APPENDIX D Aboriginal due diligence advice – emergency storage tank, Cattai Creek carrier, Mile End Road, Rouse Hill, NSW

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11 March 2014

Sydney Water
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Attn: **Gill Fowler (A/Environmental Services Manager)**

Re: Aboriginal Heritage Due Diligence Advice - Emergency Storage Tank, Cattai Creek Carrier, Mile End Road, Rouse Hill NSW

Dear Ms Fowler,

This report provides Aboriginal heritage due diligence advice about the proposed Sydney Water Emergency Storage Tank, Cattai Creek Carrier, Mile End Road, Rouse Hill, NSW. The due diligence advice is provided in accordance with the NSW Office of Environment and Heritage's (OEH) (2010) *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (hereafter 'the Code'). This Due Diligence advice has three objectives:

1. To identify whether or not Aboriginal objects are, or are likely to be, present in the proposed development area;
2. To determine whether or not the proposed activities are likely to harm Aboriginal objects (if present); and
3. To determine whether further assessment in the form of an Aboriginal Cultural Heritage Assessment (ACHA) and/or an Aboriginal Heritage Impact Permit (AHIP) application is required.

Under the OEH guidelines the term Aboriginal Cultural Heritage Assessment (ACHA) has a specific meaning and refers to a document that includes a prescribed consultation process with Registered Aboriginal Parties (RAPs) in addition to archaeological investigations on site. Such a detailed assessment is only required where a Due Diligence assessment concludes that there is a likelihood that the land subject to proposed development contains Aboriginal sites which will be harmed by the proposed development and an AHIP is required.

The current document is not an ACHA. It should be regarded as advice as to whether more detailed archaeological/heritage investigation is required. As such, this document meets the Due Diligence requirement for Aboriginal cultural heritage. It provides a guide to Aboriginal heritage cultural issues that may be encountered during the activity, in addition to providing AHMS's opinion regarding whether or not detailed Aboriginal heritage assessment is warranted to inform management of the activity and/or to assess its heritage impacts.

The report presented here may be summarised within and/or appended to Statements of Environmental Effects and Environmental Assessments when the advice concludes that an Aboriginal heritage assessment is not warranted, however, the Due Diligence report cannot be cited as an Aboriginal Heritage Cultural Assessment.

Please do not hesitate to contact Alan Williams, at our Sydney office, should you require any further information.

Yours faithfully,

Susan McIntyre-Tamwoy,

Associate Director and Research Co-ordinator.

SYDNEY WATER EMERGENCY STORAGE TANK, CATTAI CREEK CARRIER: ABORIGINAL HERITAGE DUE DILIGENCE ADVICE

1 INTRODUCTION

1.1 Background

Sydney Water proposes to install an emergency storage tank as part of its wider water-related infrastructure for the North West Growth Centre first and precincts. The storage tank is located at the northern end of Mile End Road, Rouse Hill (and encompasses part of Lot 2 DP 835727) (hereafter 'study area') (**Figure 1**).The storage tank will form part of the infrastructure currently being installed along Cattai Creek for the North Kellyville precinct, which has been approved under Part 3A of the *Environmental Planning and Assessment Act 1979* (MP 07_0125). Sydney Water has engaged Archaeological and Heritage Management Solutions Pty Ltd (AHMS) to prepare the Aboriginal Heritage Due Diligence advice, to provide guidance in relation to legislative requirements under the *National Parks and Wildlife Act 1974* and the existing Project Approval.

1.2 Statutory Context

In NSW, Aboriginal objects, whether recorded or as yet undiscovered, are afforded blanket statutory protection under the National Parks and Wildlife Act 1974. Under Section 90 of the Act it is an offence to disturb, destroy or deface Aboriginal objects without the approval of the Director General of the Office of Environment and Heritage (OEH). A breach of this section of the Act could result in prosecution and fines in excess of $1 million.

The OEH provides a series of guidelines to give a framework for identifying and managing Aboriginal heritage and the cultural heritage interests of Aboriginal parties within development planning contexts. The preparation of Due Diligence advice for a proposed activity is the first stage of the investigation of Aboriginal cultural heritage, and is undertaken in accordance with the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (DECCW 2010).

The Due Diligence process is intended to identify whether or not a proposed activity may harm Aboriginal objects. The Due Diligence advice will either identify that no Aboriginal heritage issues exist within a subject site; or provide guidance about subsequent stages of heritage investigation and/or permit requirements, as defined by the OEH codes of practice. In the case of this document, the due diligence will also contribute to the process and environmental requirements implemented under the existing Project Approval issued under Part 3A of the *Environmental Planning and Assessment Act 1979.*

1.3 Authorship and Acknowledgements

This report was written by Michelle Lau (Archaeologist), with the assistance of Alan Williams (Manager NSW - Aboriginal Heritage), and reviewed by Susan McIntyre-Tamwoy (Associate Director). The assistance of Gill Fowler and Sally Spedding (Sydney Water) is gratefully acknowledged.

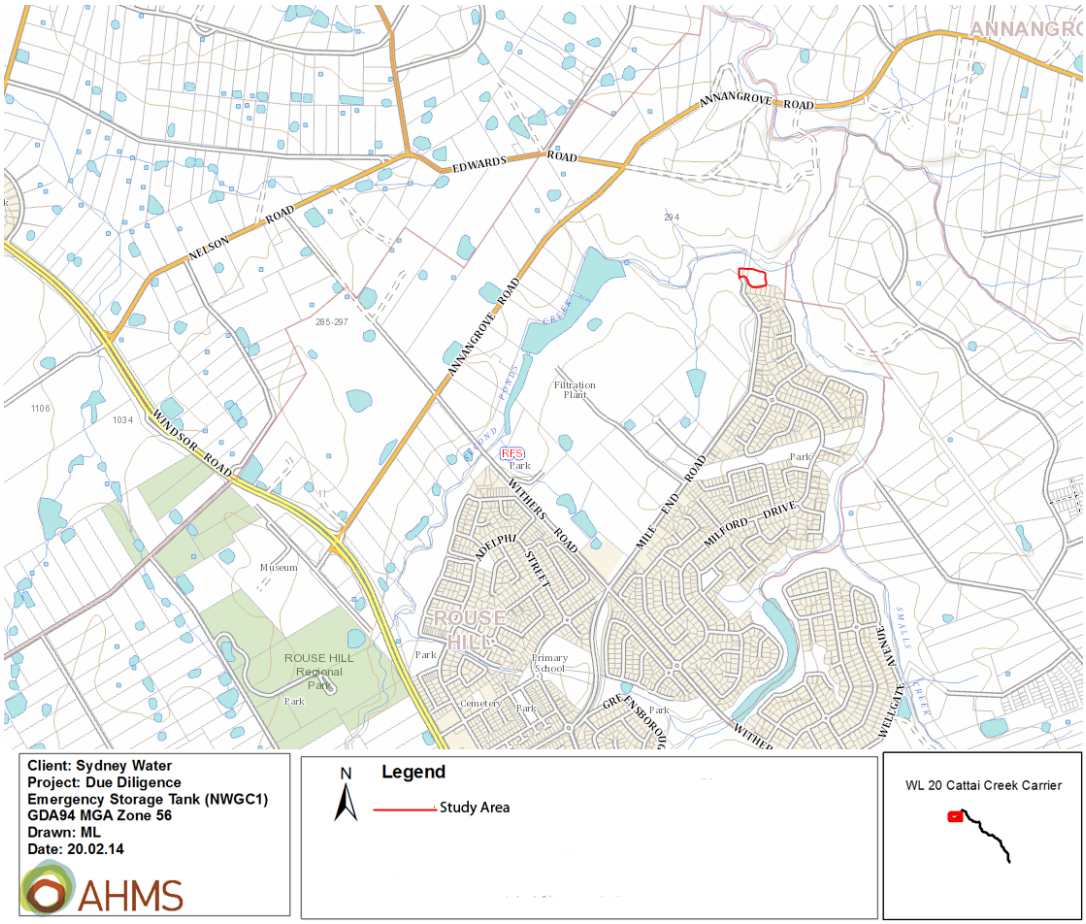

Figure 1 ***Study area, outlined in red (source of photograph: LPI, SIXMaps).***

2 EXISTING ENVIRONMENT

The environment plays an important role in influencing the types of archaeological sites in any given area. Physical environments influenced both the type and availability of natural resources for use by Aboriginal people prior to European colonisation, and to varying extents the cultural activities undertaken in certain places. These in turn are linked to the types of archaeological sites that may be found in an area. A determination of the former environmental context is essential to develop accurate models of cultural activity, site distribution patterns and the archaeological potential of any given area. This section also includes a consideration of historical land use, and the potential impact of this development on survival of archaeological material.

2.1 Soils

The study area falls within the Gymea Soil Landscape (Bannerman & Hazelton 1990) (**Figure 2**). The typical Gymea topography consists of undulating to rolling low hills with local relief 20–80 m and slopes of 10–25%. Side slopes with narrow to wide outcropping sandstone rock benches (10–100 m), often forming broken scarps of <5 m.

Gymea is an erosional landscape, which consists of yellow earths and earthy sands on crests and insides of benches; shallow (<20 cm) siliceous sands on leading edges of benches; localised gleyed podzolic soils and yellow podzolic soils on shale lenses; shallow to moderately deep (<l00 cm) siliceous sands and leached sands along drainage lines. These soils sit over Hawkesbury Sandstone which is a medium to coarse-grained quartz sandstone with minor shale and laminite lenses.

Gymea soil profiles are often shallow to moderately deep, and on undulating to rolling rise and low hills on Hawkesbury Sandstone (such as the location of the study area) and are often subject to a high water erosion hazard. The loss of the upper soil profile generally reduces the potential for any archaeological material to be present where this has occurred.

2.2 Vegetation

The study area has been cleared of much of its original vegetation, the JMCHM 1993-1998 surveys reported the site was populated by sparse regrowth vegetation and weeds. Nearby it was noted, the upper storey consists of forest red gum (*E. tereticornis*) and a large population of cabbage gum (*E. amplifolia*) was noted during test excavation. Prior to clearance, the vegetation of the Gymea Soil Landscape would have comprised open forest or dry sclerophyll forest (Bannerman & Hazelton 1990), with the following common species: *Eucalyptus gummifera* (red bloodwood), *E. eximia* (yellow bloodwood), *E. haemastoma* (scribbly gum), *E. capitellata* (brown stringybark), *E. fibrosa* (broad-leaved ironbark), *E. agglomerata* (blue-leaved stringybark) and *Banksia serrata* (old man banksia). On the more sheltered slopes: *E. sieberi* (black ash), *E. piperita* (Sydney peppermint) and *Angophora costata* (smooth-barked apple) are common tree species.

The vegetation would have provided a valuable resource for the local Aboriginal population. However, clearing has reduced the potential to find culturally scarred trees, or contemporary vegetation of cultural significance.

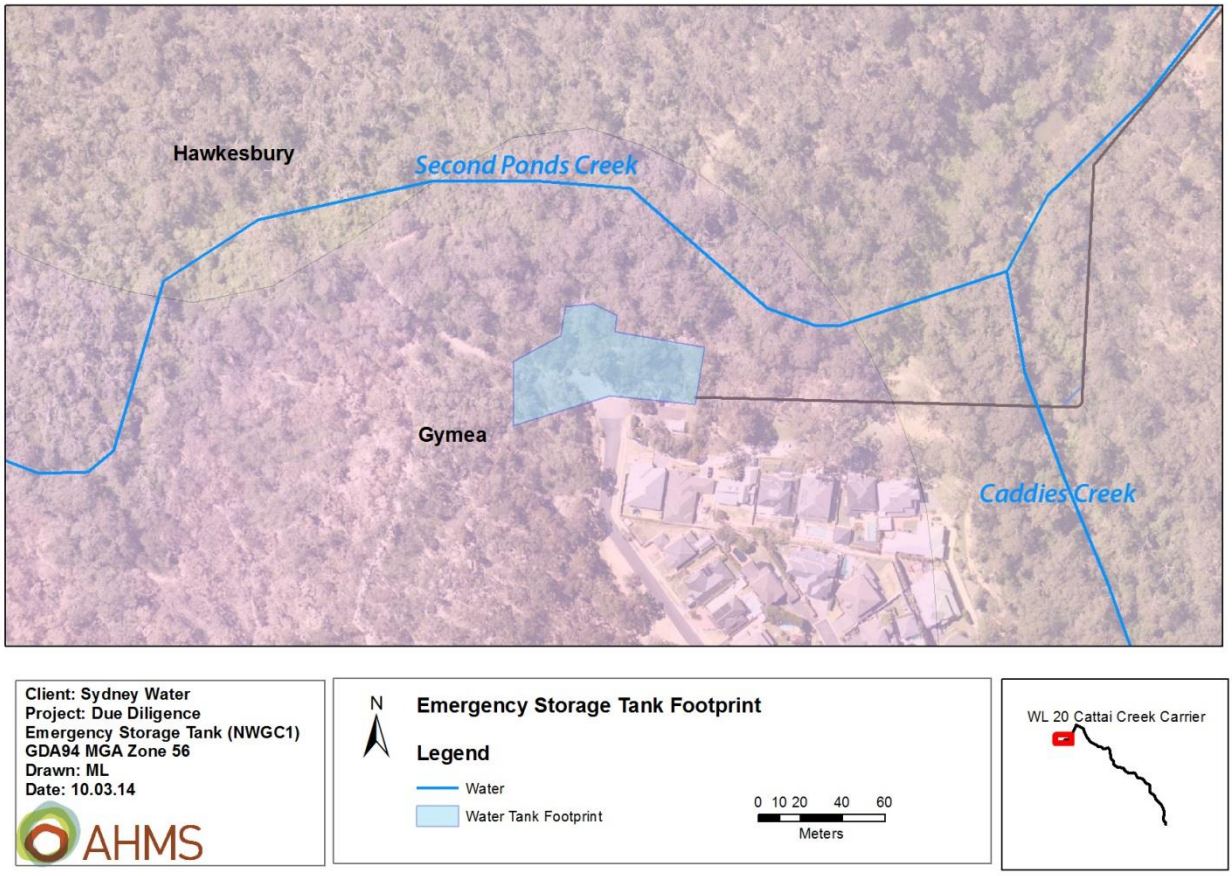

Figure 2 ***The study area (blue) in relation to soil landscape mapping and creeks. Also note the Cattai Creek carrier feeding into the study area (black line). (source of map: Bannerman & Hazelton 1990).***

2.3 Landforms

The *Due Diligence Code of Practice* contains a list of landscape features considered to indicate the likely existence of Aboriginal objects:

- Areas within 200 m of waters.
- Areas located within a sand dune system.
- Areas located on a ridge top, ridge line or headland.
- Areas located within 200 m above or below a cliff face.
- Areas within 20 m of or in a cave, rock shelter or a cave mouth.

Topographic mapping indicates that the nearest permanent water source to the study area is Second Ponds Creek, located within 60 m to the north (**Figure 2**).Soil mapping indicates that the study area is within an area of outcropping rock that may contain caves or rock shelters. The study area is not located within a sand dune system, in proximity to a cliff face, or located on a ridge line.

The study area therefore contains two of the landforms specified by OEH as having potential to contain Aboriginal objects. However, the survival of archaeological materials is also influenced by other factors, in particular impact due to historical land use activities and recent development. In the case of the study area, such impact is likely to have been exacerbated, as it is situated on an erosional soil landscape, where vegetation clearance and development can lead to the loss of the upper soil profile and associated archaeological material. .

3 ARCHAEOLOGICAL BACKGROUND

A search of the Aboriginal Heritage Information Management System (AHIMS) database, and a review of selected relevant previous archaeological reports was undertaken, to determine whether any previously recorded sites are situated within the study area, or within close proximity to its boundaries and to assess archaeological potential based on local site distribution patterns.

3.1 Aboriginal Heritage Information Management System (AHIMS)

A search of the Aboriginal Heritage Information Management System (AHIMS) database, maintained by OEH, was carried out on 19 February 2014 (ID:130530-2) (**Appendix 1**). No registered sites were located within the study area but one site was located within 200m (#45-5-0976).

The AHIMS database search area was broader than the current study boundary and it is noted that there are 10 registered sites within 2km of the study area. These comprise rockshelters (n=4), artefact sites (n=4), art sites (n=1) and potential archaeological deposits (n=2) material. Of these, three were in close proximity (<500m) of the study area (#45-5-0967, 45-5-0976, and 45-5-0763). However, two of these have previously been destroyed through development (specifically #45-5-0976 and 45-5-0763). #45-5-0976 was a rockshelter containing charcoal drawings and Aboriginal objects on the banks of Second Ponds Creek. The site is some distance from the study area (**Figure 3**).

A site known as RH/SP9 SPOP8 'Potential Archaeological Deposit and Artefact Scatter with Deposit' - was not recorded in AHIMS. It has been partially destroyed, but this is discussed further below. Despite this site not being recorded in the AHIMS database, the site was broadly captured in the Bobbie Oakley (2007) assessment as part of the Cattai Creek carrier plan. The site was not discussed in the Kelleher Nightingale Consulting (2008) assessment for the North Kellyville Growth Centre precinct plan.

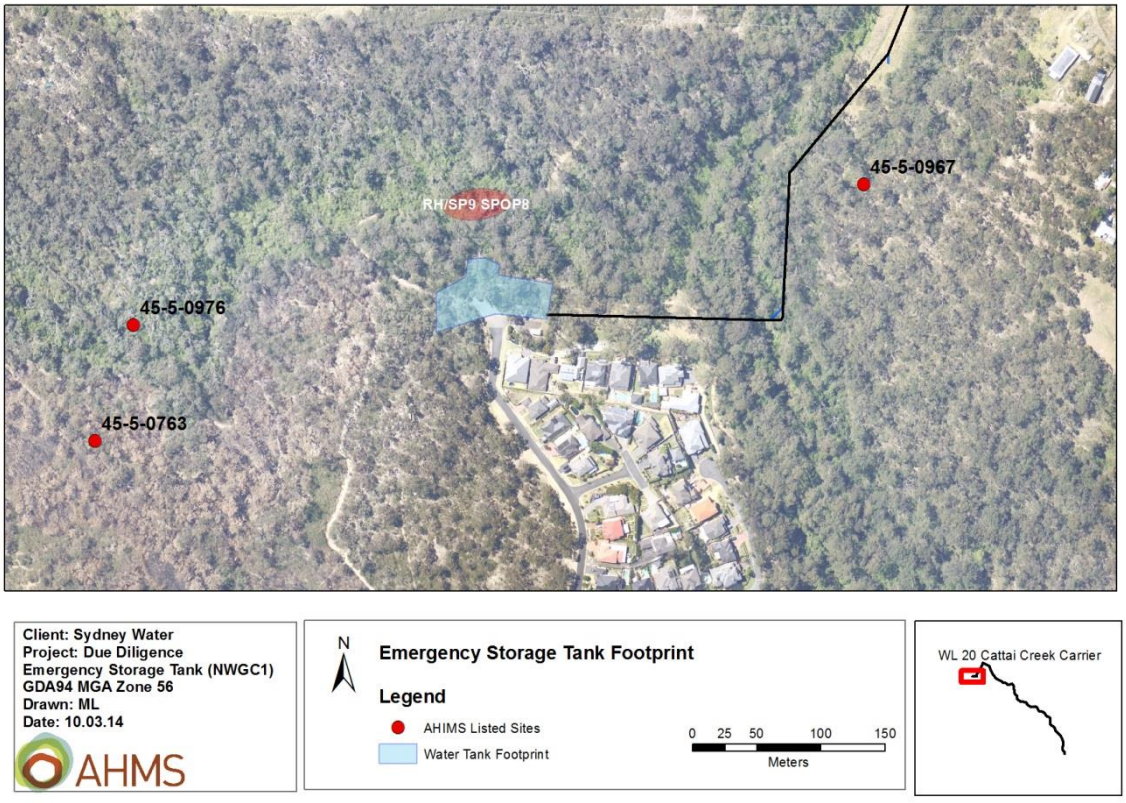

Figure 3 ***AHIMS sites (red) in the vicinity of the study area (blue) and the RH/SP9 SPOP8 PAD (not in AHIMS) as mapped using coordinates provided in Oakely (2007) (source of map: LPI, TopoView).***

McDonald - Rouse Hill Infrastructure Development (1993 – 2005) and results of Salvage Excavation from 6 sites in the Rouse Hill Development Area (2005)

A series of archaeological investigations associated with various stages of the Rouse Hill Infrastructure Development were undertaken from 1993 to 2005. The investigations covered a large area of urban release land in the vicinity of Kellyville and Rouse Hill. The sites were located near Caddies, Second Ponds, Smalls and Cattai Creeks. More than 1,800 square metres were excavated during the project, yielding almost 68,000 Aboriginal objects (stone artefacts).

The landform types investigated included alluvial floodplain along high order creeklines, creek terraces adjacent to high order creeklines, a creekbank adjacent to a low order streamline and low hillslopes adjacent to low order creeklines. Many sites had little or no indication of artefacts on the ground surface, yet subsurface testing revealed artefacts were present. Therefore, it was concluded that potential archaeological deposits should be identified on the basis of low levels of previous land use disturbance.

Fluvial deposits on a lower order tributary of Second Ponds Creek yielded a Pleistocene date. Although the date was not associated with cultural activity, it indicated significant changes in hydrology over time and suggests there is potential for investigating Pleistocene occupation on lower-order drainage lines.

The JMCHM (2005) excavations at Rouse Hill and Kellyville had a number of key findings relating to site patterning for the area. It was found that sites were located in proximity to several creek lines. The order of the creekline had a bearing on the density of artefacts found on various landforms tested. Higher artefacts densities were found on higher order creeks and lower densities along low order creeks.

As part of these works and these criteria that RH/SP9 SPOP8 was identified. Originally recorded in 1993 by JMCHM as RH/SP 9, it was subsequently test excavated in 1999 before the construction of the nearby Sewerage Pumping Station (SPS). The site was described as being at least 120m long and 70m wide, extending from the confluence of Second Ponds and Caddies Creeks, westwards along Second Ponds Creek. The western boundary of the site was denoted by increasing steepness of hill slope and increasing numbers of sandstone boulders. The Caddies Creek frontage, south and eastwards of the confluence, comprises a steeper slope which was considered to have a lower potential for site location.

The archaeological evidence from the excavation of sixteen $1m^2$ test pits that contained 933 artefacts at RH/SP9 indicated a number of discrete knapping events which were interspersed with a low density background scatter of artefacts. An additional two test pits containing 301 artefacts, were excavated on the spur closer to the confluence with Caddies Creek in the eastern portion of the site (**Figure 4**). These indicated and showed more complex evidence of stone tool production with a palimpsest of activities evident. The archaeological evidence retrieved from this site conforms to the predictive models mentioned above. **PAD8-SPOP8.** This PAD is located across a low spur separating Second Ponds and Caddies Creek (**Figure 4**)

JMCHM assessed RH/SP9 as having good archaeological potential because 1998-1999 site inspections showed nil-low disturbance across the site. Only minor surface disturbances were noted during the test excavations. RH/SP9 was considered to have moderate-high significance due to:

- The site is in a unique landscape within the Rouse Hill Development Area being at the confluence of streams;
- The site had low disturbance and suggests good site integrity, with bioturbation is considered to have only affected vertical but not horizontal integrity;
- The site had low-moderate artefact densities with localised areas of activity and focus;
- The site demonstrated evidence of repeated occupation in a focal area, and therefore had potential to contribute knowledge to spatial patterning and different raw material procurement and technological strategies through time.

JMCHM recommended that RH/SP9 was worthy of salvage excavation before the SPS development and the remaining majority (92%) of the site should be considered worthy of conservation. This site encompasses much of the subject area (**Figure 5**).

Oakely - Indigenous Heritage Assessment Proposed Potable, Recycled & Wastewater Pipelines North Kellyville NSW (2007)

Oakely (2007, 34) provided the AMG coordinates: 308000.6272850 for RH/SP9 SPOP 8. The RH/SP9 SPOP 8 are described in Oakely (2007, 32 and 43) as:

"**RH/SP9** (Jo McD CHM 2005) is an open camp site situated at the junction of Second Ponds and Caddies Creeks, less than 1km upstream of the junction of Second Ponds and Cattai Creeks. Sections of this site have been the subject of test and salvage excavations. The site is located along the boundary between a colluvial apron of hillslope sediments derived from Hawkesbury Sandstone, and a low alluvial terrace above the narrow channels and floodplains along the streams. No clear stratigraphic boundaries were identified and the geomorphology was the best indicator of the probable origin of any sedimentary unit. A buried sandstone ridge (spur) separates the two creeks. The soil on this spur is a colluvial slope mantle with discontinuous sandy clay subsoil derived from in situ weathering of the sandstone."

"**PAD8-SPOP8** is an open PAD associated with recorded and excavated site RH/SP9. The site and PAD are located across a low spur separating Second Ponds and Caddies Creek. Although RH/SP9 has been subjected to salvage excavation the entire area potentially covered by the site was not salvaged and although no artefacts were visible on the surface, PAD would extend across the spur along the proposed carrier route, east and north of the excavation locations (see Jo McD CHM 2005 Figure 9.2). As such the PAD is potentially affected by the proposed works. However the RH/SP9 PAD can be avoided by boring the pipeline deep beneath the surface."

Oakely (2007, 45) recommended RH/SP9 PAD 8 SPOP8 be avoided and protected.

3.2 Summary

In the general region of the study area, archaeological discoveries are likely to consist of rock shelters, art and open sites containing small concentrated deposits of stone artefacts, as well as isolated finds. Rock shelters and grinding grooves are only found within areas of exposed sandstone bedrock, located further to the north of the study area where Hawkesbury sandstone country rises off the Cumberland Plain. Sites with high artefact densities are generally located in close proximity to water and on top of hills. Slopes generally do not contain high densities of stone artefacts, most likely because they were not areas that were frequented as camp sites, and are highly prone to post taphonomic change such as erosion. Local patterning suggests there is a possibility that modified trees and potential archaeological deposits may occur. However, there has been a high level of disturbance, from both natural and anthropogenic causes, in the study area (and surrounding region) that will impact the survival of archaeological material in the area. Consideration of changing hydrology is important when considering archaeological potential, with lower order drainage lines having potential for intact older (Pleistocene) deposits to be found.

More specifically, further investigation of RH/SP9 SPOP 8 was identified by JMCHM in the 1990s. This site contained significant artefact densities in some areas, with over 1,000 artefacts being recovered from 18 test pits (~55/m^2), and was considered by JMCHM to be of moderate-high significance. The site encompasses the lower slopes and terraces adjacent Caddies Creek, and an overlay of the site's curtilage based on a mud map in the report indicates it encompasses much of the subject area (**Figure 4**).

4 SITE INSPECTION

A site inspection was conducted by AHMS archaeologists Michelle Lau and Alistair Hobbs on 7 March 2014. The purpose of the inspection was to verify the results of the background research, and determine whether Aboriginal objects were likely to be present on or below the ground surface within the subject area. The visual inspection aimed to determine the presence or absence of Aboriginal objects, archaeologically sensitive landforms and existing disturbance within the study area.

Conditions

Ground surface visibility was relatively low throughout the study area (<10%). Few areas demonstrated good ground exposure as the ground surface was covered by regrowth trees and scrub. The majority of dirt track exposures had heavy top soil erosion. The area has been subject to previous ground disturbance associated with the construction of civil infrastructure (roads, cycle paths, and drainage). There was also a considerable amount of rubbish dumping from the construction of nearby residential houses.

Aboriginal Objects and Archaeologically Sensitive Landforms

Two Aboriginal objects were identified during the site visit; one yellow silcrete proximal flake and one red silcrete proximal flake. The objects had been exposed in a white-yellow sand body at the edge of a dirt walking track approximately 20m away from the proposed development footprint (**Figure 4**). The area where the objects were found is 90m south of Second Ponds Creek on a terrace flat area. There were no other objects identified in the sand body due to vegetation coverage that gave the ground surface low visibility, however, there is potential for this sand body to contain more Aboriginal objects (**Figure 11**).

The full extent of the RH/SP9 SPOP8 site could not be relocated during the site inspection due to the dense regrowth vegetation, but it is considered highly likely that the finds above reflect its western edge.

The trees on the site appeared to all be young regrowth, rather than remnant native original vegetation. As such, no cultural scars were identified.

Prior Disturbance and Physical Characteristics

Evidence of a variety of past disturbances was noted during the site inspection (**Figure 5** to **Figure 10**). Disturbances within the study area identified during the site inspection include:

- Modification of the landscape for the construction of the road and cycle path.
- Construction of drainage works and associated stabilisation works to the south of the proposed development.
- Farming practices (land clearing/ploughing).

The site inspection also confirmed that the local landscape has been cleared. Several areas are now populated by regrowth trees (**Figure 5**). The south of subject area has been levelled for the road and cycle path with evidence of earthworks also visible, including the construction a drainage channel (**Figure 6 - Figure 10**). There are no sandstone outcrops with art work visible or rock shelters located in the study area.

These disturbances have potentially obscured or removed Aboriginal objects within parts of the study area. Vegetation clearance has resulted in the removal of culturally scarred trees if they were ever present. Additionally, to the south the vegetation clearance may have destabilised the soil, encouraging erosion and subsequently disturbed any Aboriginal stone artefact scatters if present. Soil (and potentially archaeological deposits) will also have been disturbed through landscaping, and activities associated with the neighbouring residences. However the majority of the site was densely vegetated and ground visibility was low, in these areas disturbance was also considered low, therefore, these areas are considered to have moderate to high archaeological potential.

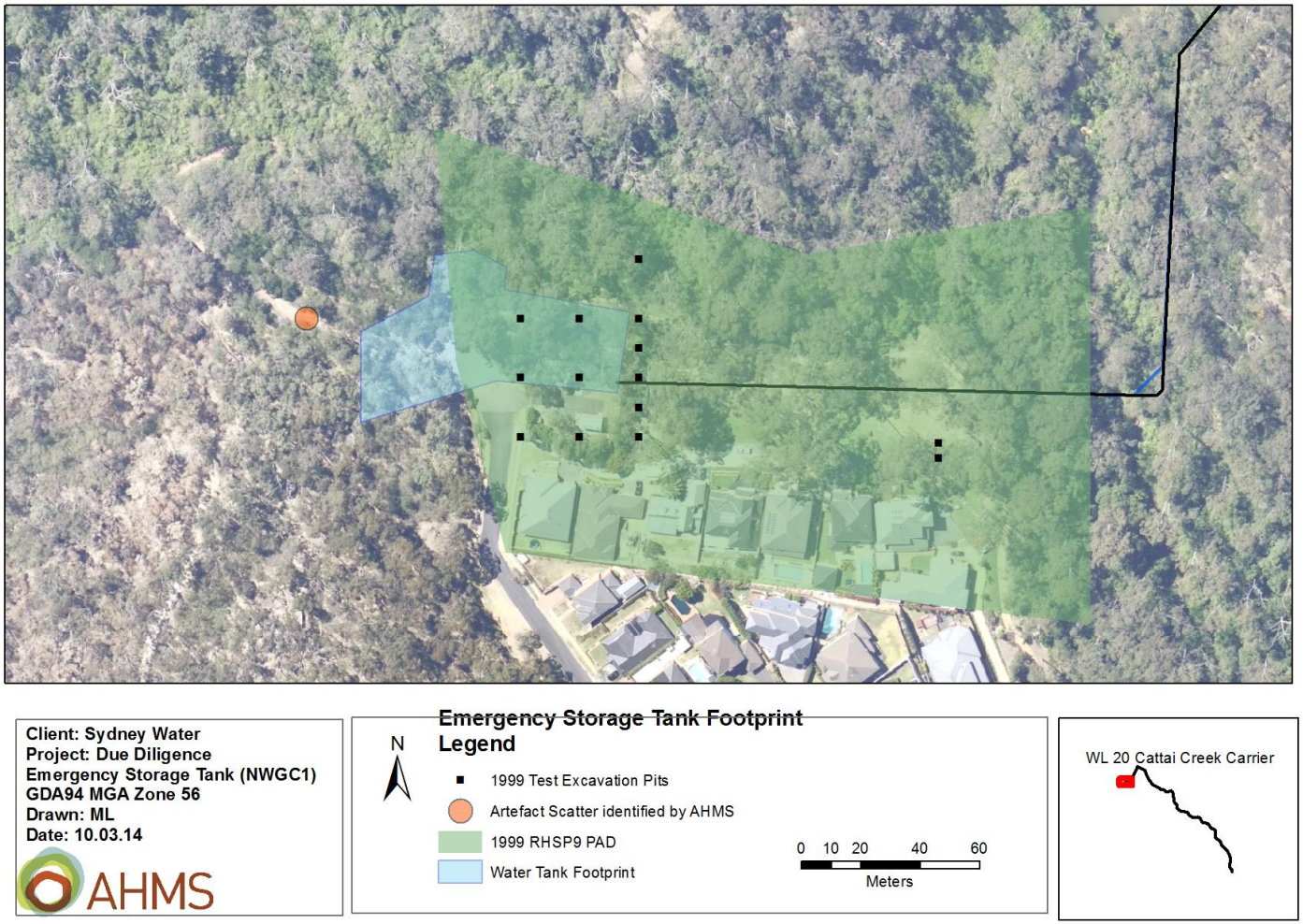

Figure 4: Map showing the Emergency Water Tank Footprint (blue) overlain by RH/SP 9 SPOP 8 (green) as it is shown in JMCHM (2005). Black squares reflect test pits undertaken by JMCHM - those to the west contained 933 artefacts (~58/m^2), while the two to the southeast of the site recovered 301 (~150/m^2). Two artefacts, probably reflecting part of RH/SP 9 SPOP 8, found during the AHMS site inspection are shown in orange. Note the western end of Cattai Creek carrier is also shown as a black line.

Figure 5 ***Regrowth trees north of the road end***

Figure 6 ***General view of the subject area facing north***

Figure 7 ***General view of the subject area facing north***

Figure 8 ***General view of the subject area facing south***

Figure 9 ***Artefact scatter identified during site inspection on 7 March 2014 facing north***

Figure 10 ***General view of subject area facing west***

5 PROPOSED ACTIVITY

5.1 Proposed Development

Sydney Water proposes to construct an Emergency Storage Tank as part of the North West Growth Centre (NWGC) water related infrastructure (**Figure 4**). The Emergency Storage Tank would be located near the northern end of the proposed Cattai Creek carrier in north Kellyville on the northern end of Mile End Road, Rouse Hill. The proposed activity will result in direct impact to the ground surface, or any Aboriginal objects (if present).

5.2 Due Diligence Flowchart

The *Due Diligence Code of Practice* provides a flowchart that is designed to identify whether or not a proposed activity has the potential to harm Aboriginal objects (**Figure 11**). The questions are addressed below.

1. Will the activity disturb the ground surface or any culturally modified tree?

The proposed activity will involve ground disturbance.

No culturally modified trees were identified within the study area, either on the AHIMS register or during the site inspection. As the study area has been entirely cleared of old-growth vegetation, no culturally modified trees are present.

2a. Are there any relevant confirmed site records or other associated landscape feature information on AHIMS?

Search results of the OEH AHIMS database indicated that there are no previously recorded Aboriginal sites, objects or places within the study area.

However, there appears to have been an issue in the lodgement of the site card for RH/SP9 SPOP8 PAD in the past. A site card for this site has been prepared for lodgement with OEH and will be lodged as soon as possible.

2b. Are there any other sources of information of which a person is already aware?

Previous archaeological studies pertaining to the local region were reviewed. Regional studies indicate that proximity to water is the most common determining factor for predicting the presence of Aboriginal objects. The study area is located within 200 m of water. A review of reports containing archaeological predictive modelling in the region showed that sandstone rock outcrops and rock shelters are also sensitive landforms present in the region. However, the study area does not contain sandstone outcrops or rock shelters, it has been totally cleared of natural vegetation in the past and has been subject to sub-surface disturbance over most of the land surface.

RH/SP9 SPOP8 PAD was recorded by JMCHM in 1993, it was subsequently test excavated in 1999 before the construction of the Pumping Station. The archaeological evidence from the excavation of sixteen $1m^2$ test pits that contained 933 artefacts at RH/SP9 indicated a number of discrete knapping events which were interspersed with a low density background scatter of artefacts. An additional two test pits that contained 301 artefacts, were excavated on the spur closer to the confluence with Caddies Creek to the southeast of the site. These indicated and showed more complex evidence of stone tool production with a palimpsest of activities evident.

A mud map of this site is shown in Figure 5 and indicates that it encompasses a large portion of the subject area.

2c. Are there any landscape features that are likely to indicate the presence of Aboriginal objects?

The study area includes one of the sensitive landform features identified in the *Due Diligence Code of Practice*:

- Within 200m of waters.

As a result, the landform feature present within the study area is considered to indicate the presence of Aboriginal objects.

3. Can harm to the Aboriginal objects listed on AHIMS or identified by other sources of information and/or can the carrying out the activity at the relevant landscape features be avoided?

The proposed activity will involve direct harm to the identified landscape feature. Given the nature of the development, construction and use of Emergency Storage Tank, it is unlikely that it will be possible to avoid ground disturbance.

4. Does a desktop assessment and visual inspection confirm that there are Aboriginal objects or that they are likely?

The results of the desktop assessment and visual inspection, as detailed above, indicated that the subject area contained a landform of archaeological interest (within 200m of waters), and is within a site of moderate-high significance (evident through the recovery of 1,234 Aboriginal objects by JMCHM in 1999). In addition, the site inspection identified a surface artefact scatter and potential archaeological deposit (PAD) to the west of the subject area that probably reflects an expansion of the existing site, RH/SP9 SPOP 8. While soil profiles are generally absent or significantly eroded on tracks through the area, much of the remaining vegetated areas remains undisturbed and the potential for Aboriginal objects was considered moderate to high.

5.3 Recommendations

The assessment above indicates that the proposed emergency storage tank and associated pipe infrastructure has high potential to impact significant Aboriginal objects/sites. Specifically, the proposed development is situated within the curtilage of RH/SP9 SPOP 8, a high density artefact scatter and deposit identified by JMCHM in the 1990s and reported on in 2005 (JMCHM 1993, 2005). Despite this site not being recorded in the AHIMS database, the site was broadly captured in various assessments of the area by Bobbie Oakley (2007) as part of the North Kellyville Growth Centre precinct and Cattai Creek carrier, respectively. However, a review of the original and subsequent reports by JMCHM indicates that the location of the site was erroneous, and it actually encompasses much of the slopes between Caddies Creek and Mile End Road (**Figure 5**).

The overall project is already permitted under Part 3A of the *Environmental Planning and Assessment Act 1979* (MP 07_0125), and therefore a formal Aboriginal Cultural Heritage Assessment or Aboriginal Heritage Impact Permit are not required. Instead, a modification to the project approval is being sought to include the proposed Emergency Storage Tank.

If approved works should be undertaken in compliance with the approved Heritage Management Plan (HMP) (AHMS, 2013) for the project. Since, this site is considered of high significance, the HMP requires that (in hierarchical order):

1. The site is archaeologically salvaged prior to construction. All indirect impacts are also managed through surface protection and fencing.
2. Where time permits, a program of test excavations across the site can be implemented to characterise and confirm the composition and significance of a site (especially potential archaeological deposits), and develop subsequent management recommendations in accordance with these findings. This may result in the size of the site being changed and/or the methods of construction to be modified.

3. Where (1) - (2) cannot be implemented, options are permitted for archaeological mitigation measures to be modified by the project archaeologist (AHMS) in consultation with Sydney Water, Abigroup and the registered Aboriginal parties.

Given this development is not part of the linear infrastructure but is rather a large storage tank that cannot be relocated, few of the recommendations can be suitably applied. Should DP&I, approve the modification then the most viable option is for the development footprint to be salvaged prior to development. Given the footprint is ~192m^2, and potentially >1m deep, a salvage of the entire footprint is likely to be unfeasible (both with regard to cost and time). Rather, it is recommended that (2) above is implemented across the footprint to further define the cultural materials, and allow for any salvage to be focussed on smaller key areas. The part of the Cattai Creek carrier leading into the site should either implement (1) above, or where time permits option (2) (please note the finding of (2) may still result in a recommendation of (1) to be undertaken). The indirect impacts around the storage tank should be minimised and appropriate fencing/surface protection installed prior to construction.

Finally, it is recommended that the registered Aboriginal parties are provided information on this development at the earliest opportunity to ensure appropriate consultation on the issue can be undertaken.

In summary, the following recommendations are made:

- An AHIMS site card for RH/SP 9 /SPOP 8 is developed and lodged with OEH at the earliest opportunity.

- The HMP is updated to include this site and relevant archaeological mitigation measures are implemented.

- The proposed development has the potential to impact a moderate-high significant Aboriginal site, RH/SP9 SPOP 8. Should the development proceed, it must be undertaken in accordance with the approved Heritage Management Plan (AHMS 2013) for the project (see above for discussion). Specifically, it is likely that the storage tank footprint would require archaeological salvage prior to construction. Indirect impacts should be minimised using surface protection and fencing, etc.

- The western end of the Cattai Creek carrier will also potentially impact RH/SP 9 SPOP 8. The installation of the pipe should be undertaken in accordance with the approved Heritage Management Plan (AHMS, 2013) for the project (see above for discussion). Given the pipe alignment is within a poorly investigated part of RH/SP 9 SPOP 8 (**Figure 5**), it is strongly recommended that a program of test excavations is implemented to identify whether the site extends into this area.

- Given the potential impacts, it is recommended that information on this development and associated heritage issues is provided to the registered Aboriginal parties at the earliest opportunity.

- If the boundaries of the proposed activity are revised to include areas not addressed during this assessment, further investigation of these additional areas should be undertaken in order to identify any potential Aboriginal heritage impact.

- In the event that previously unidentified Aboriginal objects, sites or places (or potential Aboriginal objects, sites or places) are discovered during works, all work in the vicinity of the find should cease, and Sydney Water should determine the subsequent course of action in consultation with a heritage professional and the relevant State government agency.

- If human skeletal material is discovered during the course of the proposed development, work should cease in the vicinity of the discovery, and the Police and the Coroner's Office should be contacted. If the skeletal material is that of an Aboriginal person, the Office of Environment and Heritage should be contacted for advice regarding management of the discovery.

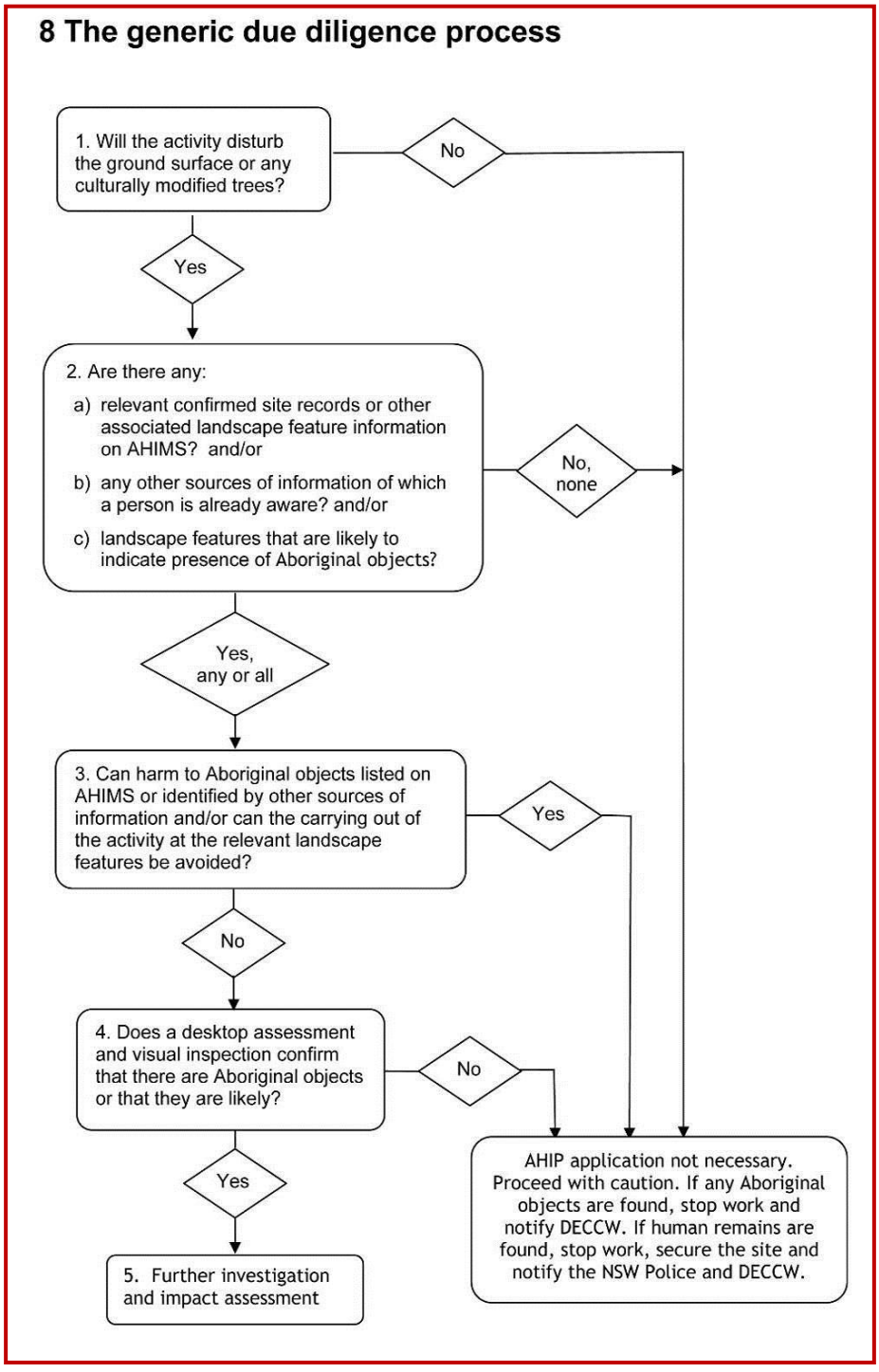

Figure 11 The due diligence flow chart (source: DECCW 2010).

6 REFERENCES

AHMS (2013) Abigroup North West Growth Centre - First and Second Release Precincts Package 2 and 3A *Heritage Management Plan* Annexure D, Abigroup Project Number 221379, Document no: CR CEMP Annex D HMP Rev C 130510.docxBannerman, S. M., & P. A. Hazelton 1990 *Soil Landscapes of the Penrith 1:100000 Sheet*, Soil Conservation Service of NSW, Sydney.

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Jo McDonald Cultural Heritage Management Pty Ltd, 1999.Test Excavation of PAD5 (RH/SP9) and PAD31 (RH/CC2) for the Rouse Hill (Stage 2) Infrastructure Project at Rouse Hill and Kellyville, NSW.

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Oakley, B, 2007 Indigenous Heritage Assessment Proposed Portable, Recycled and Wastewater Pipelines North Kellyville. Unpublished Report for Sydney Water Corporation.

Smith, Laurajane 1985 Archaeological investigation of a proposed sewerage treatment plant at Rouse Hill, NSW. Report for the MWS&DB

Smith, Laurajane 1989 Aboriginal site planning study in the Sydney Basin: the Cumberland Plain. Stage 1 Report to NWPS.

Smith, Laurajane 1990 Rouse Hill Proposed Sewerage treatment works: second and third archaeological survey for Aboriginal sites. Report to Manidis Roberts Consultants for Sydney Water Board. Report in EIS report.

Appendix 1 - AHIMS Search Result

Office of Environment & Heritage
NSW GOVERNMENT

AHIMS Web Services (AWS)
Search Result

Your Ref Number : 130530-2
Client Service ID : 125625

Archaeological & Heritage Management Solutions Pty Ltd (AHMS)
Level 2, 729 Elizabeth Street
WATERLOO New South Wales 2017
Attention: Michelle Lau

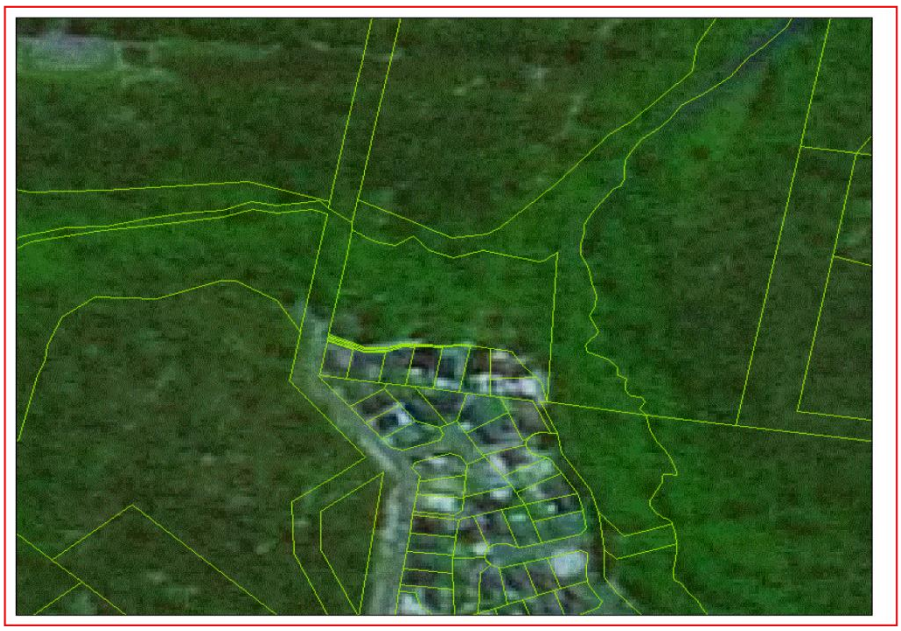
Email: mlau@ahms.com.au

Date: 19 February 2014

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 2, DP:DP839874 with a Buffer of 200 meters, conducted by Michelle Lau on 19 February 2014.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

1	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

APPENDIX E Community information night details, 19 February 2014

13 February 2014

Dear resident or business owner

Water and wastewater services – North West Growth Centre Package 2 and 3A

Sydney Water has engaged Lend Lease (formerly Abigroup) to build water and wastewater services for parts of the North West Growth Centre including Box Hill, Schofields, Alex Avenue, North Kellyville and Riverstone precincts.

Work in the North Kellyville precinct involves constructing a wastewater main, the Cattai Creek carrier. The Cattai Creek carrier will be built mostly alongside the creek between Glenhaven Road North Kellyville and Mile End Road Rouse Hill.

As part of this work we will be building a new emergency storage structure in the Sydney Water land at the end of Mile End Road. Please refer to the diagrams overleaf.

The emergency storage structure is required to provide sufficient storage capacity within the Cattai Creek carrier during peak wet weather events.

We would like to invite you to a community information session for the storage structure on:

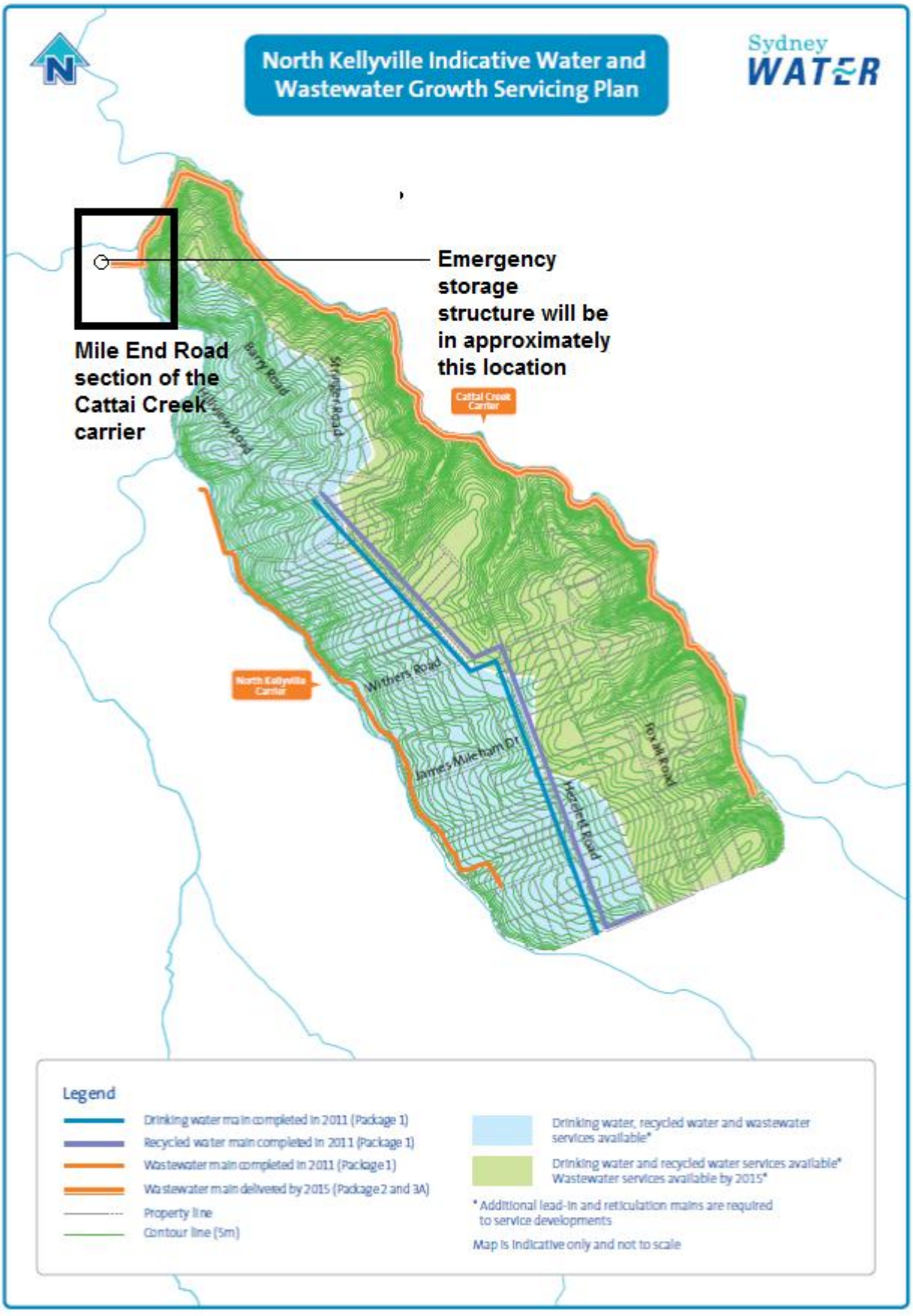
Wednesday 19 February 2014, 7.00pm-8.30pm
at
Rouse Hill Community Centre, Activity Room 5
Clower Avenue, Rouse Hill (entry opposite Aberdour Road)

Please call 1300 768 166 or email enquiry.NWGC@abigroup.com.au if you would like to speak with the project team prior to the information session. For more information about the project, visit sydneywatertalk.com.au/nwgc.

Yours sincerely

Thambirajah Karunahararaj
Project Representative

Sydney WATER



Sydney Water Corporation ABN 49 776 225 038
1 Smith St Parramatta 2150 | PO Box 399 Parramatta 2124 | DX 14 Sydney | T 13 20 92 | www.sydneywater.com.au
Delivering essential and sustainable water services for the benefit of the community


Emergency
storage
structure
Smalls Creek Cycleway
Cattai Creek
carrier
Mile End Rd
Smalls Creek Cycleway

Northwest Growth Centre Package 2 & 3A

Emergency Storage Structure

Mile End Road, Rouse Hill

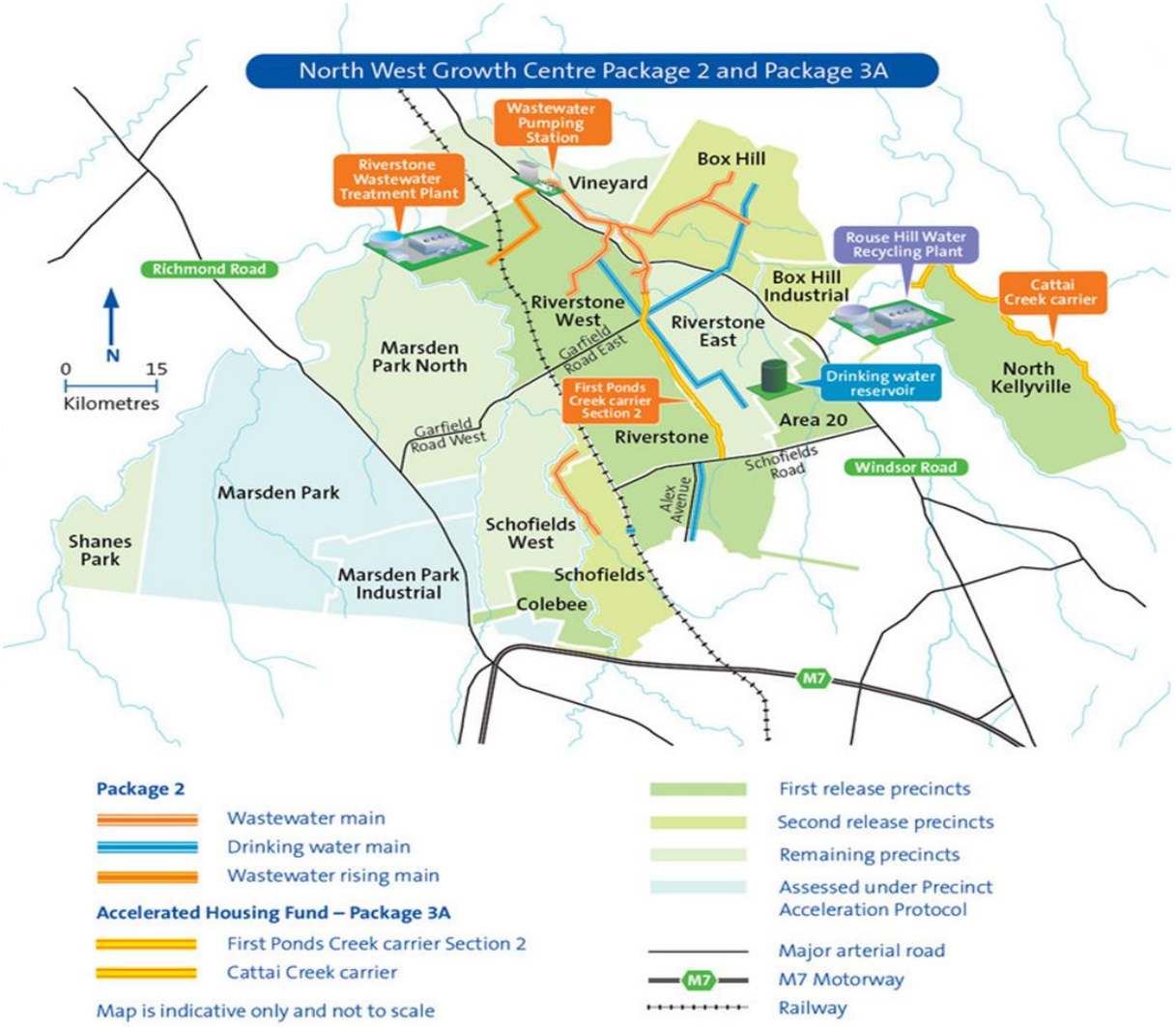
Community Presentation

19 February 2014

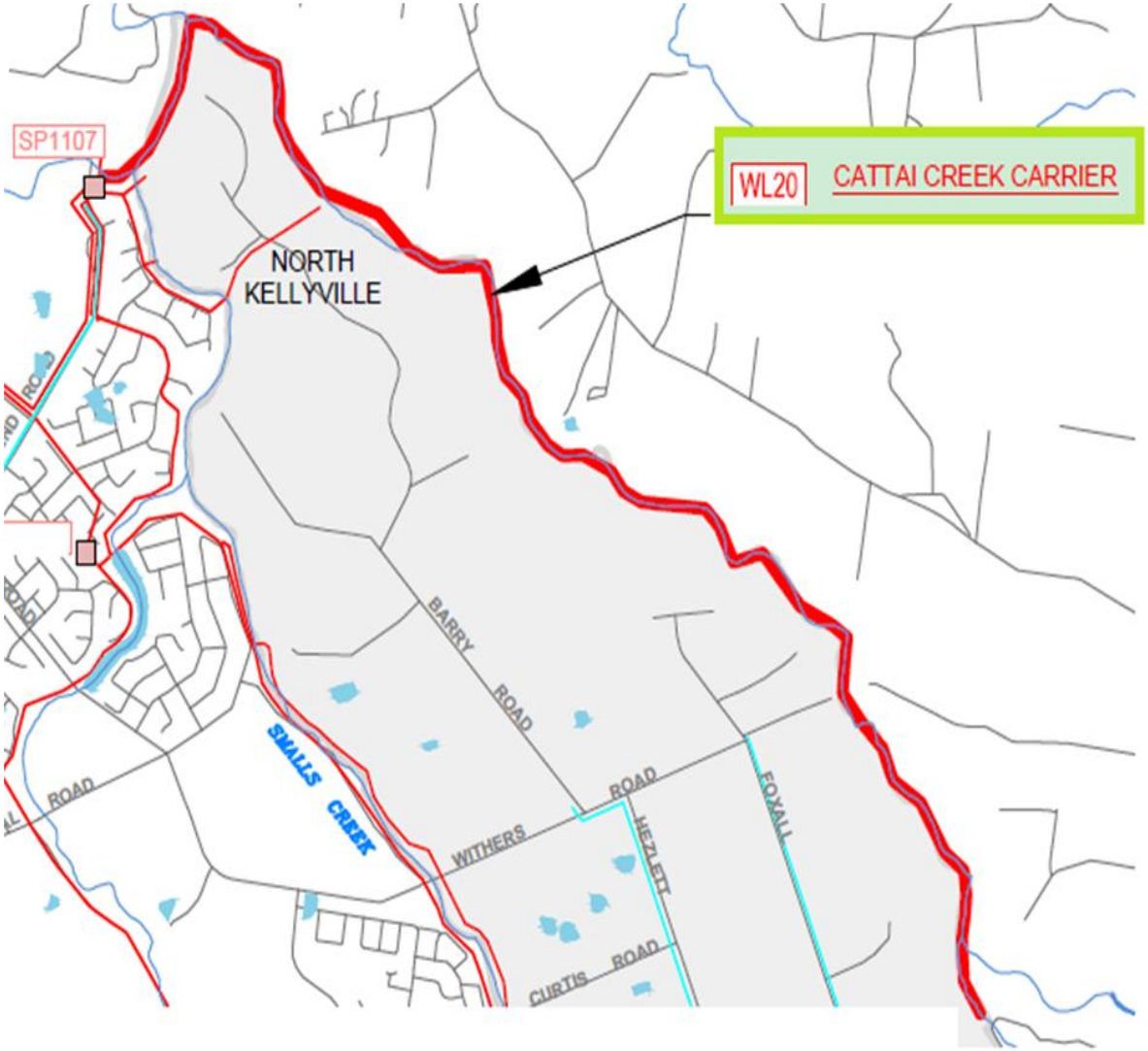
NWGC Package 2 & 3A

The project is providing water and wastewater services for parts of the following precincts:

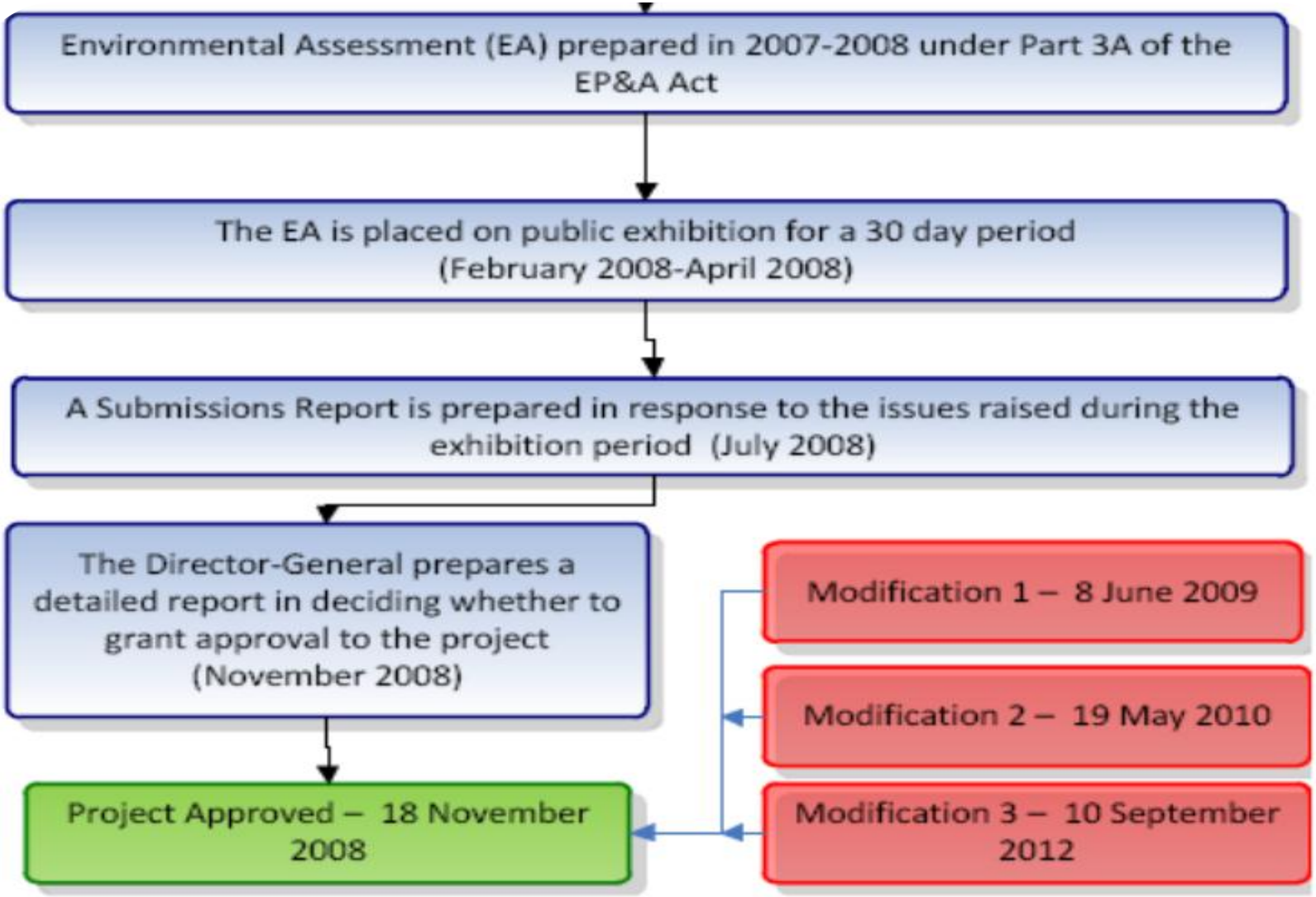
- Box Hill
- Schofields
- Alex Avenue
- **North Kellyville**
- Riverstone.



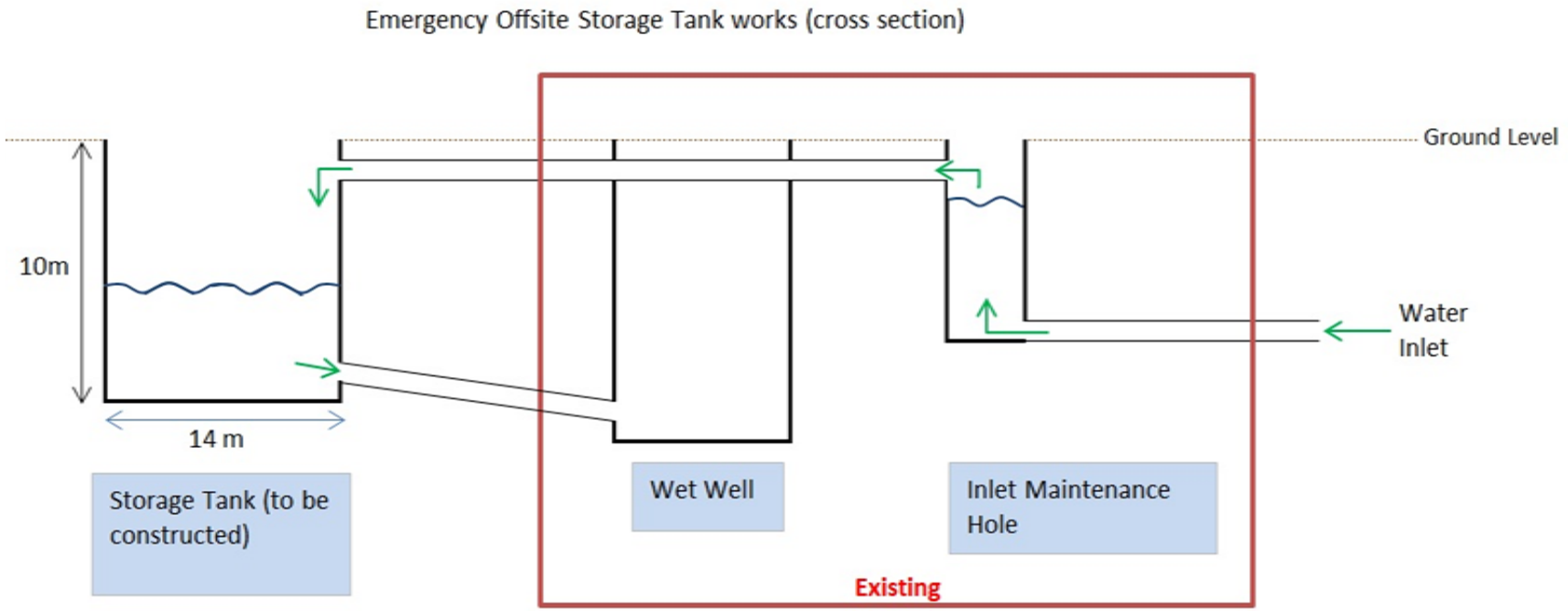
Cattai Creek Carrier



Project Approval



Design, propose & function



Operation of the Emergency Storage Structure (E2S)

Frequency

- Average once a year

Cleaning

- Self-draining
- Following peak wet weather events

Odour

- No additional impacts

Location


~14m
~18m
PROPOSED EMERGENCY STORAGE TANK NO.2
SMALLS CREEK CYCLEWAY
SP1107 EXISTING PUMP STATION
MILE END ROAD
© 2013 Google
Image © 2014 Sinclair Knight Merz
LEGEND
Proposed underground Structures or Pipeworks
Existing underground Structures or Pipeworks
LOCATIONS INDICATIVE ONLY
Google earth

Location

Construction timing

1. Starting May 2014 – subject to approvals
2. Expected completion November/December 2014

Construction overview

- Reinforced concrete in-ground tank
- Existing road will be reinstated
- The cycle-way will be reinstated and adjusted to the new street level
- Bollards and handrails will be installed for public safety

Construction overview

- Reinforced concrete in-ground tank
- Existing road will be reinstated
- The cycle-way will be reinstated and adjusted to the new street level
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Sydney WATER

Construction overview

Construction hours

Normal working hours

- Monday to Friday
  - 7 am to 6 pm
- Saturday
  - 7 am to 1 pm

Out of hours work

- Maybe be required for:
  - Placement of concrete
  - Emergency works

Sydney WATER

Construction sequencing

- Clearing of vegetation
- Establishment of temporary offices
- Excavation
- Formwork
- Pipework and mechanical fit-out
- Finishing works

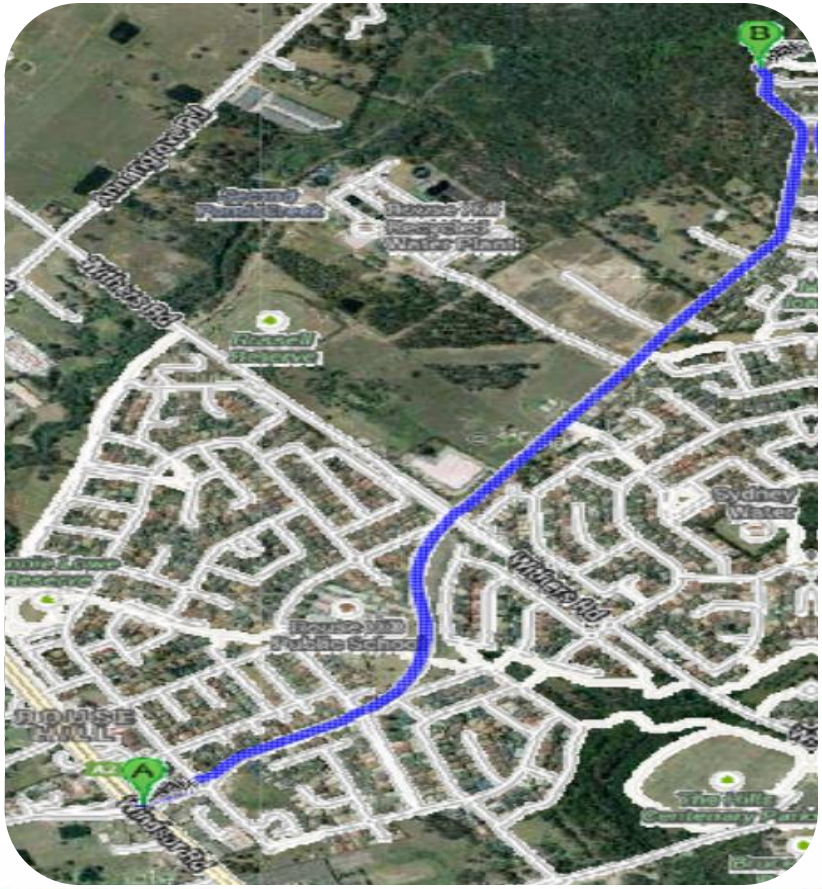
Traffic management

Windsor Road to Mile End Road:

- Limited during school pick up and drop off
- No heavy truck queuing
- Construction speed limits

Truck movements:

- Excavation and spoil movement
  - About 10 trucks a day for 4 weeks
- Concrete
  - About 30 trucks a day on 4-5 days



Sydney WATER

Environmental Controls

Noise management

- Construction Noise Guidelines DECC 2009
- Consultation with residents
- Construction team education
- Scheduling of noisy activities
- Noise monitoring

Environmental controls

Noise mitigation:

- Squawkers
- Insulated equipment
  - Pumps, generators etc.
- Noise walls and fencing

Environmental controls

Vibration

- Guidelines for human comfort:
  - Continuous vibration - 0.2 mm per second
  - Impulsive vibration - 2.8 mm per second
- Building structures:
  - 5 mm per second
- Predicted levels:

Source	Peak Particle Vibration Levels (mms^{-1})					
	5m	10m	20m	30m	40m	**50m**
Vibratory roller	-	4.1	2.6	2.4	2.2	**1.9**
Heavy Rock Breaker	4.5	1.3	0.4	0.2	0.12	**0.085**
Light Rock Hammer (eg: 600kg)	0.2	0.06	0.02	0.01	-	**-**
Impact Piling	11	3.5	1.0	0.5	0.2	**0.05**
Bored Piling	**-**	**0.2**	**<0.1**	**-**	**-**	**-**

Environmental controls

Dust controls:

- Cleaning access roads
- Stabilised entries and exits
- Water sprays and carts
- Education of construction teams

Sydney WATER

Community

- Community team available to assist
- Today's feedback to DP&I
- Regular updates to the community

Contact information

- Project line:1800 768 166
- Project email: enquiry.NWGC@abigroup.com.au

Sydney WATER


Questions?

Registration

Sydney WATER

North West Growth Centre – Package 2 and 3A
Emergency Storage Structure, Mile End Road, Rouse Hill
Community information session, Rouse Hill Community Centre
19 February 2014
7 pm to 8.30 pm

send powerpoint to both.

Name	Address	Email	Phone
ALISON SEYMOUR	8 BERKELEY GROVE, ROUSE HILL	race03@bigpond	8883 2052
Sharon Hogan	177 Mile End Road Rouse Hill	sharonLhogan@gmail.com	0411 140 477