LONG TERM ENVIRONMENTAL MANAGEMENT PLAN
CATHERINE MCAULEY CATHOLIC COLLEGE, MEDOWIE, NSW

Prepared for DIOCESE OF MAITLAND NEWCASTLE

Prepared by RCA Australia

RCA ref 13156d-409/2

DECEMBER 2020

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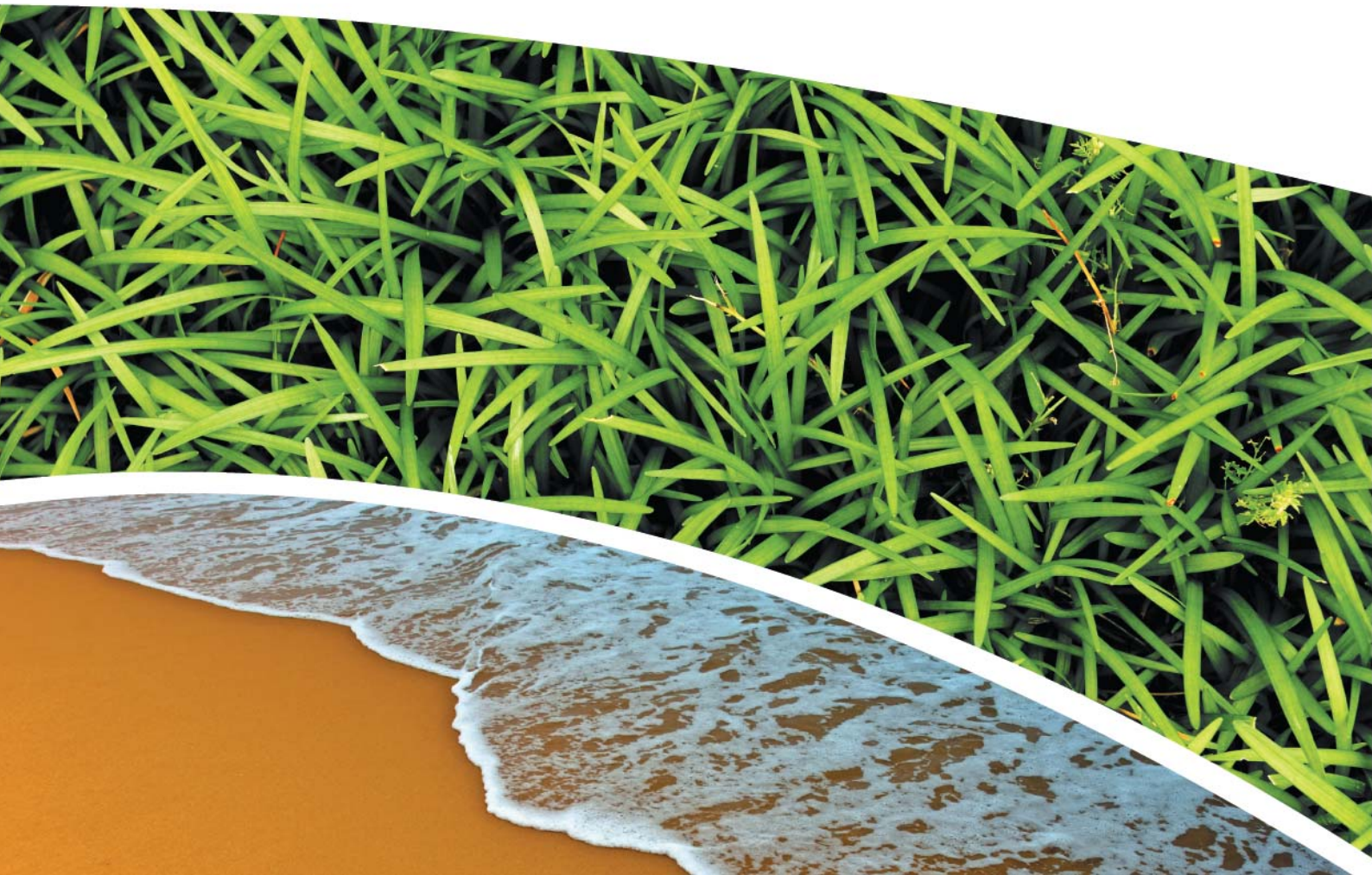

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bsi. ISO 9001 Quality Management

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RCA ref 13156d-409/2
Client ref 21921

15 December 2020

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LONG TERM ENVIRONMENTAL MANAGEMENT PLAN
CATHERINE MCAULEY CATHOLIC COLLEGE, MEDOWIE NSW

1 INTRODUCTION

This long term environmental management plan (LTEMP) provides details regarding a portion of the Catherine McAuley Catholic College (the 'site'), located at Lots 412 & 413 DP 1063902, Medowie NSW, which comprises a sub-surface containment cell holding material which was not considered to be suitable for a school with sensitive receptors.

This report is a stand-alone document which details management requirements with regards to the containment cell and sequestered impacted material, surface water and groundwater during the remainder of the staged construction works to complete the development and, in the future, once the site is operational to prevent potential health risks. This report supplements the site's validation report (Ref [1]) which details the remedial works undertaken to verify and determine that the site is suitable for the proposed use. Reference should be made to the validation report (Ref [1]) for details of soil, groundwater and surface water results from previous investigations and validation of the site.

This report has been prepared for the Diocese of Maitland Newcastle on behalf of North Construction and Building Pty Ltd. (North) who have undertaken the Stage 1 construction at the site, including the construction of the containment cell. The Diocese has accepted the responsibility for the implementation of this LTEMP as of December 2020.

2 PURPOSE

The purpose of this LTEMP is to detail management requirements with relation to the site due to a number of aspects of residual contamination at the site.

A containment cell is located on the central portion of the site which has been constructed to sequester contaminated material in accordance with a remedial action plan (RAP) and associated addendum (Ref [2] & [3]). The material within the cell comprised:

- Anthropogenic waste sieved from a fill mound previously located at the site.
- Asbestos impacted soil from a portion of a fill mound previously located at the site and from an area encountered during the construction of HS Block A.
- Soil from an unexpected stockpile which, while there was no specific contaminant concern, was not characterised for suitability of use.
- Material from under the house and shed which had anthropogenic material within.
- Soil contaminated with benzene, polycyclic aromatic hydrocarbon (PAH) and anthropogenic material. The material further exhibited acid sulfate soil properties however this has been neutralised by the addition of lime such that it is no longer considered acid sulfate soil.

At the time of writing the containment cell is situated in a residual clay profile, with similar capping material derived from areas of excavation undertaken in other areas of the site: the cell will be subject to the construction of basketball courts and surrounding surfacing in a later stage of the development which include concrete surfacing. As such there is considered to be a negligible risk of contaminant migration and therefore the site is considered to be manageable under passive management measures such that no excavation below the extent of the containment cell cap is undertaken. Where excavation is unavoidable, management measures for the protection of human health and the environment are detailed within this LTEMP.

Contamination in the form of per- and polyfluoroalkyl substances (PFAS) has been identified within the water of the creek at the southern boundary and as such access to the creek is to be restricted, refer **Sections 4.1** and **5.2**.

There has been limited assessment of groundwater, refer **Section 4.1**, and as such there are restrictions to extraction of groundwater, refer **Section 5.3**.

Implementation as per this LTEMP is a legal requirement under State Significant Development (SSD 8989) approval condition F9:

> *Upon completion of remediation works, the Applicant must manage the site in accordance with the LTEMP approved under condition E57 and any on-going maintenance of remediation notice issued by EPA under the Contaminated Land Management Act 1997.*

As the owner of the site, the Diocese of Maitland Newcastle will be responsible for the implementation, maintenance and currency of this LTEMP however other parties will also bear some responsibility as detailed in **Section 6.1**.

The existence of the LTEMP will be included as part of the site audit statement for the suitability of the site. It is envisaged that Port Stephens Council will record the existence of the site audit statement in the Section 10.7 certificate for the site. The SSD condition is a legal requirement, however it is considered unlikely that the NSW EPA will issue an on-going remediation notice based on the passive controls required to managed the site in the long term.

The SSD approval conditions which are apply to the content of this LTEMP are reproduced in **Table 1** which also includes the Section reference as to where these points are addressed within this report.

The LTEMP applies to the site indefinitely unless it is remediated and appropriately validated or otherwise suitable for use without restriction (i.e. change of land use).

It is noted that there are acid sulfate soils present at the site and any disturbance of these will require the implementation of an acid sulfate soil management plan.

Table 1 *Conditions of SSD approval condition E57 relevant to the LTEMP*

Condition No.	Condition Requirements	Relevant LTEMP Section
E57	Within one month of the completion of remediation works or other timeframe agreed by the Planning Secretary, the Applicant must submit a Long-Term Environmental Management Plan (LTEMP) to the Planning Secretary for information. The plan must:	
E57(a)	Be prepared by a suitably qualified and experienced person whose appointment has been endorsed by the Planning Secretary in consultation with EPA.	The LTEMP has been prepared by Katy Davies, an environmental scientist with ten (10) years' experience in contaminated land assessment and management. Katy undertook the investigative works as part of the RAP (Ref [2]) preparation. The LTEMP has been reviewed by Mrs Fiona Brooker from RCA Australia. Her appointment was endorsed by the Planning Secretary on the 3rd December 2020.
E57(b)	Be submitted to EPA for review prior to submission to the Planning Secretary.	Following concurrence by the NSW EPA accredited contaminated sites auditor, this LTEMP will be submitted to the NSW EPA for review.
E57(c)	Include, but not be limited to:	
E57(c) i	A description of the nature and location of any remaining contamination on site.	**Section 5**.
E57(c) ii	Provisions to manage and monitor any remaining contamination, including details of any restrictions placed on the land to prevent development over the containment cell.	**Section 6**.
E57(c) iii	A description of the procedures for managing any leachate generated from the containment cell, including any procedures for testing, pumping, treatment and/or disposal.	Not applicable based on the cell construction in low permeability residual clay (**Section 5.7**) unless a contingency (**Section 6.7**) is triggered.
E57(c) iv	A description of the procedures for monitoring the integrity of the containment cell.	**Section 6.2** and **Section 6.3**.
E57(c) v	A surface and groundwater monitoring programme.	Not applicable based on the cell construction in low permeability residual clay (**Section 5.7**) unless a contingency (**Section 6.7**) is triggered.
E57(c) vi	Mechanisms to report results to relevant agencies.	**Section 6.6** and **Section 7.4**.
E57(c) vii	Triggers that would indicate if further remediation is required.	**Section 6.6**.

Condition No.	Condition Requirements	Relevant LTEMP Section
E57(c) viii	Details of any contingency measures that the Applicant is to carry out to address any ongoing contamination.	This is considered to be limited non-standard operations or unexpected finds is conducted (**Section 6.2.3** and **Section 6.6**). Controls will be reviewed as detailed in **Section 7.2** and **Section 7.3**.

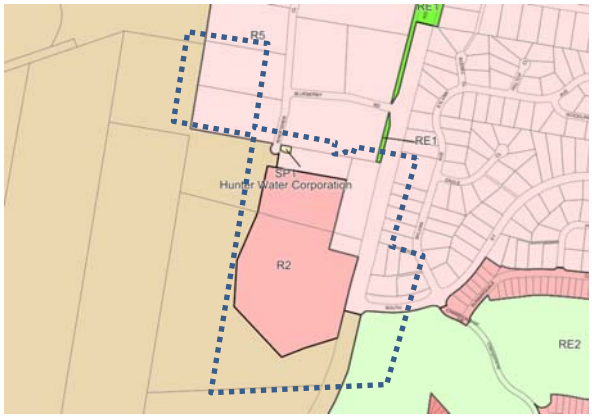
3 SITE IDENTIFICATION AND DESCRIPTION

The College area comprises part of two (2) Lots, which are described as:

- 507 Medowie Road, Medowie, NSW, Lot 412 DP 1063902.
- 2 Kingfisher Close, Medowie, NSW, Lot 413 DP 1063902:

Full site details are included in **Table 2**. The college does not take up the entire area of the two (2) Lots and the footprint of the containment cell is only a small portion of the College.

Table 2 *Site Details*

Site Owner	Catholic Diocese of Maitland Newcastle
Consent Authority	Port Stephens Council
Lots	Part Lot 412 DP 1063902 Part Lot 413 DP 1063902
Street Address	507 Medowie Road & 2 Kingfisher Close, Medowie, NSW
Current zoning (Ref [4])	 R2 Low density residential, RU2 Rural Landscape and R5 Large Lot Residential.
Current use **Proposed use**	The site is currently an active construction site for the development of the school. Stage 1 of the development has recently been completed with Stage 2 recently commencing. Parts of the Lots will become a Catholic College.
Size of site	Lot 413 DP 1063902 – 10 ha Lot 412 DP 1063902 – 16.83 ha Footprint of Sports Courts – 1,945m^{2}Site Audit Boundary – 7.62 ha

The containment cell is located in the central portion of the site, in an area which will become sports/ basketball courts once development is complete: the location of which is shown on **Figure 1**, below.

Figure 1 *Location of Containment Cell in relation to College development*

4 SITE BACKGROUND

4.1 SITE HISTORY

A previous assessment was undertaken in 2018 (Ref [5]) as part of the SSD application and included a historical review of the Lots and surrounding notifications, local council records, site specific requirements under SSD 8989, published local geology and hydrogeology, nearby registered groundwater bores and historical aerial photographs.

RCA determined (Ref [5]) that the site was formerly used for go-karting activities, residential use, and some agricultural use including a small orchard in the southern portion of the Lot 412 DP1063902. Fill mounds were observed on the site within close proximity to the asphalt go-kart track, however the source of the fill material was unknown.

Intrusive works to adequately characterise and determine the contamination status of the site were conducted as part of the assessment at a reduced frequency to that recommended (Ref [6]) for the size of the site based on the limited potential for impact as identified by the historical assessment. The assessment included soil and groundwater as well as assessment of potential acid sulfate soils and saline soils.

Further intrusive works were undertaken within the fill mounds as part of the preparation of the RAP (Ref [2]) and following the consent to refine the understanding of acid sulfate soil (Ref [7]) and suitability of material under the building footprints and go-kart track (Ref [3]).

Identified contamination was limited to the two (2) fill mounds:

- The northern fill mound which was suitable for use on site with the exception of anthropogenic material identified in the mound. The anthropogenic material was to be removed from the mound prior to its re-use on site.
- The southern fill mound which required remediation or management due to the presence of hydrocarbons (TRH and PAH): anthropogenic material and acid sulfate soil properties were also identified within the mound and required management/treatment.

Concentrations (244mg/kg) of zinc in excess of the ecological criterion (230mg/kg, Ref [8]) was identified at one location, BH20, and concentrations of TRH (130mg/kg) in a further sample, BH13, were in excess of human health and ecological criteria (110mg/kg and 120mg/kg respectively, Ref [8]). These concentrations were considered to be isolated based on the results of the remainder of the data set and as the concentrations were less than 250% the criteria, were not considered to affect the suitability of the site for the proposed land use.

Characterisation of the groundwater encountered indicated that contaminant concentrations assessed as part of this assessment were suitable for human ingestion at all three (3) locations noting some minor uncertainty with benzo(a)pyrene and some pesticides due to detection limit. Metals concentrations in MW1 and MW2 were in excess of those relevant for freshwater aquatic systems (Ref [9]), however in the absence of significant metals concentrations in the soil or potential contamination activities at the site it was considered that these concentrations are likely a regional issue. In the understood absence of use of groundwater at the site RCA did not recommend remediation.

Per- and polyfluoroalkyl substances (PFAS) were identified to be present within stationary pools of surface water in the creek at the southern portion of the site at variable concentrations including some in excess of the ecological and drinking water guidelines (Ref [10]) as presented in **Table 3** below.

Table 3 *Results of PFAS within Creek at Southern Boundary of Site*

	Ecological Guideline	Drinking Water Guideline	21/10/19	2/12/19	10/2/20
Perfluorohexane sulfonic acid (PFHxS)	--	--	0.003	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	0.00023	--	**0.002**	**0.14**	<0.01
Perfluorooctanoic acid (PFOA)	19	0.56	0.005	<0.01	<0.01
PFOS + PFHxS	--	0.07	0.005	0.15	0.015

Units in μg/L

Where summation required (PFAS) calculation includes components reported as non detected as 1/2 PQL.

PFAS was not detected the morning after a rainfall event (noting that at the time of sampling the Creek was not flowing however it was apparent that it had been based on water level and the direction of bent reeds) and it was therefore considered that concentrations were dependent on water flow. The source of the PFAS was unknown however PFAS was only detected at concentrations below relevant criteria (Ref [10]) in one (1) of three (3) soil samples analysed (Ref [5]) and there were considered to be other potential sources from upgradient, historical firefighting activities and regional flooding. Due to the absence of proposed use of surface water, and the fencing which would restrict access following the completion of the development, no remediation was recommended. PFAS was not identified in groundwater accumulated in the sedimentation dam, consistent with previous groundwater assessment findings (Ref [5]).

No hazardous materials were identified within the existing dwelling and associated shed structures on the site.

The final remedial strategy, based on the RAP (Ref [2]) however with refinements (Ref [3]) as approved by the NSW EPA accredited auditor, comprised the placement of the material from the southern fill mound, following treatment for acid sulfate soil properties and geotechnical deficiencies (such as oversize anthropogenic material), into a designated containment area and placement of a high visibility marker layer as a visual aid for future works in the area. The containment area was to be capped with a suitable material and survey verification of the extent, depth and coverage of the area was also required.

The validation report for the site (Ref [1]) details the verification that remedial works were undertaken in accordance with the remedial strategy.

4.2 GEOLOGY AND HYDROGEOLOGY

Alluvial and residual soil profiles are present across the College site. The soil type within the vicinity of the containment cell and BH13 comprises residual sandy clay loams, overlying deeply weathered clay deposits under the Medowie landscape, which is the material that the containment cell was excavated into. The dominant geology across the site is from the Permian period, consisting of Tomago coal measures which is generally represented by shales, mudstones, sandstones, coals, tuffs and clays (Ref [11]).

Groundwater within the residual profile of the site was recorded greater than 10m below the (pre-construction) ground surface, located directly above bedrock, during early investigation works in 2018. Some seepage at shallower depths was encountered in 2019, however part of the containment cell construction requirements included a minimum buffer of 1m between the base of the containment cell and the groundwater table, as identified during construction works (Ref [1]).

Table 4 below, includes photographs of the soil profile on the site and the containment cell during construction.

Table 4 *Containment Cell Material and Construction*

Residual clay profile that the containment cell was constructed within. Photograph taken during assessment of groundwater/ seepage in April 2020.	

Containment Cell following the completion of construction (19th May 2020), prior to material placement. Note water is due to rainfall[1].	**Wall profile of the containment cell following construction (19th May 2020) but prior to material placement. Note water is due to rainfall[1].**
Orange fabric marker warning layer: this indicates that <u>impacted material will be encountered directly below</u>.	**Containment Cell fully covered with interim cap, which will remain until the sports court is constructed.**

[1] The Williamtown Bureau of Meteorology Station recorded 6.2mm from 9am 17th to 9am 18th May and 2.2mm from 18th May to 19th May. Photos taken approximately 9.15am.

5 STATUS OF REMAINING CONTAMINATION

The RAP (Ref [2]) identified the southern fill mound which required remediation for the site to be suitable for use; other minor issues such as the presence of anthropogenic waste, surface water and groundwater quality and the presence of minor hydrocarbons were identified however were not considered to require remediation. The following sections provide a summary of the remaining contamination at the site which requires management under this LTEMP.

5.1 SPORTS/ BASKETBALL COURTS

Remediation as part of Stage 1 comprised the movement of impacted materials, both identified during early investigation and unexpected finds during construction, into a designated containment cell (Ref [1]) which was chosen and approved prior to the commencement of works in accordance with the RAP and RAP Addendum (Ref [3]). The types of material which has been sequestered into the containment cell is considered to be less than 700m^3 and comprises the following (in order of deepest placement):

- The anthropogenic waste sieved from the northern fill mound. This generally comprised material such as asphalt, glass, concrete, geo fabric, plastic and rebar.
- The asbestos impacted soil from a portion of the northern fill mound, and the asbestos impacted material from HS Block A.
- The material from an unexpected stockpile identified to the north of the northern fill mound.
- The material from under the house and shed.
- The southern fill mound material following addition, and mixing through with an excavator, of lime at a rate of 6kg /tonne.

The containment cell location, footprint and construction are shown on **Drawing 1**, **Attachment A** and the surveyed position of the cell is included in **Attachment B**. As can be seen from this, the cell is smaller than the concrete surrounds of the sports court footprint: however, for the purposes of management, the concrete area around and including the sports/ basketball court on the whole is to be managed by the controls of the LTEMP: this will provide a buffer and will assist in providing robust management consistently.

At present the containment cell is covered with a high visibility marker layer and overlain with a minimum of 0.76m of interim clay capping. The finished surface level of the court is 10.058mAHD and requires a total 250mm construction thickness comprising sub-base gravels overlain with concrete and base course as shown below in **Figure 2**.

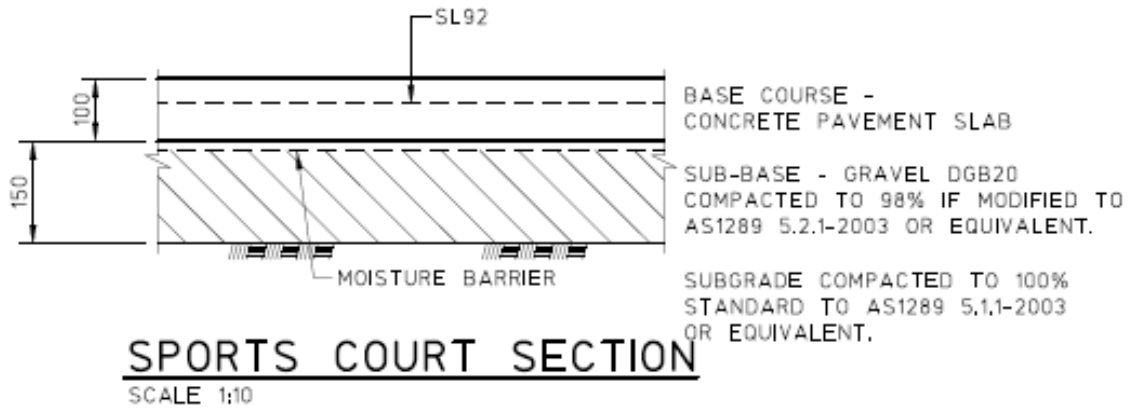


Figure 2 *Finished Pavement Design of the Sports Court overlying the Containment Cell.*

Currently the top of the impacted material, as demarcated with orange geofabric material, is between 9.1 and 9.61mAHD. As such, at the completion of the court and surrounds construction, the containment cap will comprise:

- Concrete pavement and base course total 0.1m thickness.
- Moisture barrier.
- 0.150m of (DG20) gravels.
- Between 0.198m and 0.708m compacted clay.
- High visibility orange geofabric material under which is the sequestered material.

The capping material which is removed as part of the construction will likely be suitable for use on the site however may require assessment by a suitably experienced contaminated land consultant if there are visual or olfactory indications of contamination and/or if the material is going to be used in an area that children will access or in close proximity to a waterway. Assessment will be required for use of material off site in accordance with the NSW EPA resource recovery framework.

5.2 SURFACE WATER WITHIN CREEK AT SOUTHERN BOUNDARY

Analysis of surface water in the Creek which runs generally along the southern boundary of the College from Medowie Road to the south west has identified the presence of PFAS at variable concentrations during the assessment period. The concentrations were in excess of the relevant ecological criterion (Ref [9]) and, during one of the three (3) sampling events, also in excess of the human health ingestion criterion (Ref [9]).

Assessment of PFAS concentrations had been undertaken in three (3) surface soil locations; PFAS in one surface soil sample (BH4) was detected however at concentrations a maximum of 4.4% of the relevant ecological and/or human health criteria (Ref [10]). As such the soil at the site does not pose a risk to human health and is unlikely to be a more than negligible source of PFAS contamination in surface water. There was no PFAS detected in any groundwater sample collected as part of the assessment or validation process.

Remediation of the surface water was not undertaken as the source was unknown, considered to be potentially from an off-site source, and as access to the Creek was to be fenced as part of standard safety practice associated with children's access to waterways. The fencing is metal vertical bars / paling approximately 2m high as is indicated in the photographs of **Table 5** below.

Table 5 *Photographs showing type of fencing used to prevent access to Creek*

5.3 GROUNDWATER

Assessment undertaken of the groundwater at the site has identified that, with the exception of metals concentrations which are considered to be representative of regional conditions, there is no significant contamination of groundwater. The assessment however has not been of sufficient extent to determine whether the groundwater may be suitable for drinking or for any extracted purpose (such as irrigation) and therefore the extraction of groundwater is prohibited without specific assessment for suitability.

5.4 NORTH OF THE SPORTS OVAL

Shallow impact of total recoverable hydrocarbons was recorded at one (1) location, BH13, in the preliminary assessment (Ref [5]). The impact was considered to be minor, with the reported F2[2] concentration 130mg/kg: 118% of the vapour intrusion guideline criterion for sensitive land use at shallow depth of less than 1m. Due to the minor impact and lack of perceived concentrations, this area was not considered to require remediation or affect the suitability of the site (Ref [5]), however was recommended to be assessed further at the time of development.

This sample was located along the north western boundary of the development and will be subject to cut, as indicated by **Figure 3**, during the construction of the sports oval. Management of this material will therefore be undertaken as part of the development process and will not require specific management under this LTEMP.

[2] F2 = TRH >C_{10}-C_{16} minus naphthalene

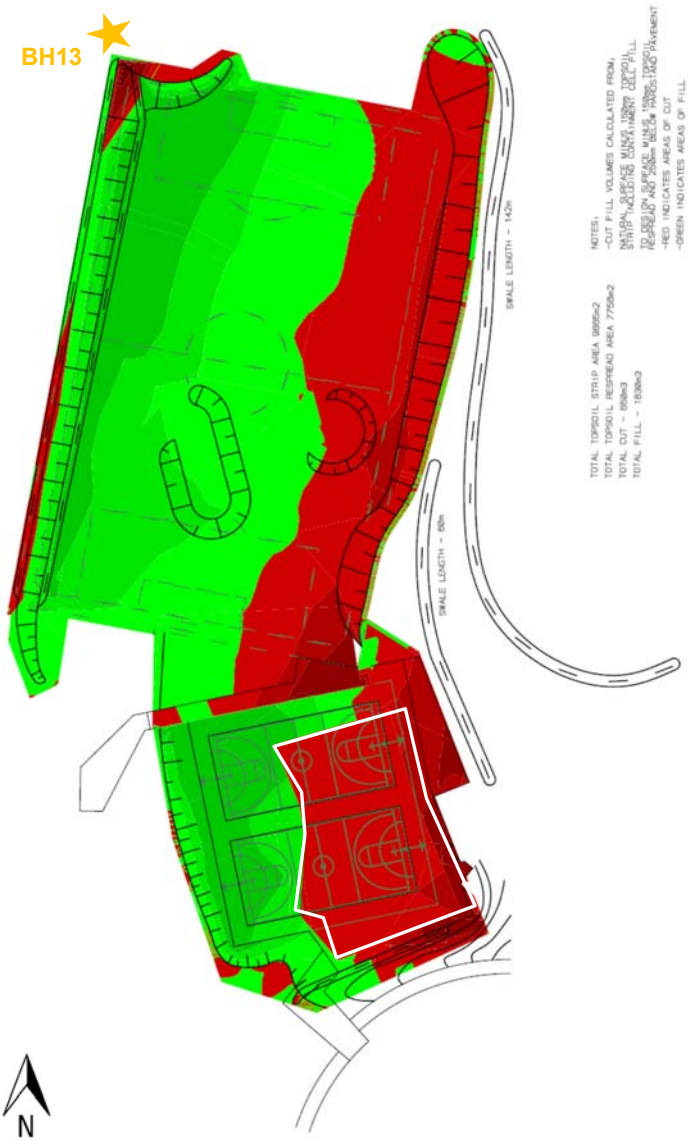


Figure 3 *Cut/ fill profile of the Sports Courts and Sports Oval as per approved design. BH13 is located within the proximity of the north west corner of the Sports Oval (shown above).*

5.5 ACID SULFATE SOILS

In-situ soil below 2m from ground surface in lower elevations of the site have been identified to be potential acid sulfate soils. In the event that the soil is disturbed, oxidisation of the acid sulfate soil may result which could cause acid generation which may leach onto the surface surrounding the area of disturbance and into underlying soils and subsequently groundwater. If stockpiles of potential acid sulfate soil are placed near waterways, leachate may cause detrimental ecological effects within the waterway.

There has been no change in the status of the in-situ soils and the potential oxidisation of soils during disturbance will have to be managed in accordance with an acid sulfate soil management plan: adjusted versions of the Stage 1 plan (Ref [7]) will be utilised for the remainder of the development however a specific acid sulfate management plan may be required should there be future excavations not included within the current scope of the development.

5.6 UNEXPECTED FINDS

There was an unexpected find of a buried refuse area during the construction of the HS Block A which included asbestos containing materials (ACM), a further unexpected incidence of ACM was identified within the northern fill mound, and a small previously unidentified stockpile. This material has been sequestered within the containment cell and based on the extent of works completed during Stage 1 of construction the potential for further unexpected finds are considered to be low, however there will remain some potential for further unexpected finds, especially when undertaking excavations at the site or in heavily vegetated areas of the site.

5.7 EXPOSURE PATHWAYS

Prior to remediation the potential exposure pathways for soil contamination at the site comprised:

- Inhalation of vapours and dust.
- Inhalation of asbestos fibres.
- Dermal contact / ingestion.
- Migration of contaminants into groundwater.
- Oxidisation of potential acid sulfate soil and impacts to the environment from acid leachate.

There was furthermore potential for detrimental aesthetic impact due to sighting of anthropogenic waste material.

There was the potential for ingestion of surface water within the Creek along the southern boundary of the site and an unquantified risk from ingestion of groundwater.

Due to the presence of a >0.76m clay cap (to be replaced in the future by concrete) over sequestered material within the containment cell there are no active exposure pathways for inhalation (vapours, dust, asbestos fibres), dermal contact or ingestion related to soil contamination. The potential for inhalation of asbestos fibres has been further minimised by the placement of ACM impacted material at the deepest position within the cell. The potential for aesthetic impacts from anthropogenic waste material has also been removed by the sequestration of the material below the cap. The low permeability of the cap and the positioning of the sequestered contaminated soil a minimum of 1m above the groundwater remove the potential for migration of contaminants into the groundwater. The material from the southern fill mound, which posed the quantified risk to groundwater, has been placed at the farthest distance from groundwater.

Pathways may be created if works are undertaken such that the capping material is penetrated, removed or fails: this is considered to be limited to ground disturbance works only or some natural disasters (such as earthquakes) which are not common in the location of the cell.

Pathways for the oxidisation of potential acid sulfate soil remain for undisturbed areas where there is a risk of presence of potential acid sulfate soils.

The potential for ingestion of surface water has been removed by the construction of a fence as part of the development which restricts access to the Creek along the southern boundary.

There is no current pathway for groundwater ingestion.

6 MANAGEMENT ACTIVITIES

6.1 MANAGEMENT STRUCTURE

The controls listed in this LTEMP must be followed to ensure the protection of human health and the environment from potential risks associated with the impacted soils. Non-compliance may result in increased and unexpected exposure to contamination and an unacceptable risk to human health and/or the environment. Prosecution for illegal/inappropriate handling of contaminated material may also result.

This LTEMP is specific to contamination and as such may fall within a wider environmental management system, the extent of which is unknown at the time of writing.

It is the responsibility of the Diocese of Maitland Newcastle and the Catherine McAuley College management to ensure that the maintenance workers and service providers affected by this LTEMP are notified of the contamination status of this area, and provided with a copy of the LTEMP prior to commencing any works in the vicinity of the containment cell.

Construction workers associated with the remaining development stages prior to final surfacing of the sports courts need to be provided with information regarding the presence of the containment cell, the associated marker layer and cap, and the controls specified within this LTEMP at the time of induction and prior to commencing any works in this area of the site. This information needs to be provided to the works contractors by the Diocese of Maitland Newcastle prior to commencing works so that the information can be reviewed and necessary controls are implemented before starting works.

It will be the responsibility of the Diocese of Maitland Newcastle and the Catherine McAuley College management to ensure that any personnel undertaking any works have risk assessments undertaken and controls implemented whilst the works are being performed.

The responsibilities and relevant stakeholders with regards to the management, including those of regulators, are detailed in **Table 6** below. It is noted that this table will need to be amended with contact details following the commencement of the College: this is not considered to require an amendment of this LTEMP however all holders of the LTEMP must be provided these details.

Table 6 *Stakeholder Responsibilities for this LTEMP*

Organisation	Relevant Contact Details	Responsibility
NSW EPA	Contaminated Land Branch 02 9995 555 / 1300 361 967	Review and approval of this LTEMP in accordance with SSD Approval Condition E57 (b)
Port Stephens Council	02 4988 0255	Inclusion of this LTEMP, as well as Site Audit Statement, onto the Section 10.7 Certificate for the site such that future owners are aware of the document's existence.
Diocese of Maitland Newcastle	To be provided upon occupation of College. Contacts to be provided for within standard operational hour and outside of standard operational hours.	Co-ordination with Council such that the Section 10.7 Certificate is amended to include this LTEMP. Overall responsibility for the implementation of this LTEMP. Ensuring that appropriate College personnel have been informed of the requirements of the LTEMP. Ensuring that the LTEMP is reviewed and updated as appropriate (refer **Section 7**). Undertaking any rectification as required in accordance with **Section 6.3**.
Catherine McAuley College management	To be provided upon occupation of College. Contacts to be provided for within standard operational hour and outside of standard operational hours	Undertaking such management requirements that fall within the capacity and capability of their personnel. Ensuring that appropriate contractors are engaged to undertake management requirements outside the capacity and capability of College personnel. Providing details of this LTEMP to personnel and contractors whose activities may require actions in accordance with this LTEMP. Ensuring that all workers associated with areas managed by this LTEMP have prepared appropriate WHS and environmental documentation as required by this LTEMP (refer **Section 6.2**).
Catherine McAuley College personnel whose duties relate to areas managed by this LTEMP	To be provided upon occupation of College. Contacts to be provided for within standard operational hour and outside of standard operational hours	Implementation of the relevant management measures and reporting as appropriate from the LTEMP during the undertaking of their duties. Taking into consideration the potential environmental and human health effects from the contamination identified in this LTEMP when undertaking works. Identifying any issues with the LTEMP based on encountered issues or perceived deficiencies to College management.

Organisation	Relevant Contact Details	Responsibility
Contractors whose duties relate to areas managed by this LTEMP	Dependent on works being undertaken: to be provided prior to commencement of any works. Contacts to be provided for within standard operational hour and outside of standard operational hours.	Implementation of the relevant management measures and reporting as appropriate from the LTEMP during the undertaking of their duties. Taking into consideration the potential environmental and human health effects from the contamination identified in this LTEMP when undertaking works. Identifying any issues with the LTEMP based on encountered issues or perceived deficiencies to College management.
Contaminated Land Consultant	RCA Australia 02 49029 200	Providing assistance with the assessment and management measures as requested by College management or contractors. Identifying any need to review the LTEMP in accordance with the aspects identified in **Section 7**. Consulting with the NSW EPA accredited contaminated sites auditor, the NSW EPA or Port Stephens Council as considered warranted or as otherwise required by this LTEMP. Revising the LTEMP as necessary and co-ordinating with the NSW EPA accredited contaminated sites auditor where necessary for a formal update.
NSW EPA accredited contaminated sites auditor	GHD 02 4979 9999	Providing assistance with the assessment and management measures as requested by College management or contractors. Co-ordinating with the contaminated land consultant and reviewing the LTEMP where necessary for a formal update.

6.2 OPERATING PROCEDURES

Remediation works at the site have improved the site's condition with impacted material moved to a designated area, installation of a marker layer, and a minimum of a 0.76m of interim clay capping material currently in place which will, under a future development stage, be partially replaced with concrete. These works have reduced the potential exposure risk to users of the site such that they are considered to be negligible.

The following sections detail what this LTEMP considers to be planned construction works; standard operations; non-standard operations and the exposure risk and considerations which should be taken into account prior to subsurface disturbance within the Sports Courts.

6.2.1 PLANNED CONSTRUCTION WORKS

This comprises the works for the overall Catherine McAuley College development as per the designs approved under SSD 8989 Approval. Works which are still be conducted within the vicinity of the areas subject to this LTEMP are considered to be as follows:

- Installation of stormwater pipework around the northern, eastern and southern extent of the Sports Courts.
  - The design indicates that these will not interact with the containment cell, however do fall within the Sports Court footprint and therefore works should be conducted in accordance with this LTEMP such that personnel are aware of the potential risks should an incident or unexpected finds occur. In the event the marker layer or containment cell is unearthed, torn or breached then works must be conducted to fix immediately in adherence to the operating procedures provided in **Attachment C**.
- Removal of part of the existing capping material, such that the Sports Court pavement can be installed as per design.
  - Works need to be conducted in accordance with this LTEMP to ensure that workers are aware of the controls which may need to be implemented and presence and significance of the warning marker layer.
  - Care must be taken such that over excavation does not occur: the design of the containment cell and cap have included a buffer such that the marker layer should not be encountered. However, if it is unearthed, torn or breached then works must be conducted to fix immediately in adherence to the operating procedures provided in **Attachment C**.
- Installation of the basketball hoops and posts, including subsurface disturbance to install the footings.
  - The western basketball hoops are outside of the footprint of the containment cell, shown in **Attachment A**, and therefore can be installed without applying specific controls.
  - The eastern basketball hoops are within the containment cell footprint and therefore installation <u>must be conducted in accordance with this LTEMP</u>. The footings will interact with the marker layer and the underlying impacted material based on the design specification of the basketball hoops which requires footings to be 1500mm below final surface and 600mm in diameter. Refer to the survey information provided in **Attachment B** for the relative levels of the marker layer.
    - Works extending to or through the marker layer, then the operating procedures provided in **Attachment C** must be adhered to.
    - Material being removed from below the marker layer must be segregated from the capping material and classified prior to being disposed of to a suitably licenced waste management facility. It is noted that the material is <u>asbestos waste</u>, but further assessment of hydrocarbons and metals is also required for the purpose of waste classification. Analysis of other contaminants, such as pesticides, are not considered necessary based on the results of the assessment prior to commencement of remediation.
    - Any changes that occur to the marker layer, capping layer, installation of sub-surface infrastructure or similar during non-standard operations need to be documented, with this LTEMP revised and reissued as necessary following the works.

The containment cell footprint should be excluded from vehicular or plant trafficking or stockpiling during the future construction prior to the final surfacing of the Sports Courts such that the integrity of the cap is not compromised. It may be prudent to include signage such as the footprint is clearly demarcated to reduce inadvertent use.

Records of the works, including the extent of replacement of the cap, are to be provided to the Diocese, with this LTEMP revised and reissued as necessary following the works.

6.2.2 STANDARD OPERATIONS

Standard operations are considered to apply following the completion of construction around the Sports Courts. Following the final surfacing of the Courts with concrete and base course, the hardstand material is considered to provide a robust barrier which removes an exposure pathway. The Sports Courts are expected to be used on a regular basis by students and staff of various age for outdoor activities, sports and possibly miscellaneous use during classes and breaks. Garden maintenance may be required if the batters of the Courts is grassed, planted or mulched.

During standard operations and whilst the cap and marker layer remain well maintained, the risk of human contact with contaminated media are minimal and the risk of ingestion, inhalation and/or dermal absorption are considered negligible.

Standard operation activities do not require the implementation of additional management controls, however if the capping layer is removed as part of shallow ground disturbance, the marker and capping layer must remain intact or otherwise be repaired/ replaced and reinstated at the completion of works with the area barricaded off from staff, pupils and the general public during works. Works which may interact with the marker layer or underlying impacted material should include thorough consideration of the potential impact to sensitive receptors at the site and schedule work hours and/or establish exclusion zones as part of exposure risk mitigation.

Records of the works, including the extent of replacement of the cap, are to be provided to the Diocese, with this LTEMP revised and reissued as necessary following the works.

6.2.3 NON-STANDARD OPERATIONS

In addition to the standard activities described in **Section 6.2.2**, non-standard operational use of the LTEMP area may occur and are defined by this LTEMP as ‘infrequent’ activities that occur at or below the marker layer. This may comprise:

- Maintenance and/or repairs to the eastern basketball pole and hoops.
- Maintenance and/or repairs to the stormwater system which surround the Courts. Note that none intersect with the Containment Cell or marker layer, but impact may occur if over-excavation occurs.
- Installation of new underground services below the marker layer.
- Installation of lighting, fencing, or any other small excavation that breach the marker layer.

The frequency non-standard activities occurring is lower however the inherent consequence without effective management control may be high. Excavations that occur under the marker layer for any purpose present the risk of human contact with contaminated soil, surface water, dust and vapours. The human exposure pathways of ingestion, inhalation and/or dermal contact are present.

There is potential for contaminated material to generate an environmental exposure pathway to surface water, air by way of dust and vapour if removed from the containment cell or if the works introduce significant volumes of water below the capping material. Exposure pathways to surface soil and surface water can be generated from stockpiled contaminated material, machinery and equipment and in the event of works involving dewatering.

Non-standard operations must be conducted in adherence to the controls outlined in the relevant operating procedures provided in **Attachment C**. Any changes that occur to the marker layer, capping layer, installation of sub-surface infrastructure or similar during non-standard operations need to be documented, with this LTEMP revised and reissued as necessary following the works.

6.2.4 WORK HEALTH AND SAFETY (WHS)

Contamination within the containment cell presents a risk to the environment and human health and there are additional risks associated with the installation of the basketball hoops. A detailed WHS Plan must be prepared prior to the commencement of the any works which will disturb the soil in this area. Specifically, the WHS controls related to minimising the risk are:

- Ensuring all personnel are informed of the contamination present at the site.
- Restriction of exposure to contamination:
    - Minimising dust generation / inhalation through implementation of the best practice controls. Personnel associated with any works which cause dust generation during disturbance or handling material within the containment cell must wear P2 masks. Personnel operating machinery with closed door/ windows and utilising recycled air-conditioning are not required to wear masks however should have these available for contingency purpose.
    - No smoking on site prior to the completion of capping replacement.
    - Hygienic principles of washing hands and face prior to consuming food and drink.
- Ensuring that plant and equipment is operated only by those with appropriate licences / permits.
- Co-ordinating activities at the site to avoid conflict between plant / equipment and personnel in light vehicles or on foot and ensuring the scope of works are considered prior to commencement such that exclusion zones or scheduling outside of active hours are implemented as required.
- Implementing best practice controls for control of noise and erosion control.
- Contingency planning.

6.3 MONITORING OF SITE CONDITIONS

No further monitoring of the site is required with the exception of conducting inspections.

Inspection should be conducted on accessible soil areas prior to final surfacing of the Sports Court by the Diocese, College Management or nominated entity on a bi-annual basis and following a significant rainfall event (>25mm in a twenty four hour period) and completion of non-standard activities which have disturbed the area.

Inspections should be conducted on the accessible soil areas of the southern and eastern batters of the Sports Court following the completion of the concrete placement by the Diocese, College Management or nominated entity on a bi-annual basis and following a significant rainfall event (>25mm in a twenty four hour period) and completion of non-standard activities which have disturbed the area(s).

Inspections of the hardstand cover should be undertaken by the Diocese, College Management or nominated entity annually or following maintenance works. It is considered that the area will be frequently used and therefore any deficiencies will be promptly reported for resolution.

Any deficiencies in the capping, such as cracking, erosion rills, slumping of material and any visual sighting of the marker layer are to be reported, refer an indicative form in **Attachment D**, to College Management and the Diocese for rectification. Inspections should be conducted on a routine basis in association with regular maintenance works on the integrity of the perimeter fence, in particular where it restricts access to the Creek on the southern boundary. No specific reporting is considered necessary except in the event when a break in the fence is identified, refer **Attachment D**.

6.4 APPROVAL AND LICENSING CONDITIONS

Table 1 details how this LTEMP has been prepared in accordance with the conditions of consent.

Following the acceptance of this LTEMP as being appropriate for the management of the remaining contamination issues at the site as part of the site audit process, the document will be provided to the NSW EPA for concurrence. Subject to this being provided, the LTEMP will be submitted to the Department in accordance with the SSD approval. No further approvals are required for the implementation of the LTEMP except in case of review, refer **Section 7**.

No licenses are required for the operation of this LTEMP.

6.5 REPORTING REQUIREMENTS

There is no reporting requirement specified for the LTEMP in the SSD approval conditions however there will be reporting requirements following completion of works (refer **Section 6.2**) and inspections (refer **Section 6.3**).

Reports will be written by personnel undertaking the works / inspections and will be provided to the Diocese / College management (refer **Table 6**) as soon as practicable from completion of works. The timing will vary depending on the scale of the works however it is considered that one week will be sufficient for most works (as per **Section 6.2**) and one day will be sufficient for results of inspections (refer **Section 6.3**).

6.6 COMMUNICATIONS PROTOCOL

No formal communications protocol for the community is considered necessary as this LTEMP is passive except for activities below the marker layer.

6.7 CONTINGENCY

Where standard activities, non-standard activities, or routine inspections identify inadequate marker layer, capping layer and/or poor vegetation cover (where applicable) mitigation works will need to be conducted promptly to rectify.

Cracking, subsidence or uneven settlement of the Sports Courts (either on the interim or final surfacing) and adjacent batters would trigger the requirement for maintenance in the form of replacing or improving the capping layer with suitable clean material: geotechnical investigation into the defects may also be required.

Works should be undertaken in accordance with the relevant operating procedure provided in **Attachment C**. This should be treated as an incident and corrective actions may be triggered to prevent reoccurrence.

In the event that a break in the perimeter fence is identified such that access to the Creek along the southern boundary is possible, this is to be prepared at the earliest practicable opportunity. Interim management measures such as notification of break to relevant personnel, e.g. early childhood centre manager, and placement of temporary fencing or exclusion area are to be implemented until the repair can be completed.

This LTEMP has sought to address all management measures that could foreseeably arise as part of the operations of the site within the areas under management. If at any stage the LTEMP does not adequately cover a situation encountered at site:

- Any operational work is to cease.
- School management, site owner and/or relevant nominated personnel is to be advised of the issue(s).
- A suitably qualified environmental consultant is to be contacted for advice. A geotechnical consultant may also be required depending on the issue.
- A NSW EPA accredited contaminated sites auditor is to be advised, or contacted for advice if recommended by the consultant, of the issue and how the issue was addressed along the principles of the LTEMP.

An unexpected finds protocol detailing the process is provided in **Attachment E**: this is be available for contractors and site users as appropriate for the extent of works.

In the event that site management protocols fail, the following is to be undertaken:

- Investigate the cause.
- Record the results.
- Assessment of whether human health or the environment were harmed and further steps as considered necessary.
- Corrective action raised by the school management or the owner/occupier.
- Notification to affected persons and/or relevant authorities if exposure to contamination has occurred.

- Incorporate procedures for corrective or preventive action.
- Revision of LTEMP by an appropriately qualified environmental consultant to address the non-compliance or major changes to this LTEMP. Control document update and distributed to registered holders of LTEMP.

Any changes to the area under management of this LTEMP will need to be documented, with this LTEMP revised and reissued as necessary following the works. Changes to the LTEMP is to be reviewed by a NSW EPA accredited contaminated sites auditor.

7 MONITORING, REVIEW & COMMUNICATION OF LTEMP

7.1 MONITORING AND REPORTING

No active monitoring which may trigger reporting is required for the site except for:

- Inspection records which indicate that there are structural issues identified in the area of the containment cell.
- Rectification of integrity of containment cell cap as part of planned construction works (refer **Section 6.2.1**) and non-standard operations (refer **Section 6.2.3**).
- Contingency items.

These records are to be included with the LTEMP if there is no requirement to alter the LTEMP in response to the report. Where the LTEMP needs adjustment, a contaminated land management consultant is to be consulted. Pending the advice of the contaminated land consultant, the Diocese may have to contact the NSW EPA accredited contaminated sites auditor, NSW EPA or Council to provide information or seek consent / approval.

The Diocese of Maitland Newcastle, Catherine McAuley College management personnel or a formally nominated entity shall be responsible for the maintenance of this LTEMP and shall be responsible for the inspection requirements as detailed in **Section 6.3**, and as required under operating procedures as included in **Attachment C**.

A record of non-standard operations conducted within the vicinity of the Sports Courts must be maintained with details of the works conducted. Complaints, incidents and non-compliances should also be maintained and periodically reviewed to evaluate the effectiveness of LTEMP implementation.

7.2 CORRECTIVE ACTION

Failure to implement the Environmental Control Procedures detailed in the Operating Procedures (**Attachment C**) are all deemed 'environmental non-conformances'.

The nature and extent of the nonconformity is to be advised to the Site Supervisor for evaluation of the significance of the nonconformity. The Contaminated Land Consultant is also to be consulted regarding potential impact to the containment cell and suitability of the site: the Contaminated Land Consultant will advise the NSW EPA accredited contaminated sites auditor if the incident is considered relevant.

If necessary, subsequent and/or associated work is to be suspended pending review of the nonconformity.

Records of all incidents and/or corrective actions are to be maintained with the relevant version of this LTEMP at the time of the incident/corrective action and the school management or owner is to notify relevant stakeholders (including pupils or families should there have been a exposure risk) affected by the stipulations of the LTEMP (i.e. during AGM, letter or similar).

If corrective action is not considered adequate to prevent further occurrence, consideration is to be given to the need for remedial action: note all relevant parties will need to be informed during discussion.

7.3 DOCUMENT CONTROL AND REVIEW

The version of the LTEMP as referenced by the Site Audit Statement is the approved version. Amendments to this document can only be made as per the following:

- Logistical – allocated personnel for instance – can be made by the site owner and/or its nominated delegate(s).
- Technical – change in management requirements – can only be made by a suitably qualified contaminated land consultant with the approval of a NSW EPA accredited contaminated sites auditor.

The approved LTEMP shall remain in place indefinitely until such time as the relevant regulatory authority determines it is no longer required. It is noted that due to the contaminants within the containment cell including asbestos, it is considered unlikely that the LTEMP will be able to be removed unless the material is wholly removed from the site.

Review of the LTEMP should be undertaken annually prior to the installation of the hardstand capping of the Sports Courts surface and obtaining the occupational certificate. Following the completion of final surfacing of the containment cell, review can be reduced to at least every 5 years, unless any of the following occur:

- Material changes to legislative and regulatory requirements affecting the LTEMP.
- Changes to the ownership and/or responsibility of the site.
- Any major LTEMP non-conformance is detected in regards to the environmental controls and measures outlined in the LTEMP.
- The LTEMP measures are found (e.g. by means of inspection, incident or near miss) to be inadequate to address the health and environmental management requirements for the site.

Documentation of the reason(s) for amending the LTEMP should include, but are not necessarily limited, to:

- The date of the change, whether amendment or addition.
- The extent of the change.
- The reason for the change.
- The person approving the change.
- If revision relates to ground disturbance and excavation of material; details regarding quantity, fate (i.e. returned to excavation, appropriate offsite disposal), and verification of works and marker/capping layer reinstatement (i.e. photo log or disposal dockets).

7.4 COMMUNICATION

The existence of this LTEMP will be noted on the Site Audit Statement as it will have formed a primary basis for the determination that the site is suitable for use.

The existence of the LTEMP should also be included on the Section 10.7 certificate for Lot 412: if this notification is not undertaken by the Department it is the responsibility of the Diocese of Maitland Newcastle to notify Council such that the Section 10.7 certificate can be amended.

Revised versions of this LTEMP, as concurred by the NSW EPA accredited contaminated sites auditor, must be supplied by the entity organising the revision (Diocese of Maitland Newcastle or Catherine McAuley College management personnel) to the other responsible entity. A copy of the most up to date version must be provided to Council and kept on the site for implementation as required and personnel inducted in the implementation of the LTEMP provided information regarding the revision of the LTEMP and aspects of management which have been altered.

7.4.1 TRAINING AND AWARENESS

An overview induction will be given to all site personnel comprising staff (teachers and other workers) and contractors which specifies that a containment cell exists on the site, its location and the notification procedure should any defects or issues arise. A register of all inductions will be kept which include details of the inductee and inductor; an indicative register is included in **Attachment D** noting that the form may be adjusted somewhat by DoMN and/or College management to be in an appropriate format.

A more detailed induction is required for College management staff and contractors / workers who are undertaking excavation works within the areas relevant to this LTEMP. The site induction will include:

- Site familiarisation.
- Overview of the requirements of this LTEMP.
- Legal requirements.
- Environmental responsibilities.
- Environmental incident reporting, management and emergency response.
- Site environmental controls.

8 LIMITATIONS

This report has been prepared for Diocese of Maitland Newcastle in accordance with an agreement between North Building and Construction Pty Ltd and RCA Australia (RCA). The services performed by RCA have been conducted in a manner consistent with that generally exercised by members of its profession and consulting practice.

This report has been prepared for the sole use of Diocese of Maitland Newcastle on behalf of North Building and Construction Pty Ltd. The report may not contain sufficient information for purposes of other uses or for parties other than Diocese of Maitland Newcastle. This report shall only be presented in full and may not be used to support objectives other than those stated in the report without written permission from RCA Australia.

The information in this report is considered accurate at the date of issue with regard to the current conditions of the site. Conditions can vary across any site that cannot be explicitly defined by investigation.

Environmental conditions including contaminant concentrations can change in a limited period of time. This should be considered if the report is used following a significant period of time after the date of issue.

Yours faithfully

RCA AUSTRALIA

Katy Davies
Senior Environmental Scientist

Fiona Brooker
Manager of Environmental Services

REFERENCES

[1] RCA Australia, *Draft Validation Report, Remedial Works and Acid Sulfate Soil Management, Catherine McAuley Catholic College, Medowie, NSW*, November 2020, Ref 13156d-406/0.

[2] RCA Australia, *Remedial Action Plan, Lots 412 and 413 DP 1063902, Medowie NSW, October 2018*, Ref 13156a-401/1.

[3] RCA Australia, *Addendum to Remedial Action Plan, Catherine McAuley Catholic College – Medowie Road, Medowie,* May 2020, Ref 13156d-401/2.

[4] Port Stephens Council, *Local Environment Plan 2013 under the Environmental Planning and Assessment Act 1979, published Land Zoning Map – sheet LZN_004C*, published December 2014.

[5] RCA Australia, *Contamination Assessment Lots 412 & 413 DP 1063902, Medowie NSW, March 2018*, RCA Ref 13156-401/1.

[6] NSW EPA, *Sampling Design Guidelines*, September 1995.

[7] RCA Australia, *Acid Sulfate Soils Management Plan, Catherine McAuley Catholic College, Medowie, NSW,* February 2020, Ref 13156d-402/0.

[8] NEPC, *National Environment Protection (Assessment of Site Contamination) Measure*, 1999 as amended 2013.

[9] ANZG, *Australian and New Zealand Guidelines for Fresh and Marine Water Quality Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia.,* August 2018. Available at www.waterquality.gov.au/anz-guidelines.

[10] HEPA, *PFAS National Environmental Management Plan*, *Version 2.0*, January 2020.

[11] Gorbert V. & Chesnut W., *Geological Survey of New South Wales, Sydney, Newcastle 1:100 000 Geological Sheet 9132*, provisional 1st edition, 1975.

GLOSSARY

ACM	Asbestos containing material(s).
AHD	Australian height datum, based on a mean sea level.
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure.
EMP	Environmental management plan.
HIL	Health investigation level. Relates to soil concentrations which may pose a risk to human health in soil.
Hotspot	A sample, or location, where contaminant concentrations exceed 250% of the appropriate criterion.
HSL	Health screening level. Relates to the vapour risk from petroleum hydrocarbons which may pose a risk to human health in soil. Also relates to exposure to asbestos fibres.
In-Situ	In place, without excavation.
ISL	Investigation screening levels for soil. Comprised of HIL/EIL and HSL/ESL
kg	kilogram, 1000 gram.
Leachate	Fluid that has passed through a soil stratum, possibly collects contaminants.
LEP	Local environment plan. A planning tool for the Local Government.
mg	milligram, 1/1000 gram.
NEPC	National Environment Protection Council.
NHMRC	National Health and Medical Research Council.
NSW EPA	NSW Environment Protection Authority – formerly a component of DECC, DECCW, OEH but made a separate entity in 2011 to regulates the contaminated land industry.
OEH	NSW Office of Environment and Heritage.
PPE	Personal Protective Equipment.
PQL	Practical Quantitation Limit.

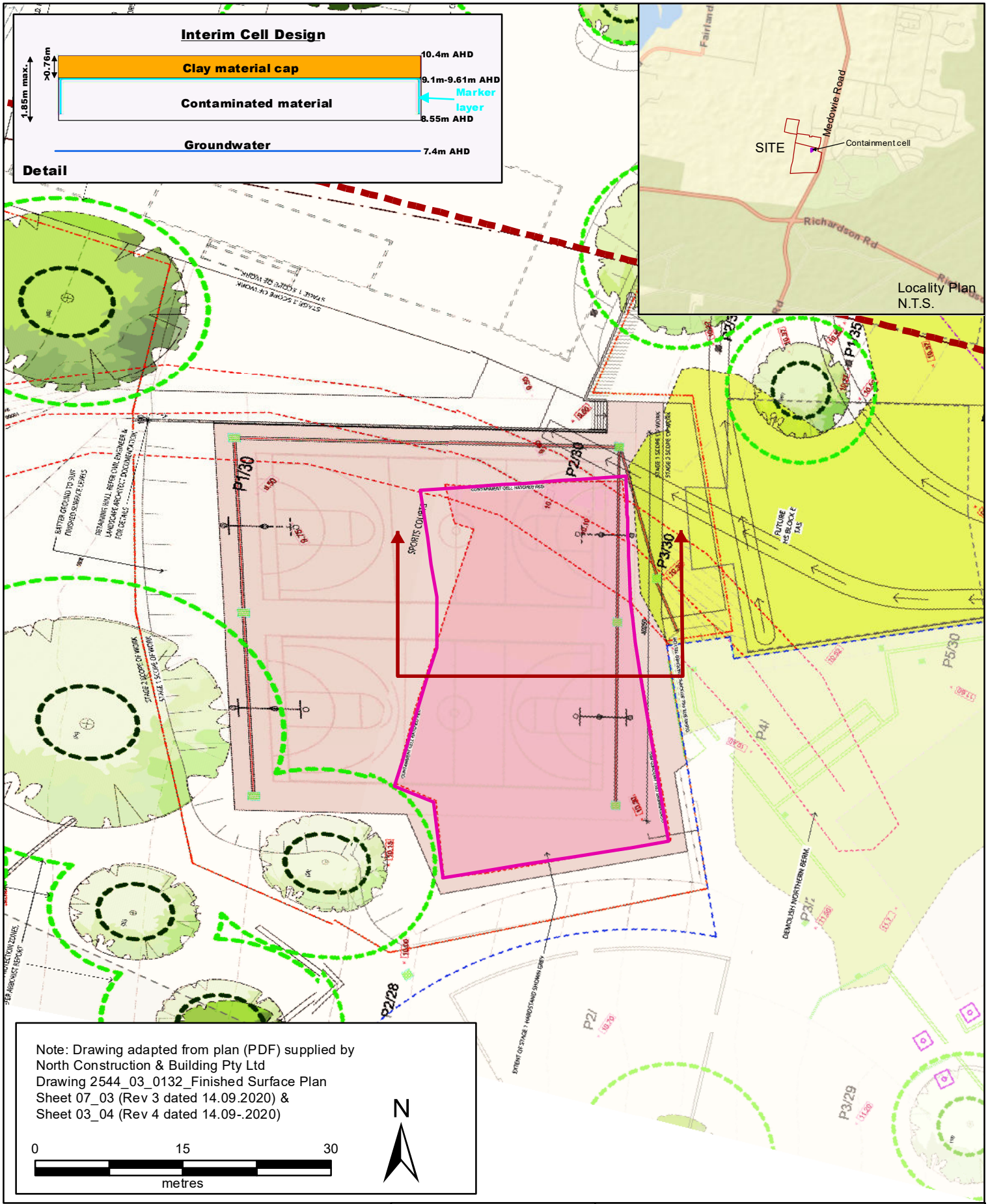
VENM	Virgin excavated natural material.
Weathering	All physical and chemical changes produced by atmospheric agents.

Chemical Compounds

TRH	Total recoverable hydrocarbons.
PAH	Polycyclic aromatic hydrocarbons.

Attachment A

Drawing



LEGEND

- Approximate Lot boundaries
- Containment cell location
- Floor of containment cell excavation
- Approximate extent of concrete surfacing for eventual sports courts
- Concept cell design cross section

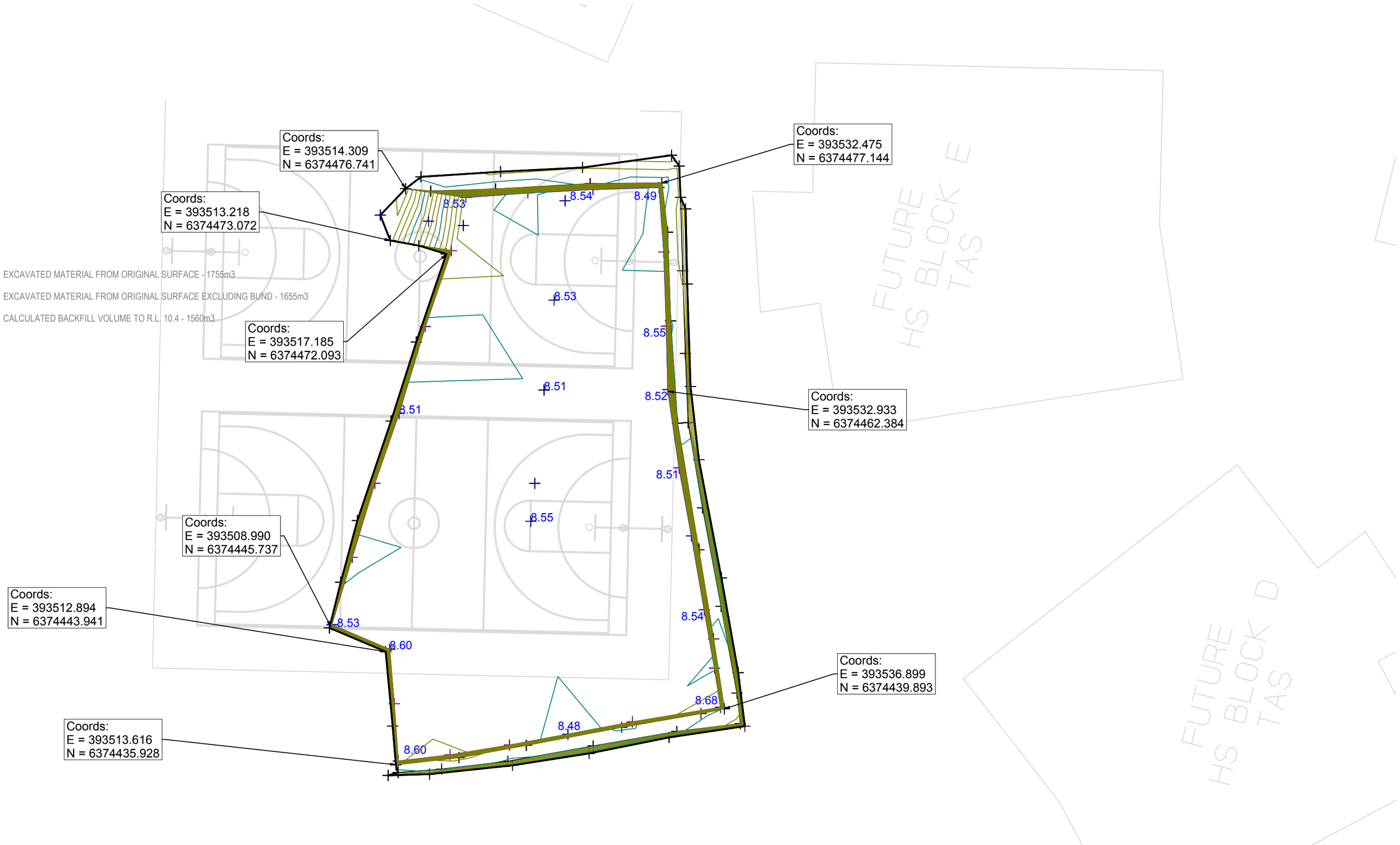
RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

DEVELOPMENT DESIGN AND CONTAINMENT CELL LONG TERM ENVIRONMENTAL MANAGEMENT PLAN CATHERINE McAULEY CATHOLIC COLLEGE MEDOWIE

CLIENT Diocese of Maitland Newcastle				RCA Ref	13156d-409/2
DRAWN BY	KD	SCALE	1:500 (A4)	DRAWING Attachment A	REV 1
APPROVED BY	FB	DATE	15/12/2020	OFFICE	NEWCASTLE

Attachment B

Containment Cell (as built & surveyed)

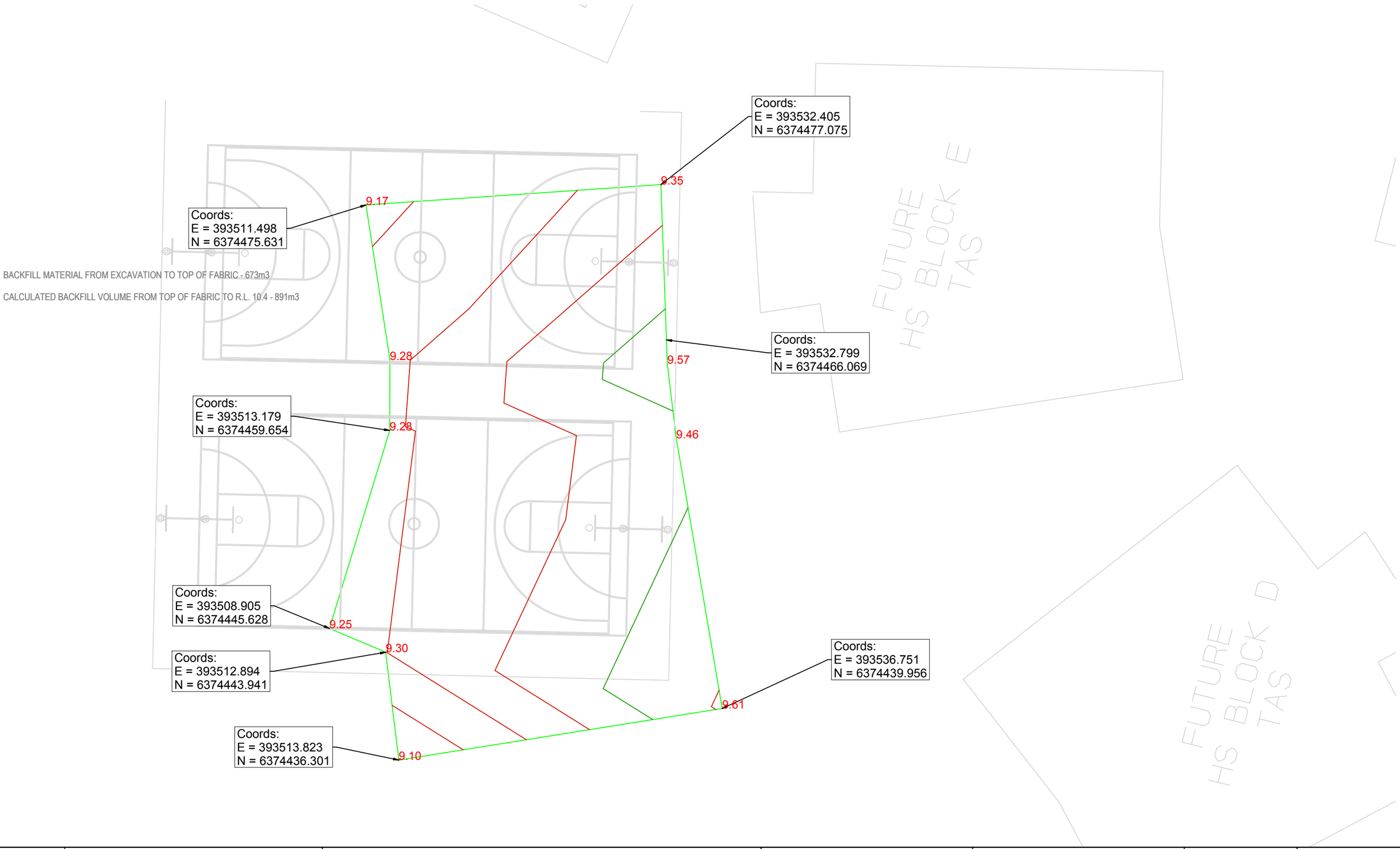


REV.	DATE	AMENDMENT
1	4/12/20	CO-ORDINATES ADDED

de Witt Consulting
planning surveying
project management

CHARLESTOWN HEAD OFFICE
7 CANBERRA STREET
P.O. BOX 850, CHARLESTOWN, 2290
PHONE: (02) 4942 5441
FAX: (02) 4942 5301

TITLE: Containment Cell Boxout	Our Reference: 9969	SURVEYED	SCALE: 1:250 A3
		DESIGNER	SURVEY DATE: 15/5/20
DESCRIPTION: CMCC	AZIMUTH: MGA	APPROVED: NJS	PROJECT No.
Medowie Rd, Meowie	ORIGIN OF LEVELS: AHD		
	CLIENT: NORTH	SHEET No.: 1 OF 1	REV.: 1



REV.	DATE	AMENDMENT
1	4/12/20	CO-ORDINATES ADDED

de Witt Consulting
planning surveying
project management

CHARLESTOWN HEAD OFFICE
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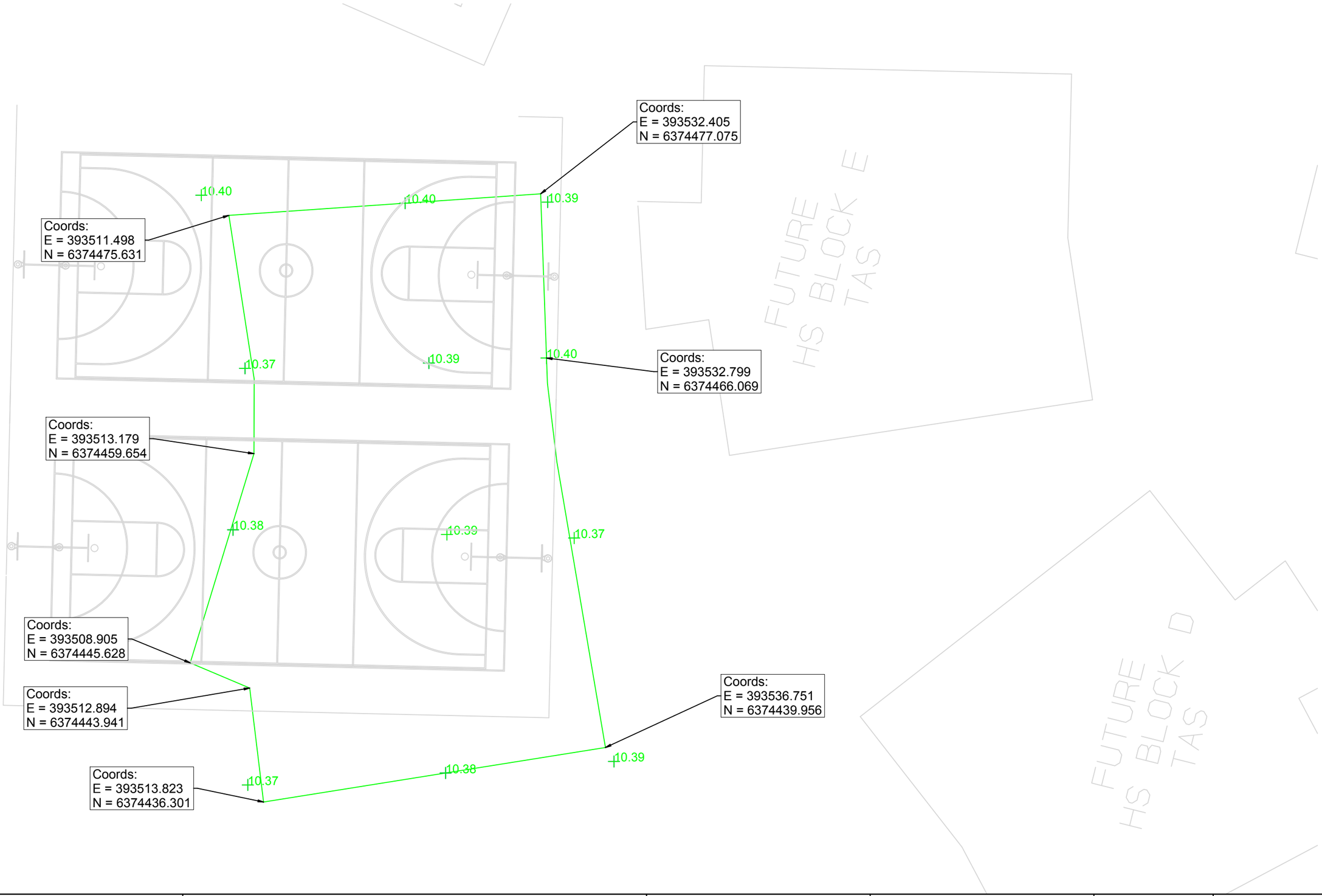
TITLE: Containment Cell Marker Layer	Our Reference: 9969	SURVEYED	SCALE: 1:250 A3
		DESIGNER	SURVEY DATE: 2/7/20
DESCRIPTION: CMCC	AZIMUTH: MGA	APPROVED: NJS	PROJECT No.
Medowie Rd, Meowie	ORIGIN OF LEVELS: AHD		
	CLIENT: NORTHS	SHEET No.: 1 OF 1	REV.: 1



REV.	DATE	AMENDMENT
1	4/12/20	CO-ORDINATES ADDED

de Witt Consulting
planning surveying
project management

CHARLESTOWN HEAD OFFICE
7 CANBERRA STREET
P.O. BOX 850, CHARLESTOWN, 2290
PHONE: (02) 4942 5441
FAX: (02) 4942 5301

TITLE	Containment Cell Top Capping
Our Reference	9969
DESCRIPTION	CMCC
AZIMUTH	MGA
ORIGIN OF LEVELS	AHD
CLIENT	NORTHS
SURVEYED	NJS
SCALE	1:250 A3
DESIGNER	
SURVEY DATE	16/11/20
APPROVED	NJS
PROJECT No.	
SHEET No.	1 OF 1
REV.	1

Medowie Rd, Meowie

Attachment C

Operating Procedures

OP Title	**General Excavations**		
OP Number		**Date Issued**	

Purpose and Scope

This procedure details the requirements for personnel undertaking excavation above the marker layer within the LTEMP area of Catherine McAuley College.

Note that any works specifically being undertaken below the marker layer are to be undertaken in accordance with the relevant OP.

There are no potential risks from the contamination during excavations above the marker layer however there are risks if excavations are undertaken beneath the marker layer. Overtime, if excavations above the marker layer are not adequately re-instated, this could compromise the effectiveness of the capping layer and create an exposure pathway.

Excavation works have the potential to affect surface water.

Procedure

1	Personnel to consult the 'As Constructed' Plans showing the thickness of soil above the marker layer in the proposed area of excavation.
2	This OP is not appropriate for situations where intended excavation depth will be below the depth of the marker layer. Refer to OP for 'Excavations Below Marker Layer'.
3	Diocese/ College Management to be advised of site/contractor intentions and the applicability of this OP discussed. Any deficiencies to be addressed by a specific procedure.
4	The location of the excavation is to be identified and marked out on site.
5	Erosion control measures to be put in place to ensure no contamination of surface water.
6	Excavation is to be undertaken with a spotter observing for signs of the marker layer. If sighted, works are to stop and not continue past the marker layer unless under the OP for 'Excavations Below the Marker Layer'.
7	Soil above the marker layer is to be stockpiled for re-use at the completion of works.
8	Works are to be completed. If suspect material is sighted unexpectedly, works are to cease and not continue unless under the OP for 'Excavations Below the Marker Layer'.
9	Given the depth to groundwater at the site prior to remediation, this is considered unlikely however, no dewatering of the excavation, or other form of groundwater discharge to the environment, is to be undertaken without an analytical assessment of the water quality and suitability.
10	Soil or concrete is to be replaced above the marker layer and the thickness measured by survey if different from initial conditions.
11	Erosion control measures to be placed as appropriate after completion of works and/or vegetation to be replaced.
12	Report to be compiled including: • Whether marker layer was sighted (include photographs). • Extent of works undertaken. • Certification that any material imported for the purpose of fill placement over the marker layer has been done so in accordance with NSW legislative requirements. Documentation to include source, volume and any chemical testing undertaken. • Thickness of capping above the marker layer. Any changes to be included with 'As Constructed' plans for future use. • Surface condition at completion of works (include photographs)
13	Area to be inspected the following day and weekly until such time that area has rehabilitated.

OP Title	**Excavations below Marker Layer**		
OP Number		**Date Issued**	

Purpose and Scope

This procedure details the requirements for personnel undertaking excavation works below the marker layer within the LTEMP area of Catherine McAuley College.

Excavations below the marker layer within the LTEMP area of Catherine McAuley College have the potential to encounter impacted soil material. Works also have the potential to affect surface water.

Some of the subsurface stormwater and retaining wall trenches have been constructed near to the marker layer and containment cell, whilst the installation of basketball hoops may extend to a depth which may encounter impacted material if excavated.

Refer to 'As Constructed' plans showing the extent of the marker layer.

Procedure

1	Determine whether an alternative to the intended works can be undertaken to avoid excavation below the marker layer or at an equivalent depth in areas where no marker layer has been placed. Where no alternative is possible, the applicability of this OP is to be discussed between the Diocese/ College Management and personnel proposing to undertake the works. Any deficiencies to be addressed by a specific procedure. The scope and risk of works are considered prior to commencement such that exclusion zones or scheduling outside of active hours are undertaken as necessary.
2	The following PPE is required to be work by all personnel: • Long sleeve and long pants. • Safety boots in accordance with Standard AS/NZS 2210. • P2 masks/ respirators and gloves if manual handling of material will be required and impacted material disturbed. Other task specific PPE may be required. The work area, including where stockpiles of excavated material may be placed, is to be barricaded off from access by anyone other than relevant personnel.
3	The location of the excavation is to be identified. If works are in relation to stormwater: water to the pipe to be turned off/ redirected (if not already done so). A water diversion is to be installed to direct water away from the excavation prior to breaking ground.
4	To the extent possible, excavation is to be limited to the required area and undertaken to avoid disturbing the marker layer to the extent possible. Works to be undertaken taking care to disturb overlying soil as little as possible.
5	Soil above the marker layer is to be stockpiled for re-use at the completion of works.
6	Where possible, the marker layer is to be left in-situ. If the marker layer is removed, deliberately or by accident, the layer is to be stored for re-use if in good enough condition. Due to the requirement for overlap during placement, additional marker layer material may be required regardless of the intention to re-use and this should be considered prior to commencing the works.

7	Any material below the marker layer that is encountered is to be stockpiled separately to other material and placed such that it doesn't contaminant underlying material (e.g. on plastic, hardstand, in skip bin). Erosion and sediment controls are to be employed around the stockpile, and water diversion controls should be considered if inclement weather is possible. It is noted that the contaminated material has been identified leachable and therefore controls must be in place to prevent migration of contaminants. Material should be placed in an area which is not accessible to students, staff or the general public and must be covered to prevent dust generation.
8	Works to be completed.
9	No dewatering of the excavation, or other form of groundwater discharge to the environment, is to be undertaken without an analytical assessment of the water quality and suitability.
10	Excavated waste to be replaced below the depth of the surrounding marker layer, or otherwise removed from site by licensed waste contractor following assessment by a suitably qualified environmental consultant for off-site disposal. It is noted that the material will be classified as asbestos waste, however there may be additional limitations associated with the waste classification depending on the chemical characteristics which may limit which licensed waste facility can receive the material.
11	Marker layer to be placed above impacted material and up the sides of excavation as appropriate to intersect / overlap with marker layer of surrounding area. Refer to OP for replacement protocol.
12	Position of marker layer to be surveyed.
13	Excavation to be backfilled with appropriate material, (quarry material, VENM, ENM or sourced from site and deemed suitable for sensitive use) and the thickness measured by survey if different from initial conditions. No impacted material is to be placed above the marker layer.
14	Erosion control measures to be placed as appropriate after completion of works and/or vegetation to be replaced.
15	Report to be compiled including: • Extent of works undertaken. • If any impacted material was encountered and what was its fate. Retain dockets if material removed to licensed waste facility. • Marker layer replacement (include photographs). If position different from initial, information to be included with 'As Constructed' plans for future use. • Certification that any material imported for the purpose of fill placement over the marker layer has been done so in accordance with NSW legislative requirements. Documentation to include source, volume and any chemical testing undertaken. • Type and thickness of capping layer above the marker layer. Any changes to be included with 'As Constructed' plans for future use. • Surface condition at completion of works (include photographs)
16	Area to be inspected the following day and weekly until such time that area has rehabilitated.

OP Title	**Replacement of Marker Layer**		
OP Number		**Date Issued**	

Purpose and Scope

This procedure details the requirements for personnel replacing the marker layer on the LTEMP area of the site following its removal. Refer to 'As Constructed' plans showing the extent of the marker layer.

Replacement marker layer is to comprise Hi Vis 801 from Geofabrics Australia (as below) or equivalent product.

The presence of the marker layer is an integral part of the remediation and subsequent management of a portion of the Catherine McAuley College site which is under long term management. While the layer may have to be removed upon occasion for specific works, the layer has to be replaced for the protection of human health and the environment in accordance with the remedial strategy.

Procedure

1	Material which is to remain below the level of the marker layer is to be compacted to the extent possible.
2	The area requiring coverage by marker layer is to be measured. An allowance for a minimum of thirty (30) cm overlap of marker layer should be allowed for at each edge.
3	The marker layer is to be placed over the ground surface and pinned into place over the top of the existing marker layer around the extent of the excavation. Pins, comprising two (2) prongs and approximately ten (10) cm in length, should be placed approximately every metre to their full extent through both layers such that there is full coverage of the area of excavation.
4	Reinstatement of the capping layer dependent on the area and particular use of the area: this may comprise soil, concrete, pavers. The depth of the capping material should be at least equal to or greater than the depth of soil material post remediation (refer to 'as constructed' plans provided in **Attachment B of the LTEMP**).

Attachment D

Form Templates

INDUCTION REGISTER

CATHERINE MCAULEY CATHOLIC COLLEGE, MEDOWIE

Location:
Date of Induction:
Time:
Convener/presenter:

The following acknowledge that they have completed the site induction and have received the following documents prior to undertaking any works within the Sports Court area of Catherine McAuley Catholic College, Medowie.

- **Long Term Environmental Plan**

By signing the following, personnel acknowledge induction for the site works and training in the requirements of the LTEMP at the site has been provided and that they have understood the requirement, will adhere to the requirements in the induction, and have included specific inclusion of the constraints in planning and WHS controls.

Name	License Number (list all licenses relevant to project such as vehicle and plant)	License Class	Expiry Date	Signature

INSPECTION FORM

CATHERINE MCAULEY CATHOLIC COLLEGE, MEDOWIE

Date & time of inspection: …….

Person conducting the inspection (name and role): ……..……...

Reason for inspection: ☐ Routine ☐ Rainfall event: (..……mm)

☐ Completion of non-standard activity (please specify: …….)

Area of inspection: ☐ Sports Court (interim/ final capping (delete as required)

☐ Creek (fencing) ☐ Other: ……...

Any signs of plant stress or loss?	Yes	No	N/A	
Any signs of erosion?	Yes	No	N/A	
Any sign of vandalism?	Yes	No	N/A	
Has the capping material been compromised?	Yes	No	N/A	
Has the marker layer been breached?	Yes	No	N/A	
Is the marker layer (orange) visible?	Yes	No	N/A	
Any sign of uneven settlement or slumping?	Yes	No	N/A	
Any sign of impacted material at the surface?	Yes	No	N/A	
Is the area adequately inaccessible to unauthorised personnel?	Yes	No	N/A	
Is the creek fencing secured and stable?	Yes	No	N/A	
Have the relevant personnel who may require access to the area been notified of any non-conformance/ temporary limitations?	Yes	No	N/A	

Any corrective actions required? If so, please specify details and locations:

……

……

……

Who has been notified and when: ……

Corrective actions completed (description, date and outcomes)?

……

……

Attachment E

Unexpected Finds

Examples of unexpected finds at the site include, but are not necessarily limited to:

- Putrescible waste.
- Buried drums or other containers.
- Bulky items such as slabs of concrete and vehicle parts.
- Discoloured or odorous material.
- Bonded asbestos containing material (ACM).

In the event of unexpected finds being encountered on the site, the following procedure, is to be adopted:

- Stop all current works in the area.
- Site worker to inform Site Supervisor of find.
- Site Supervisor to consider need for external assistance (Geotechnical Consultant, Contaminated Land Consultant or other) and make appropriate contact.
- If issue cannot be resolved within framework provided with the LTEMP, the area of find is to be made into an excluded area until issue is resolved.
- All personnel are to be made aware of the reason for the exclusion.
- If required, the incident notification process is to be undertaken.