ANNEXURE 9

Geotechnical, Contamination and

Acid Sulphate Soils Assessment

and

Addendum Letter addressing Riverbank Stability

prepared by

GHD

22, 24, 171 and 220
Bolong Road, Bomaderry

Manildra Group

Proposed Modification Application to MP06-0228, Shoalhaven Starches Expansion Project, Proposed New Specialty Processing Facility, New Gluten Dryer and other associated works at 22, 24 and 171 Bolong Road, Bomaderry.

Desktop Study - Geotechnical, Contamination and ASS

May 2018

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1. Introduction

1.1 Background

Manildra Group Pty Ltd (Manildra) was previously granted Project Approval (MP06_0228, dated 28 January 2009) by the Minister for Planning for the proposed Shoalhaven Starches Expansion project which encapsulated previous approvals for the general site.

To proceed with the above proposed changes, Manildra intends to undertake modification of their application to the NSW Department of Planning and Environment (DPE) Project Approval for the Shoalhaven Starches Expansion Project. Cowman Stoddart is acting on behalf of Manildra in submitting the modification request in relation to an existing Development Application to the NSW DPE.

1.2 Objectives

To support the modification application, GHD has prepared this geotechnical and environmental assessment in relation to the proposed development of various structures with the following objectives:-

- Provide geotechnical advice in relation to the proximity of the various structures proposed to the northern bank of Shoalhaven River and banks of Abernethy's Creek and the potential effects of the proposed modifications on the stability of the river and creek banks.
- Provide a Phase 1 Contamination and Acid Sulfate Soil (ASS) assessment for the sites proposed for development, including potential effects of construction work.

2. Proposed development

Shoalhaven Starches Pty Ltd intend to undertake further modifications to the Shoalhaven Starches Expansion Project Approval (MP06_0228) as follows:

GHD Site ID	Proposed modification to existing development approval
Site 1	• Construction of a new industrial building which will house a new Gluten (No.8) Dryer, and the plant and equipment associated with the production of speciality foods for the food industry. • Construction of a small sifter room in the north-east corner of this site close to the western bank of Abernethy's Creek. • Construction of an addition to the northern elevation of the Starch Dryer No.5 to house a Bag House for a proposed dryer.
Site 2	Relocation of the existing Boiler No.7 to the northern side of the overall Boiler House Complex.
Site 3	Construction of a coal-fired Co-generation plant to the south of the existing Boiler House complex, which will involve the construction of a new coal fired boiler (No.8). Other structures proposed for this area include lime silos and generator set.
Site 4	Modification to rail unloading, which includes: • A new intake pit positioned to the east of and adjacent to the existing pit. The pit will be approximately 3.9m deep.

GHD Site ID	Proposed modification to existing development approval
	• Second conveyor with associated bucket lift and chutes connect to grain silos.
Site 5	Construction of an indoor electrical substation on the northern side of Bolong Road (No. 171).
Site 6	Proposed car park accommodating 26 car spaces.
Site 7	Proposed extension second storey to main sub-station. Structure is above ground and anticipated to have minimal ground disturbance.
Site 8	Proposed ventilation for Flour Mills A, B and C. These are above ground structures and built upon existing structures. Limited ground penetration anticipated. Install a third Flour Mill C within existing Flour Mill B building.
Site 9	Conversion of two existing Gluten Dryers (Nos. 1 and 2) to starch dryers, within existing starch plant production building. No ground penetration anticipated.

Proposed changes to the original project approval are indicated by red in the overall development plan provided by Cowman Stoddart, as shown in Figure 1 below.

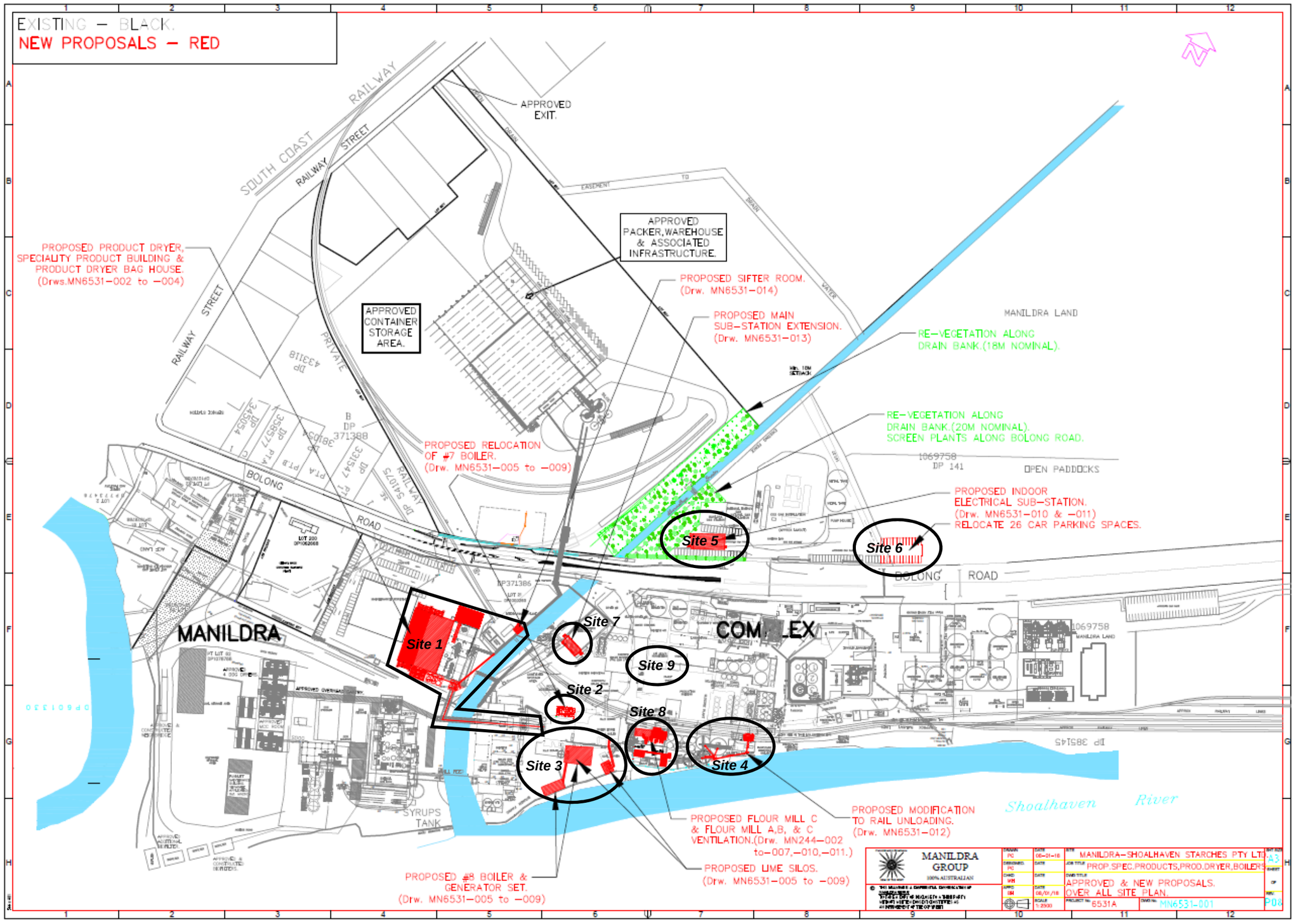

Figure 1 Proposed modifications to Shoalhaven Starches expansion development approval (shown in red)

3. Scope of work

The scope of work for this assessment comprised the following:

- Desktop study including a review of existing subsurface information in the vicinity of the proposed structures.
- Review previous reporting/advice by Coffey on geotechnical, contamination and ASS assessments in the plant area (noting that current GHD staff previously with Coffey were involved in these assessments).
- Site visit and observations by a Senior Environmental Scientist and Principal Geotechnical Engineer from GHD to visually assess potential sources of contamination, proximity of structures to the northern bank of Shoalhaven River and banks of Abernethy's Creek and the general condition of these banks, observe surrounding land uses, topography, drainage, nearby sensitive environments to confirm the findings from previous reports and assess any major changes to site conditions since our last report.
- Report on desktop review, drawing upon information within recent reports prepared adjacent to the proposed development areas, site observations and recommendations in accordance with the objectives as outlined above.

4. Site information

4.1 Site identification

The site consists of multiple areas, as outlined in red in Figure 1. The majority of the proposed construction work is with the Shoalhaven Starches Plant with two small areas adjacent to the gas plant on the southern side of Bolong Road Bomaderry, NSW. Site identification details are summarised in Table 1.

Table 1 Summary of site details

Site Address:	Bolong Road, Bomaderry, NSW
Site Area	As shown on Figure 1
Site identification	The various portions of the site are situated in the following Lots: • Lot 1 DP 838753 (Sites 2, 3,4,7,8 and 9) • Lot 201 DP 1062668 (Site 1) • Lot 21 DP 1000265 (Site 1 – Sifter Room) • Lot B DP 334511 (Site 3 – Generator Set, Part Site 1 overhead pipework) • Lot 241 DP 1130535 (Site 5 & Part Site 6) • Lot 141 DP 1069758 (Site 6)
Current zoning	The sites are zoned under Shoalhaven City Council Local Environment Plan 2014 as follows: • Sites 1 to 5, 7 to 9: IN1 - General industrial • Site 6: RU2 Rural Landscape
Current land use	Industrial use – part of the Shoalhaven Starches facility
Surrounding land use	The proposed structures are shown in red on Figure 1 along with surrounding land uses. These land uses include: • Existing plant structures inc. dryers, boilers, rail siding, coal hoppers, starch storage, workshops, etc. • Bolong Road • Shoalhaven River • Abernethys Creek • Natural Gas Installation and Station • Grass paddocks • Car parks • Sewage treatment plant

4.2 Local soil landscape, geology and hydrogeology

Reference to the 1:100,000 Kiama Soil Landscape Series Sheet (9028, First Edition), produced by the Department of Conservation and Land Management NSW (1993) indicates that the site is located on Shoalhaven Soils. These soils are described as moderately deep Prairie Soils on levees, Red Earths and Yellow and Red Podzolic Soils on terraces and Alluvial Soils and Gleyed Podzolic soils on the floodplains. The soil landscape map also indicates that this group is subject to flood hazard, seasonal water logging, permanently high water table, hardsetting, acid sulphate potential (subsoil), strongly acidic and moderate shrink-swell.

Reference to the 1:250,000 Wollongong Geological Series Sheet (S1 56-9, First Edition) prepared by the NSW Department of Mines (1952) indicates the site is likely to be underlain by Quaternary Alluvium, gravel, swamp deposits and sand dunes.

Previous investigations in the Shoalhaven Starches site (Coffey 2007, 2014) indicated the presence of fill ranging between 0.5m to 2.5m depths, generally comprising silty sand/ sandy silt/gravelly sand or bedding sands. Generally, deeper fill soils were encountered to the south of the plant, towards the river embankment. The fill is underlain by alluvium (clayey silt/ silty sand) or estuarine soils (dark grey silty clay) to depths generally greater than 5m below ground surface. The estuarine soils are generally soft to firm and the alluvial soils are generally firm to stiff. Bedrock generally comprises siltstone or sandstone encountered at depths generally greater than 15m.

Based on observations made of the local area, surrounding topography, and proximity of the nearby Shoalhaven River, groundwater is expected to occur at depths of between 2m and 3m bgs and flow to the south towards the river.

4.3 Acid sulfate soil occurrence

ASS is naturally occurring soil and sediment containing iron sulfides which when exposed to oxygen can generate sulfuric acid.

Reference to the Burrier/Berry 1:25,000 Acid Sulfate Soil Risk Map (1997) Edition 2, prepared by the Department of Land and Water Conservation (DLWC), indicates that the site is mapped within an area having a low probability of ASS occurrence being described as elevated alluvial plains and levees. ASS, if present, is likely to be greater than 3m below the ground surface. The map shows areas immediately to the south of the site within the river, as being estuarine bottom sediments with a high probability of ASS occurrence.

Previous assessments by Coffey (2007 and 2014) indicate that acid sulfate soils are likely to exist at depths greater than 3m at the Shoalhaven starches site.

The intake pit proposed for Site 4 is likely to intercept ASS. Therefore, appropriate management of ASS is required during the excavation and dewatering for the construction of this pit.

5. Site observations and interviews

5.1 Site 1 – Product Dryer Building and Warehouse

5.1.1 Contamination

The proposed Site 1 development area is located on the northern, western and southern sides of Starch Dryer No. 5 and extends west to the maintenance workshop (Photo 1). The area was near level and occupied by concrete pavement and gravel hardstand. No evidence of contamination or contaminating activities were observed within the proposed development area.

The southern area was used for storage of various acids and sodium hydroxide in IBC containers. The chemicals were stored within a concrete paved area. There was no apparent evidence of historical spillages which was consistent with anecdotal information provided by John Studdert, a Manildra employee for 17 years (Photo 2).

Mr Studdert indicated that this area was formerly occupied by the Moor House Building.

Photo 1: Looking south towards proposed Site 1 development area

Photo 2: Looking east at Site 1 along the southern side of Starch Dryer No. 5.

The maintenance area is located to the west of Site 1 and includes a store and contractor mechanical engineers workshop. Photo 3 shows workshop areas.

The maintenance store includes spare parts and small quantities (~20L) of oil, thinners, cleaners, detergents, grease, etc. Oil was also stored in 205L steel drums. (Photos 4 & 5).

Some oil was observed on the concrete floor of the maintenance stores building. The concrete floor appeared to be in good condition, however joints between concrete slabs were up to 1cm wide, which may allow surplus spills to seep into underlying ground.

The store manager indicated no large spills have occurred. Incidental spills are soaked up using spill kit absorbents.

The northern development area adjoined a carpark (north) and undercover wheat starch store (Photo 6). Mr Studdert indicated that prior to ownership by Manildra, this area was a steel fabrication workshop. No other activities other that wheat starch storage had occurred in this area.

Mr Studdert indicated during earthworks for the recently constructed Starch Dryer No. 5 no evidence of contamination such as oil staining, odours or Asbestos Containing Material (ACM) was encountered. Below the gravel hardstand, soils encountered were reported to be consistent with those observed during previous Coffey investigations for the Starch Dryer No. 5 development.

Photo 3: Looking northwest of Site 1 towards workshop areas

Photo 4: Typical chemical storage

Photo 5: Oil storage area

Photo 6: Undercover wheat starch storage area

5.1.2 Geotechnical

The various structures proposed are located on the western side of Abernethy's Creek. The main structures are relatively remote from the nearest point of the creek bank. The sifter room and pipework associated with the new structures are close to the top of the western creek bank.

Our recent observations of the creek bank did not reveal any obvious change to the creek banks since the previous observations by Coffey. Construction of concrete paving has occurred over the near level area to the west of the creek bank as part of the Starch Dryer No. 5 development. No evidence of erosion or slumping of the bank was observed.

5.2 Site 2 – Proposed Relocation of No. 7 Boiler

5.2.1 Contamination

The proposed Site 2 development is located adjacent to the existing boilers, substation No. 4 and internal access road. (Photo 7 – use IMG-20180117-103018). At the time of our site visit, the site was asphalt paved and occupied by three shipping containers (Photo 8 – IMG-20180227-103227). The asphalt pavement was in fair to good condition. No apparent evidence of contamination observed.

Mr Studdert indicated this area had been asphalt passed for over 17 years and the adjoining buildings were the original plant buildings. The buildings were understood to have been constructed on original natural ground and that no fill has been placed in the area.

Photo 7: Looking south towards proposed development area

Photo 8: Looking west towards the proposed development area

5.2.2 Geotechnical

This site is remote from the Shoalhaven River bank and Abernethy's Creek and development will have no influence on the river or creek bank stability.

5.3 Site 3 – Proposed No 8 Boiler / Generator Set / Lime Silos

5.3.1 Contamination

The proposed Site 3 development is located on the southern side of the existing boiler house (Photos 9 and 10). The existing boiler house forms part of the original plant structures constructed approximately 30 years ago. The boilers are coal, gas and woodchip fired. Coal and woodchip are stored in stockpiles south of the proposed development and adjacent to the Shoalhaven River (Photo 9). Mr Studdert indicated that the coal ash from the boilers was washed then transported to the farm.

At the time of our site visit, surface water was ponded due to recent rain over parts of the paved or gravel surfaces. The ground surface appeared impaired, comprising mostly woodchip and coal dust/fragments to give it its black colour (Photos 9 & 11). Some fill may exist below the woodchip.

No chemical storage was observed in the general vicinity of Site 3, however 25kg bags of water softener salt were noted (Photo 12). Mr Studdert indicated that the softener is a form of sea salt and used in the boiler water. No apparent evidence of contamination was observed.

Photo 9: Looking east towards proposed Site 3 development area

Photo 10: Looking northeast towards proposed generator set location

Photo 11: Looking east towards woodchip and coal stockpiles

Photo 12: 25kg salt bags stored adjacent to proposed #8 Boiler.

5.3.2 Geotechnical

The proposed Lime Silos, No.8 Boiler and Generator Set are located in relatively close proximity to the northern bank of the Shoalhaven River. The river bank at this location has significant tree growth comprising mainly coral trees and no significant recent slumping or erosion of the bank has occurred in this area.

5.4 Site 4 – Proposed modification to rail unloading pit

5.4.1 Contamination

The proposed development of the extension to the grain unloading pit will require excavations for the unloading pit and foundations for the conveyor bucket elevator. The proposed intake pit will be positioned on the eastern side of the existing intake pit, within the rail corridor (Photo 13). The railway infrastructure forms part of the original plant and is used to transport flour, wheat and millfeed. The trains are pulled by diesel locomotives. Mr Studdert indicated that there have not been any reported diesel spills associated with the locomotives. The rail corridor comprised a single operational track. Within Site 4, the 4 foot section of shoulders were asphalt paved. Photo 14 shows an example of pavement condition within Site 4.

The proposed foundation area for the conveyor bucket occupies a relatively small area adjacent to the existing grain silo (north and west) and Shoalhaven River (south) (Photo 15). Photo 16 shows the general foundation area which appears to have been filled. The fill may have been generated during the construction of adjoining silos.

No apparent evidence of contamination was observed in either of these areas.

Photo 13: Looking west towards proposed unloading pit extension (Site 4 development area), as shown in yellow.

Photo 14: Typical condition of the rail track near grain unloading pit.

Photo 15: Looking west towards area for conveyor bucket foundations. Note proximity to Shoalhaven River immediately to left of photo.

Photo 16: Looking west towards area for conveyor bucket foundations. Note potential fill within foreground of photo.

5.4.2 Geotechnical

The proposed extension to the rail unloading pit and piped connection to the proposed grain elevator are located in an area where rock revetment protection of the river bank has occurred. Monitoring of the rock revetment has been undertaken since construction in 2009 and only minor lateral and vertical displacement has occurred. The major structures in this area, including the existing grain silos are supported on piles terminating in the underlying bedrock.

No surface features indicative of ground movement were observed in this area during our recent site observations.

5.5 Site 5 – Proposed indoor electrical sub-station

5.5.1 Contamination

This site is currently used as a gravel hardstand carpark and demountable office building (Photos 17 & 18). The gravel hardstand comprised crushed rock sourced from a local quarry. Apart from the gravel, we understand no other fill has been placed at this site. North and east of the site there is a gas plant which was built over 20 years ago. Mr Studdert indicated that no other activities have been undertaken at the site, and prior to being developed was used as farming land.

Photo 17: Looking east at the proposed Site 5 development area.

Photo 18: Looking west at the proposed Site 5 development area.

5.5.2 Geotechnical

This site is located on the eastern side of Abernethy's Creek and is set back about 20m from the nearest point of the bank where there is a riparian corridor. In view of this setback and the current profile of the eastern bank of the creek, the development will have no influence on the stability of the creek bank.

5.6 Site 6 – Relocate 26 car parking spaces

5.6.1 Contamination

The proposed carpark area will be located east of an earthen drain within an open paddock area. The site divided by a chain wire fence, which is orientated north-south (Photo 19).

The western bank of the drain appeared to have been filled with concrete and topsoil evident (Photo 20). Ash may have also been placed in the vicinity of the drain, however no evidence of ash was observed. The drain receives stormwater from Bolong Road. A drainage valve and temporary bunded area within the adjacent farmland allows containment of process water overflows from the main plant area.

Apart from the fill, no apparent evidence of contamination was observed.

Photo 19: Looking south towards an earth drain that receives runoff from Bolong Road.

Photo 20: Looking at the southern section of the western bank of drain indicating topsoil fill.

5.6.2 Geotechnical

This site is located to the east of Abernethy's Creek and due to its remoteness from the creek the development will have no influence on the stability of the creek bank.

5.7 Site 7 – Construction of extension to main substation

5.7.1 Contamination

The area of the proposed substation extension is shown in Photos 21 and 22. The site adjoins an asphalt paved access way and appeared to be in relatively good condition. The current substation footprint comprises coarse grained gravel. We note transformers are present and can contain PCB oil. Mr Studdert confirmed that one transformer was replaced in 2007 and the other in 2011. At the time of replacement, the oil was tested and did not contain PCB's. No information was available regarding PCBs in oil prior to this time. No oil releases from transformers have occurred onsite.

Photo 21: View of brick building at existing substation area

Photo 22: View of existing substation

5.7.1 Geotechnical

This site is located to the east of the eastern bank of Abernethy's Creek over a near level area. The creek bank, at this location, has not experienced any significant slumping or erosion and the proposed site for the extension to the main substation is sufficiently remote from the bank not to influence the stability of the bank.

5.8 Site 8 – Proposed ventilation for Flour Mills A, B and C

This area is occupied by the existing Flour Mills A and B and the proposed ventilation works do not involve ground disturbance. Limited ground disturbance is anticipated for Flour Mill C. The site for these proposed works is sufficiently remote from the Shoalhaven River bank not to influence the stability of the banks. Any heavily loaded additions to the flour mill structures will require support by a deep pile footings to rock.

5.9 Site 9 - Conversion of two existing Gluten Dryers (Nos. 1 and 2) to starch dryers

This will involve the conversion of two existing Gluten Dryers (Nos. 1 and 2) to starch dryers, within the existing starch plant production building. No ground penetration anticipated. The site for these proposed works is sufficiently remote from the Shoalhaven River bank and the eastern bank of Abernethy's Creek not to influence the stability of the river or creek banks. Photo 23 shows the general area of the proposed development.

Photo 23: View of proposed Starch Plant Building

6. Site history

6.1 Summary

The area now occupied by Manildra has been used for industrial land use purposes since 1949. Between 1949 and late 1960's the area was occupied by a factory producing cheese, gluten and a drink product. From the late 1960's onward the site was occupied by Manildra and used for the production of wheat, starch, gluten and later ethanol (Coffey, 2008). The Boiler House has been in its current location since at least 1977. This is consistent with anecdotal information.

The land on the northern side of Bolong Road opposite the main Manildra plant (i.e. Sites 5 and 6) was historically used for farming (dairy and grazing) but has progressively been developed with a gas plant and site offices.

6.2 Review of NSW EPA records

A search of the NSW EPA Contaminated Land and Public Register for the Protection of the Environment Operations (POEO) Act 1997 was carried out on 20 April 2018. There were no new records within the database pertaining to the Manildra site or areas within 500m since the Coffey 2016 investigation.

6.3 Review of previous environmental reports

Based on review of previous Coffey environmental reports on investigations undertaken within or near the currently proposed development sites, following is a summary of previous reports that provide information on contamination and ASS for particular sites:

- Sites 4 and 8 – Coffey 2007 report conclusions:
  - Low likelihood of contamination. Subsurface investigations including environmental sampling and testing were undertaken in areas nearby Sites 4 and 8.
  - Low probability of ASS in upper 2m but may be encountered at depths below 2m.
- Sites 2 to 4 and 6 to 9 – Coffey 2008 report conclusions:
  - Low likelihood of contamination based on desktop review. Limited subsurface investigations within the proposed development areas. USTs potentially storing petroleum products were noted near Bolong Road. The report did not provide their location.
  - Low probability of ASS but may occur in lenses. ASSMP was recommended.
- Site 8 – Coffey 2016 report conclusions:
  - Potential sources of contamination was identified in fill soils. Based on results of fill material in other parts of the site, the likelihood of contamination was assessed to be low.
  - Low probability of ASS in upper 2m but may be encountered at depths below 2m
- Site 3 – Coffey 2017 report conclusions:
  - The report noted potentially hazardous chemical additives may have been stored and used in the boiler house(s). However, due to paved areas surrounding the boiler houses, the potential for contamination was considered low.
  - Due to limited intrusive investigations at the site, the report recommended that precautions should be taken when disturbing and managing surplus soils.

  - Potential for the presence of acid sulfate soils to be located in the vicinity of the proposed development areas.
- Site 1 – Starch Dryer No. 5 Environment Assessment (Cowman Stoddart, 2015) report discussion and conclusions:
  - Workshop (immediately west of proposed development area): mechanical repairs, and manufacture of tractors and front end loaders. Floor of workshop appeared to be in good conditions with only minor cracking.
  - An Underground Storage Tank (UST) with a capacity of 300 gallons was installed in the vicinity of the proposed development area. The UST stored petrol and used for refuelling vehicles. The UST was abandoned in situ by way of fill with concrete approximately 30 years ago. Anecdotal evidence indicated that the tank had not leaked. Intrusive investigations in the vicinity of the UST did not identify petroleum hydrocarbon impact; and therefore concluded a low likelihood for contamination associated with the UST.
  - Other potential areas of environmental concern reported included fill of unknown quality and origin and weathering of hazardous building materials
- Site 5 – no available reports.

6.4 Gap analysis

Based on information provided in the previous Coffey reports, interviews and observations made, site activities have remained relatively unchanged. This indicates that the likelihood of contamination to be present within the proposed development areas is considered low. Limited information was available for Site 5.

7. Discussion and recommendations

7.1 Geotechnical

Based on information provided in the previous Coffey reports and observations made during our recent site walkover our advice in relation to the potential for the development to effect the stability of the Shoalhaven River bank or banks of Abernethy' Creek are summarised as follows:-

- **Site 1 – Product Dryer Building and Warehouse.** Only the minor structures including the sifter room developed along the top of the bank have the potential to disturb the ground or locally load the top of the bank. These structures may be founded on shallow footings positioned at least 2m from the top of bank or alternatively may be supported on deep footings below the zone of influence of the creek bank. In this case these structures will not influence the stability of the creek bank. The larger structures for this part of the development are more remote from the creek bank and will be founded on deep piles to rock, and therefore will have no influence on the stability of the creek bank.
- **Site 2 – Proposed re-location of No. 7 Boiler**. This site is remote from the Shoalhaven River bank and Abernethy's Creek and development will have no influence on the river or creek bank stability.

- **Site 3 – Proposed No. 8 Boiler/Generator Set/Lime Silos.** These structures are relatively close to the Shoalhaven River Bank. The Silos and structures with heavy or concentrated loads will be supported on deep piles to rock. At this stage non displacement piles (CFA) are advised. If displacement piles (driven piles) are proposed then we would recommend stability analysis be undertaken to assess the effects on the stability of the river bank. The effects of vibration should also be assessed if driven piles are proposed. Monitoring of the river bank in this area by weekly observations during the construction period should be undertaken.
- **Site 4 – Extension to train unloading pit, and pipeline to silo and grain elevator.** These structures should not influence the stability of the river bank at this location. The pit extension is relatively remote from the river bank and is adding only minor load to the ground. The pit may require pile support to rock due to soft ground in this area. The grain elevator has limited space to provide additional foundations- it assumed that the elevator will be structurally tied to the existing structure or will be supported on a deep footing system to rock.
- **Sites 5, 6 and 7 –** These sites are sufficiently remote from the Shoalhaven River and Abernethy's Creek not to influence the stability of the river or creek banks.
- **Site 8** – The proposed ventilation works will involve minimal disturbance to the ground and existing structures are supported on piles to rock. Any new heavily loaded structures will require a deep piled footing system with all piles terminated in the bedrock. Based on the proximity of the structures to the river bank and provide all of the main building structures are supported on piled footings to rock, we confirm that these works will not influence the stability of the river bank.
- **Site 9** – The proposed conversion of two existing Gluten Dryers (Nos. 1 and 2) to starch dryer will occur within existing starch plant production building, therefore no ground penetration is anticipated.

7.2 Contamination

Based on information provided in the previous Coffey reports, interviews and observations made during our recent site walkover; the likelihood for widespread contamination within the proposed development areas is considered low.

Due to the history of industrial activities and indirect shallow investigations we recommend that precautions be taken with any subsurface penetrations. In particular if any are required in the vicinity of the chemical storage bund (e.g. southern side of Site 1), coal storage areas, ash/coal waste (e.g. Site 3) and locations where fill was observed (i.e. Sites 4 and 6). The Coffey 2017 report also noted some chemical additives used in the boiler houses, potentially affecting Site 3. Soils should be handled with caution as per the requirements of material safety data sheets of chemicals/substances that may be routinely used in the vicinity of the development sites.

An abandoned UST is located in the vicinity of Site 1. Although widespread contamination was not identified, localised petroleum hydrocarbon impact may exist within backfill sands surrounding the UST. Additionally, the UST may be intercepted during excavation of foundations. Therefore, removal of the UST may need to be considered.

There was limited information for Site 5. Although not considered to preclude proposed development, precautions during ground penetration activities should be undertaken within these areas.

If any evidence of contamination is identified during construction stages (e.g. soil discolouration, chemical odour, unusual odour, waste, asbestos containing material, staining etc.), then work should cease and a suitably qualified environmental practitioner should be engaged to assess the potential for risk to human health or environment and provide advice on proper management. We recommend preparation of a generic unexpected finds procedure which can be implemented in the evident contamination is encountered during construction.

Soil assessment for waste classification or resource recovery would also be required for any excess construction spoil generated during construction that requires offsite disposal or reuse.

7.3 Acid sulfate soil

Acid sulfate soils could be encountered within alluvial soils underlying the fill materials at depths below 3m. Disturbance of ASS is likely to occur at Sites requiring CFA piles and the new rail unloading pit at Sites 3 and 4, respectively.

It is recommended that should the proposed development involve the excavation of soils to depths greater than 3m at any of the proposed development sites and/or dewatering that could result in lowering of the water table then an acid sulfate soil management plan (ASSMP) should be developed and actioned.

8. Limitations

This report: has been prepared by GHD for Manildra Group and may only be used and relied on by Manildra Group for the purpose agreed between GHD and the Manildra Group as set out in Section 1 of this report. GHD otherwise disclaims responsibility to any person other than Manildra Group 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. The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of 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.

9. References

Coffey Geotechnics Pty Ltd (2007) Preliminary Contamination Assessment, Proposed Starches Product Dryer Manildra, Bomaderry, NSW. Report reference GEOTUNAN02584AA-AD. Dated 20 April 2007.

Coffey Environments Pty Ltd (2008) Preliminary Environmental Site Assessment and Geotechnical Investigation, Proposed Ethanol Expansion, Shoalhaven Starches Plant, Bolong Road, Bomaderry, NSW. Report reference: ENVIWOLL00111AA-R02. Dated 25 June 2008.

Coffey Geotechnics Pty Ltd (2014) Geotechnical Investigation and Preliminary Environmental Assessment, Proposed New Silos, Bomaderry, NSW. Report reference GEOTWOLL03658AA-AA. Dated 6 August 2014

Coffey Geotechnics Pty Ltd (2015) Geotechnical Advice and Preliminary Environmental Assessment, New Flour Mill, Bomaderry, NSW. Report reference GEOTWOLL03658AC-AA. Dated 11 February 2015.

Coffey Services Australia Pty Ltd (2016) Phase 1 Contamination Assessment, Acid Sulfate Soils Investigation, and Riverbank Stability Assessment Report Reference ENAUWOLL04319AA-R01 Rev 1, dated 10 October 2016.

Coffey Services Australia Pty Ltd (2017) Phase 1 Contamination and Acid Sulfate Soil Assessment – Boiler House Modifications Report Reference 754-WOLEN205147-L01 Rev. 1, dated 8 May 2017.

Cowman Stoddart Pty Ltd (2015) Environmental Assessment – Proposed Relocation of Starch Dryer No. 5, Lot 201 DP 1062668, Bolong Road, Bomaderry. Report Reference 14/35, dated November 2015.

Appendices

Appendix A – NSW EPA Search Results

Search results

Your search for:LGA: Shoalhaven City Council

Matched 9 notices relating to 2 sites.

Search Again

Refine Search

Suburb	Address	Site Name	Notices related to this site
NOWRA	Lamonds LANE	Former gasworks	2 current and 1 former
NOWRA EAST	Lot 3 Kalandar STREET	Mobil Service Station	6 former

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20 April 2018

List of NSW Contaminated Sites Notified to EPA as of 9 February 2018

Background

A strategy to systematically assess, prioritise and respond to notifications under Section 60 of the *Contaminated Land Management Act 1997* (CLM Act) has been developed by the EPA. This strategy acknowledges the EPA's obligations to make information available to the public under *Government Information (Public Access) Act 2009*.

When a site is notified to the EPA, it may be accompanied by detailed site reports where the owner has been proactive in addressing the contamination and its source. However, often there is minimal information on the nature or extent of the contamination.

For some notifications, the information indicates the contamination is securely immobilised within the site, such as under a building or carpark, and is not currently causing any offsite consequences to the community or environment. Such sites would still need to be cleaned up, but this could be done in conjunction with any subsequent building or redevelopment of the land. These sites may not require intervention under the CLM Act, but could be dealt with through the planning and development consent process.

Where indications are that the nominated site is causing actual harm to the environment or an unacceptable offsite impact (i.e. it is a "significantly contaminated site"), the EPA would apply the regulatory provisions of the CLM Act to have the responsible polluter and/or landowner investigate and remediate the site.

As such, the sites notified to the EPA and presented in the following table are at various stages of the assessment and/or remediation process. Understanding the nature of the underlying contamination, its implications and implementing a remediation program where required, can take a considerable period of time. The tables provide an indication, in relation to each nominated site, as to the management status of that particular site. Further detailed information may be available from the EPA or the responsible landowner.

The following questions and answers may assist those interested in this issue:

Frequently asked questions

What is the difference between the "List of NSW Contaminated Sites Notified to the EPA" and the "Contaminated Land: Record of Notices"?

A site will be on the Contaminated Land: Record of Notices only if the EPA has issued a regulatory notice in relation to the site under the *Contaminated Land Management Act 1997*.

The sites appearing on this "List of NSW contaminated sites notified to the EPA" indicate that the notifiers consider that the sites are contaminated and warrant reporting to the EPA. However, the contamination may or may not be significant enough to warrant regulation by the EPA. The EPA needs to review and, if necessary, obtain more information before it can make a determination as to whether the site warrants regulation.

Why my site appears on the list?

Your site appears on the list because of one or more of the following reasons:

- The site owner and/or the person partly or fully responsible for causing the contamination notified to the EPA about the contamination under Section 60 of the *Contaminated Land Management Act 1997*. In other words, the site owner or the "polluter" believes the site is contaminated.
- The EPA has been notified via other means and is satisfied that the site is or was contaminated.

Does the list contain all contaminated sites in NSW?

No. The list only contains contaminated sites that the EPA is aware of, with regard to its regulatory role under the CLM Act. An absence of a site from the list does not necessarily imply the site is not contaminated.

The EPA relies upon responsible parties to notify contaminated sites.

How are these notified contaminated sites managed by the EPA?

There are different ways that the EPA manages these notified contaminated sites. First, an initial assessment is carried out by the EPA. At the completion of the initial assessment, the EPA may take one or more than one of the following management approaches:

- The contamination warrants the EPA's direct regulatory intervention either under the *Contaminated Land Management Act 1997* or the *Protection of the Environment Operations Act 1997* (POEO Act), or both. Information about current or past regulatory action on this site can be found on EPA website.
- The contamination with respect to the current use or approved use of the site, as defined under the *Contaminated Land Management Act 1997,* is not significant enough that it warrants EPA regulation.
- The contamination does not require EPA regulation and can be managed by a planning approval process.
- The contamination is related to an operational Underground Petroleum Storage System, such as a service station or fuel depot. The contamination may be managed under the POEO Act and the Protection of the Environment Operation (Underground Petroleum Storage Systems) Regulation 2008.
- The contamination is being managed under a specifically tailored program operated by another agency (for example the Department of Industry and Investment's *Derelict Mines Program*).

I am the owner of a site that appears on the list. What should I do?

First of all, you should ensure the current use of the site is compatible with the site contamination. Secondly, if the site is the subject of EPA regulation, make sure you comply with the regulatory requirements, and you have considered your obligations to notify other parties who may be affected.

If you have any concerns, contact us and we may be able to offer you general advice, or direct you to accredited professionals who can assist with specific issues.

I am a prospective buyer of a site that appears on the list. What should I do?

You should seek advice from the vendor to put the contamination issue into perspective. You may need to seek independent expert advice.

The information provided in the list is meant to be indicative only, and a starting point for your own assessment. Site contamination as a legacy of past site uses is not uncommon,

particularly in an urbanised environment. If the contamination on a site is properly remediated or managed, it may not materially impact upon the intended future use of the site. However, each site needs to be considered in context.

List of NSW Contaminated Sites Notified to the EPA

Disclaimer

The EPA has taken all reasonable care to ensure that the information in the list of contaminated sites notified to the EPA (the list) is complete and correct. The EPA does not, however, warrant or represent that the list is free from errors or omissions or that it is exhaustive.

The EPA may, without notice, change any or all of the information in the list at any time.

You should obtain independent advice before you make any decision based on the information in the list.

The list is made available on the understanding that the EPA, its servants and agents, to the extent permitted by law, accept no responsibility for any damage, cost, loss or expense incurred by you as a result of:

1. any information in the list; or
2. any error, omission or misrepresentation in the list; or
3. any malfunction or failure to function of the list;
4. without limiting (2) or (3) above, any delay, failure or error in recording, displaying or updating information.

Site Status	Explanation
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or *Protection of the Environment Operations Act 1997*. Alternatively, the EPA may require information via a notice issued under s77 of the *Contaminated Land Management Act 1997* or issue a Preliminary Investigation Order.
Regulation under CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the *Contaminated Land Management Act 1997* is not required.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the *Contaminated Land Management Act 1997*. A regulatory approach is being finalised.

Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the *Contaminated Land Management Act 1997* (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the *Protection of the Environment Operations Act 1997* (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the *Environmental Planning and Assessment Act 1979* (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the *Contaminated Land Management Act 1997* (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the *Protection of the Environment Operations Act 1997* (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the *Environmental Planning and Assessment Act 1979* (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the *Contaminated Land Management Act 1997* (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record.

Suburb	Site Name	Site Address	Contamination Activity Type	EPA Management Class	Latitude	Longitude
BEROWRA	Shell Coles Express Berowra	955 Pacific (Cnr Yallambee Rd) HIGHWAY	Service Station	Regulation under CLM Act not required	-33.62818015	151.1475736
BEROWRA	7-Eleven Berowra Service Station	965-969 Pacific (Cnr Waratah Rd) HIGHWAY	Service Station	Regulation under CLM Act not required	-33.62673163	151.1479171
BERRIGAN	Caltex Service Station Berrigan	155-165 Chanter STREET	Service Station	Regulation under CLM Act not required	-35.6557616	145.8015557
BERRY	Shell Berry - Now BP branded	75 Queen STREET	Service Station	Under assessment	-34.77500516	150.695167
BERRY	Berry Service Centre - Shell Branded	88 Queen STREET	Service Station	Regulation under CLM Act not required	-34.77571634	150.6961713
BEXLEY	7-Eleven Bexley	474 Forest ROAD	Service Station	Regulation under CLM Act not required	-33.95160096	151.1252355
BEXLEY	7-Eleven (former Mobil) Service Station Bexley	613 Forest ROAD	Service Station	Regulation under CLM Act not required	-33.95539246	151.118447
BILLINUDGEL	CSR Readymix	Mogo PLACE	Other Industry	Regulation under CLM Act not required	-28.50210255	153.5278161
BLACKMANS FLAT	Mount Piper Extension Development Site	2847 Boulder ROAD	Other Industry	Regulation under CLM Act not required	-33.35619968	150.0279881
BLACKMANS FLAT	Lamberts Gully Mine	Castlereagh HIGHWAY	Other Industry	Regulation under CLM Act not required	-33.36713827	150.0483236
BLACKTOWN	Former Caltex Service Station	131 Richmond ROAD	Service Station	Regulation under CLM Act not required	-33.75866104	150.8962614
BLACKTOWN	Valspar Blacktown	4 Steel STREET	Chemical Industry	Regulation under CLM Act not required	-33.75425018	150.9127714
BLACKTOWN	7-Eleven Service Station	60 Walters ROAD	Service Station	Regulation under CLM Act not required	-33.77599783	150.8948926
BLACKTOWN	Land at Reservoir Road	Reservoir ROAD	Unclassified	Regulation under CLM Act not required	-33.79119448	150.8967838
BLAKEHURST	Woolworths Service Station Blakehurst	390 Princes HIGHWAY	Service Station	Contamination currently regulated under CLM Act	-33.990197	151.11361
BLAKEHURST	The Bay Nursing Home	392-394 Princes HIGHWAY	Service Station	Under assessment	-33.99030465	151.1140293
BLAXLAND	7-Eleven (former Mobil) Service Station	137 Great Western HIGHWAY	Service Station	Regulation under CLM Act not required	-33.74627	150.6137669
BOAMBEE	Lindsay Bros transport depot site	542 Pacific HIGHWAY	Other Petroleum	Regulation under CLM Act not required	-30.33106848	153.0802985
BOAMBEE	BP-branded (former Mobil) Boambee Service Station	601 Pacific HIGHWAY	Service Station	Regulation under CLM Act not required	-30.33544287	153.0817266
BOBS FARM	Bob's Farm	15 Fenningham Island ROAD	Other Industry	Regulation under CLM Act not required	-32.74867207	152.0316217
BOGGABILLA	Former Caltex Service Station	90 Simpson Street, corner Newell HIGHWAY	Service Station	Regulation under CLM Act not required	-28.60654029	150.3571056
BOGGABILLA	Lowes (Former Mobil) Depot	Newell HIGHWAY	Other Petroleum	Regulation under CLM Act not required	-28.61023985	150.3529156
BOMADERRY	Bomaderry Works Depot	10 McIntyre WAY	Other Petroleum	Regulation under CLM Act not required	-34.84576748	150.6131411
BOMADERRY	Caltex Service Station	246 Princes HIGHWAY	Service Station	Regulation under CLM Act not required	-34.83833824	150.5958799

Suburb	Site Name	Site Address	Contamination Activity Type	EPA Management Class	Latitude	Longitude
BOMADERRY	Commercial Land	320 Princes Highway HIGHWAY	Other Industry	Under assessment	-34.84424073	150.5958149
BOMADERRY	Caltex Service Station	341 Princes HIGHWAY	Service Station	Regulation under CLM Act not required	-34.84561952	150.5946978
BOMADERRY	Former Shell Depot	44 Railway STREET	Other Petroleum	Regulation under CLM Act not required	-34.85193621	150.6117038
BOMADERRY	Former Mobil Emoleum Depot	7 Victa WAY	Other Petroleum	Regulation under CLM Act not required	-34.84454618	150.6139462
BOMADERRY	SRA Land	Lot 2 Meroo STREET	Unclassified	Regulation under CLM Act not required	-34.85314813	150.6099573
BOMBALA	Caltex Service Station Bombala	159-161 Maybe STREET	Service Station	Regulation under CLM Act not required	-36.91234945	149.2374622
BOMBALA	Former Bright Street Timber Mill	Bright STREET	Other Industry	Regulation under CLM Act not required	-36.91547645	149.2302454
BOMBALA	Caltex Bombala Service Station	High Street corner Stephen STREET	Service Station	Regulation under CLM Act not required	-36.90447935	149.241292
BOMBALA	Prime Pine site	Sandy LANE	Other Industry	Regulation under CLM Act not required	-36.9315425	149.2110959
BOMEN	Caltex Terminal	34 Lewington STREET	Other Petroleum	Regulation under CLM Act not required	-35.0700202	147.4121955
BONDI	BP-branded Service Station	185 Bondi ROAD	Service Station	Regulation under CLM Act not required	-33.89432208	151.2647671
BONDI	Caltex Service Station Bondi	51 Bondi ROAD	Service Station	Regulation under CLM Act not required	-33.8936307	151.260001
BONDI JUNCTION	Waverley Bus Depot	1-15 Oxford STREET	Other Industry	Regulation under CLM Act not required	-33.89165341	151.2421246
BONNY HILLS	Bonny View Store	923 Ocean DRIVE	Service Station	Regulation under CLM Act not required	-31.59075636	152.8392935
BONNYRIGG	Metro Bonnyrigg (Formerly United & AP SAVER)	709 Cabramatta ROAD	Service Station	Contamination currently regulated under POEO Act	-33.893058	150.892476
BONNYRIGG HEIGHTS	BP-Branded Service Station Bonnyrigg	451 North Liverpool ROAD	Service Station	Regulation under CLM Act not required	-33.89416327	150.8578378
BOOLAROO	Incitec Pivot	13 Main STREET	Other Industry	Contamination formerly regulated under the CLM Act	-32.94803538	151.6302187
BOOLAROO	Bunnings Site - Pasminco Cockle Creek	13a Main ROAD	Metal Industry	Contamination formerly regulated under the CLM Act	-32.94364503	151.6252316
BOOLAROO	Cardiff West Estate - Pasminco Cockle Creek	Adjacent to PCC Smelter at 13A Main ROAD	Metal Industry	Regulation under CLM Act not required	-32.93950137	151.6349183
BOOLAROO	Pasminco Cockle Creek Smelter	Lake ROAD	Metal Industry	Contamination currently regulated under CLM Act	-32.94434593	151.6307345
BOOLAROO	Cockle Creek and Cockle Bay Sediments	Off Creek Reserve ROAD	Metal Industry	Contamination currently regulated under CLM Act	-32.96079541	151.6141327
BOOROWA	Former Mobil Depot	14-16 Brial STREET	Other Petroleum	Regulation under CLM Act not required	-34.43673234	148.7300821
BOOROWA	Mobil Service Station	63-69 Marsden STREET	Service Station	Contamination formerly regulated under the CLM Act	-34.44157331	148.7162391

The search results for the public register under section 308 of the Protection of the Environment Operations Act 1997 (the POEO Act)

Number	Name	Location	Type	Status	Issued date
2534	AUSTRALIAN CO-OPERATIVE FOODS LIMITED	220 BOLONG ROAD, BOMADERRY, NSW 2541	POEO licence	Surrendered	9-Oct-00
1012594	AUSTRALIAN CO-OPERATIVE FOODS LIMITED	220 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	21-Jul-03
1035240	AUSTRALIAN CO-OPERATIVE FOODS LIMITED	220 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	17-May-04
1043465	AUSTRALIAN CO-OPERATIVE FOODS LIMITED	220 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	10-Feb-05
11164	BOC LIMITED	LOT 241 BOLONG ROAD, BOMADERRY, NSW 2541	POEO licence	Issued	12-Dec-00
1035676	BOC LIMITED	LOT 241 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	25-Jun-04
1048156	BOC LIMITED	LOT 241 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	17-Jun-05
1513148	BOC LIMITED	LOT 241 BOLONG ROAD, BOMADERRY, NSW 2541	Compliance Audit	Complete	2-Apr-13
1516480	BOC LIMITED	LOT 241 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	26-Aug-13
1514411	BOC LIMITED	LOT 241 BOLONG ROAD, BOMADERRY, NSW 2541	Compliance Audit	Complete	26-Aug-13
1529674	BOC LIMITED	LOT 241 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	8-Apr-15
58	CLEARY BROS (BOMBO) PTY LTD	LOT 3 BOLONG ROAD, BOMADERRY, NSW 2541	POEO licence	No longer in force	19-Nov-99
1009284	CLEARY BROS (BOMBO) PTY LTD	LOT 3 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	6-Aug-01
566	PAPER AUSTRALIA PTY LTD	340 BOLONG ROAD, BOMADERRY, NSW 2541	POEO licence	Surrendered	15-Feb-00
1004205	PAPER AUSTRALIA PTY LTD	340 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	27-Feb-01
1010261	PAPER AUSTRALIA PTY LTD	340 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	10-Jan-02
1035034	PAPER AUSTRALIA PTY LTD	340 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	5-Mar-04
1044586	PAPER AUSTRALIA PTY LTD	340 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	14-Mar-05
1071922	PAPER AUSTRALIA PTY LTD	340 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	3-Apr-07
1084599	PAPER AUSTRALIA PTY LTD	340 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	2-May-08
1085840	PAPER AUSTRALIA PTY LTD	340 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	27-Jun-08
1516476	PAPER AUSTRALIA PTY LTD	340 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	23-Aug-13
1513902	PAPER AUSTRALIA PTY LTD	340 BOLONG ROAD, BOMADERRY, NSW 2541	Compliance Audit	Complete	10-Sep-13
1517150	PAPER AUSTRALIA PTY LTD	340 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	17-Sep-13
21029	ROADS AND MARITIME SERVICES	Princes Highway, BOMADERRY, NSW 2541	POEO licence	Pending	
1735	SHOALHAVEN CITY COUNCIL	RAILWAY STREET, BOMADERRY, NSW 2541	POEO licence	Issued	5-Jan-01
1013003	SHOALHAVEN CITY COUNCIL	RAILWAY STREET, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	4-Apr-02
1029195	SHOALHAVEN CITY COUNCIL	RAILWAY STREET, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	14-Aug-03
1048456	SHOALHAVEN CITY COUNCIL	RAILWAY STREET, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	21-Jun-05
1060655	SHOALHAVEN CITY COUNCIL	RAILWAY STREET, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	26-Jun-06
1085947	SHOALHAVEN CITY COUNCIL	RAILWAY STREET, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	16-May-08
1514246	SHOALHAVEN CITY COUNCIL	RAILWAY STREET, BOMADERRY, NSW 2541	Compliance Audit	Complete	25-Jul-14
1526880	SHOALHAVEN CITY COUNCIL	RAILWAY STREET, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	10-Dec-14
1539716	SHOALHAVEN CITY COUNCIL	RAILWAY STREET, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	11-May-16
883	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	POEO licence	Issued	24-Oct-00
1004267	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	4-Apr-01
1007313	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	11-May-01
1015342	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	26-Feb-02
1019838	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	15-Aug-02
1024268	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	11-Feb-03
1027489	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	26-Nov-03
1033645	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	1-Mar-04
1036799	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	29-Jun-04
1039275	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	20-May-05
1048817	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	28-Jul-05
1051704	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	31-Oct-05
1054751	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	21-Feb-06
1080589	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	31-Mar-08
1091373	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.96 Prevention Notice	Issued	4-Sep-08
1093973	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	27-Nov-08
1097588	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	10-Feb-09
1098548	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	9-Apr-09
1104957	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	14-Aug-09
1113256	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.91 Clean Up Notice	Issued	3-May-10
1500684	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	4-Aug-11
1501899	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	30-Sep-11
1513143	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	Compliance Audit	Complete	28-Mar-13
1505439	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	8-Nov-13
1521553	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	28-Apr-14
1513905	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	Compliance Audit	Complete	25-Jul-14
1530188	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	23-Jul-15
1536447	SHOALHAVEN STARCHES PTY LTD	160 BOLONG ROAD, BOMADERRY, NSW 2541	s.58 Licence Variation	Issued	18-Dec-15
20759	SOUTH COAST PLANT HIRE PTY LTD	11 Victa Way, BOMADERRY, NSW 2541	POEO licence	Issued	7-Oct-16
1559940	SOUTH COAST PLANT HIRE PTY LTD	11 Victa Way, BOMADERRY, NSW 2541	s.91 Clean Up Notice	Issued	22-Dec-17

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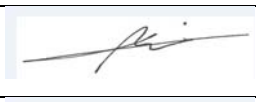
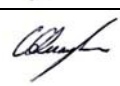
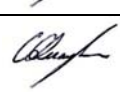
Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	Colee Quayle	Jon Thompson		Dom Trani		23/4/18
0	Jon Thompson	Colee Quayle		Dom Trani		23/4/18
1	Jon Thompson	Colee Quayle		Dom Trani		3/5/18
2	Jon Thompson	Colee Quayle		Dom Trani		4/5/18
3	Jon Thompson	Colee Quayle		Dom Trani		4/5/18

www.ghd.com

30 May 2018

John Studdert
Manildra
36 Bolong Road
Bomaderry NSW 2541

Our ref: 2316306-6427
Your ref:

Dear John

Gluten Dryer and Flour Mill Modifications
Stability of River Bank, Proposed permanent structures Manildra Plant, Bolong Road, Bomaderry

1 Introduction

Manildra Group Pty Ltd (Manildra) was previously granted Project Approval (MP06_0228, dated 28 January 2009) by the Minister of Planning for the proposed Shoalhaven Starches Expansion project, which encapsulated previous approvals for the general site.

The proposed development includes some permanent structures to be located close to the northern bank of the Shoalhaven River. Manildra has requested that GHD Pty Ltd (GHD) provide geotechnical advice on the potential for these structures to affect the stability of the river bank. The proposed structures considered include the Lime Silos, the Co-Generator Set, and Boiler No. 8. The proposed positions of these structures are shown in Figure 1 attached.

2 Effects of Structures on River Bank Stability

Based on our extensive knowledge of the subsurface conditions within the Manildra Plant, including a recent geotechnical investigation of the Lime Silos site, we conclude the following in relation to the effects of these proposed structures on the stability of the river bank:

- The proposed structures mentioned above will all be founded on deep piled footing systems, with all piles terminated in weathered rock well below the river bank and bed levels. This will transfer the loads from the structures onto weathered rock, so that the structures will not apply any loading to the soils between the structures and the river bank. It is assumed that the piles will be non-displacement piles such as CFA or cased bored piles to minimise application of temporary loads to the soil during construction.
- The stability of the river bank will therefore not be adversely affected by the presence of the three structures described above.

Should you have any questions in relation to the above advice, please contact the undersigned.

3 Limitations

This report: has been prepared by GHD for Manildra and may only be used and relied on by Manildra for the purpose agreed between GHD and the Manildra as set out in Section 1 of this report. GHD otherwise disclaims responsibility to any person other than Manildra 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. The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of 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.

Sincerely
GHD Pty Ltd

Jon Thompson CPEng
Technical Director – Geotechnical
+61 2 4222 2328

Attachments:

Figure 1 – Site Plan

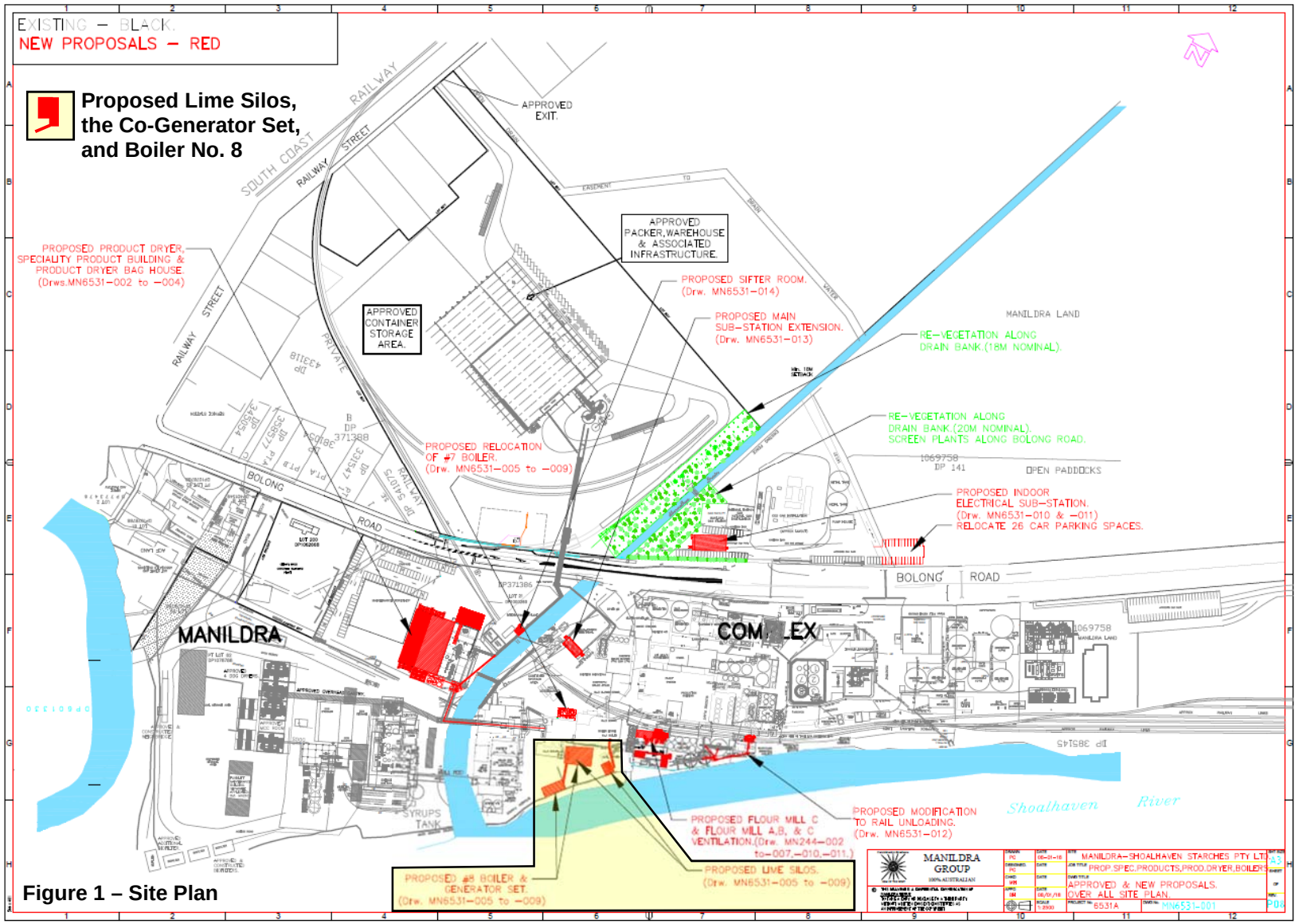


Figure 1 – Site Plan