Owners of the site	Shell Company of Australia Limited
Person requesting a Certificate	Peter Oxnam of Shell Company of Australia Limited (SCOA)
Planning Authority	Development Consent Authority
Title Information	Lot 5649, Town of Darwin
Area of the Site	21,668 m²
Zoning	Central Business under the Northern Territory Planning Scheme
Address of the Site	McMinn Street, Darwin, Northern Territory.
Current Occupier	Unoccupied
Site Assessor	URS Australia Pty Ltd (URS)
Audit Completion Date	4 August 2014

The audit has had regard to, amongst other things:

- The Waste Management and Pollution Control Act NT 1998.
- The National Environmental Protection Measure for Assessment of Site Contamination 1999 (NEPM, 1999).
- The NT Water Act 1992;
- Advice provided by the Northern Territory Environment Heritage & Arts Division, Department of Natural Resources Environment & the Arts (EHA/DNRETA), and
- The general principles for undertaking audits, as outlined by Part IXD of the Victorian Environment Protection Act, 1970, and the associated policies and guidelines.

Summary of findings

The site was held as Crown land and unoccupied in its natural state until Shell purchased the site circa 1930 and commenced operation as the Shell Terminal in 1937. The site was established for bulk storage and handling of hydrocarbon products. Remediation of the Site has been undertaken to the extent practicable and to make the Site suitable for future development. The development and ongoing use of the Site is subject to certain conditions and the Site Contamination Management Plan (SMP) and Groundwater Quality Management Plan (GQMP) attached to this Statement of Environmental Audit.

The following information is relevant regarding the condition of the Site:

- All on site infrastructure potentially containing hydrocarbons including ASTs, USTs, loading gantries, valve exchanges and associated product delivery lines were decommissioned and removed from site in 2005/2006.

Soil

- Large portions of hydrocarbon impacted unconsolidated material in the lower site area were excavated (in Areas 2 and 3). Land farming of hydrocarbon contaminated soil was carried out to reduce the mass of hydrocarbon contamination in the impacted unconsolidated material through the central portion of the Site (Areas 2 and 3).
- During the Site works undertaken in 2011, fragments of suspected asbestos containing material were observed and in Area 1. This material was removed and validated. Visual inspection for ACM was undertaken across other areas of the site at the time of site surface vegetation removal and observation, and there was no evidence of fragments of asbestos containing material remaining at the site.
- Soil hydrocarbon impacts remain at the top of and within the bedrock in areas closely associated with former infrastructure across the Site. The risk posed by this residual contamination has been assessed, and it is concluded that the site is not suitable for unrestricted sensitive use, and restrictions on allowable building types have been defined in the SMP.
- The site has been divided into five (5) development zones (Zones A to E) that correspond to certain types of development that are acceptable in view of the remaining contamination. The zones are shown in Figure 1 of Statement Attachment A. It is noted:
  - The restrictions placed on development in each of the zones are precautionary, and it is possible that other development scenarios or land uses may be allowable either through the use of engineering controls, or if further more intensive sampling is undertaken that confirms that the residual contamination does not pose an unacceptable risk to the proposed land use. It is noted that natural degradation of the residual hydrocarbon contamination continues to occur, and it is possible that in the future the residual concentrations will not pose a risk to more sensitive uses.
  - If the use of engineering controls is proposed to reduce risks and allow other land uses, the proposed controls should be reviewed by an environmental auditor.
  - If further soil, soil vapour or groundwater sampling is undertaken to define the residual contamination, the results should be compared to the criteria listed in this report, or other risk-based criteria developed by an appropriately experienced and qualified specialist in risk assessment, and the conclusions reviewed and confirmed by an environmental auditor.
- With respect to below ground works, the assessment has concluded that the residual contamination does not pose an unacceptable risk to persons working above bedrock level. It is noted:
  - On a precautionary basis, the SMP outlines appropriate management controls that should be implemented, and appropriate occupational health and safety practices that should be followed. This includes appropriate personal protective equipment for workers engaged in excavation or entering confined spaces, and consideration of the need for protection of the public and environment from possible dust or vapour emissions.

- The SMP requires that, if works are proposed to be undertaken within bedrock, consideration be given to the engagement of an appropriately qualified and experienced environmental consultant to assess potential for contamination within bedrock fractures and zones of weathering.

- Hydrocarbon odours may be observed during excavations or construction in parts of the site previously impacted when the soil is disturbed (such as in the north-eastern corner of the site); however, it is expected that odorous material will be minor, limited in extent, and the odours will be transitory.
- This report included an assessment for the potential for UXO which found no evidence that explosive ordnance had impacted the site, and that the risk rating for the site was low, refer to Section 6.5.4. The work undertaken to assess contamination has included field surveys and extensive intrusive environmental investigations during 2006, 2008 and 2011, including broad scale excavation over areas of unconsolidated material and outcropping bedrock. This work did not identify material that would suggest that impact from EO or UXO is present.

Groundwater

- There are four plumes of dissolved phase groundwater contamination beneath the site, three of which overlap in the northern section of the site (Area 2).
- The TDS of the groundwater is low (<1000 mg/L) making it potentially suitable for all beneficial uses, however yield is low and the nature of the development and location of the site in the Darwin CBD (with reticulated water supply) means that uses such as agricultural/irrigation, primary contact recreation, potable and industrial uses are unlikely to occur. The auditor has been previously advised by the NT Government that these beneficial uses do not require protection within the Darwin CBD, and the auditor has assumed that these beneficial uses of groundwater are not relevant at the site.
- Plumes 1, 2 and 4 do not pose an unacceptable risk for residents and commercial workers for the various residential and commercial building scenarios that were modelled.
- Plume 3, located in the northern portion of the site (centred around the former footprint of AST2), can give rise to concentrations of volatile contaminants that may exceed acceptable levels for residents living on the ground floor of a slab-on- ground residential building and to occupational workers working in a slab-on-ground commercial building. Because of this, the development of the area of the site in the vicinity of MW07 and MW207 will be restricted and designated as open space. This area has been defined as Development **Zone E**.

  The auditor concludes that, with the restrictions on land use in this area as proposed by URS, volatile contamination in groundwater will not pose an unacceptable risk to residents or commercial workers.
- Minor groundwater impact has been observed offsite to the north and north east. Monitoring has shown that the impact is localised and restricted to an area close to the site boundary, and is stable and not migrating towards the Bay.
- The land down-gradient of the site to the north and north-east is vacant Crown Land and zoned Proposed Main Road. The auditor consulted with the relevant Government planning department to determine the potential for development of this land. The Department noted that it potentially could be developed for a range of uses, but is a natural drainage area. The auditor advised that localised contamination close to the boundary might require controls if development were to involve basements.

- In their letter dated 23 May 2014 (Appendix B), the NT EPA requested that "In relation to the adjacent lots, Barneson Street Road Reserve and Crown Land Lot 6663, that have residual groundwater impact, Shell make formal written notification to the Department of Transport and the Department of Land, Planning and the Environment informing them of the status of the groundwater impact and the statement of environmental audit and associated conditions".
- Consideration has been given as to whether further clean up should take place. It has been determined that clean up has been carried out to the extent practicable, and NT EPA has advised that it has reviewed the report and is in agreement with the proposed actions.
- As groundwater contamination remains at the site and further clean up of this contamination will be achieved through the process of monitored natural attenuation, ongoing groundwater monitoring will be required until it has been confirmed that the contamination is reducing and the risk is such that further monitoring is not necessary. A Groundwater Quality Management Plan (GQMP) has been prepared by URS and is attached as Appendix B of the SMP (attached as Attachment B of this report).

A site contamination management plan (SMP) has been prepared to outline site management practices which will ensure residual contamination does not cause adverse impact on human health, the environment or otherwise affect the amenity of the site. The SMP includes guidance for future owners of the site including:

- Soil excavation and intrusive works.
- Groundwater abstraction and incidental contact.
- Property management activities.

The Groundwater Management Plan provides information on the requirements for ongoing monitoring of groundwater at the Site.

Note that this audit considers only contamination of the soil and groundwater by potentially hazardous substances, and does not consider or advise on geotechnical conditions, suitability of soil and fill for planting from the perspective of nutrient content and physical form, the possible presence of unexploded ordnance, and other aspects of the suitability of the land for development that are not related to hazardous substances.

Suitability of the site – Zone C

On the basis of the work undertaken, the auditor is of the opinion that the Site (Zone C) is suitable for the intended purpose, that being a development of medium and/or density residential and/or commercial retail/office space as outlined in the site contamination management plan (Attachment B) comprising:

- Medium and/or high density residential apartments and/or
- Commercial retail office space.
- Subject to the following conditions:
    1. All future development and maintenance works at the site involving excavation, and disposal of soil and fill shall be carried out in accordance with the Site Contamination Management Plan (Attachment B).
    2. All garden areas shall be backfilled with at least 1.0 metre of clean fill / topsoil.
    3. Groundwater at the site shall be managed in accordance with the Groundwater Management Plan (Attachment B).

4. Groundwater shall not be abstracted from the site for uses other than clean-up or monitoring.
5. If a basement car park is proposed, it can be expected to include a moisture/vapour barrier beneath the basement slab to prevent water ingress during the wet season when the water table is high.

Other related information:

The reader should note that the SMP and GQMP are subject to review and will be updated as appropriate. The GQMP is expected to cover a minimum period of four years. After this time it may be reviewed and updated, and in this instance the SMP and GQMP attached to this statement may be superseded.

The limitations outlined in Section 1.7 of this report should be referred to.

DATED: 4 August 2014

SIGNED:

PETER NADEBAUM

Environmental Auditor (Appointed Pursuant to the Victorian Environmental Protection Act 1970) and recognised in the Northern Territory under section 68 of the *Waste Management and Pollution Control Act (NT).*

Statement Attachment A:	Site Development Zones and restrictions
Statement Attachment B	Site Contamination Management Plan (SMP) – Current version as at 16/7/2014

Statement of Environmental Audit Zone D

This Statement provides a summary of the findings of an Environmental Audit of Zone D of the property located at 38 McMinn Street, Darwin, Northern Territory in accordance with Section 47d of the *Waste Management and Pollution Control Act* (NT). The site is defined on Figure 1 in Statement Attachment A.

Name of Auditor	Dr Peter Nadebaum
Term of appointment of Auditor	16 May 1990 to 25 September 2015
Date Audit requested	11 June 2010
Owners of the site	Shell Company of Australia Limited
Person requesting a Certificate	Peter Oxnam of Shell Company of Australia Limited (SCOA)
Planning Authority	Development Consent Authority
Title Information	Lot 5649, Town of Darwin
Area of the Site	18705m²
Zoning	Central Business under the Northern Territory Planning Scheme
Address of the Site	McMinn Street, Darwin, Northern Territory.
Current Occupier	Unoccupied
Site Assessor	URS Australia Pty Ltd (URS)
Audit Completion Date	4 August 2014

The audit has had regard to, amongst other things:

- The Waste Management and Pollution Control Act NT 1998.
- The National Environmental Protection Measure for Assessment of Site Contamination 1999 (NEPM, 1999).
- The NT Water Act 1992.
- Advice provided by the Northern Territory Environment Heritage & Arts Division, Department of Natural Resources Environment & the Arts (EHA/DNRETA).
- The general principles for undertaking audits, as outlined by Part IXD of the Victorian Environment Protection Act, 1970, and the associated policies and guidelines.

Summary of findings

The site was held as Crown land and unoccupied in its natural state until Shell purchased the site circa 1930 and commenced operation as the Shell Terminal in 1937. The site was established for bulk storage and handling of hydrocarbon products. Remediation of the Site has been undertaken to the extent practicable and to make the Site suitable for future development. The development and ongoing use of the Site is subject to certain conditions and the Site Contamination Management Plan (SMP) and Groundwater Quality Management Plan (GQMP) attached to this Statement of Environmental Audit.

The following information is relevant regarding the condition of the Site:

- All on site infrastructure potentially containing hydrocarbons including ASTs, USTs, loading gantries, valve exchanges and associated product delivery lines were decommissioned and removed from site in 2005/2006.

Soil

- Large portions of hydrocarbon impacted unconsolidated material in the lower site area were excavated (in Areas 2 and 3). Land farming of hydrocarbon contaminated soil was carried out to reduce the mass of hydrocarbon contamination in the impacted unconsolidated material through the central portion of the Site (Areas 2 and 3).
- During the Site works undertaken in 2011, fragments of suspected asbestos containing material were observed and in Area 1. This material was removed and validated. Visual inspection for ACM was undertaken across other areas of the site at the time of site surface vegetation removal and observation, and there was no evidence of fragments of asbestos containing material remaining at the site.
- Soil hydrocarbon impacts remain at the top of and within the bedrock in areas closely associated with former infrastructure across the Site. The risk posed by this residual contamination has been assessed, and it is concluded that the site is not suitable for unrestricted sensitive use, and restrictions on allowable building types have been defined in the SMP.
- The site has been divided into five (5) development zones (Zones A to E) that correspond to certain types of development that are acceptable in view of the remaining contamination. The zones are shown in Figure 1 of Statement Attachment A. It is noted:
  - The restrictions placed on development in each of the zones are precautionary, and it is possible that other development scenarios or land uses may be allowable either through the use of engineering controls, or if further more intensive sampling is undertaken that confirms that the residual contamination does not pose an unacceptable risk to the proposed land use. It is noted that natural degradation of the residual hydrocarbon contamination continues to occur, and it is possible that in the future the residual concentrations will not pose a risk to more sensitive uses.
  - If the use of engineering controls is proposed to reduce risks and allow other land uses, the proposed controls should be reviewed by an environmental auditor.
  - If further soil, soil vapour or groundwater sampling is undertaken to define the residual contamination, the results should be compared to the criteria listed in this report, or other risk-based criteria developed by an appropriately experienced and qualified specialist in risk assessment, and the conclusions reviewed and confirmed by an environmental auditor.
- With respect to below ground works, the assessment has concluded that the residual contamination does not pose an unacceptable risk to persons working above bedrock level. It is noted:
  - On a precautionary basis, the SMP outlines appropriate management controls that should be implemented, and appropriate occupational health and safety practices that should be followed. This includes appropriate personal protective equipment for workers engaged in excavation or entering confined spaces, and consideration of the need for protection of the public and environment from possible dust or vapour emissions.

- The SMP requires that, if works are proposed to be undertaken within bedrock, consideration be given to the engagement of an appropriately qualified and experienced environmental consultant to assess potential for contamination within bedrock fractures and zones of weathering.

- Hydrocarbon odours may be observed during excavations or construction in parts of the site previously impacted when the soil is disturbed (such as in the north-eastern corner of the site); however, it is expected that odorous material will be minor, limited in extent, and the odours will be transitory.

- This report included an assessment for the potential for UXO which found no evidence that explosive ordnance had impacted the site, and that the risk rating for the site was low, refer to Section 6.5.4. The work undertaken to assess contamination has included field surveys and extensive intrusive environmental investigations during 2006, 2008 and 2011, including broad scale excavation over areas of unconsolidated material and outcropping bedrock. This work did not identify material that would suggest that impact from EO or UXO is present.

Groundwater

- There are four plumes of dissolved phase groundwater contamination beneath the site, three of which overlap in the northern section of the site (Area 2).

- The TDS of the groundwater is low (<1000 mg/L) making it potentially suitable for all beneficial uses, however yield is low and the nature of the development and location of the site in the Darwin CBD (with reticulated water supply) means that uses such as agricultural/irrigation, primary contact recreation, potable and industrial uses are unlikely to occur. The auditor has been previously advised by the NT Government that these beneficial uses do not require protection within the Darwin CBD, and the auditor has assumed that these beneficial uses of groundwater are not relevant at the site.

- Plumes 1, 2 and 4 do not pose an unacceptable risk for residents and commercial workers for the various residential and commercial building scenarios that were modelled.

- Plume 3, located in the northern portion of the site (centred around the former footprint of AST2), can give rise to concentrations of volatile contaminants that may exceed acceptable levels for residents living on the ground floor of a slab-on- ground residential building and to occupational workers working in a slab-on-ground commercial building. Because of this, the development of the area of the site in the vicinity of MW07 and MW207 will be restricted and designated as open space. This area has been defined as Development **Zone E**.

  The auditor concludes that, with the restrictions on land use in this area as proposed by URS, volatile contamination in groundwater will not pose an unacceptable risk to residents or commercial workers.

- Minor groundwater impact has been observed offsite to the north and north east. Monitoring has shown that the impact is localised and restricted to an area close to the site boundary, and is stable and not migrating towards the Bay.

- The land down-gradient of the site to the north and north-east is vacant Crown Land and zoned Proposed Main Road. The auditor consulted with the relevant Government planning department to determine the potential for development of this land. The Department noted that it potentially could be developed for a range of uses, but is a natural drainage area. The auditor advised that localised contamination close to the boundary might require controls if development were to involve basements.

- In their letter dated 23 May 2014 (Appendix B), the NT EPA requested that "In relation to the adjacent lots, Barneson Street Road Reserve and Crown Land Lot 6663, that have residual groundwater impact, Shell make formal written notification to the Department of Transport and the Department of Land, Planning and the Environment informing them of the status of the groundwater impact and the statement of environmental audit and associated conditions".
- Consideration has been given as to whether further clean up should take place. It has been determined that clean up has been carried out to the extent practicable, and NT EPA has advised that it has reviewed the report and is in agreement with the proposed actions.
- As groundwater contamination remains at the site and further clean up of this contamination will be achieved through the process of monitored natural attenuation, ongoing groundwater monitoring will be required until it has been confirmed that the contamination is reducing and the risk is such that further monitoring is not necessary. A Groundwater Quality Management Plan (GQMP) has been prepared by URS and is attached as Appendix B of the SMP (attached as Attachment B of this report).

A site contamination management plan (SMP) has been prepared to outline site management practices which will ensure residual contamination does not cause adverse impact on human health, the environment or otherwise affect the amenity of the site. The SMP includes guidance for future owners of the site including:

- Soil excavation and intrusive works.
- Groundwater abstraction and incidental contact.
- Property management activities.

The Groundwater Management Plan provides information on the requirements for ongoing monitoring of groundwater at the Site.

Note that this audit considers only contamination of the soil and groundwater by potentially hazardous substances, and does not consider or advise on geotechnical conditions, suitability of soil and fill for planting from the perspective of nutrient content and physical form, the possible presence of unexploded ordnance, and other aspects of the suitability of the land for development that are not related to hazardous substances.

Suitability of the site – Zone D

On the basis of the work undertaken, the auditor is of the opinion that the Site (Zone D) is suitable for the intended purpose, that being a development of medium and/or density residential and/or commercial retail/office space as outlined in the site contamination management plan (Attachment B) comprising:

- Medium and/or high density residential apartments and/or
- Commercial retail office space.
- Subject to the following conditions:
    1. All future development and maintenance works at the site involving excavation, and disposal of soil and fill shall be carried out in accordance with the Site Contamination Management Plan (Attachment B).
    2. Medium or high density residential must be constructed above open ground level parking.

3. Larger scale commercial retail/office space may be constructed as slab on grade or above open ground level parking
4. Smaller scale commercial retail/office space must be constructed above open ground level parking
5. No Slab on grade for residential or small scale commercial retail/office
6. If a basement car park is proposed, it can be expected to include a moisture/vapour barrier beneath the basement slab to prevent water ingress during the wet season when the water table is high.
7. All garden areas must be backfilled with at least 1.0 metre of clean fill / topsoil
8. Groundwater at the site shall be managed in accordance with the Groundwater Management Plan (Attachment B).
9. Groundwater shall not be abstracted from the site for uses other than clean-up or monitoring

Other related information:

The reader should note that the SMP and GQMP are subject to review and will be updated as appropriate. The GQMP is expected to cover a minimum period of four years. After this time it may be reviewed and updated, and in this instance the SMP and GQMP attached to this statement may be superseded.

The limitations outlined in Section 1.7 of this report should be referred to.

DATED: 4 August 2014

SIGNED:

PETER NADEBAUM

Environmental Auditor (Appointed Pursuant to the Victorian Environmental Protection Act 1970) and recognised in the Northern Territory under section 68 of the *Waste Management and Pollution Control Act (NT).*

Statement Attachment A:	Site Development Zones and restrictions
Statement Attachment B	Site Contamination Management Plan (SMP) – Current version as at 16/7/2014

Statement of Environmental Audit Zone E

This Statement provides a summary of the findings of an Environmental Audit of Zone E of the property located at 38 McMinn Street, Darwin, Northern Territory in accordance with Section 47d of the *Waste Management and Pollution Control Act* (NT). The site is defined on Figure 1 in Statement Attachment A.

Name of Auditor	Dr Peter Nadebaum
Term of appointment of Auditor	16 May 1990 to 25 September 2015
Date Audit requested	11 June 2010
Owners of the site	Shell Company of Australia Limited
Person requesting a Certificate	Peter Oxnam of Shell Company of Australia Limited (SCOA)
Planning Authority	Development Consent Authority
Title Information	Lot 5649, Town of Darwin
Area of the Site	4231 m^2
Zoning	Central Business under the Northern Territory Planning Scheme
Address of the Site	McMinn Street, Darwin, Northern Territory.
Current Occupier	Unoccupied
Site Assessor	URS Australia Pty Ltd (URS)
Audit Completion Date	4 August 2014

The audit has had regard to, amongst other things:

- The Waste Management and Pollution Control Act NT 1998.
- The National Environmental Protection Measure for Assessment of Site Contamination 1999 (NEPM, 1999).
- The NT Water Act 1992.
- Advice provided by the Northern Territory Environment Heritage & Arts Division, Department of Natural Resources Environment & the Arts (EHA/DNRETA).
- The general principles for undertaking audits, as outlined by Part IXD of the Victorian Environment Protection Act, 1970, and the associated policies and guidelines.

Summary of findings

The site was held as Crown land and unoccupied in its natural state until Shell purchased the site circa 1930 and commenced operation as the Shell Terminal in 1937. The site was established for bulk storage and handling of hydrocarbon products. Remediation of the Site has been undertaken to the extent practicable and to make the Site suitable for future development. The development and ongoing use of the Site is subject to certain conditions and the Site Contamination Management Plan (SMP) and Groundwater Quality Management Plan (GQMP) attached to this Statement of Environmental Audit.

The following information is relevant regarding the condition of the Site:

- All on site infrastructure potentially containing hydrocarbons including ASTs, USTs, loading gantries, valve exchanges and associated product delivery lines were decommissioned and removed from site in 2005/2006.

Soil

- Large portions of hydrocarbon impacted unconsolidated material in the lower site area were excavated (in Areas 2 and 3). Land farming of hydrocarbon contaminated soil was carried out to reduce the mass of hydrocarbon contamination in the impacted unconsolidated material through the central portion of the Site (Areas 2 and 3).
- During the Site works undertaken in 2011, fragments of suspected asbestos containing material were observed and in Area 1. This material was removed and validated. Visual inspection for ACM was undertaken across other areas of the site at the time of site surface vegetation removal and observation, and there was no evidence of fragments of asbestos containing material remaining at the site.
- Soil hydrocarbon impacts remain at the top of and within the bedrock in areas closely associated with former infrastructure across the Site. The risk posed by this residual contamination has been assessed, and it is concluded that the site is not suitable for unrestricted sensitive use, and restrictions on allowable building types have been defined in the SMP.
- The site has been divided into five (5) development zones (Zones A to E) that correspond to certain types of development that are acceptable in view of the remaining contamination. The zones are shown in Figure 1 of Statement Attachment A. It is noted:
  - The restrictions placed on development in each of the zones are precautionary, and it is possible that other development scenarios or land uses may be allowable either through the use of engineering controls, or if further more intensive sampling is undertaken that confirms that the residual contamination does not pose an unacceptable risk to the proposed land use. It is noted that natural degradation of the residual hydrocarbon contamination continues to occur, and it is possible that in the future the residual concentrations will not pose a risk to more sensitive uses.
  - If the use of engineering controls is proposed to reduce risks and allow other land uses, the proposed controls should be reviewed by an environmental auditor.
  - If further soil, soil vapour or groundwater sampling is undertaken to define the residual contamination, the results should be compared to the criteria listed in this report, or other risk-based criteria developed by an appropriately experienced and qualified specialist in risk assessment, and the conclusions reviewed and confirmed by an environmental auditor.
- With respect to below ground works, the assessment has concluded that the residual contamination does not pose an unacceptable risk to persons working above bedrock level. It is noted:
  - On a precautionary basis, the SMP outlines appropriate management controls that should be implemented, and appropriate occupational health and safety practices that should be followed. This includes appropriate personal protective equipment for workers engaged in excavation or entering confined spaces, and consideration of the need for protection of the public and environment from possible dust or vapour emissions.

- The SMP requires that, if works are proposed to be undertaken within bedrock, consideration be given to the engagement of an appropriately qualified and experienced environmental consultant to assess potential for contamination within bedrock fractures and zones of weathering.

- Hydrocarbon odours may be observed during excavations or construction in parts of the site previously impacted when the soil is disturbed (such as in the north-eastern corner of the site); however, it is expected that odorous material will be minor, limited in extent, and the odours will be transitory.

- This report included an assessment for the potential for UXO which found no evidence that explosive ordnance had impacted the site, and that the risk rating for the site was low, refer to Section 6.5.4. The work undertaken to assess contamination has included field surveys and extensive intrusive environmental investigations during 2006, 2008 and 2011, including broad scale excavation over areas of unconsolidated material and outcropping bedrock. This work did not identify material that would suggest that impact from EO or UXO is present.

Groundwater

- There are four plumes of dissolved phase groundwater contamination beneath the site, three of which overlap in the northern section of the site (Area 2).

- The TDS of the groundwater is low (<1000 mg/L) making it potentially suitable for all beneficial uses, however yield is low and the nature of the development and location of the site in the Darwin CBD (with reticulated water supply) means that uses such as agricultural/irrigation, primary contact recreation, potable and industrial uses are unlikely to occur. The auditor has been previously advised by the NT Government that these beneficial uses do not require protection within the Darwin CBD, and the auditor has assumed that these beneficial uses of groundwater are not relevant at the site.

- Plumes 1, 2 and 4 do not pose an unacceptable risk for residents and commercial workers for the various residential and commercial building scenarios that were modelled.

- Plume 3, located in the northern portion of the site (centred around the former footprint of AST2), can give rise to concentrations of volatile contaminants that may exceed acceptable levels for residents living on the ground floor of a slab-on- ground residential building and to occupational workers working in a slab-on-ground commercial building. Because of this, the development of the area of the site in the vicinity of MW07 and MW207 will be restricted and designated as open space. This area has been defined as Development **Zone E**.

  The auditor concludes that, with the restrictions on land use in this area as proposed by URS, volatile contamination in groundwater will not pose an unacceptable risk to residents or commercial workers.

- Minor groundwater impact has been observed offsite to the north and north east. Monitoring has shown that the impact is localised and restricted to an area close to the site boundary, and is stable and not migrating towards the Bay.

- The land down-gradient of the site to the north and north-east is vacant Crown Land and zoned Proposed Main Road. The auditor consulted with the relevant Government planning department to determine the potential for development of this land. The Department noted that it potentially could be developed for a range of uses, but is a natural drainage area. The auditor advised that localised contamination close to the boundary might require controls if development were to involve basements.

- In their letter dated 23 May 2014 (Appendix B), the NT EPA requested that "In relation to the adjacent lots, Barneson Street Road Reserve and Crown Land Lot 6663, that have residual groundwater impact, Shell make formal written notification to the Department of Transport and the Department of Land, Planning and the Environment informing them of the status of the groundwater impact and the statement of environmental audit and associated conditions".
- Consideration has been given as to whether further clean up should take place. It has been determined that clean up has been carried out to the extent practicable, and NT EPA has advised that it has reviewed the report and is in agreement with the proposed actions.
- As groundwater contamination remains at the site and further clean up of this contamination will be achieved through the process of monitored natural attenuation, ongoing groundwater monitoring will be required until it has been confirmed that the contamination is reducing and the risk is such that further monitoring is not necessary. A Groundwater Quality Management Plan (GQMP) has been prepared by URS and is attached as Appendix B of the SMP (attached as Attachment B of this report).

A site contamination management plan (SMP) has been prepared to outline site management practices which will ensure residual contamination does not cause adverse impact on human health, the environment or otherwise affect the amenity of the site. The SMP includes guidance for future owners of the site including:

- Soil excavation and intrusive works.
- Groundwater abstraction and incidental contact.
- Property management activities.

The Groundwater Management Plan provides information on the requirements for ongoing monitoring of groundwater at the Site.

Note that this audit considers only contamination of the soil and groundwater by potentially hazardous substances, and does not consider or advise on geotechnical conditions, suitability of soil and fill for planting from the perspective of nutrient content and physical form, the possible presence of unexploded ordnance, and other aspects of the suitability of the land for development that are not related to hazardous substances.

Suitability of the site – Zone E

On the basis of the work undertaken, the auditor is of the opinion that the Site (Zone E) is suitable for the intended purpose, that being open space parklands and landscaped gardens as outlined in the site contamination management plan (Attachment B).

- Subject to the following conditions:
  1. No slab on grade habitable structures.
  2. No accessible gardens or soil.
  3. No swimming pool with enclosed change rooms/toilets or filter room.
  4. All future development and maintenance works at the site involving excavation, and disposal of soil and fill shall be carried out in accordance with the Site Contamination Management Plan (Attachment B).
  5. The soil shall be covered by a minimum of 1.0 metre of clean soil or fill. The soil or fill shall be maintained at all times or otherwise replaced with the equivalent material.

6. Groundwater at the site shall be managed in accordance with the Groundwater Management Plan (Attachment B).
7. Groundwater shall not be abstracted from the site for uses other than clean-up or monitoring
8. In their letter dated 23 May 2014 (Appendix B), the NT EPA requested that "In relation to the adjacent lots, Barneson Street Road Reserve and Crown Land Lot 6663, that have residual groundwater impact, Shell make formal written notification to the Department of Transport and the Department of Land, Planning and the Environment informing them of the status of the groundwater impact and the statement of environmental audit and associated conditions".

Other related information:

The reader should note that the SMP and GQMP are subject to review and will be updated as appropriate. The GQMP is expected to cover a minimum period of four years. After this time it may be reviewed and updated, and in this instance the SMP and GQMP attached to this statement may be superseded.

The limitations outlined in Section 1.7 of this report should be referred to.

DATED: 4 August 2014

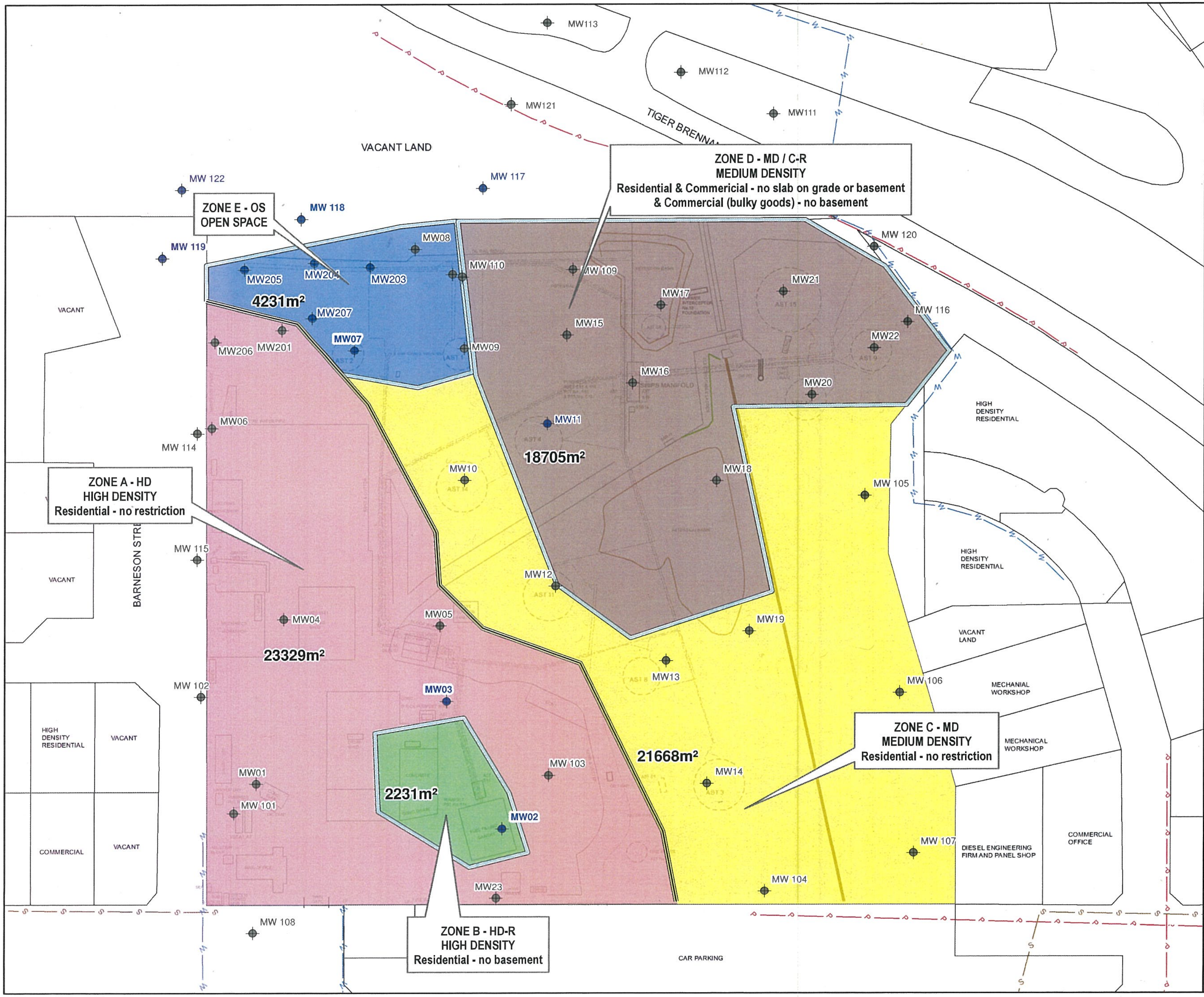
SIGNED:

PETER NADEBAUM

Environmental Auditor (Appointed Pursuant to the Victorian Environmental Protection Act 1970) and recognised in the Northern Territory under section 68 of the *Waste Management and Pollution Control Act (NT)*.

Statement Attachment A:	Site Development Zones and restrictions
Statement Attachment B	Site Contamination Management Plan (SMP) – Current version as at 16/7/2014

Attachment 2: Site Management Plan – Development Zones and Restrictions



Legend

- Monitoring wells included in the SMP monitoring schedule
- Monitoring wells not included in the SMP monitoring schedule
- Escarpment approximate location

Zoning Areas

- HD
- HD-R
- MD
- MD/C-R
- OS
- Former Fuel Lines
- Former Infrastructure
- W — Water Services
- S — Sewer Sevices
- P — Power Services

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Drawn: JD	Approved: TS	Date: MAY 2014
Job No: 42213921	File No: 42213921-045.mxd	

Client

The Shell Company of Australia Pty

Project

MCMINN STREET FORMER SHELL TERMINAL

Title

SITE MANAGEMENT PLAN - DEVELOPMENT ZONES AND RESTRICTIONS

Figure: 1 | Rev: A | A3

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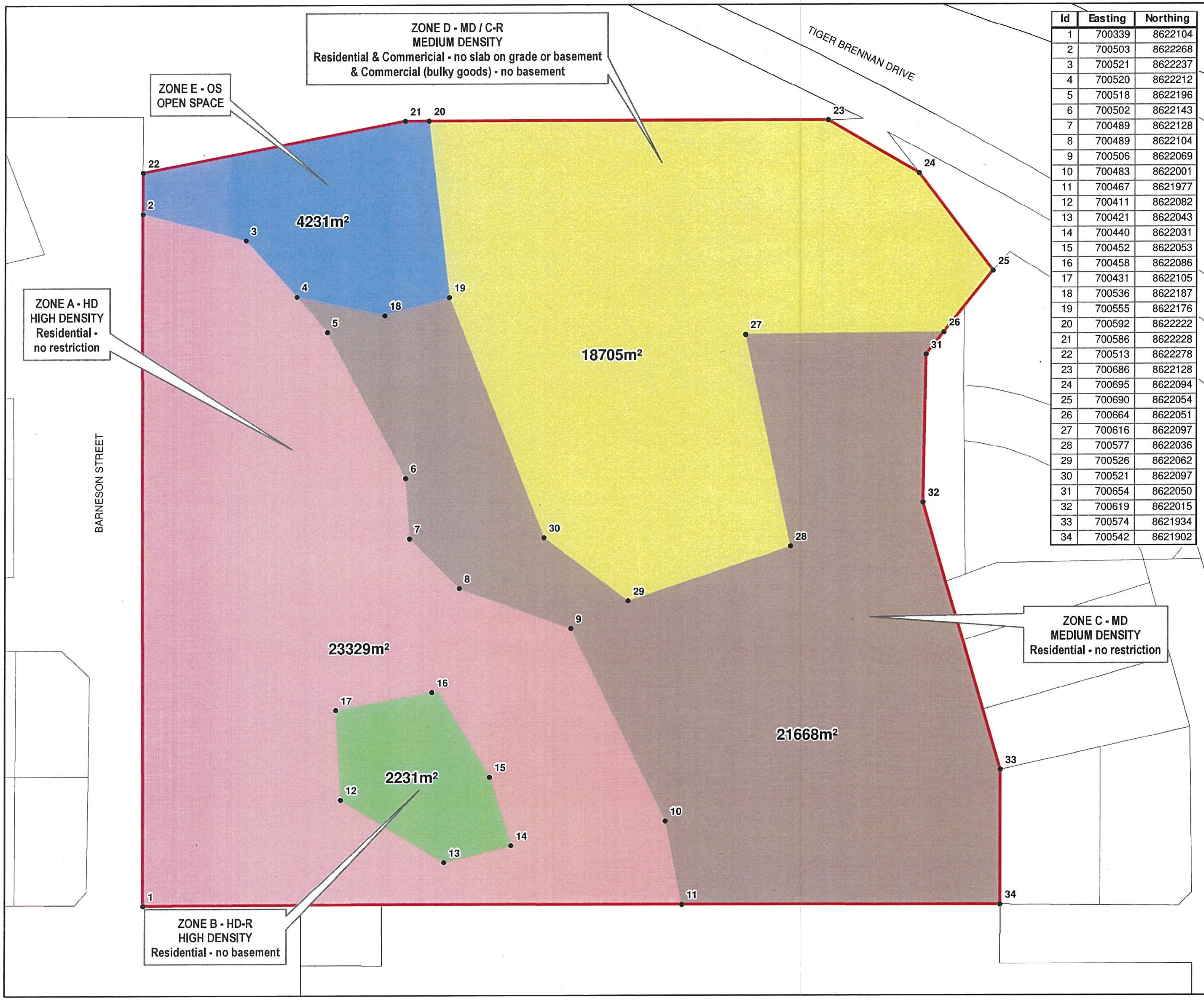

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8	700489	8622104
9	700506	8622069
10	700483	8622001
11	700467	8621977
12	700411	8622082
13	700421	8622043
14	700440	8622031
15	700452	8622053
16	700458	8622086
17	700431	8622105
18	700536	8622187
19	700555	8622176
20	700592	8622222
21	700586	8622228
22	700513	8622278
23	700686	8622128
24	700695	8622094
25	700690	8622054
26	700664	8622051
27	700616	8622097
28	700577	8622036
29	700526	8622062
30	700521	8622097
31	700654	8622050
32	700619	8622015
33	700574	8621934
34	700542	8621902

Drawn: JD	Approved: TS	Date: MAY 2014
Job No: 42213921	File No: 42213921-046.mxd	

Client

The Shell Company of Australia Pty

Project

MCMINN STREET FORMER SHELL TERMINAL

Title

SITE MANAGEMENT PLAN - DEVELOPMENT ZONES AND RESTRICTIONS

Figure: 2 | Rev: A | A3

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