

**REVIEW OF ENVIRONMENTAL FACTORS**  
of proposed  
**SEWER LEAD-IN CONSTRUCTION**  
servicing  
**PROPOSED SUBDIVISIONS SOUTH OF NEW ENGLAND  
HIGHWAY, EAST LOCHINVAR**

Prepared On

**30/05/2019**

By

**PULVER COOPER & BLACKLEY**

For



**REFERENCE: 2017-969**

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## Revision History

| Revision | Details of Change              | By                        | Date      |
|----------|--------------------------------|---------------------------|-----------|
| <b>A</b> | Initial draft                  | Hope O’Dea and Rod Hawkes | 8/1/2019  |
| <b>B</b> | Following first review by HWC  | Hope O’Dea and Rod Hawkes | 29/3/2019 |
| <b>C</b> | Following second review by HWC | Hope O’Dea and Rod Hawkes | 15/5/2019 |
| <b>D</b> | Entry Permit                   | Rod Hawkes                | 22/5/2019 |
| <b>1</b> | Finalised, no changes          | Rod Hawkes                | 30/5/2019 |

## 1 Introduction

### 1.1 Proposal Identification

This Review of Environmental Factors (REF) is in relation to the initial portion of the proposed Sewer Lead-In works that will ultimately service 1,435 residential lots across 4 separate subdivisions to the south of the New England Highway, east of Lochinvar village. Concept plans for the full sewer lead-in are attached.

The initial portion is work to bring the sewer lead-in to the boundary of Lot 1 DP 718712 on the New England Highway and Lot 2 DP 1244625 on Christopher Road.



Figure 1 - Site Location (Source: Google Maps)

Figure 1 shows the site location with a sketch of the path of the initial portion, the subject of this REF, of the sewer lead-in system. Key points of interest of the site are:

- Crossing the New England Highway
- Lochinvar Creek
- Nearby Schools
- Playing fields, NBN hub and graveyard off Gregory Road
- 2 x unnamed tributaries and ponds
- Existing residence at 853 & 855 New England Highway

## Sewer Lead-In Construction – South East Lochinvar

The highway and local roads are owned by Maitland Council. The lots involved and ownership are:

| Lot/DP             | Address                     | Owner                    |
|--------------------|-----------------------------|--------------------------|
| Lot 15 DP 250821   | Public reserve beside creek | Maitland City Council    |
| Lot 1 DP 516963    | 1 Station Lane              | Stephen & Leesa Ellicott |
| Lot 2 DP 1241101   | 10 Station Lane             | Catholic Diocese         |
| Lot 3 DP 1241101   | Gregory Road, Cemetery      | Catholic Diocese         |
| Lot 320 DP 585900  | Ted Coffey Field            | Maitland City Council    |
| Lot 433 DP 1095562 | RFS                         | Maitland City Council    |
| Lot 434 DP 1095562 | 308, 310, 480 Robert Road   | Maitland City Council    |
| Lot 12 DP 1195444  | 530 Robert Road             | Robert Road Pty Ltd      |
| Lot 3 DP 1218389   | 859 New England Highway     | Mrs Wilkes               |
| Lot 2 DP 1218389   | 857 New England Highway     | Mrs Wilkes               |
| Lot 1 DP 567712    | 855 New England Highway     | McCloy Group             |
| Lot 1 DP 1218389   | 853 New England Highway     | Mr Jim Aird              |

## 1.2 Report Information

This report was prepared by Pulver Cooper & Blackley on behalf of Urban Land Housing Pty Ltd, which is the lead developer in the area, and documents the findings of an assessment of potential environmental impacts.

The proposed works were assessed in accordance with Hunter Water's policies and the Environmental Impact Assessment (EIA) requirements of the Environmental Planning and Assessment Act 1979 (EPAA)

## 2 Proposal Need and Justification

### 2.1 Objectives of the proposal

The objective of the proposed works is to provide sewer services to lots in the lead subdivision that is yet to be approved by Council and in accordance with Notice of Requirements 2017-969 issued by Hunter Water.

### 2.2 Existing water/wastewater infrastructure

Existing sewer:

- Existing housing on the south side of the New England Highway including schools, church facilities and sporting field, drain through gravity sewer mains toward Lochinvar Creek;
- Lochinvar 1 Wastewater Pumping Station pumps to the Farley Waste Waste Treatment Works and has already been upgraded to service the envisaged growth area.

### 2.3 Options considered

An earlier sewer concept considered a pumped system. The proposed option manages to use gravity for the full lead-in.

Consideration was given to alternate sewer crossing of Lochinvar Creek near the highway. The proposed path crosses to the rear of 1 Station Lane not crossing into that lot.

Consideration was given to the NBN hub and dense fibre network on the south side of Gregory Road resulting in the proposed crossing to the north side when opposite the graveyard.

## 2.4 Preferred option justification

The proposed option predominantly traverses existing Council and the upper edge of proposed future creek reserve land and lays the foundation for servicing much of the land recently zoned residential, as shown in the attached full concept plan.

## 3 Description of the proposed works

### 3.1 Scope

This REF covers that part of the Sewer Lead-In works that are indicated in Figure 1 - Site Location (Source: Google Maps), above. Details of the layout, existing structures, contours, etc can be found in the attached Concept Sewer Lead-In Plan which shows the full sewer lead-in concept. Specific Sewer Lead-In works for this REF are:

| From        | To           | Type         | Length(m)   | ACs       |
|-------------|--------------|--------------|-------------|-----------|
| Farley WWTW | J9840        | 525PP-SN10   | 37          | 0         |
| J9840       | J9847        | 525PP-SN10   | 388         | 8         |
| J9847       | J9856        | 375uPVC-SN8  | 537         | 9         |
| J9856       | A4           | 375uPVC-SN8  | 150         | 4         |
| A4          | A11          | 300uPVC-SN8  | 309         | 7         |
| J9856       | MH 3.7       | 300uPVC-SN8  | 567         | 7         |
| MH 3.7      | Lot 1/718712 | 150uPVC      | 440         |           |
|             |              | <b>TOTAL</b> | <b>2427</b> | <b>35</b> |

### 3.2 Construction activities

Delivering the Scope will involve:

- Site establishment, survey/setout and location of existing services;
- Traffic and Pedestrian Control plans and activities;
- Erosion and sediment control;
- Clearing;
- Sewermain installation by open trenching and backfill;
- Ripping rock in some sections of trench;
- Sewermain installation by underboring including grouting;
- Maintenance hole installation;
- Connecting to existing sewer; and
- Backfill and restoration.

### 3.3 Operational requirements

No abnormal operational requirements are envisaged. The portion of the infrastructure within the Farley WWTW will be required to operate under the Farley WWTW Environmental Planning Licence (EPL).

### 3.4 Timing and staging

Construction work is anticipated to be taking place sometime in JUN-SEP in 2019.

Open trenching of the minor watercourses will only take place if the 3 day forecast does not predict rain.

Works to take place predominantly during daylight hours. Construction hours are expected to be 7am to 6pm Monday to Friday and 8am to 1pm Saturdays. No works to occur on Sundays or public holidays and no night works.

Timing restrictions apply for works that might affect traffic from/to the school or cemetery on Gregory Road. These are detailed below.

### 3.5 Design Guidance from RMS

The following guidance notes are offered by RMS for design purposes and to be adopted as design requirements:

- The main is to be installed using trenchless technology
- The main is to have a minimum of 1.5 metres of cover at all points in the state road corridor
- The main and any additional infrastructure such as manholes or the like, must be located within 2 metres of the corridor boundary
- No aspect of the works may affect the bridge abutment, foundations or adjacent zone of influence.
- A Section 138 application will be required to be submitted to RMS prior to the installation and following detailed design completion

### 3.6 Ancillary facilities and access

Access will be via the New England Highway, Robert Road or Station Lane.

## 4 Statutory framework

### 4.1 Environmental Planning Instruments

The relevant State Environmental Planning instruments include:

#### *SEPP (Coastal Management) 2018*

The aim of this policy is to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the *Coastal Management Act 2016*, including the management objectives for each coastal management area. This policy is not applicable to the proposal as the project area does not fall within a coastal zone or a coastal management area as identified within the SEPP. This policy therefore does not need to be considered further.

#### *SEPP (Infrastructure) 2007*

This policy is applicable to the proposal. The aim of this policy is to facilitate effective delivery of infrastructure across the state. Under clause 106 development which is carried out on behalf of a public authority for the purpose of a sewage reticulation system may be carried out without consent on any land. Therefore, the proposal is permissible without consent under this policy.

#### *SEPP 44 Koala Habitat Protection*

The aim of this policy is to encourage the conservation and management of koala habitats within natural vegetation areas. This policy was considered by the Development Application for the subdivision which found that no potential koala habitat occurred within the site and that there are no records of koalas in the locality with that finding able to be extended to the sewer lead-in route. An ecological assessment report (attached) on the route indicates that no threatened fauna species were encountered. This policy therefore does not need to be considered further.

#### *SEPP 55 Remediation of Land*

The aim of this policy is to provide a state-wide planning approach to the remediation of contaminated land. This policy was assessed and considered by the Development Application for the subdivision. Based on the site history review, field observations and laboratory results, the potential for soil and/or surface water contamination present, at the levels requiring remediation and/or management, is considered to be low. The nature of the land within the sewer lead-in route is very similar to that of the subdivision with the subdivision findings highly likely to apply to the sewer lead-in. With normal conditions to stop work should any contaminants be uncovered this policy would not need to be considered further.

### *Maitland Local Environmental Plan 2011*

The Maitland Local Environmental Plan 2011 is also relevant to the proposal and permits the construction of sewage reticulation systems under SEPP (Infrastructure). Development consent is not required from Council under Part 3 or Part 4 of the EP&A Act therefore the provisions of the Maitland City Council Development Control Plan (DCP) do not apply.

### *Farley WWTW Environmental Protection Licence, from NSW EPA*

The Farley WWTW EPL specifies conditions, particularly the Operating Conditions, that are to be maintained for the extent of works within the Farley WWTW.

### *Zoning*

Per Property Reports from the Department of Planning the properties involved are variously zoned:

- E3 – Environmental Management (for the WWPS);
- RE1 – Public Recreation for Lochinvar Creek and the playing fields; and
- R1 – General Residential for the majority of the area.

Figure 2 shows the different zoning areas and rough route of the sewer line through those zones. These zonings do not require consideration beyond the standard controls for noise, dust, sediment control, etc during construction in a residential zone.

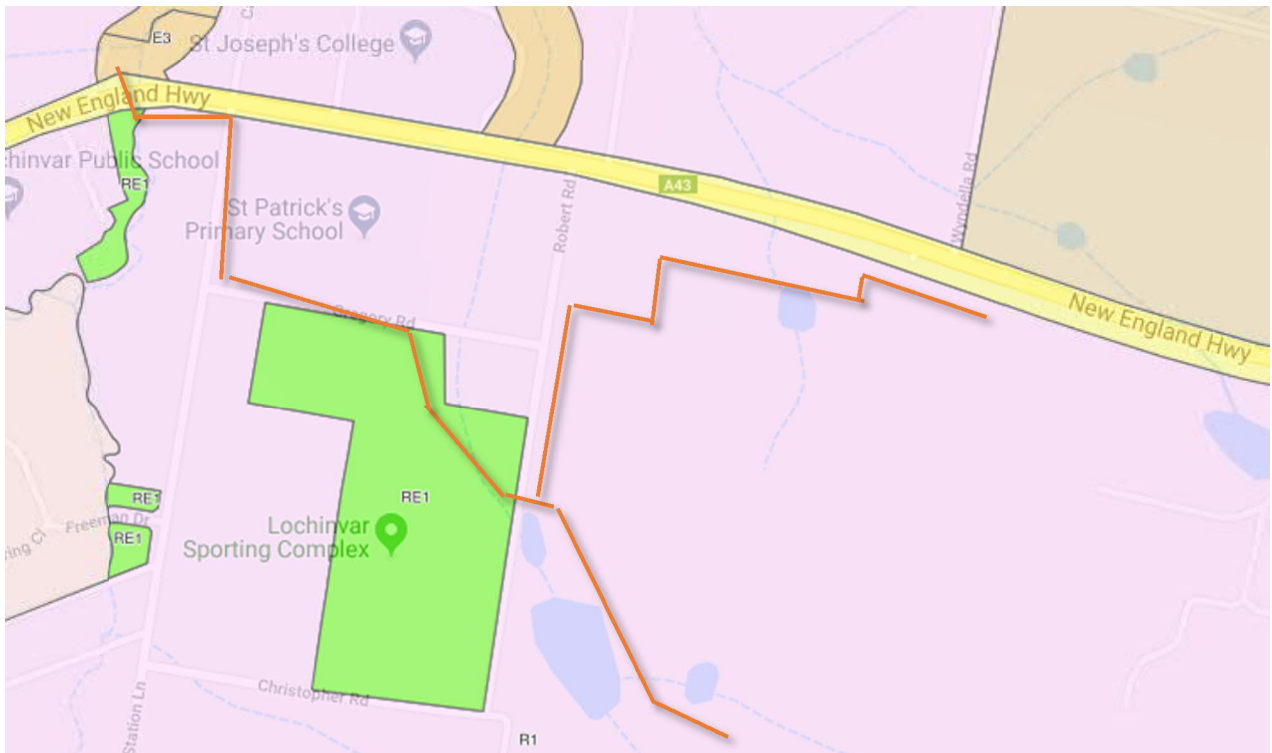


Figure 2 – Zoning along the route

### *Heritage Conservation*

Figure 3 illustrates the heritage items within the Maitland LEP Heritage Map relevant to the proposal.





Figure 3 - Local Heritage items along the route

I105 is the Catholic cemetery through which the sewer lead-in will pass near the boundary avoiding graves, with permission from the Diocese already obtained. I106 (shown on map as 161) is the Police Station which is avoided as the proposed route runs along the north of Gregory Road when opposite the Police Station.

A Statement of Heritage report on the Catholic Cemetery has been prepared by RPS with three recommendations.

The proposal will have no effect on the heritage significance of the items identified within the Heritage Map as per clause 5.10 of the Maitland LEP.

Clause 5.12 of the Maitland LEP does not restrict or prohibit the carrying out of any development, by or on behalf of a public authority, that is permitted to be carried out with or without development consent, or that is exempt development, under the SEPP (Infrastructure) 2007. The proposal is permissible without consent under the SEPP.

#### 4.2 NSW and Commonwealth legislation

##### *Biosecurity Act 2015*

Under this Act, all plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. This Act requires any person, so far as reasonably practicable to prevent, eliminate or minimise any biosecurity risk when dealing with any plant. A search of the DPI noxious weed declarations (29 March 2019) within the Maitland LGA listed a significant number of species, of which several occur within the project area. These include Privets, African Olive, Camphor Laurel and Typha. The Ecological Assessment Report identified that project will have no effect on these weeds as the sewer lead-in in these risk areas is to be underbored. However, if required, appropriate controls will be put in place during construction not to exacerbate the existing weed status.

##### *Environment Protection and Biodiversity Conservation Act 1999*

The proposal does not have a significant impact on a matter of national environmental significance. See 13 Matters of National Environmental Significance (MNES) checklist, below,



and conclusion in the attached Ecological Assessment Report that there no matters of National Environmental Significance are expected.

#### *Biodiversity Conservation Act 2016*

The purpose of this Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. Section 7.3 of this Act lists five factors that must be taken into account in determining the significance of potential impacts of proposed activities on threatened species, ecological communities and/or their habitats. The attached Ecological Assessment Report undertaken for the project determined that no significant impacts upon threatened entities listed under the Act are likely and no further investigation is required.

#### *Roads Act 1993*

Approval from Maitland City Council is required under section 138 of the Roads Act to carry out a work in, on or over a public road or to dig up or disturb the surface of a public road. The proposal involves the disturbance of a number of roads and approval will be sought from Council pre-construction by way of a standard S138 Application.

RMS road act or WAD approval will be obtained for works on or under the New England Highway.

#### *Heritage Act 1977*

As noted above, no items listed under the NSW Heritage Act will be affected by the proposal.

#### *National Parks and Wildlife Act 1974*

The aim of this Act is to conserve objects, places and features of significance to Aboriginal People. An Aboriginal Heritage Impact Permit is required where harm to an Aboriginal object or Aboriginal place cannot be avoided.

Please see attached Aboriginal Heritage Due Diligence Report by RPS (10/12/2018) which concludes that the potential for subsurface archaeological deposits being present in project area is low and that no Aboriginal objects or places have been identified in the Project Area.

#### *Water Management Act 2000*

The intent of the Water Management Act (WMAct) is to ensure the sustainable and integrated management of the state's water resources, including the application for water access licences and management of riparian corridors on waterfront land. Under the WMAct any works on waterfront land requires a Controlled Activity Approval (CAA) issued by the NSW Office of Water. Waterfront land which includes all land within 40m of the highest bank of a watercourse. There are 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> order streams within the proposed sewer lead-in route.

The Water Management (General) Regulation 2018, Schedule 4, notes exemptions for groundwater licencing. A WaterNSW officer suggesting that any groundwater won during works be reused for dust suppression within the works, thus falling under exemption no. 5.

#### *Hunter Water Act 1991*

The Hunter Water Act establishes the legal framework in which Hunter Water Corporation operates. The function of HWC is to provide facilities or services that are necessary, ancillary or incidental to its principal functions, and conduct any business or activity that it considers will further its objectives.

All Hunter Water operations are undertaken in accordance with *Hunter Water Operating Licence 2017-2022*. This licence authorises Hunter Water to construct, operate and manage viable systems for providing sewerage services within its area of operation.

This sewer lead-in work will be conducted under Notice of Requirements 2017-969 already issued by Hunter Water.

## 5 Stakeholder and community consultation

### 5.1 Community consultation

#### 5.1.1 Adjoining, and/or affected, landholders

PCB and/or the lead developer has been in discussion with the owners and Developers of the lands noted above with the following outcomes:

- Chris Lowry, Urban Land Housing (Developer, Airds land) – supportive, as this sewer lead-in is key to their proposed ~890 lot “Lochinvar Ridge” subdivision;
- Shane Boslem, McCloy (Developer, Wilkes land) – supportive, as this sewer lead-in will service their proposed ~280 lot “Hereford Hill” subdivision;
- Nick Murphy, Robert Road Pty Ltd (Developer, Murphy land) – supportive, as this sewer lead-in will service their proposed ~95 lot subdivision with an Entry Permit being signed for the works;
- Kevin Stein, Maitland City Council – was provided with Council feedback from January 2014 meetings which has been adopted in the proposed design and responded in November 2018 that the matter was being referring within Council;
- Catholic Diocese – was contacted in July 2014 regarding the then proposed sewer and water trunk main with the result being a signed Permission to Enter form. A meeting was held in January 2019 with tentative agreement following provision of detailed plans. Notes from that meeting are included below.
- Mr & Mrs Ellicot, 1 Station Lane – were contacted and provided with concept plans. Their concern was over potential loss of building envelope at the rear. An analysis of flood levels and building offsets from the highway was provided them, indicating that no usable land would be impacted. A copy of the signed Entry Permit is below.
- Megan Smith, Telstra – was contacted in January 2014 regarding the then proposed sewer trunk main with result being confirmation that assets were present and advise to use the DBYD arrangement and work with their Asset Relocation Team should that be required.
- RMS was contacted in November 2018 and subsequently advised by way of email that it has no objections to the proposed under bore of the New England Highway.

#### 5.1.2 Local Aboriginal communities

The Due Diligence Aboriginal Heritage Study by RPS, attached, indicates that no further consultation is required regarding the proposed works.

### 5.2 Government agency and other stakeholder consultation

| Area   | Impact?  |
|--|--|
| <b>Consultation with Council – Council related infrastructure or services.</b>   |  |
| Will the works:  |  |
| <ul style="list-style-type: none"> <li>• potentially have a substantial impact on stormwater management services provided by council?</li> </ul>   | <input type="checkbox"/> Yes<br><input checked="" type="checkbox"/> No |
| <ul style="list-style-type: none"> <li>• be likely to generate traffic that will strain the capacity of the LGA road system?</li> </ul>  | <input type="checkbox"/> Yes<br><input checked="" type="checkbox"/> No |
| <ul style="list-style-type: none"> <li>• involve connection to, and have a substantial impact on, the capacity of a sewerage system owned by council?</li> </ul>   | <input type="checkbox"/> Yes<br><input checked="" type="checkbox"/> No |
| <ul style="list-style-type: none"> <li>• involve connection to and use a substantial volume of water from a water supply system owner by council?</li> </ul>   | <input type="checkbox"/> Yes<br><input checked="" type="checkbox"/> No |
| <ul style="list-style-type: none"> <li>• involve installation of a temporary structure on, or enclosing, a public space under council’s control that will cause a disruption to pedestrian or vehicular traffic that is not minor? (Proposed underboring will keep impact to minor)</li> </ul> | <input type="checkbox"/> Yes<br><input checked="" type="checkbox"/> No |

|  |  |
|--|--|
| <ul style="list-style-type: none"> <li>involve excavation of the surface of, or a footpath adjacent to, a road for which the council is the roads authority that is not minor or inconsequential?<br/>Also proposed excavation within Council playing fields.</li> </ul> | <input checked="" type="checkbox"/> Yes<br><input type="checkbox"/> No |
| <p><b>Consultation with council – local heritage</b></p> <p>Are the works likely to have an impact on a local heritage item (that isn't also a State heritage item) or a heritage conservation area that is not minor or inconsequential?</p>                            | <input type="checkbox"/> Yes<br><input checked="" type="checkbox"/> No |
| <p><b>Consultation with Council – flood liable land</b></p> <p>Will the works be located on flood liable land and will they alter flooding patterns more than to a minor extent?</p>   | <input type="checkbox"/> Yes<br><input checked="" type="checkbox"/> No |
| <p><b>Consultation with other public authorities</b></p> <ul style="list-style-type: none"> <li>Will the proposal be located on land adjacent to land reserved under the National Parks and Wildlife Act 1974?</li> </ul>  | <input type="checkbox"/> Yes<br><input checked="" type="checkbox"/> No |
| <ul style="list-style-type: none"> <li>Will the proposal be adjacent to a marine park declared under the Marine Parks Act 1997?</li> </ul>   | <input type="checkbox"/> Yes<br><input checked="" type="checkbox"/> No |
| <ul style="list-style-type: none"> <li>Will the proposal be adjacent to an aquatic reserve declared under the Fisheries Management Act 1994?</li> </ul>  | <input type="checkbox"/> Yes<br><input checked="" type="checkbox"/> No |
| <ul style="list-style-type: none"> <li>Will the development involve a fixed or floating structure in or over navigable waters?</li> </ul>  | <input type="checkbox"/> Yes<br><input checked="" type="checkbox"/> No |
| <ul style="list-style-type: none"> <li>Will there be works within waterfront land?</li> </ul>  | <input checked="" type="checkbox"/> Yes<br><input type="checkbox"/> No |

There are 1st, 2nd and 3rd order streams along the sewer lead-in route and a Controlled Activity Application (CAA) is being sought from the Office of Water prior to construction. This REF is a pre-requisite for a CAA.

Dewatering is likely to be required in the vicinity of Lochinvar Creek. WaterNSW was contacted by phone on 3 April 2019 regarding licencing for dewatering and an Officer from their Hunter Office suggested that any groundwater won during works be reused for dust suppression on the works.

As per the requirements of clause 13 of the Infrastructure SEPP, Maitland City Council was given written notice on 13 November 2018 of the intention to carry out the development (together with a scope of works) for the area in which the land is located. The written notice is reproduced in Image 13 of this report. PCB has not yet received a response from Maitland City Council.

As noted above, a Section 138 roads opening application will be sought from Maitland City Council prior to construction.

RMS was contacted to confirm that nothing more than a Road Opening Licence prior to construction near/under the New England Highway would be required.

## 6 Environmental assessment

Existing Environment: The existing environment is in 3 parts:

- Farmland to the east;
- Residential area in the centre predominantly being streets and playing fields; and
- New England Highway and Lochinvar Creek to the west

These areas are described in more detail in 14 Existing Environment, below.

## Sewer Lead-In Construction – South East Lochinvar

The results of a risk assessment are noted below. Likelihood/Chance and Consequence/Impact ratings are: None, v.Low, Low, Medium or High. Impact rating is the assessment of impact following application of standard controls or additional controls as noted in the table.

## 6.1 Soils and geology

| Risk to/from  | Chance  | Impact | Notes & Sources   |
|---|---------|--------|---|
| Excavation?   | Certain | Low    | 670m of trench excavation to depth of 1-6m for 300-535mm sewer main, including an estimated<br>- 700m <sup>3</sup> of rock to be ripped, plus<br>- 294m of under boring and grouting.<br>Trench width varying from 0.8 to 2.4m.<br>Standard construction controls to be used to minimise impact.                        |
| Landslip area?  | None    |        |   |
| Area of high erosion potential?   | Low     | Low    | The creek crossings are normally dry or not running. In a rain event they pose potential for erosion however the under boring approach will reduce area of exposed/raw earth to a minimum.  |
| Disturb any natural cliff features, rock outcrops or rock shelves?                        | None    |        |   |
| Result in permanent changes to surface slope or topography?                               | None    |        |   |
| Acid sulphate soils within or immediately adjacent to the works that could get disturbed? | None    |        | See the ASS map below for results of the Acid Sulphate Soil search.   |
| Salinity?   | None    |        |   |
| Contaminated material?  | Low     | v.low  | While most of the route is through natural grassland with no history of buildings or fill, there are some sections passing close to earlier works such as back-yard sheds and Telstra cabling that could contain old contaminants.<br>Standard controls to be used to handle contaminants if found during construction. |

## 6.2 Hydrology, flooding and water quality

| Risk to/from                 | Chance | Impact | Notes & Sources   |
|------------------------------|--------|--------|---|
| Bank of natural watercourse? | High   | Low    | Works will occur on the banks of and then under Lochinvar Creek and unnamed tributaries. Some impact will likely occur and a Controlled Activity Approval will be sought from Office of |

| Risk to/from   | Chance  | Impact | Notes & Sources  |
|--|---------|--------|--|
|  |         |        | Water nominating the controls and reparation required.   |
| Creek crossing?  | Certain | v.low  | Under boring approach will keep impact to a minimum.   |
| Floodplain?  | None    |        |  |
| Diversion of a creek?                                    | None    |        |  |
| Intercept groundwater?                                   | High    | Low    | The geotechnical investigation indicates groundwater will likely be present and management required for the underboring of the New England Highway and Lochinvar Creek. The report indicates that de-watering is likely to be required to handle a “low inflow”. |
| Licence under Water Act, or CAA required?                | Certain |        | See above.   |
| Impact on water catchment?                               | None    |        | Not in catchment area.   |
| Drain into Hunter Water special areas?                   | None    |        | Not in special area.   |
| Discharge or overflow of sewage?                         | None    |        | No live sewage involved.   |
| Pipe flushing and potable water discharging to waterway? | None    |        | No pipe flushing involved.   |

### 6.3 Ecology

| Risk to/from  | Chance  | Impact | Notes & Sources  |
|---|---------|--------|--|
| Threatened species, ecological community or migratory species? <sup>1 2</sup> | None    |        | See 4.2 above and attached Ecological Assessment Report.                           |
| National Park or reserve administered by Office of Environment and Heritage?  | None    |        | See 4.2 above and attached Ecological Assessment Report.                           |
| Important vegetation or habitat <sup>3</sup>                                  | None    |        | See 4.2 above and attached Ecological Assessment Report.                           |
| Aquatic fora or habitat eg seagrasses, mangroves                              | None    |        | See 4.2 above and attached Ecological Assessment Report.                           |
| Noxious or environmental weeds  | None    |        | See 4.2 above and attached Ecological Assessment Report.                           |
| Clearing of native vegetation?  | Certain | v.low  | One tree, not considered significant in the attached Ecological Assessment Report. |

<sup>1</sup> Per the Environment Protection and Biodiversity Conservation Act 1999 (Cth) [Search Tool](#)

<sup>2</sup> Threatened Species Conservation Act (1995) [Wildlife Atlas Database](#)

<sup>3</sup> i.e. SEPP 14 Urban Bushland, SEPP 14 Wetlands, SEPP 26 Littoral Rainforest

#### 6.4 Noise and vibration

The NSW Interim Construction Noise Guideline “qualitative” approach, for short term works, was used to assess potential noise issues.

| Risk to/from  | Chance  | Impact | Notes & Sources  |
|---|---------|--------|--|
| Residential, school, etc areas and construction noise? <sup>4</sup> | Certain | Low    | <p>Apart from the houses at</p> <ul style="list-style-type: none"> <li>• 1 Station Street</li> <li>• 855 New England Highway</li> </ul> <p>the route remains 17m from dwellings and 20m from schools.</p> <p><b>1 Station Street:</b> consultation with residents on timing of works, particularly near side of their house, to minimise noise, dust and access impact.</p> <p><b>Church, Station Street:</b> works will not take place on Sunday when this venue is most used.</p> <p><b>St Patricks Primary School:</b> while the route crosses to the south of Gregory Road when opposite the school there will be trenching/underbore works in the reserve opposite. Initial conversation with the Diocese about the location and nature of the works suggests that noise/vibration are not a prime concern. Follow-up conversations are planned once detail plans are available.</p> <p><b>855 New England Highway:</b> is part of the McCloy subdivision and covered by the associated consultation. A 225 sewer crosses the front of the property and access as well as noise, dust, etc will need to be managed during construction.</p> |
| Noise for more than 3 weeks?  | None    |        | Construction works will not take more than 3 weeks in any one area.  |
| Residential, school, etc areas and operation noise? <sup>5</sup>    | None    |        | Underbore operations planned as prime means to limit noise, as well as dust and traffic issues for the school. Launch pad is not close to school and little noise impact is anticipated.   |
| Construction outside standard working hours?                        | None    |        | None anticipated.  |

<sup>4</sup> Per the [Interim Construction Noise Guidelines](#).

<sup>5</sup> Per the [NSW Industrial Noise Policy](#)



| Risk to/from  | Chance | Impact | Notes & Sources |
|---|--------|--------|-----------------|
| Properties or infrastructure from vibration? <sup>6</sup> | None   |        |                 |

### 6.5 Air quality and energy

| Risk to/from   | Chance | Impact | Notes & Sources   |
|--|--------|--------|---|
| Dust?  | High   | v.low  | Excavation can cause dust, with the same proximity issues as noted for noise, above. Standard controls will suffice to keep the impact very low.  |
| Odours during construction?  | Low    | Low    | Odours from the connection of the new sewer works to the existing main may occur but are expected to be short term (approx. 2 hours) and only apparent during the time of cutting into the existing main. |
| Odours during operation?   | None   |        |   |
| Fuel driven heavy machinery?   | Low    | v.Low  | Odours and diesel particulate matter from excavators may be present during construction. Standard construction controls are expected to keep the impact very low.   |
| Nearby sensitive areas that may be affected by dust, odours or emissions eg schools, hospitals | Medium | Low    | Note that under boring or trenching during school drop-off/pick-up times is being considered to manage impact on school traffic and this will also manage impact on air quality.                          |
| Have energy use been considered in the design?   | n/a    |        |   |

### 6.6 Non-Aboriginal heritage

| Risk to/from   | Chance | Impact | Notes & Sources   |
|--|--------|--------|---|
| Heritage listed items within or nearby works? <sup>7</sup> | None   |        | See notes, associated with Figure 3 above, about heritage items and route of sewer avoiding same. |
| Archaeological remains?                                    | None   |        | -- " --   |

### 6.7 Aboriginal heritage

The works will involve ground disturbance, for trenching.

Please see attached Aboriginal Heritage Due Diligence Report by RPS (7/5/2019) which concludes that the potential for subsurface archaeological deposits being present in project area is low, that no Aboriginal objects or places have been identified in the Project Area and that an AHIP is not required.

<sup>6</sup> Per the [Assessing Vibration: a technical guideline](#)

<sup>7</sup> Per the NSW heritage database, Council LEP ([Search for NSW heritage](#)) and Commonwealth EPBC heritage list

### 6.8 Visual amenity

| Risk to/from                          | Chance | Impact | Notes & Sources          |
|---------------------------------------|--------|--------|--------------------------|
| Visual amenity for nearby properties? | None   |        | Underground sewer        |
| Area of high scenic value?            | None   |        |                          |
| Night lighting for works?             | None   |        | No night works intended. |

### 6.9 Traffic and access

| Risk to/from  | Chance  | Impact | Notes & Sources  |
|---|---------|--------|--|
| Roads and Maritime Services (RMS) road reserve?   | None    |        | Route will pass alongside then cross under a section of the New England Highway with works occurring well onto footway and under boring used for the crossing. No traffic impact is envisaged.   |
| Traffic or access on local or regional roads, considering whether full or partial road closures are required? | High    | Low    | Station Lane and Gregory Road will be underbored with no significant impact on local traffic. Any trenching across roads will be managed such that access can be used at all times with only a few minutes delay. Appropriate Traffic Control will be installed. |
| Access to private properties?   | Certain | Low    | Access to 855 New England Highway will be interrupted for a short period, estimated as 2-4hrs. Arrangements to be made with residents beforehand.  |
| Site access   | None    |        |  |
| Areas highly sensitive to vehicle movements such as schools?  | None    |        | See discussion above regarding the school where access during drop-off/pick-up times   |

### 6.10 Land uses and services

| Risk to/from   | Chance | Impact | Notes & Sources   |
|--|--------|--------|---|
| Loss of or permanent disruption of an existing land use?                         | None   |        |   |
| Installation of structures that may be perceived as objectionable or a nuisance? | None   |        |   |
| Disturbance or removal of asbestos?  | None   |        |   |
| Exposure of contaminants on the site?  | v.low  | Low    | See above discussion on handling potential contamination.   |
| Existing electricity, etc services?  | Low    | Low    | See above discussion on Telstra services and adjustment of route to reduce risk. Residual risk can be |

| Risk to/from | Chance | Impact | Notes & Sources   |
|--------------|--------|--------|---|
|              |        |        | managed with standard construction controls including DBYD. |

### 6.11 Waste generation

| Risk to/from   | Chance | Impact | Notes & Sources   |
|--|--------|--------|---|
| Generation of non-hazardous waste?                   | High   | v.low  | Trench spoil will be spread on-site where it is able to be classified for disposal on the land. Otherwise excess will be removed to landfill. |
| Generation of hazardous waste?                       | None   |        |   |
| Generation of wastewater requiring offsite disposal? | None   |        |   |

### 6.12 Cumulative impacts

Cumulative impacts may arise however are not expected to require any further controls that those required to treat each of the above risks.

## 7 Summary of mitigation measures

The following mitigation measures are to be incorporated as conditions of contract in any contract or work specification for the project and be incorporated into a project-specific Construction Environmental Management Plan (CEMP) which is also to include a map of the site showing key features identified in this REF.

| Mitigation measure  | Timing                         |
|---|--------------------------------|
| <b>General</b>  |                                |
| 1. All contractors and machine operators will be inducted on the environmental sensitivities of the work site(s) and relevant safeguards.   | Construction<br>By: Contractor |
| <b>Soils and geology</b>  |                                |
| 2. An erosion and sediment control plan will be prepared, and include controls for works within watercourses and low-lying areas.   | Pre-start<br>By: Designer      |
| 3. Erosion and sediment control to be undertaken in accordance with the Blue Book – Managing Urban Stormwater: Soils and Construction   | Construction<br>By: Contractor |
| 4. All erosion and sediment control measures will be established before excavation, demolition or vegetation clearance begins and are to remain in place until all surfaces have been fully restored and stabilised.  | Construction<br>By: Contractor |
| 5. Sediment control devices (eg silt fences, straw bales wrapped in geotextile etc) will be installed parallel with the contours of the site and immediately downslope of any areas where the natural ground surface has been disturbed.  | Construction<br>By: Contractor |
| 6. Trench spoil left on-site to be protected by sedimentation control fence.  | Finalisation<br>By: Contractor |
| 7. Sediment and erosion control devices will be inspected regularly, maintained to ensure effectiveness over the entire duration of the project, and cleaned out before 30% capacity is reached.  | Construction<br>By: Designer   |
| 8. Upslope surface runoff will be redirected around work areas by using diversion drains or other methods.  | Construction<br>By: Contractor |
| 9. Branches, limbs and trunks of cleared vegetation will be reused wherever possible as sediment and erosion control devices during the works – ie. laid parallel to contours or at right angles to drainage lines.   | Construction<br>By: Contractor |
| <b>Water quality / hydrology &amp; drainage</b>   |                                |
| 10. The storage and handling of fuels and chemicals shall comply with relevant Australian Standards (e.g AS1940 etc).   | Construction<br>By: Contractor |
| 11. No chemicals, fuels, and/or waste will be stored or collected for disposal within or adjacent to drainage lines or unsealed surfaces.   | Construction<br>By: Contractor |
| 12. A 'spill kit' will be kept on site at all times for potential chemical or fuel spills.  | Construction<br>By: Contractor |
| 13. Refuelling, fuel decanting and vehicle maintenance work will take place in a designated sealed and bunded area.   | Construction<br>By: Contractor |
| 14. An Incident Management Plan (IMP) will be prepared as part of the Contractors EMP and will include a contingency plan and emergency procedures for dealing with the potential spillage of fuel or other environmental incidents that may occur on the work site. The IMP should also contain procedures dealing with the unexpected onset of rainfall during the work period. | Pre-Start<br>By: Contractor    |

| <b>Mitigation measure</b>   | <b>Timing</b>   |
|---|---|
| 15. <del>Sewage diversion/bypass provisions will only take place if there are guarantees of adequate capacity in the receiving sewer for the flows and sewage surcharges or overflows will not occur.</del>   | Construction<br>By: Contractor                                  |
| 16. Water from trench de-watering will be pumped and either collected in tanks AND SUBSEQUENTLY USED OR IMMEDIATELY USED FOR DUST SUPPRESSION ACROSS THE WORKS.   | Construction<br>By: Contractor                                  |
| 17. Drilling water and lubricating fluids will be reused wherever possible prior to disposal at a licenced waste management facility.   | Construction<br>By: Contractor                                  |
| 18. Appropriate containment measures will be used to ensure that all drilling fluids from directional drilling or boring activities are captured and contained.   | Construction<br>By: Contractor                                  |
| 19. The minor watercourses will only be open trenched when the three-day forecast does not predict rain.  | Construction<br>By: Contractor                                  |
| 20. Works shall not commence until a Controlled Activity Approval is gained from NSW natural Resources Access Regulator.  | Pre-start<br>By: Designer                                       |
| 21. Works within low-lying areas shall be avoided during wet weather  | Construction<br>By: Contractor                                  |
| <b><u>Flora, fauna &amp; ecosystems</u></b>   |   |
| 22. 'The full extent of any vegetation clearance will be clearly documented and mapped in site EMP(s).  | Pre-Start<br>By: Contractor                                     |
| 23. Materials/equipment lay-down areas, stockpiles, site compound, launch and receival pits will be shown in the EMP(s) and located in cleared or degraded areas to prevent any damage to the surrounding plants or habitat. The plan shall be generally in accord with the Sewer Plan, Lead-In Stockpile Areas and Access plan by Pulver Cooper & Blackley on 15/5/2019. | Pre-Start<br>By: Contractor                                     |
| 24. Materials, plant and equipment will not be stored within the drip-lines of any trees at the site(s) or near the site(s).  | Construction<br>By: Contractor                                  |
| 25. To prevent damage to vegetation outside the boundaries of access tracks/roads, vehicles and machinery will be restricted to designated access roads and tracks.   | Construction<br>By: Contractor                                  |
| 26. Where access tracks/roads run alongside areas of natural bushland, protective fencing or paraweb fencing is to be installed along the boundaries of the track/road to prevent vehicles from inadvertently entering/damaging bushland.   | Construction<br>By: Contractor                                  |
| 27. Degradation or disturbance to areas of water-side (riparian) vegetation or banks of watercourses will be avoided to the greatest possible extent. A CONTROLLED ACTIVITY APPROVAL (CAA) WILL BE OBTAINED FROM THE OFFICE OF WATER PRIOR TO WORKS COMMENCING AND USED TO MANAGE ACTIVITY WITHIN AND RESTORATION OF THE WATER FRONT LANDS.                               | Pre-Start<br>By: Designer<br><br>Construction<br>By: Contractor |
| 28. The removal of large isolated canopy trees will be avoided - particularly those with tree-hollows EXCEPT AS INDICATED IN THE TREE REMOVAL PLAN.   | Construction<br>By: Contractor                                  |
| 29. A frog hygiene protocol to reduce the risk of spread of chytrid fungus would be implemented. This would involve the decontamination of  | Construction<br>By: Contractor                                  |

| <b>Mitigation measure</b>  | <b>Timing</b>                  |
|--|--------------------------------|
| plant/equipment prior to accessing the site through sterilisation with cleaning products containing benzalkonium chloride, in accordance with the OEH Hygiene protocol for the control of disease in frogs, 2008.  |                                |
| 30. Open trenching will be undertaken during dry conditions and completed as quickly as possible to minimise impacts to the drainage lines. Disturbed areas of vegetation will be stabilised and revegetated immediately following construction.   | Construction<br>By: Contractor |
| 31. Risk of harm/injury to fauna would be minimised by: Continuously backfilling excavations to minimise the amount of open trench that is exposed; If an animal is trapped within a trench an animal handling expert/wildlife carer or appropriately qualified ecologist would be contacted to assist with the capture and relocation.  | Construction<br>By: Contractor |
| 32. In the event of the presence of any declared priority weeds, manage them in accordance with the requirements of the Biosecurity Act 2015 including the correct disposal of weed contaminated soil and following washdown procedures; Any person dealing with weeds in the construction corridor has a duty to ensure the biosecurity risk associated with the weed is prevented, eliminated or minimised, so far as is reasonably practicable; Include photos of priority weeds for use by contractors during toolbox talks and site inductions. | Construction<br>By: Contractor |
| 33. Weed removal will be undertaken in accordance with contemporary bush regeneration principles and practices.  | Construction<br>By: Contractor |
| 34. All weeds removed from a site(s) will be transported in a sealed container or bag and disposed at a licenced waste disposal facility.  | Construction<br>By: Contractor |
| 35. Where works are being undertaken in a weed-infested area(s), all construction vehicles will be cleaned before they leave the site to prevent the spread of weed species.   | Construction<br>By: Contractor |
| <b><u>Restoration Activities</u></b>   |                                |
| 36. Disturbed areas will be stabilised immediately following construction and in a progressive manner as works are completed. Waterfront land shall be revegetated in accordance with the Controlled Activity Approval. Disturbed grassland shall be hydro-mulched or stabilised as required under relevant Development Application approval. The playing fields shall be revegetated with turf if required by Council. Disturbed roads, footpaths and hardstand shall be restored to pre-construction condition.                                    | Construction<br>By: Contractor |
| 37. Mulched/shredded vegetation removed from the site may be used to assist in stabilisation of batters or disturbed surfaces (provided it does not contain weeds).  | Construction<br>By: Contractor |
| 38. Where excavated soil is to be used in site restoration, it will be excavated and stockpiled in sequential layers corresponding to the existing soil profile. Topsoil and leaf litter is to be removed first and windrowed in separate stockpiles of less than 1m in height on the upslope side of excavations. Soil layers will be replaced sequentially so that the soil profile is restored as closely as possible to its pre-work status.   | Construction<br>By: Contractor |
| 39. The natural landform of the site(s) will be restored as closely as possible to the pre-works condition.  | Finish<br>By: Contractor       |



| <b>Mitigation measure</b>  | <b>Timing</b>                  |
|--|--------------------------------|
| 40. All temporary erosion and sediment control devices such as silt-stop fencing will be removed from the site at the completion of the works or when the site(s) are fully revegetated/stabilised.  | Finish<br>By: Contractor       |
| 41. Rehabilitation of native vegetation areas will use brush matting or mulching or planting of appropriate local native tubestock.  | Construction<br>By: Contractor |
| <b><u>Air quality &amp; energy</u></b>   |                                |
| 42. Machinery and vehicles will not be left running or idling when not in use.   | Construction<br>By: Contractor |
| 43. Odour or air pollutant emission complaints will be dealt with promptly and the source will be eliminated wherever practicable.   | Construction<br>By: Contractor |
| 44. All loads of excavated material, soil, fill and other erodible matter that are transported to or from the work site will be kept covered at all times during transportation and will remain covered until they are unloaded either for use at the work site, reuse or disposal at a licensed waste disposal facility   | Construction<br>By: Contractor |
| 45. Ensure vehicles and equipment are serviced regularly and operate efficiently.  | Construction<br>By: Contractor |
| 46. Determine and signpost a suitable speed limit for unsealed access tracks.  | Construction<br>By: Contractor |
| 47. All work sites, general work areas and stockpiles will be closely monitored for dust generation and watered down (with clean water) or covered (via seeding or tarpaulins) in the event of dry and/or windy conditions.  | Construction<br>By: Contractor |
| <b><u>Heritage</u></b>   |                                |
| 48. If Aboriginal objects are discovered during operations, all work will cease in the area and the Contractor will inform the Hunter Water Contracts Manager as soon as possible. HWC will determine the preferred management approach and contact OEH and relevant local Aboriginal stakeholders if required.  | Construction<br>By: Contractor |
| 49. If Non-Aboriginal heritage items are discovered during the course of the project, all work will cease in the area and the Contractor will inform the Hunter Water Contracts Manager as soon as possible. HWC will determine the preferred management approach and the local council and/or NSW Heritage Division will be notified via the HWC Contracts Manager if required. | Construction<br>By: Contractor |
| 50. SOIL REMOVED WITHIN THE CEMETERY AS PART OF THE TRENCHING PROCESS SHOULD BE RETURNED AS FILL. THE AREA SHOULD BE TAMPED DOWN AND REFEGETATED WITH GRASS.   | Construction<br>By: Contractor |
| 51. All due care will be taken to ensure that heritage items listed in this report are not adversely affected by any works.  | Construction<br>By: Contractor |
| 52. Hand digging or small machinery will be used in the close proximity of any heritage items to minimise impacts and preserve heritage values.  | Construction<br>By: Contractor |
| 53. Protective barriers will be installed to prevent damage to heritage items either located within the site or adjacent to it.  | Construction<br>By: Contractor |
| <b><u>Visual environment</u></b>   |                                |
| 54. The site(s) will be maintained in an orderly manner.   | Construction<br>By: Contractor |

| <b>Mitigation measure</b>  | <b>Timing</b>                  |
|--|--------------------------------|
| 55. On completion of the works, all vehicles, construction equipment, materials, and refuse relating to the works will be removed from the work site(s) and any adjacent affected areas  | Finish<br>By: Contractor       |
| 56. Work sites will be restored as close to their original condition as possible following the completion of the proposed works.   | Finish<br>By: Contractor       |
| <b><u>Noise &amp; vibration</u></b>  |                                |
| 57. Work and deliveries will only occur during the following times: Monday to Friday 7am to 6pm, Saturday 7am to 1pm (if inaudible at residential premises) or 8am to 1pm (if audible at residential premises). No construction work or deliveries will occur on Sundays or public holidays. | Construction<br>By: Contractor |
| 58. Approval from the HWC Contracts Manager and HWC Environmental Planner will be sought for any changes to the approved works hours.  | Construction<br>By: Contractor |
| 59. All sensitive receivers, including the church and school, will be notified at least 14 days in advance of the works prior to commencement including anticipated duration and nature of works.  | Construction<br>By: Contractor |
| 60. CONSTRUCTION WORKS SHALL NOT OCCUR FOR MORE THAN THREE WEEKS IN ANY ONE AREA THAT IS WITHIN RANGE OF SENSITIVE RECEIVERS.  | Construction<br>By: Contractor |
| 61. A site board will be erected providing site foreman contact details. A register of any complaints will be maintained and any reasonable complaint will receive a response.   | Construction<br>By: Contractor |
| 62. All vehicles and plant will be turned off when not in use.   | Construction<br>By: Contractor |
| 63. The operation of noisy plant/equipment will be avoided during early morning and preferably only occur between 9.00 am and 4.00 pm.   | Construction<br>By: Contractor |
| 64. All stationary and mobile equipment will be fitted with mufflers and in serviceable condition. Evidence of log book services are to be provided. Generators, if used are to have sound proof enclosures.   | Construction<br>By: Contractor |
| <b><u>Traffic and Access</u></b>   |                                |
| 65. The Contractor will prepare a Traffic Management Plan in consultation with the relevant traffic authority(s). The plan shall be generally in accord with the Sewer Plan, Lead-In Stockpile Areas and Access plan by Pulver Cooper & Blackley on 15/5/2019.                               | Pre-Start<br>By: Contractor    |
| 66. Appropriate exclusion barriers, signage and site supervision will be employed at all times to ensure that the work site is controlled and that unauthorised vehicles and pedestrians are excluded from the works area.   | Construction<br>By: Contractor |
| 67. All traffic control devices will be in accordance with AS 1742.3-1996 "Traffic control devices for works on roads".  | Construction<br>By: Contractor |
| 68. Pedestrian and vehicle access will be maintained to buildings by alternate means, such as ramps, if the proposed works obstruct access to the buildings for an extended period of time. Residents/ occupiers to be notified in advance if obstruction to access is likely to occur.      | Construction<br>By: Contractor |
| 69. Vehicle access routes to and within the site(s) are to be defined via 'paraweb' or other clearly visible and robust fencing.   | Construction<br>By: Contractor |

| <b>Mitigation measure</b>  | <b>Timing</b>   |
|--|---|
| 70. <b>SCHOOL:</b> CONSTRUCTION TO BE ARRANGED SUCH THAT THERE IS NO IMPEDIMENT TO SCHOOL DAY DROP-OFF / PICK-UP TRAFFIC ON GREGORY ROAD OR STATION LANE FROM 8 TO 9.30AM AND 2.30 TO 4PM PLUS ALLOW FOR BEFORE SCHOOL AND AFTER SCHOOL CARE DROP-OFF / PICK-UP FROM 6AM TO 8AM AND 4PM TO 6PM.  | Construction<br>By: Contractor                                    |
| 71. <b>CEMETERY:</b> COMMUNICATIONS TO BE ESTABLISHED WITH THE DIOCESE AND ARRANGEMENTS PUT IN PLACE TO HAVE THE CEMETERY WORK SITE MADE SAFE AND KEPT CLEAR AND QUIET DURING ANY FUNERAL SERVICES THAT MAY ARISE WHILE WORKS ARE HAPPENING IN THE VICINITY OF THE CEMETERY. NOTE THAT ACCESS THROUGH THE CEMETERY GATES IS CONSTRAINED AND WORKS TO BE ARRANGED SO THAT NO FURTHER RESTRICTION IS PLACED ON FUNERAL TRAFFIC, INCLUDING ALLOWING FOR MONUMENTAL MASON ACCESS BEHIND THE LAUCH PIT. | Pre-Start<br>By: Contractor<br><br>Construction<br>By: Contractor |
| 72. <b>HIGHWAY:</b> ACCESS TO SITE IS TO BE MANAGED SUCH THAT NO SIGNIFICANT OBSTRUCTIONS ARE MADE TO TRAFFIC FLOW ON THE NEW ENGLAND HIGHWAY.   | Construction<br>By: Contractor                                    |
| <b><u>Land use, services &amp; public amenity</u></b>  |   |
| 73. Surrounding residences directly affected by the works will be notified at least 14 days in advance of the proposed commencement of works, work methods and the duration of the construction period.  | Pre-start<br>By: Contractor                                       |
| 74. Where entry to private properties is required, a notice of entry letter will be provided at least 7 days in advance.   | Pre-start<br>By: Contractor                                       |
| 75. The contractor will personally contact the occupant when they enter a private property to notify of their presence and what works are intended.  | Construction<br>By: Contractor                                    |
| 76. Any accidental damage to property occurred by the works must be repaired in consultation with the owner.   | Construction<br>By: Contractor                                    |
| 77. The Contractor will maintain a complaints register. Any complaints received will be responded to as soon as possible.  | Construction<br>By: Contractor                                    |
| 78. All services in the vicinity of the works will be located in the field and 'pegged-out' and noted in the Environmental Management Plan and/or work plans prior to excavation works - "dial 1100 before you dig".   | Construction<br>By: Contractor                                    |
| 79. Work sites will be restored as close to their original condition as possible following the completion of the proposed works.   | Finish<br>By: Contractor  |
| 80. Accurate public information signs will be displayed while work is in progress and maintained in presentable manner.  | Construction<br>By: Contractor                                    |
| <del>81. If tree removal has been approved in a residential area, all local residents in the immediate vicinity of the tree(s) will be notified via letter/notice</del>  | <del>Construction<br/>By: Contractor</del>                        |
| <b><u>Waste generation</u></b>   |   |
| 82. All waste generated during the course of the works will be reused or removed from the work areas as soon as practicable and disposed of in accordance with waste regulations.  | Construction<br>By: Contractor                                    |
| 83. Evidence of the lawful disposal or reuse of waste will be retained and provided to the HWC Contracts Manager on request.   | Construction<br>By: Contractor                                    |

| Mitigation measure   | Timing                         |
|--|--------------------------------|
| 84. All vessels used for contaminated or hazardous waste should be sealed, labelled according to their contents, and stored within bunded areas until their removal from the work site.  | Construction<br>By: Contractor |
| 85. Any fuel, lubricant or hydraulic fluid spillages will be collected using absorbent material and the contaminated material disposed of at a licensed waste facility.                  | Construction<br>By: Contractor |
| 86. The work site(s) will be left clean and free of weeds, debris and other rubbish at the end of works.   | Finish<br>By: Contractor       |
| 87. All hazardous wastes on site will be removed and disposed in accordance with the state and national regulations and guidelines and best practice for the removal of these materials. | Construction<br>By: Contractor |
| 88. The Contractor's recycling and reuse proposal will be detailed in the EMP.   | Pre-start<br>By: Contractor    |
| 89. Excess spoil material that cannot be reused or recycled will be removed from the site and disposed of at a licensed facility.  | Construction<br>By: Contractor |

## 8 Conclusion

The proposed works can be conducted with low risk to the environment. Those risks that are present can be significantly mitigated using standard construction measures, under boring and working in consultation with the local school.

## 9 Declaration

This Review of Environmental Factors provides a true and fair review of the activity in relation to its likely impact on the environment. It addresses to the fullest extent possible, all the factors listed in Clause 228 of the Environmental Planning and Assessment Regulation Act (as amended) and the Commonwealth Environmental Protection and Biodiversity Conservation Act (as amended).

Signed & Dated:

Position:        Operations Manager  
                      Pulver Cooper & Blackley

## 11 Clause 228 Environmental factors checklist

| <b>Has the REF considered the following points</b>   | <b>Positive</b>   | <b>Negative</b>                               |
|--|---|---|
| Any environmental impact on a community  | Long term provision of sewer services                           | Short term inconvenience during construction. |
| Any transformation of locality   | Enabling sewer services to approx.. 1,400 new residential lots. | None  |
| Any environmental impact on the ecosystems of the locality   | None  | None  |
| Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality   | None  | None  |
| Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations | None  | None  |
| Any impact on the habitat of protected fauna (within the meaning of the National Parks and Wildlife Act. 1974)   | None  | None  |
| Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air  | None  | None  |
| Any long-term effects on the environment   | None  | None  |
| Any degradation of the quality of the environment  | None  | Short-term, minor                             |
| Any risk to the safety of the environment  | None  | None  |
| Any reduction in the range of beneficial uses of the environment   | None  | Short-term, minor                             |
| Any pollution of the environment   | None  | None  |
| Any environmental problems associated with the disposal of waste   | None  | None  |
| Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply   | None  | None  |
| Any cumulative environmental effect with other existing or likely future activities  | None  | None  |



### 13 Matters of National Environmental Significance (MNES) checklist

| Significance matter  | Yes/No | Relevant details |
|--|--------|------------------|
| Listed threatened species and communities  | No     |                  |
| Listed migratory species   | No     |                  |
| Ramsar wetlands of international importance <sup>8</sup>                                     | No     |                  |
| Commonwealth marine environment  | No     |                  |
| World heritage properties <sup>9</sup>   | No     |                  |
| National heritage places   | No     |                  |
| The Great Barrier Reef Marine Park   | N/A    |                  |
| Nuclear actions  | No     |                  |
| A water resource, in relation to coal seam gas development and large coal mining development | No     |                  |

### 14 Existing Environment

The existing environment is in 3 parts:

- Farmland to the east;
- Residential area in the centre predominantly being streets and playing fields; and
- New England Highway and Lochinvar Creek to the west

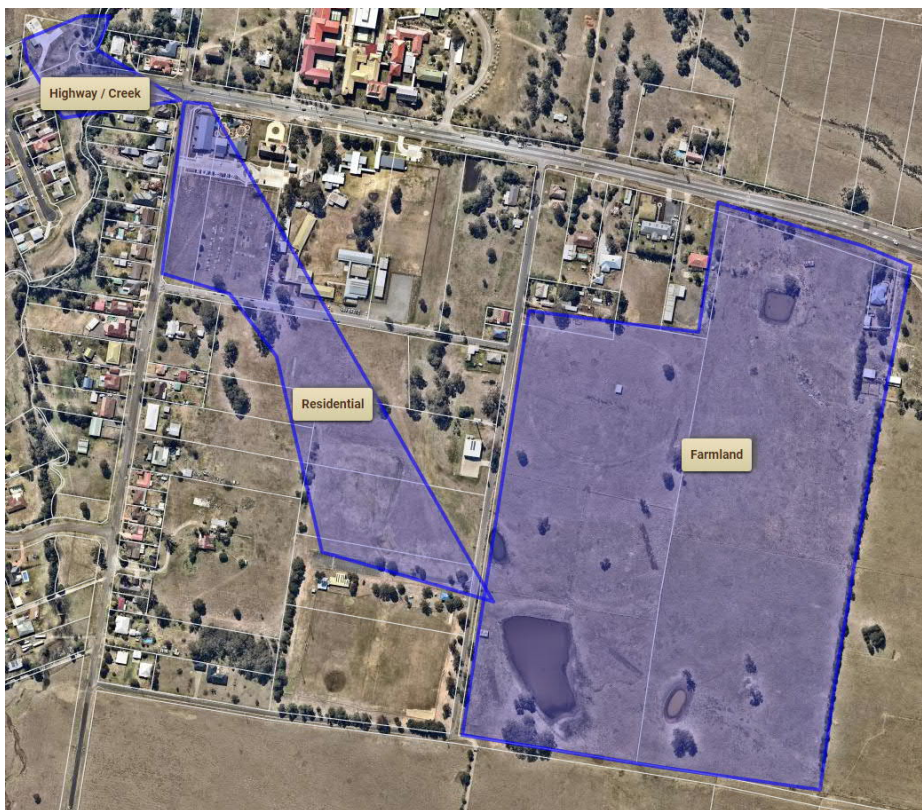


Figure 4 - Three areas of Existing Environment

<sup>8</sup> There is currently one Ramsar Wetland within Hunter Water's area of operation, the Hunter Estuary Wetlands.

<sup>9</sup> There is currently one World Heritage property within Hunter Water's area of operation, the Barrington Tops National Park.



Review of Environmental Factors  
Sewer Lead-In Construction – South East Lochinvar

The eastern farmland is reasonably flat, open country with a scattering of trees and includes several unnamed streams and dams. It has been grazed for many years and continues to be used for grazing.



Image 1 - Farmland with dam



Image 2 - Christopher Road

The residential playing field area is similarly open grassland with an unnamed creek, being used as playing fields.



Image 3 - Playing Fields



Image 4 - Playing Fields

The residential streets are bounded by items of historical significance. Due to choice of route these items are avoided except for the cemetery where the graves are significantly offset from the route which traverses a walkway along the street boundary.



Image 5 - Gregory Road and Cemetery



Image 6 - Station Street

The eastern section of highway has considerable footway area including a footpath. The route traverses the back of private property to access Lochinvar Creek, passing among trees



Image 7 - New England Highway footpath

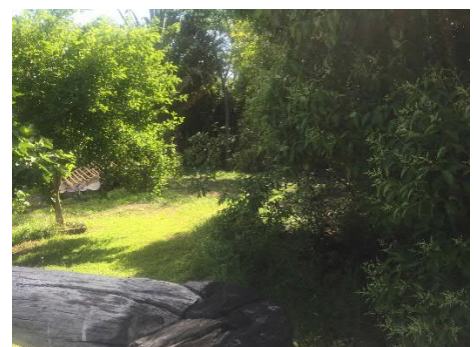


Image 8 - New England Highway to Lochinvar Creek

## Sewer Lead-In Construction – South East Lochinvar

Lochinvar Creek at the point of crossing is well vegetated with a pool of standing water.

The western side is an open grass area.



Image 9 - Lochinvar Creek at point of crossing



Image 10 - Western side of creek crossing

The attached Flora and Fauna and Aboriginal Heritage Reports discuss environmental factors for these areas.

## 15 Attachments

### 15.1 Reports and Plans

The following documents are attached:

- Concept Sewer Layout, Lochinvar by Pulver Cooper & Blackley, 3/10/2018
- Sewer Concept Overall Site with Aerial Underlay by Pulver Cooper & Blackley, 4/4/2019
- Sewer Plan, Lead-in locality plan for CAA by Pulver Cooper & Blackley, 4/4/2019
- Sewer Plan, Lead-in Detail by Pulver Cooper & Blackley, 25/3/2019
- Sewer Plan, Lead-In Stockpile Areas and Access, 15/5/2019
- Report on Geotechnical Investigation – Proposed Sewer Trunk Mains Lochinvar Urban Release Area by Cardno Geotech Solutions, March 2014
- Ecological Assessment Report – Lead-In Sewer Main at Lochinvar by Anderson Environment and Planning, **16/12/2018**

The report covers Matters of National Significance and threatened species so separate search results covering these items have not been included in this REF.

- Aboriginal Heritage Due Diligence Assessment – Lochinvar Sewer lead-In Main by RPS, **10/12/2018**
- The report covers aboriginal places of significance so separate search results have not been included in this REF.
- Statement of Heritage Impact – Lochinvar Catholic Cemetery by RPS, 02 May 2019.

### 15.2 Record of Consultation

The following images show the recent correspondence with the various land owners, developers or neighbours to the proposed works i.e.


- McCloy Group
- Christopher Road Pty Ltd
- Maitland City Council
- Catholic Diocese
- Mr & Mrs Ellicot
- RMS




Review of Environmental Factors  
Sewer Lead-In Construction – South East Lochinvar

Image 11 - Consultation with McCloy Group

Tue 18/12/2018 11:52 AM

 Rod Hawkes  
RE: Consultation and Entry Permit, Sewer Route, Lochinvar

To: 'Shane Boslem'  
Cc: 'Christopher Lowry'; David England

**Message**  14\_46 - Review of Environmental Factors (REF) Report - Sewer Lead-In Rev....pdf

Shane,

Thanks for your time on the phone. As discussed please see link below to a DWG of the concept sewer route which matches into a layout we had for your subdivision. I think that you will be happy with the proposed main but let us know if you have any questions or want any adjustments.

<http://remote.pcbsurveyors.com.au:2266/SharedLinks.aspx?accesskey=81571e02789cbf519398a3c6e0edd22efc8e63acabf1e1cbc4d58d2685687d67&VaultGUID=6EDF3A47-7B0F-40C2-B497-D692283CCEAD>

Also attached is the current draft of the REF report, as requested. I'm interested in your comments about AIMS and Section 90. Please let me know if you spot anything missing.

I understand that you need to finalise a Deed before being able to sign-off on an Entry Permit. In the interim, I'd appreciate an email or similar noting the consultation and in principal acceptance of the proposed sewer lead-in route.

regards,  
Rod Hawkes B.Sc PMP

**From:** Rod Hawkes  
**Sent:** Monday, 17 December 2018 3:07 PM  
**To:** 'Shane Boslem' <[Shane@mccloygroup.com.au](mailto:Shane@mccloygroup.com.au)>  
**Subject:** Consultation and Entry Permit, Sewer Route, Lochinvar

Hi Shane,

Chris Lowry has asked me to make contact regarding the sewer lead-in works for the developments at Lochinvar.

I understand that Chris has been talking with you about the sewer lead-in and that you/McCloy are happy enough with the concept design. I believe that Chris has also sent you copies of the recently completed flora/fauna and heritage assessments, both of which basically gave an 'all clear' for the proposed route.

We are getting ready to submit the REF to Hunter Water which is the next step in getting approval for the proposed lead-in works. For that we have to demonstrate that we've been in consultation with all of the land owners.

When you get a minute would you mind giving me a call to confirm that you guys are happy to proceed along the lines of the concept plans and whether you would be in position to sign-off on an Entry Permit for the proposed works? I've attached a draft of the Entry Permit form in case you are happy to use it now, in which case we'd need from the owner of each of the lots which I believe are:

|                  |                         |              |
|------------------|-------------------------|--------------|
| Lot 3 DP 1218389 | 859 New England Highway | Mrs Wilkes   |
| Lot 2 DP 1218389 | 857 New England Highway | Mrs Wilkes   |
| Lot 1 DP 567712  | 855 New England Highway | McCloy Group |

regards,  
Rod Hawkes B.Sc PMP

Review of Environmental Factors  
Sewer Lead-In Construction – South East Lochinvar

Image 12 - Entry Permit for Works - Christopher Road Pty Ltd



Hunter Water Corporation  
ABN 46 228 513 446

PO Box 5171  
HRMC NSW 2310  
36 Honeysuckle Drive  
NEWCASTLE NSW 2300  
1300 657 657 (T)  
(02) 4979 9625 (F)  
hunterwater.com.au

**ENTRY PERMIT**

File Number: 2017-969

Christopher Road Pty Ltd

.....being the Owner/s  
of the Land described in Schedule A, grants permission to:

**Urban Land Housing**

.....(the Developer),  
described in Schedule B, to enter upon the Land and carry out the Work described in Schedule C.

The Owner acknowledges that the Developer will execute the Deed with the Hunter Water Corporation for delivery of the Work described in Schedule C.

The Owner acknowledges that upon completion of the Works the infrastructure will be handed over to Hunter Water for ownership and operation under the Hunter Water Act 1991.

Dated at ..... (Place) this ..... day of ..... 2017

*[Signature]* (DIRECTOR) ..... (Signature/s of Owner/s)

*[Signature]* ..... (Signature of Witness)

Tess van Weerdenburg ..... (Name of Witness)

**SCHEDULE A (Land)**

LOT: 12 ..... DP: 1195444 ..... SUBURB: Lochinvar

**SCHEDULE B (Developer)**

Company: ..... ABN: .....

Contact: ..... Position: ..... Phone: .....

..... (Signature)

**SCHEDULE C (Work)**

Construction of 375 and 300 sewer main as indicated on PCB Concept Sewer Layout, 3/10/2018

Review of Environmental Factors  
Sewer Lead-In Construction – South East Lochinvar

*Image 13 - Consultation with Maitland City Council*

### Rod Hawkes

---

**From:** Rod Hawkes  
**Sent:** Monday, 19 November 2018 11:51 AM  
**To:** 'Kevin.Stein@maitland.nsw.gov.au'  
**Subject:** Consulting with Council re proposed sewer main at Lochinvar  
**Attachments:** 14\_46 - Sewer Plan CONCEPT Overall Site Rev A (ID 169050).pdf; Lochinvar Sewer Consultation Rev A (ID 172329) pp2-4.pdf

'morning Kevin,

Further to this, please find attached a record of earlier (2014) discussion and advice between PCB and Council on this matter. The proposed sewer lead-in has not significantly changed since these earlier discussions with the attached concept plan showing the latest route.

regards,

Rod Hawkes B.Sc PMP  
 Operations Manager  
 mob. 0417 039 157

email: [rhawkes@pcbnsw.com.au](mailto:rhawkes@pcbnsw.com.au)



98 Lawes Street,  
 East Maitland 2323

PO Box 729, Newcastle 2300

Ph (02) 4934 3026

Email [admin@pcbnsw.com.au](mailto:admin@pcbnsw.com.au)

CONSULTING SURVEYORS | TOWN PLANNERS | CIVIL ENGINEERS | PROJECT MANAGERS

---

**From:** Rod Hawkes  
**Sent:** Tuesday, 13 November 2018 10:45 AM  
**To:** 'Kevin.Stein@maitland.nsw.gov.au' <Kevin.Stein@maitland.nsw.gov.au>  
**Subject:** Consulting with Council re proposed sewer main at Lochinvar

#### Kevin Stein

Manager Engineering & Design  
 Infrastructure and Works | Maitland City Council  
 t 02 4934 9808  
 f 02 4934 8469  
 m 0408 711 133  
[Kevin.Stein@maitland.nsw.gov.au](mailto:Kevin.Stein@maitland.nsw.gov.au)

Kevin,

I am not sure who to ask about this and hope, if it is not you, that you could point me in the right direction.

PCB is working with the lead developer and Hunter Water to provide a sewer lead-in main that will ultimately service 1,435 residential lots across 4 separate subdivisions to the south of the New England Highway, east of Lochinvar village. The proposed route traverses the boundary of Council's Lochinvar playing fields and crosses (underbores) some Council roads We would like to engage with Council to see if there are any concerns, etc.

A schematic of the proposed route is below and a full concept plan is attached.

Review of Environmental Factors  
Sewer Lead-In Construction – South East Lochinvar



Would you please suggest a how we might catch up with Council about this proposal.

regards,  
Rod Hawkes B.Sc PMP  
Operations Manager  
mob. 0417 039 157  
email: [rhawkes@pcbnsw.com.au](mailto:rhawkes@pcbnsw.com.au)



98 Lawes Street,  
East Maitland 2323  
PO Box 729, Newcastle 2300  
Ph (02) 4934 3026  
Email [admin@pcbnsw.com.au](mailto:admin@pcbnsw.com.au)

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Review of Environmental Factors  
Sewer Lead-In Construction – South East Lochinvar

Image 14 - Consultation with Catholic Diocese

Meetings and on-site inspection held with several Diocese staff, resulting in slight adjustment to underbore machine position in Cemetery, adjustments to timing and durations of works and then acceptance by the Diocese.



Hunter Water Corporation  
ABN 46 228 513 446

PO Box 5171  
HRMC NSW 2310  
36 Honeysuckle Drive  
NEWCASTLE NSW 2300  
1300 657 657 (T)  
(02) 4979 9625 (F)  
hunterwater.com.au

**ENTRY PERMIT**  
File Number: 2017-969

Trustees of the Roman Catholic Church for the Diocese of Maitland-Newcastle being the Owner/s of the Land described in Schedule A, grants permission to:

Urban Land Housing (the Developer), described in Schedule B, to enter upon the Land and carry out the Work described in Schedule C.

The Owner acknowledges that the Developer will execute the Deed with the Hunter Water Corporation for delivery of the Work described in Schedule C.

The Owner acknowledges that upon completion of the Works the infrastructure will be handed over to Hunter Water for ownership and operation under the Hunter Water Act 1991.

Dated at Newcastle (Place) this 17<sup>th</sup> day of May 2017 2019.

Sean Scanlon, Chief Executive Officer Catholic Diocese of Maitland-Newcastle (Signature/s of Owner/s)  
Katie Rodwell (Signature of Witness)  
Katie Rodwell (Name of Witness)

SCHEDULE A (Land)

LOT: 2 & 3 DP: 1241101 SUBURB: Lochinvar

SCHEDULE B (Developer)

Company: Urban Land Housing ABN: 81 084 681 617

Contact: Rod Hawkes Position: Operations Manager Phone: 0417 039 157

(Signature)

SCHEDULE C (Work)

Construction of 375 sewer main as indicated on PCB Detail Sewer Plan 25/3/2019

Review of Environmental Factors  
Sewer Lead-In Construction – South East Lochinvar

Image 15 – Entry Permit for Works – 1 Station Lane, Mr & Mrs Ellicott

*rhawkes@pcbnsw.com.au*



Hunter Water Corporation  
ABN 46 228 513 446

PO Box 5171  
HRMC NSW 2310  
36 Honeysuckle Drive  
NEWCASTLE NSW 2300  
1300 657 657 (T)  
(02) 4979 9625 (F)  
hunterwater.com.au

**ENTRY PERMIT**  
File Number: 2017-969

Steven and Leesa Ellicott .....being the Owner/s  
of the Land described in Schedule A, grants permission to:

Urban Land Housing .....(the Developer),  
described in Schedule B, to enter upon the Land and carry out the Work described in Schedule C.

The Owner acknowledges that the Developer will execute the Deed with the Hunter Water Corporation  
for delivery of the Work described in Schedule C.

The Owner acknowledges that upon completion of the Works the infrastructure will be handed over to  
Hunter Water for ownership and operation under the Hunter Water Act 1991.

Dated at *1st Tea Gardens* (Place) this *1st* day of *April* .....201*7*

*[Signature]* .....(Signature/s of Owner/s)

*[Signature]* .....(Signature of Witness)

*Therese Lilly* ..... (Name of Witness)

**SCHEDULE A (Land)**

LOT: *1* ..... DP: *516963* ..... SUBURB: *Lochinvar*  
*1 Station Lane, Lochinvar*

**SCHEDULE B (Developer)**

Company: *Urban Land Housing* ..... ABN: *81 084 681 617*


Contact: *Chris Lowry* ..... Position: ..... Phone: *0411 172 000*

.....(Signature)

**SCHEDULE C (Work)**

Construction of Sewer Lead-In as indicated on PCB Concept Sewer Layout, 3/10/2018

Image 16 - Consultation with RMS

 Wed 12/12/2018 3:26 PM  
Hunter Road Asset <Hunter\_Road\_Asset@rms.nsw.gov.au>  
CR2018/005232 RE: HW9 FW: Sewer Main Construction works - New England Highway, Lochinvar

To Rod Hawkes

Rod,

RMS has no objection in principal to a trenchless crossing at the proposed location. The following guidance notes are offered for design purposes. It is noted that you have not advised RMS, at this stage, of the type (gravity or pressure) or the size of the main that is proposed or any other detail of the proposal.

Please quote CR2018/005232 with any further correspondence on this matter

Guidance Notes

- The main is to be installed using trenchless technology
- The main is to have a minimum of 1.5 metres of cover at all points in the state road corridor
- The main and any additional infrastructure such as manholes or the like, must be located within 2 metres of the corridor boundary
- No aspect of the works may affect the bridge abutment, foundations or adjacent zone of influence.
- A Section138 application will be required to be submitted to RMS prior to the installation and following detailed design completion

Please direct any follow up enquiries to this email address.

Kind Regards,

- End of Report -