PROPOSED EXPANSION OF FAIRFIELD SUSTAINABLE RESOURECE CENTRE

WETHERILL PARK, FAIRFIELD

ABORIGINAL ARCHAEOLOGICAL ASSESSMENT

Report to DFP Planning on behalf of Fairfield City Council

LGA: Fairfield

January 2019

APEX ARCHAEOLOGY

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Executive Summary

Apex Archaeology has been commissioned by DFP Planning to undertake an Aboriginal heritage archaeological assessment to support a Development Application (DA) for the expansion of the Fairfield Sustainable Resource Centre (SRC). It is a requirement to prepare an archaeological assessment considering both European and Indigenous archaeological values of the area. This report details the results of the Aboriginal heritage assessment of the study area. This report has been produced with reference to the OEH 2011 *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*, as well as the DECCW 2010 *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (the Due Diligence Code of Practice).

The SRC is located in Wetherill Park approximately 25 kilometres east of Sydney Central Business District. It is located within the City of Fairfield Local Government Area (LGA).

The Fairfield SRC is bounded by Prospect Creek to the north and east, Widemere Road to the west and Hassall Street to the south. The study area comprises approximately 3ha in total.

A search of the AHIMS database was undertaken for the study area with a 5km radius. 25 previously recorded sites were identified on the AHIMS database for this project. However, none of the sites recorded on the database fall within the current study area.

A site visit was conducted on Tuesday 5 September 2017. No newly identified archaeological material was identified during the survey. Ground surface visibility (GSV) was low throughout the study area. GSV was rated at 30% overall. No raw material sources were identified within the study area.

A subsequent site visit was conducted on Friday 20 November 2018 to assess two additional impact areas (Car Parking Area & Sedimentation Basin) for the project.

The car park area was noted to have been heavily disturbed due to previous construction and landscaping on the site and the location of the sedimentation basin was similarly identified as disturbed with evidence of imported material and landscape modification.

It is recommended that:

- No further Aboriginal archaeological assessment is required prior to the commencement of upgrade works as described in this report.
- The results of this assessment fulfil the requirement for Due Diligence in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (Code of Practice). Works may proceed with caution.

- The proposed works must be contained to the area assessed during this archaeological assessment, as shown on Figure 2. If the proposed location is amended, further archaeological assessment may be necessary to determine if the proposed works will impact any Aboriginal objects or archaeological deposits.
- Should unanticipated archaeological material be encountered during site works, all work must cease and an archaeologist contacted to make an assessment of the find. Further archaeological assessment and Aboriginal community consultation may be required prior to the recommencement of works. Any objects confirmed to be Aboriginal in origin must be reported to the OEH under Division 1, Section 89A of the NPW Act.

Apex Archaeology would like to acknowledge the Aboriginal people who are the traditional custodians of the land in which this project is located. Apex Archaeology would also like to pay respect to Elders both past and present.

Document Control

The following register documents the development and issue of the document entitled 'Proposed Expansion of Fairfield Sustainable Resource Centre, Wetherill Park – Aboriginal Archaeological Assessment', prepared by Apex Archaeology in accordance with its quality management system.

Revision	Prepared by	Reviewed by	Comment	Issue Date
1 – Draft	Leigh Bate	Jenni Bate	Initial preparation	14 September 2017
2 - Draft	Leigh Bate	Stephen Earp/Kirk Osborne	Client review	23 November 2017
3 – Final	Jenni Bate		Report finalisation	7 May 2018
4 - Final	Leigh Bate	Stephen Earp/Kendal Mackay	Additional impact areas added	5 December 2018
5 – Final	Jenni Bate	Kendal Mackay	Report finalisation	16 January 2019

GLOSSARY OF TERMS

Aboriginal Object	An object relating to the Aboriginal habitation of NSW (as defined in the NPW Act), which may comprise a deposit, object or material evidence, including Aboriginal human remains.
AHIMS	Aboriginal Heritage Information Management System maintained by OEH, detailing known and registered Aboriginal archaeological sites within NSW
AHIP	Aboriginal Heritage Impact Permit
ATER	Aboriginal Test Excavation Report
BP	Before Present, defined as before 1 January 1950.
Code of Practice	The DECCW September 2010 *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*
Consultation	Aboriginal community consultation in accordance with the DECCW April 2010 *Aboriginal cultural heritage consultation requirements for proponents 2010.* Consultation is not a required step in a due diligence assessment; however, it is strongly encouraged to consult with the relevant Local Aboriginal Land Council and to determine if there are any Aboriginal owners, registered native title claimants or holders, or any registered Indigenous Land Use Agreements in place for the subject land
DA	Development Application
DCP	Development Control Plan
DECCW	The Department of Environment, Climate Change and Water – now OEH
Disturbed Land	If land has been subject to previous human activity which has changed the land's surface and are clear and observable, then that land is considered to be disturbed
Due Diligence	Taking reasonable and practical steps to determine the potential for an activity to harm Aboriginal objects under the *National Parks and Wildlife Act 1974* and whether an application for an AHIP is required prior to commencement of any site works, and determining the steps to be taken to avoid harm
Due Diligence Code of Practice	The DECCW Sept 2010 *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*
GCP	Growth Centres Precinct
GIS	Geographical Information Systems
GSV	Ground Surface Visibility
Harm	To destroy, deface or damage an Aboriginal object; to move an object from land on which it is situated, or to cause or permit an object to be harmed
LALC	Local Aboriginal Land Council
LGA	Local Government Agency
NPW Act	NSW *National Parks and Wildlife Act* 1974
OEH	The Office of Environment and Heritage of the NSW Department of Premier and Cabinet
RAPs	Registered Aboriginal Parties
SRC	Sustainable Resource Centre

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1.0 INTRODUCTION

Apex Archaeology has been commissioned by DFP Planning to undertake an Aboriginal heritage assessment to support a Development Application (DA) for the expansion of the Fairfield Sustainable Resource Centre (SRC). It is a requirement to prepare an archaeological assessment considering both European and Indigenous archaeological values of the area.

In order to assess the Aboriginal archaeological values of the study area, Apex Archaeology has been engaged to undertake an archaeological assessment of the archaeological values of the study area. This report has been produced with reference to the OEH 2011 *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*, as well as the DECCW 2010 *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (the Due Diligence Code of Practice).

1.1 STUDY AREA

The SRC is located in Wetherill Park, approximately 25 kilometres east of Sydney Central Business District (Figure 1). It is located within the City of Fairfield Local Government Area (LGA).

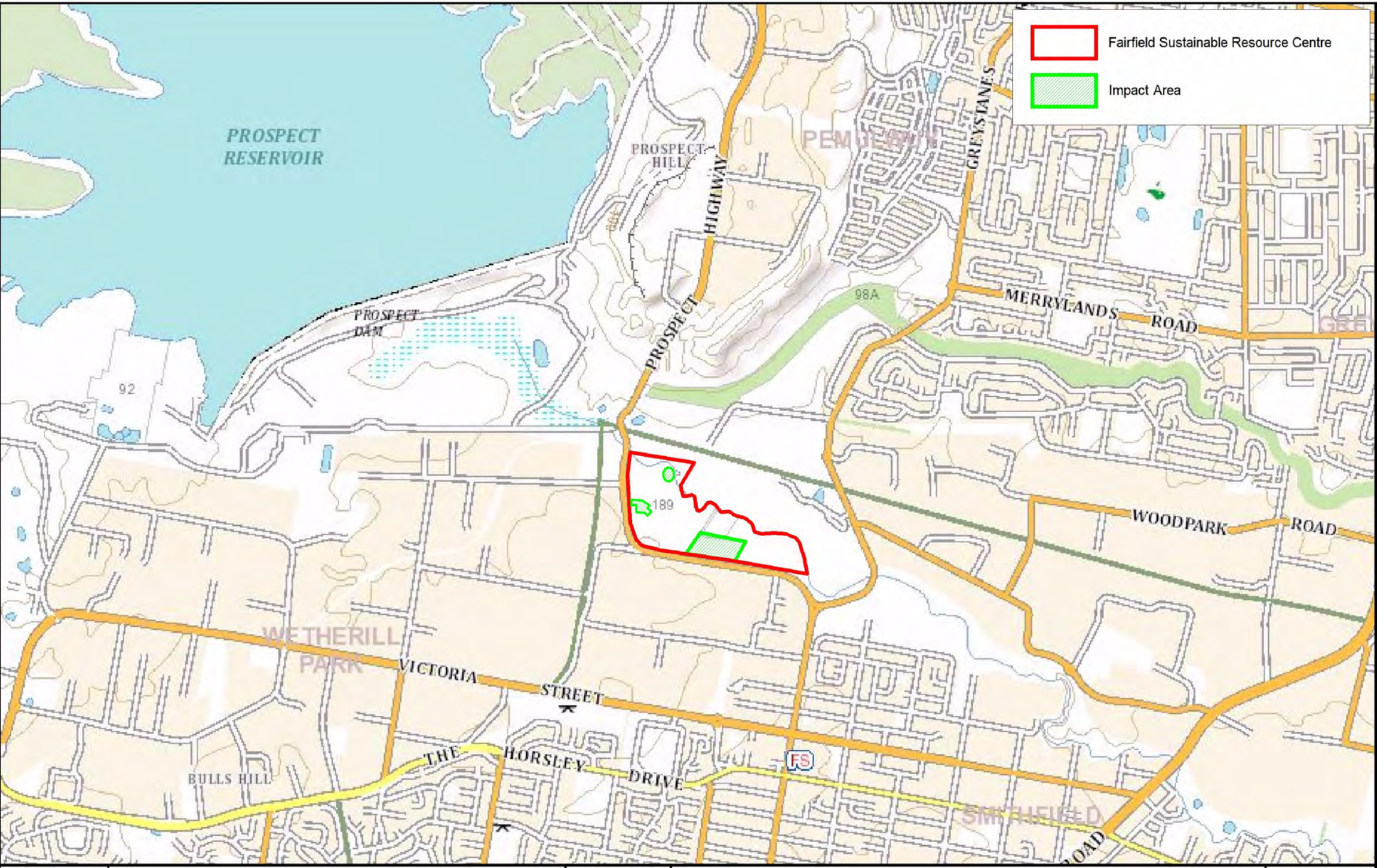
The Fairfield SRC is bounded by Prospect Creek to the north and east, Widemere Road to the west and Hassall Street to the south (the study area). The SRC comprises approximately 3ha in total. The proposed impact area is a smaller section of the former Canal Road reserve, which will be infilled as part of the proposal, and an area of ground to the east of the Canal Road reserve. Further details of the study area can be seen in Figure 2.

1.2 PROPOSED ACTIVITY

The proposed development is for an expansion of the SRC to increase its processing capacity to up to 550,000 tonnes of recyclable construction material per year. The proposal is also seeking to fill a gully running north-south through the centre of the site, known locally as 'Canal Road' and fill a small area of land to the south east of the gully, fronting Hassall Street.

The following is proposed:

- A processing capacity of up to 550,000 tonnes of recycled construction materials per year.
- Importation of approximately 31,000m^3 of Virgin Excavated Natural Material (VENM) for site fill.
- Site earthworks and grading to establish a level site, including the construction of batters.
- Removal of a small stormwater basin and construction of a new larger sediment basin and stormwater harvesting basin.



PO Box 291
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kilometres

Projection:
MGA Zone 56 (GDA 94)
Base Map:
Six Maps Topo
FINAL - Version 1

Figure 1: General location of the Fairfield SRC in its local context

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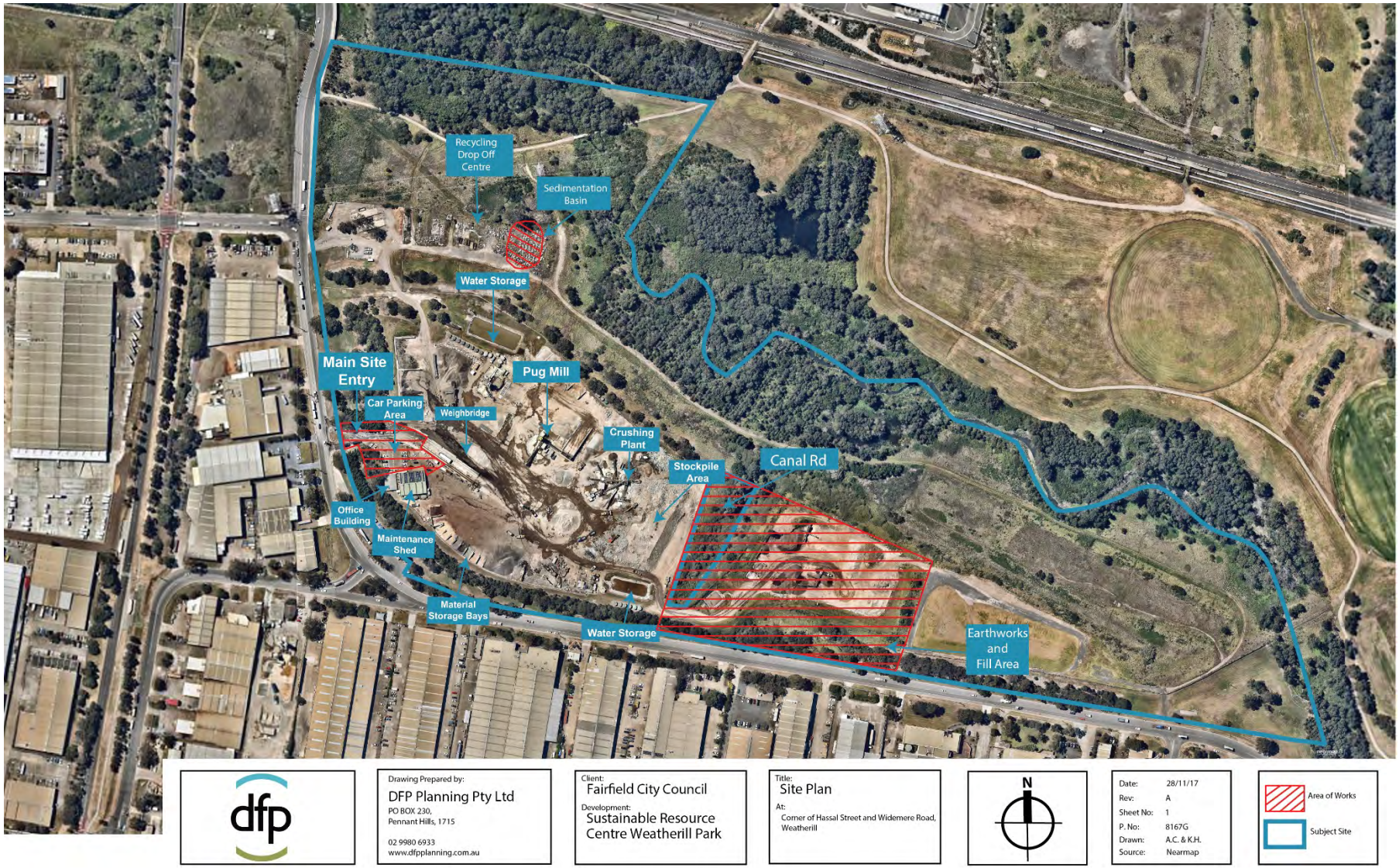


Figure 2: Proposed layout of the SRC upgrade.

- Receiving, processing, recycling and storage of the following waste material, consistent with existing operations and EPA licensing:
    - VENM;
    - Building and demolition waste including roof tiles, clay bricks, concrete;
    - Asphalt waste (including asphalt resulting from road construction and waterproofing);
    - Spoil and Soils.
- Modifications to the main site entry and exit and carparking area to provide additional car parking spaces.
- Change to the site operating hours to the following:
    - Receiving and loading of trucks – 24hrs/7 days;
    - Crushing operations 5.00am – 6.00pm (Monday to Friday);
    - Pug Mill operations 3.00am – 4.00pm (Monday to Friday).
- Vegetation and tree removal to facilitate the proposed works and replacement tree planting.
- Associated infrastructure and services works.

1.3 Additional Disturbance Areas

Two additional impact areas were added to this assessment in October 2018. A sedimentation basin located within the north west portion of the SRC near to Prospect Creek and a carpark area located at the entrance to the site (Figure 2).

The sedimentation basin will impact an area of approximately 50m x 30m. The volume will accommodate roughly 800 cubic metres with a depth between 0.5-2m.

1.4 Investigators and Contributors

This report has been prepared by Leigh Bate, Director and Archaeologist with Apex Archaeology, and Jenni Bate, Director and Archaeologist with Apex Archaeology. Both have over eleven years of consulting experience within NSW.

Name	Role	Qualifications
Leigh Bate	Primary Report Author, GIS, Field inspection	B.Archaeology; Grad. Dip. Arch; Dip. GIS
Jenni Bate	Project Manager, Review	B.Archaeology; Grad. Dip. CHM

1.5 NSW Heritage Legislation

Protection for Aboriginal heritage in NSW is provided primarily under the *National Parks and Wildlife Act* 1974 (NPW Act). Although cultural heritage is protected by other Acts, the NPW Act is the relevant Act for undertaking due diligence assessments. Protection for Aboriginal sites, places and objects is overseen by the Office of Environment and Heritage (OEH), of the Department of Premier and Cabinet.

Changes to the NPW Act with the adoption of the *NPW Amendment (Aboriginal Objects and Places) Regulation* 2010 in October 2010 led to the introduction of new

offences regarding causing harm to Aboriginal objects or declared Aboriginal places. These offences include destruction, defacement or movement of an Aboriginal object or place. Other changes to the NPW Act include:

- Increased penalties for offences relating to Aboriginal heritage for individuals and companies who do not comply with the legislation;
- Introduction of the strict liability offences, meaning companies or individuals cannot claim 'no knowledge' if harm is caused to Aboriginal objects or places; and
- Changes to the permitting process for AHIPs – preliminary archaeological excavations can be undertaken without the need for an AHIP, providing the excavations follow the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*.

A strict liability offence was introduced, meaning a person who destroys, defaces or moves an Aboriginal object without an Aboriginal Heritage Impact Permit (AHIP) is guilty of an offence, whether they knew it was an Aboriginal object or not. Exercising due diligence (as described in Section 1.4) provides a defence against the strict liability offence.

1.6 OEH Guide to Investigating, Assessing and Reporting

The OEH *Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage* was introduced in April 2011. It provides guidance on how Aboriginal cultural heritage should be investigated and assessed, as well as the requirements for an Aboriginal cultural heritage assessment report.

Section 2 of the guide outlines what to do if it is not known whether a proposed activity or development will impact on Aboriginal cultural heritage. When this is the case, it is considered appropriate to follow the Due Diligence Code of Practice (see Section 1.6). Following this process can assist in determining if Aboriginal objects and places are or may be present within the study area, and whether further assessment including Aboriginal consultation should be undertaken.

As it was not known whether the study area contained Aboriginal objects or places, or the potential to contain such, it was considered appropriate to reference the Code of Practice during this archaeological assessment.

1.7 NSW Due Diligence Code of Practice

The *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (Code of Practice) was introduced in September 2010. It outlines a method to undertake 'reasonable and practical' steps to determine whether a proposed activity has the potential to harm Aboriginal objects within the subject area, and thereby determine whether an application for an Aboriginal Heritage Impact Permit (AHIP) is required. When due diligence has been correctly exercised, it provides a defence against prosecution under the NPW Act under the strict liability clause if Aboriginal objects are unknowingly harmed without an AHIP.

The Code of Practice provides the 'reasonable and practicable' steps to be followed when determining the potential impact of a proposed activity on Aboriginal objects. Due diligence has been defined by OEH as "taking reasonable and practical steps to determine whether a person's actions will harm an Aboriginal object and, if so, what measures can be taken to avoid that harm" (DECCW 2010:18).

These steps include:

- Identification of whether Aboriginal objects are, or are likely to be, present within the subject area, through completing a search of the Aboriginal Heritage Information Management System (AHIMS); Determine whether the proposed activity is likely to cause harm to any Aboriginal objects; and
- Determine the requirement for an AHIP.

Should the conclusion of a due diligence assessment be that an AHIP is required, further assessment must be undertaken, with reference to the following guidelines:

- DECCW, April 2010, *Aboriginal cultural heritage consultation requirements for proponents 2010.* Part 6 National Parks and Wildlife Act 1974;
- DECCW, Sept 2010, *Code of Practice for Archaeological Investigation of Aboriginal Objects In New South Wales*;
- OEH, April 2011, *Guide to Investigation, assessing and reporting on Aboriginal cultural heritage in NSW*; and
- OEH, May 2011, *Applying for an Aboriginal Heritage Impact Permit: Guide for Applicants*.

1.7.1 Fairfield Local Environmental Plan 2013

The Fairfield LEP 2013 guides heritage conservation and assessment within the Fairfield LGA, with a number of heritage restrictions included. Clause 5.10(2)(c) states that archaeological sites may not be disturbed or excavated without development consent. Further, Clause 5.10(2)(e) identifies that no buildings may be erected on land within a heritage conservation area or which contains an Aboriginal object, without first obtaining development consent, and Clause 5.10(2)(f) states that development consent is required for the subdivision of land within a heritage conservation area, on which a heritage item is located, on which an Aboriginal object is located, or within an Aboriginal place of heritage significance. Exceptions to the requirement for development consent are detailed by Clause 5.10(3) and include low impact activities, or activities for the maintenance of a heritage item.

Clause 5.10(4) requires that the effect of any development on a heritage item or heritage conservation area must be considered, and 5.10(5) details that a heritage assessment is required for land which is within a heritage conservation zone.

Additionally, Clause 5.10(5) states that:

> *The consent authority may, before granting consent to any development:*

(a) on land on which a heritage item is located, or

(b) on land that is within a heritage conservation area, or

(c) on land that is within the vicinity of land referred to in paragraph (a) or (b),

require a heritage management document to be prepared that assesses the extent to which the carrying out of the proposed development would affect the heritage significance of the heritage item or heritage conservation area concerned.

There are no heritage items within or in the vicinity of the study area (Figure 3).

Figure 3: Detail of Fairfield LEP heritage maps, showing no heritage items in the vicinity of the study area, marked in green. (Source: FLEP 2013 Sheet HER_015)

1.7.1 Fairfield Citywide Development Control Plan 2013

The Fairfield Citywide Development Control Plan 2013 (DCP) provides development controls for any development activities within the Fairfield LGA. A number of clauses reference assessing the heritage significance of a proposed development area, including Chapter 3.13 Heritage Items, which details the objectives and controls applicable to heritage assessment and development in the vicinity of a heritage item. However, there are no specific controls relevant to this project on heritage grounds.

2.0 The Due Diligence Code of Practice Process

The Due Diligence Code of Practice provides a specific framework to guide the assessment of Aboriginal cultural heritage. The following section presents the results of this process.

2.1 Step 1: Will the activity disturb the ground surface?

The proposed works will disturb the ground surface. The proposed development is for an expansion of the SRC to increase its processing capacity to up to 550,000 tonnes of recycled materials per year. The concrete crushing plant has the capacity to process up to 600,000 tonnes of waste material per annum and the pug mill has the capacity to process up to 150,000 tonnes of waste material per annum.

The proposal is also seeking to fill a gully running north-south through the centre of the site, known locally as 'Canal Road'. The old reserve for Canal Road has been extinguished and the land (now Lot 100 1220637) is under the ownership of Fairfield Council. The gully is proposed to be filled with VENM and potentially stockpiled material.

The filling of the 'Canal Road' (an unmade road) will create a more level site and operational efficiencies. This will ensure that the SRC is also capable of accommodating future industrial activities on the site.

Additionally, a sedimentation basin will be excavated in close proximity to Prospect Creek. The excavation will impact and area about 50m x 30m with a depth of around 0.53m.

2.2 Step 2a: AHIMS and Available Literature Search

OEH is required to maintain a register of Aboriginal sites recorded during archaeological assessments and other activities within NSW. This is known as the Aboriginal Heritage Information Management System (AHIMS). This register provides information about site types, their geographical location, and their current status. It is the requirement for the recorder of a newly identified site to register this site with OEH to be placed onto the AHIMS register. It is a requirement of the Code of Practice to undertake a search of this register as part of undertaking a due diligence assessment.

OEH also maintains a register of archaeological reports relating to archaeological investigations throughout NSW. These reports are a valuable source of information regarding investigations previously completed and their findings, and can inform the assessment process regarding the potential for Aboriginal cultural material and archaeological potential within a study area.

2.2.1 AHIMS Results

A search of the study area with a 5km buffer was conducted on 16 May 2017. Subsequently, an extensive search of the database was completed, with a total of 25 sites registered on the AHIMS database, as shown in Table 1 below. A copy of the extensive search is attached in Appendix A.

Table 1: Sites identified during AHIMS search

Site ID	Site Name	Context	Recorders
45-5-2447	Prospect Hill 1	Open site	Mrs. Angela Besant
45-5-2745	PH3	Open site	Environmental Resources Management Pty Ltd - Sydney
45-5-2746	PH1	Open site	Environmental Resources Management Pty Ltd - Sydney
45-5-2866	Holroyd Substation PAD	Open site	
45-5-2897	PAD4 Prospect	Open site	Doctor.Jo McDonald
45-5-2978	Archaeological Test Area 1	Open site	
45-5-3950	Prospect Pipehead (PP) 1	Open site	Ms.Jillian Comber, Comber Consultants Pty Limited
45-5-3951	Prospect Pipehead (PP) 2	Open site	Ms.Jillian Comber, Comber Consultants Pty Limited
45-5-3952	Prospect Pipehead (PP) 3	Open site	Ms.Jillian Comber, Comber Consultants Pty Limited
45-5-2555	Prospect Hill 7	Open site	Mrs. Angela Besant
45-5-2547	Prospect Hill 2,3,4	Open site	Mrs. Angela Besant
45-5-2522	CS-IF-1	Open site	Mrs. Robynne Mills
45-5-0802	PB2 (Prospect Reservoir)	Open site	Ms.Jillian Comber, Elizabeth Rich
45-5-0803	PB3 (Prospect Reservoir)	Open site	Ms.Jillian Comber, Elizabeth Rich
45-5-0804	PB4 (Prospect Reservoir)	Open site	Ms.Jillian Comber, Elizabeth Rich
45-5-0805	PA1;Prospect Reservoir;	Open site	Ms.Jillian Comber
45-5-0806	PA2;Prospect Reservoir;	Open site	Ms.Jillian Comber
45-5-1083	CSIRO 1;	Open site	Stephanie Garling
45-5-0868	PP1;Prospect Reservoir;	Open site	Ms.Jillian Comber, L Grey
45-5-0869	PP2;Prospect Reservoir;	Open site	Ms.Jillian Comber

Site ID	Site Name	Context	Recorders
45-5-0836	Prospect Tunnel;PT 1;	Open site	Ms.Jillian Comber
45-5-3691	Prospect Ck 3	Open site	Michael Guider
45-5-3692	Prospect Creek 4	Open site	Mary Dallas Consulting Archaeologists, Michael Guider, Ms. Tamika Goward
45-5-3701	Propect Ck 1	Open site	Mary Dallas Consulting Archaeologists, Michael Guider, Ms. Tamika Goward
45-5-3702	Propect Ck 2	Open site	Michael Guider
45-5-2447	Prospect Hill 1	Open site	Mrs. Angela Besant

These sites are all listed as open sites, comprising 19 artefact sites, 3 Potential Archaeological Deposit (PAD) sites, 2 modified or carved tree sites and 1 modified or carved tree site with associated area of potential archaeological deposit. Figure 4 shows the location of these sites in relation to the current study area. No sites fall within the study area boundaries.

2.2.1 Literature review

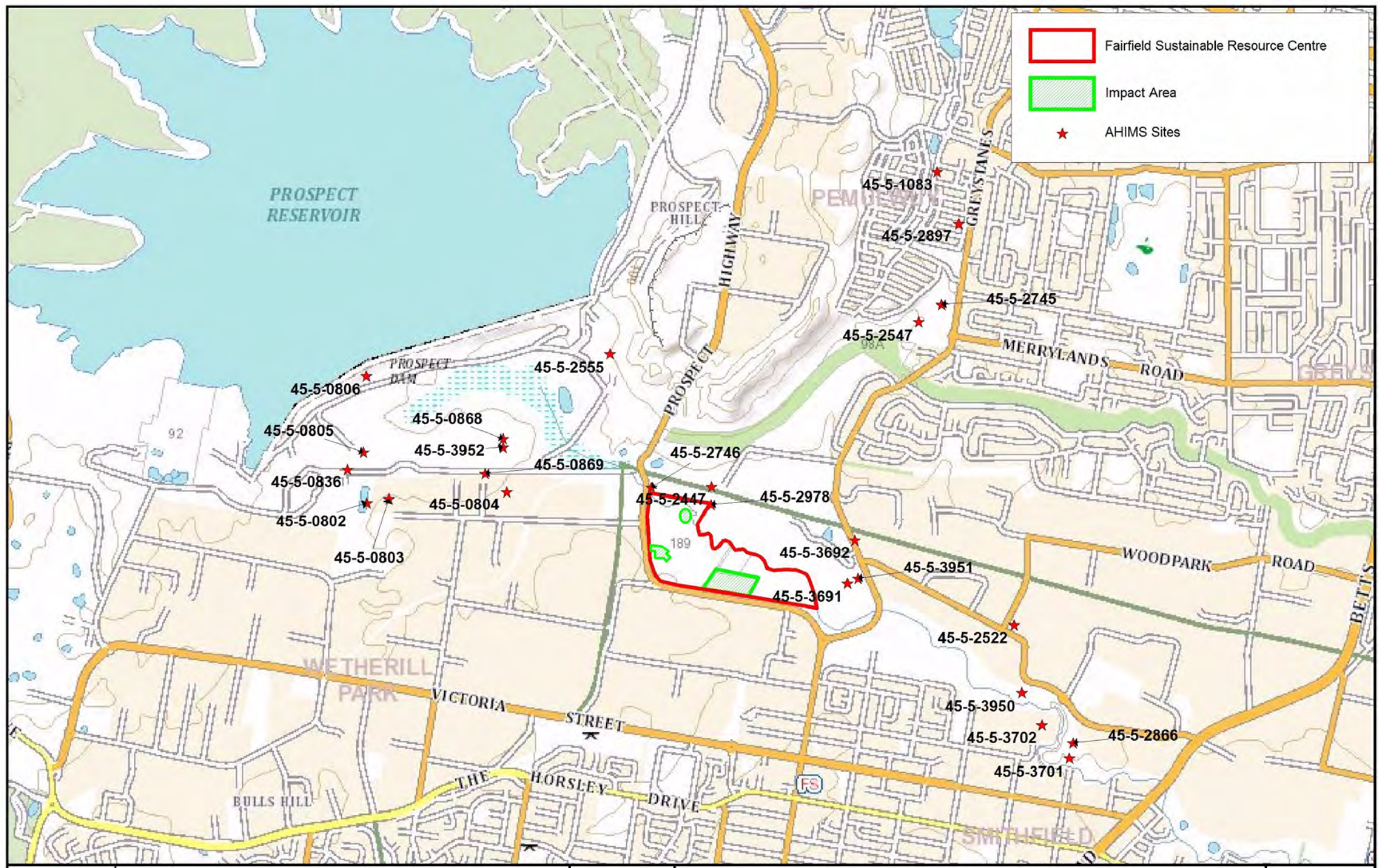
A review of previous archaeological work within the surrounding region of the study area was undertaken. A number of reports were identified from background research and the AHIMS database and are detailed below.

Comber 1990a

Jillian Comber was engaged by the NSW Water Board to undertake an archaeological survey for Aboriginal and historical sites for the construction of a chloramination plant and pipeline as part of its project to bypass Prospect Reservoir. Four areas of PAD with associated artefact scatters, three isolated finds and one scarred tree were identified during this assessment. Recommendations for test excavation on the areas of PAD were made. Consultation was undertaken with the Daruk LALC and the recommendations made for the project were supported.

Comber 1990b

Jillian Comber was commissioned to undertake additional survey for the NSW Water Board for an alternate pipeline route for the chloramination plant as part of its project to bypass Prospect Reservoir. Consultation with the Daruk LALC was undertaken, although no formal comment was included in the report. Two additional artefact scatters and one isolated find were identified during this assessment. Avoidance of the site was recommended.



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Projection:
MGA Zone 56 (GDA 94)
Base Map:
Six Maps Topo
FINAL - Version 1

Figure 4 : Known Aboriginal sites within a 1km^2 radius of the study area.

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COMBER 1991A

In 1991 Jillian Comber was engaged to undertake an archaeological survey for Aboriginal and historic sites for the Prospect Tunnel project for the NSW Water Board. Consultation with the Daruk LALC was undertaken, although no formal comment was included in the report. One artefact scatter and an isolated find were identified during the survey. It was recommended that these sites be avoided and fenced off during construction activities.

COMBER 1991B

The NSW Water Board commissioned Jillian Comber to assess an area on the south western shores of the Prospect Reservoir for the construction of a water treatment works. Two artefact sites and one area of sub-surface archaeological potential were identified during the survey. Avoidance of these sites was recommended.

JMCDCHM 2002

JMcDCHM were engaged by the Rose Consulting group on behalf of Stockland to undertake an archaeological survey for Aboriginal sites at the former CSIRO animal research laboratory. No artefact scatters or isolated finds were recorded during the survey. However, three areas of potential archaeological deposit were identified. A program of sub-surface testing was recommended for two of the PAD sites.

MCINTYRE-TAMWOY 2003

In 2003 Susan Mcintyre-Tamwoy was engaged to undertake an assessment of a block of land for a proposed substation. No artefacts or sub-surface deposits were identified. No Aboriginal cultural heritage constraints were thus identified for the development to proceed. The three Aboriginal groups consulted for the project supported the recommendations made for the project.

NAVIN OFFICER 2004

Navin Officer were engaged by the NSW Roads & Traffic Authority to undertake an archaeological grading program under Aboriginal Heritage Impact Permit #1949. A limited subsurface inspection was undertaken on the northern side of Prospect Creek. A grader scraped back an area 47m long and progressively revealed the subsurface soils down to a depth of 15cm. No artefacts were identified from this assessment. This excavation was undertaken approximately 130m north of the proposed sedimentation basin for the current project.

AMBS 2008

AMBS undertook a preliminary cultural heritage assessment for the Rosehill Recycled Water Scheme. The report found that there were areas with both Aboriginal and historical archaeological potential within and adjacent to the pipeline which would more than likely be impacted by the proposed works. Further assessment was recommended in the form of field survey.

COMBER CONSULTANTS 2010

Comber Consultants were engaged by Sydney Water to undertake an Aboriginal cultural heritage assessment for the Prospect to Pipehead pipeline maintenance project. Three Aboriginal sites were identified during the survey and a subsequent s90 AHIP with a salvage component was recommended to be applied for.

2.3 STEP 2B: LANDSCAPE FEATURES

An assessment of landscape features is required to determine whether Aboriginal objects are likely to be present within the proposed activity area. Certain landscape features are more likely to have been utilised by Aboriginal people in the past and therefore are more likely to have retained archaeological evidence of this use. Focal areas of activity for Aboriginal people include rock shelters, sand dunes, water courses, waterholes and wetlands, as well as ridge lines for travel routes.

The presence of specific raw materials for artefact manufacture, as well as soil fertility levels to support vegetation resources, are also factors to be considered in the assessment of the environmental context of a study area. Geomorphological factors, such as erosion and accretion of soils, affect the preservation of potential archaeological deposits and therefore need to be considered when making an assessment of the potential for archaeological material to be present within a study area. This assessment is predominantly a desktop exercise.

2.3.1 EXISTING ENVIRONMENT

The study area is characterised by an elevated area running above the Prospect Creek with a small gully running through the middle. The area has been intensely modified over the last 200 years from initial vegetation clearance, to land fill, to subsequent earth moving activities related to the current SRC. The area would have originally been cleared and used for agricultural purposes in the past as the aerial image from 1930 shows (Figure 5).

By 1933, the area had been mostly cleared. Several small structures were visible along the alignment of the Canal Road reserve, and several others were present within the study area.

Figure 5: detail from 1930 aerial imagery. Study area indicated by green circle. Source: LPI 1930 22000 BW

Figure 6: detail of 1975 aerial imagery. Study area indicated by green circle. Source: LPI 1975 40000 BW

The 1975 aerial imagery showed further clearing within the study area, and at least one lot appears to have been used for crops. Other lots appeared to have been graded. The structures that were present along the Canal Road reserve had been

removed. Between the late 1970s and 1980s the area was used as a land fill site, predominately for household refuse. When closed, this was sealed with a clay capping of approximately 1m deep.

Figure 7: Detail of 1991 aerial imagery. Study area indicated by green circle. Source: LPI 1991 25000 COL.

By 1991, the entirety of the study area had been cleared and initial works for the construction of the SRC had commenced. All structures within the area had been removed. In 1992, the Fairfield Sustainable Resource Centre (SRC) was opened on the site (Aust Gov 2011). The SRC is run as a stand-alone business unit of Fairfield City Council and recycles construction materials into new materials for use.

The study area has continued to be modified in response to the operational requirements of the SRC.

Soil Landscapes, Geology and Topography

The study area falls within the Sydney Basin, which is roughly bounded by the Great Dividing Range to the west, the coast to the east, Newcastle to the north and Wollongong to the south. It is the geographic extent of the Hawkesbury sandstone (McDonald 2008). The Cumberland Plain is located within the Sydney Basin, and is formed on shale geology with open plain woodlands, and is surrounded by the Hornsby Plateau to the north, the Woronora Plateau to the south, and the Blue Mountains Plateaux to the west (McDonald 2008). The Cumberland Plain is comprised of generally low gradient, rolling topography, located on shale-dominated Triassic formations, including Tertiary and later alluvial based sediments.

The Hawkesbury River has incised a course through an open valley on Hawkesbury Sandstone, with a broad flood plain present.

The study area falls wholly within the Blacktown soil landscape (Figure 9). The Blacktown soil landscape is a shallow to moderately deep soil found across the Wianamatta Group shales. This soil landscape is a residual landscape in which the soils form *in situ.* There is limited erosion within this landscape which means bedrock exposures are also rare.

HYDROLOGY

The nearest major permanent water source is Prospect Creek which is located approximately 160m to the north of the study area. Prospect Creek is a third order watercourse as defined by the Strahler stream ordering system as used by DPI Water (Figure 8). Watercourse classification ranges from first order through to fourth order (and above) with first order being the lowest, ie a minor creek or ephemeral watercourse.

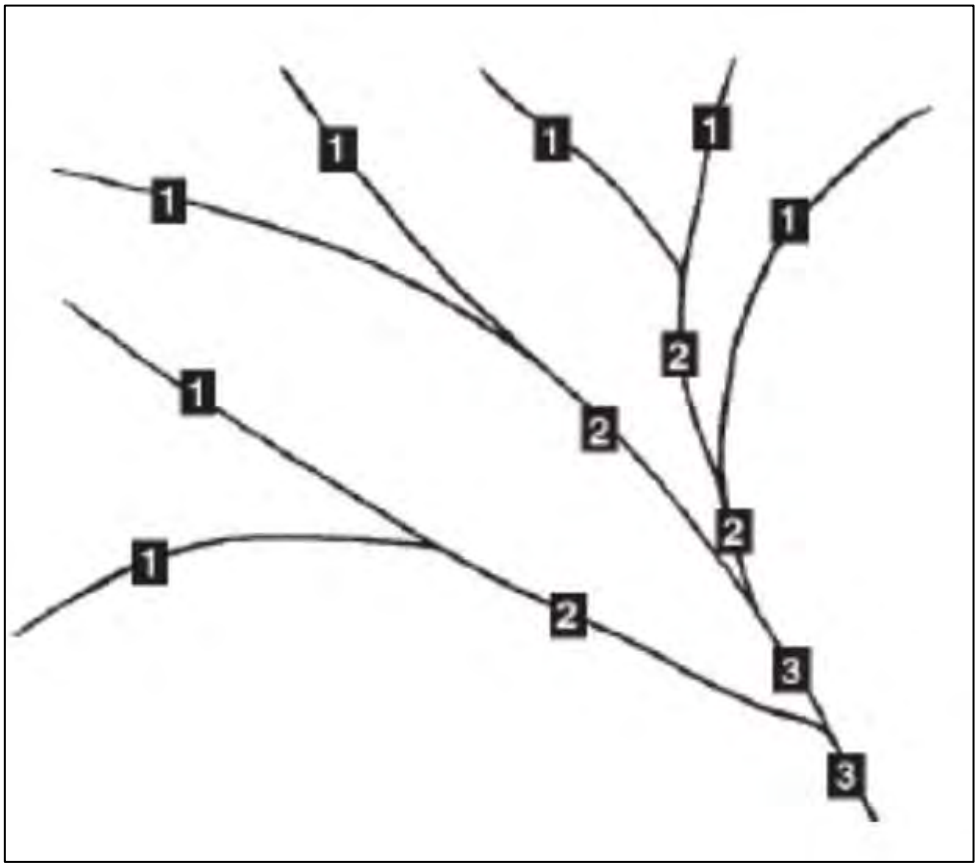


Figure 8: The Strahler system (Source: Department of Planning and Environment 2016).

The study area is located within 200m of a natural watercourse. Although the study area meets the definition of "disturbed land", there is a requirement to proceed to Step 3 of the due diligence assessment process as the study area is in close proximity

to a watercourse, and this landscape feature is associated with Aboriginal archaeological potential.

2.3.1 Raw Materials

A wide range of raw materials were selected by Aboriginal people for flaking to create stone implements. Material types ranged from high quality to poor quality for flaking purposes, depending on the geology of the area and readily available material types. The following is a description of a range of raw material types known to have been utilised by Aboriginal people for the creation of stone artefacts.

Breccia

Breccias are coarse, angular volcanic fragments cemented together by a finer grained tuffaceous matrix.

Chalcedony

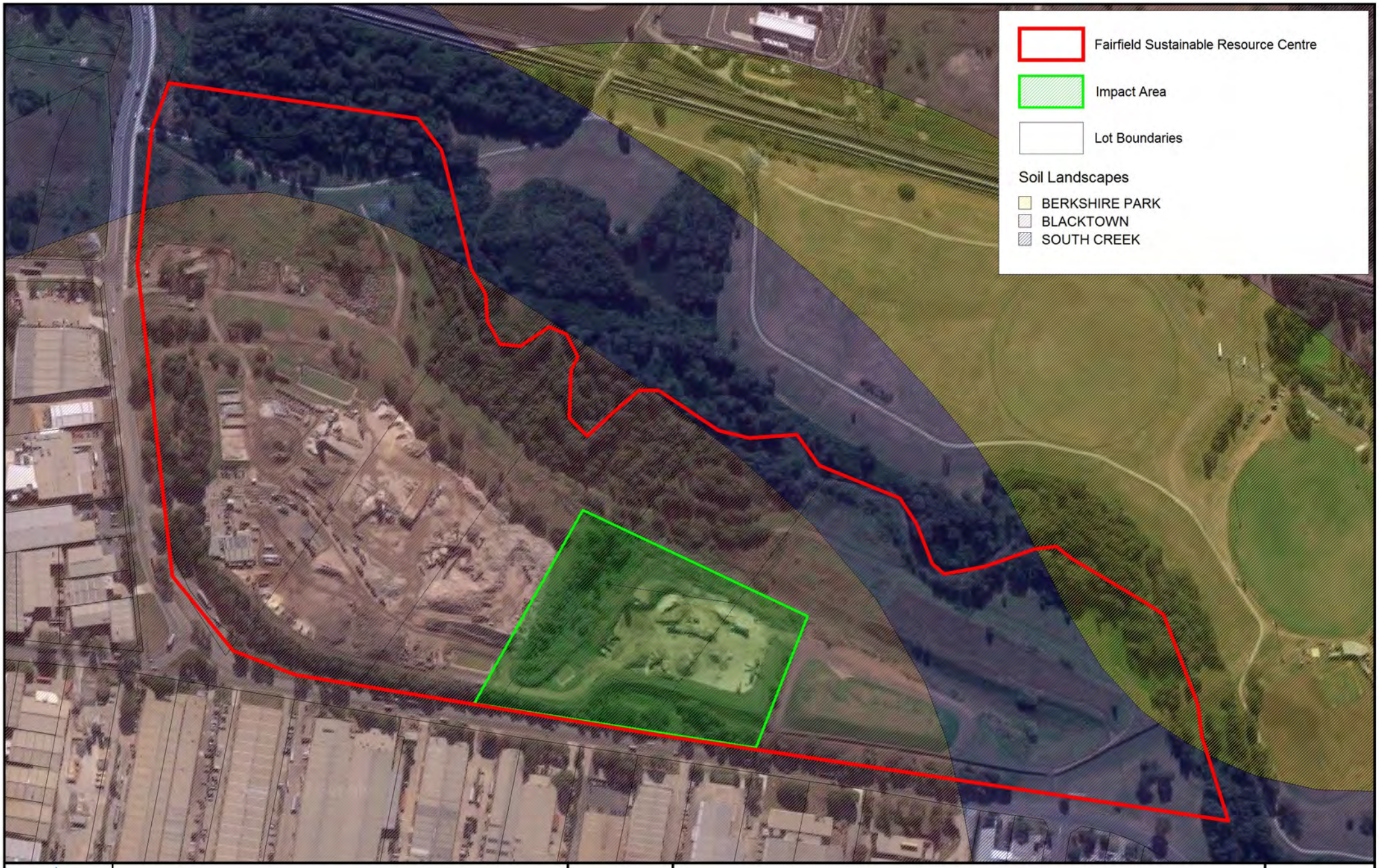
Chalcedony is a microcrystalline, siliceous rock which is very smooth and can be glossy. Introduction of impurities can produce different coloured versions of chalcedony, including yellow/brown (referred to as carnelian), brown (sard), jasper (red/burgundy) and multicoloured agate. It flakes with a sharp edge and was a prized material type for the creation of stone artefacts in parts of Australia (Kuskie & Kamminga 2000: 186).

Chert

Chert is a highly siliceous sedimentary rock, formed in marine sediments and also found within nodules of limestone. Accumulation of substances such as iron oxide during the formation process often results in banded materials with strong colours. Chert is found in the Illawarra Coal Measures and also as pebbles and colluvial gravels. It flakes with durable, sharp edges and can range in colour from cream to red to brown and grey.

Petrified Wood

Petrified wood is formed following burial of dead wood by sediment and the original wood being replaced by silica. Petrified wood is a type of chert and is a brown and grey banded rock and fractures irregularly along the original grain.



PO Box 291
Macarthur Square
NEW SOUTH WALES 2560

0 125 250

metres

Projection:
MGA Zone 56 (GDA 94)
Base Map:
Six Maps Topo
FINAL - Version 1

Figure 9: Study area in relation to soil landscapes within the Fairfield area.

N

2.3.2 QUARTZ

Pure quartz is formed of silicon dioxide, and has a glossy texture and is translucent. Introduction of traces of minerals can lead to colouration of the quartz, such as pink, grey or yellow. The crystalline nature of quartz allows for minute vacuoles to fill with gas or liquid, giving the material a milky appearance. Often quartz exhibits internal flaws which can affect the flaking quality of the material, meaning that in general it is a low-quality flaking material (Kuskie & Kamminga 2000: 186). However, quartz is an abundant and widely available material type and therefore is one of the most common raw materials used for artefact manufacture in Australia. Flaking of quartz can produce small, very sharp flakes which can be used for activities such as cutting plant materials, butchering and skinning.

QUARTZITE

Formed from sandstone, quartzite is a metamorphic stone high in silica that has been heated or had silica infiltrate the voids found between the sand grains. Quartzite ranges in colour from grey to yellow and brown.

SILCRETE

Silcrete is a siliceous material formed by the cementing of quartz clasts with a matrix. These clasts may be very fine grained to quite large. It ranges in colour from grey to white, brown, red or yellow. Silcrete flakes with sharp edges and is quite durable, making silcrete suitable for use in heavy duty woodworking activities and also for spear barbs (Kuskie & Kamminga 2000:184).

TUFF/INDURATED MUDSTONE

There is some disagreement relating to the identification of lithic materials as tuff or indurated mudstone. The material is a finely textured, very hard yellow/orange/reddish-brown or grey rock. Kuskie and Kamminga (2000: 6, 180) describe that identification of lithic materials followed the classification developed by Hughes (1984), with indurated mudstone described as a common stone material in the area. However, Kuskie and Kamminga's analysis, which included x-ray diffraction, identified that lithics identified as 'indurated mudstone' was actually rhyolitic tuff, with significant differences in mineral composition and fracture mechanics between the stone types. They define mudstone as rocks formed from more than 50% clay and silt with very fine grain sizes and then hardened.

The lithification of these mudstones results in shale (Kuskie & Kamminga 2000: 181) and thus 'indurated mudstone', in the opinion of Kuskie and Kamminga, do not produce stones with the properties required for lithic manufacture.

In 2011, Hughes, Hiscock and Watchman undertook an assessment of the different types of stones to determine whether tuff or indurated mudstone is the most appropriate terminology for describing this lithic material. The authors undertook thin section studies of a number of rocks and determined that the term 'indurated mudstone' is appropriate, with an acknowledgment that some of this material may

have been volcanic in origin. They also acknowledge that precise interpretation of the differences between material types is difficult without detailed petrological examination, and suggest that artefacts produced on this material are labelled as 'IMT' or 'indurated mudstone/tuff'.

2.3.3 PROCUREMENT

Assemblage characteristics are related to and dependent on the distance of the knapping site from raw materials for artefact manufacture, and different material types were better suited for certain tasks than other material types. Considerations such as social or territorial limitations or restrictions on access to raw material sources, movement of groups across the landscape and knowledge of source locations can influence the procurement behaviour of Aboriginal people. Raw materials may also have been used for trade or special exchange between different tribes.

2.3.4 MANUFACTURE

A range of methodologies were used in the manufacture of stone artefacts and tools, through the reduction of a stone source. Stone may have been sourced from river gravels, rock outcrops, or opportunistic cobble selection. Hiscock (1988:36-40) suggests artefact manufacture comprises six stages, as follows:

1. The initial reduction of a selected stone material may have occurred at the initial source location, or once the stone had been transported to the site.
2. The initial reduction phase produced large flakes which were relatively thick and contained high percentages of cortex. Generally the blows were struck by direct percussion and would often take advantage of prominent natural ridges in the source material.
3. Some of these initial flakes would be selected for further reduction. Generally only larger flakes with a weight greater than 13-15 grams would be selected for further flaking activities.
4. Beginning of 'tranchet reduction', whereby the ventral surface of a larger flake was struck to remove smaller flakes from the dorsal surface, with this retouch applied to the lateral margins to create potential platforms, and to the distal and proximal ends to create ridges and remove any unwanted mass. These steps were alternated during further reduction of the flake.
5. Flakes were selected for further working in the form of backing.
6. Suitable flakes such as microblades were retouched along a thick margin opposite the chord to create a backed blade.

Hiscock (1986) proposed that working of stone materials followed a production line style of working, with initial reduction of cores to produce large flakes, followed by heat treatment of suitable flakes before the commencement of tranchet reduction. These steps did not necessarily have to occur at the same physical location, but instead may have been undertaken as the opportunity presented.

2.3.5 ETHNOHISTORY

The original Aboriginal inhabitants of the Wetherill Park region were tribes of the Darug (Daruk) language group (Tindale 1974). The Darug are the traditional inhabitants of the Wetherill Park area. The Darug language group originally extended from the eastern suburbs of Sydney as far south as Botany Bay, west as far as Bathurst and north as far as the Hawkesbury River.

Early recorded accounts of European settlers have shed a light on some aspects of the traditional lifestyles of Aboriginal peoples. By studying these accounts we can reconstruct portions of the Darug traditional lifestyle.

The traditional lifestyles of Aboriginal groups such as the Darug depended largely on the environment in which they lived. The Darug people's economy and subsistence was based on a hunter gatherer society. Whilst coastal groups utilised marine and estuarine resources, hinterland groups relied on freshwater and terrestrial animals and plants. Animals such as kangaroos, wallabies, possums, gliders, bandicoots, wombats, quolls, fruit bats, echidnas, native rats and mice, emus, ducks, tortoises, snakes and goannas (Attenbrow, 2010), played a major role in the subsistence of hinterland groups.

One specific account was written by Captain-Lieutenant Watkin Tench during his exploration along the Hawkesbury-Nepean River in 1791. During their search for Richmond Hill, Tench and his companions travelled northwest from Rose Hill (Parramatta) following the Hawkesbury River to Cattai Creek. Maps drawn by Tench indicate that the party crossed directly west of the study area. Guided and informed by Colbee, an Aboriginal man from the Cadigal tribe, Tench recorded some information about the local Darug group living in the area to the north west of Parramatta (Nicol & Sewell, 1793):

> *We asked Colbee the name of the people who lived inland, and he called them boo-roo-ber-on-gal; and said they were bad; whence we conjectured, that they sometimes war with those on the sea coast.....We asked how they lived. He said, on birds and animals, having no fish.*

Inland population densities were assessed by early settlers as being less than those on the coast. Historical sources regarding the Cumberland Plain suggest that there was a minimum population density of 0.5 persons per km². This is comparable to the coastal zone around Port Jackson with estimates being around 0.75 persons per km² (Attenbrow, 2010).

The pre-contact environments of the Wetherill Park area would have contained a diverse range of plant and animal species. The vegetation communities along the creeks and gullies, primarily wet sclerophyll would have provided shelter for numerous animal and plant species that could be eaten or used for other purposes such as providing shelter and medicines.

2.3.6 PREDICTIVE MODEL

Based on the results of previous archaeological investigations within the wider area, a number of predictions regarding Aboriginal use of the area can be made. These predictions focus on the nature, extent and integrity of the remaining evidence.

The landscape characteristics of the area influence the prediction of the nature of potential sites within the landscape itself. Isolated finds and small artefact scatters are the most common site type identified within the wider area, and are predicted to be the most likely site type to be identified in future.

Site types associated with sandstone country, such as grinding grooves, rock art sites, petroglyph (rock engravings) and sandstone rockshelters with art/and or archaeological deposit are not considered likely to occur within the study area. Scarred trees are also not considered likely within the study area due to the high levels of historical clearing which have occurred within the landscape.

Distribution of sites is related to the landforms on which sites are known to be located. Generally, sites are focused on elevated landforms and reduce with increasing distance from high order watercourses. This includes both artefact (isolated finds and artefact scatters) and areas of PAD.

Site disturbance and post-depositional processes heavily influence the integrity of archaeological sites. An assessment of these impacts must be considered when predicting the likelihood of Aboriginal sites being present within an area. Consideration of both natural and cultural ground disturbance must be made, and past land use must also be considered. Results of this assessment assist in the prediction of the integrity of potential sites within the study area.

Surface sites are likely to have been impacted by agricultural processes within the area over the historic period. Flooding events are also likely to have impacted the area through the disturbance or wholesale removal of archaeological deposits. Natural actions such as bioturbation are likely to have impacted at least the upper levels of archaeological deposits, as are cultural activities such as excavation, construction, ploughing, clearing and planting. Whilst these actions may impact the integrity of stratigraphy within the deposit, this does not necessarily mean associated archaeological objects will also be disturbed.

In general, Aboriginal use of an area is based on a number of factors, such as:

- Proximity to permanent water sources – generally permanent or areas of repeat habitation are located within approximately 200m of permanent water;
- Proximity to ephemeral water sources – generally sites near ephemeral water sources were utilised for one-off occupation;
- Ease of travel – ridgelines were often utilised for travel during subsistence activities; and

- The local relief – flatter areas were more likely to be utilised for long term or repeat habitation sites than areas of greater relief, especially if the slopes are at a distance from water.

In terms of the study area, sites are considered more likely to comprise:

- Isolated finds, which may occur anywhere across a landscape; and
- Open sites, in areas of high relief in close proximity to ephemeral or permanent water sources.

2.4 Step 3: Avoid harm

Given the result of previous studies within the area, it was considered necessary to undertake a visual inspection of the land parcels to identify any surface objects or landforms with potential archaeological deposits (PAD). This inspection would allow conclusions to be made regarding the probability of archaeological objects occurring within the proposed development areas. This would assist in determining if there was any archaeological potential within the study areas which could potentially be harmed by the proposed words, and in turn, assist in determining if harm to the archaeological resource could be avoided.

The proposed development would impact the entirety of the study area through upgrade activities relating to filing in the Canal Road reserve and levelling the site. There are no recorded Aboriginal sites within the study area, and many years of the site being modified through earthworks have erased any potential for subsurface archaeological material to be present.

2.5 Step 4: Visual Inspection

A visual pedestrian inspection of the proposed SRC upgrade was undertaken on Tuesday 5 September 2017 by Leigh Bate, Archaeologist with Apex Archaeology.

A subsequent site visit was conducted on Friday 20 November 2018 to assess two additional impact areas (Car Parking Area & Sedimentation Basin) for the project by Leigh Bate, Archaeologist with Apex Archaeology.

2.5.1 Survey Coverage

Given the small size of the study area, the area was inspected by pedestrian survey to identify any surface artefacts or any areas with potential for intact subsurface deposits to be present. The area known as Canal Road, which encompasses a gorge running through the study area was completely overgrown with vegetation at the time of the site inspection and inaccessible.

The proposed location for the sedimentation basin and carpark area were inspected. Both areas were visibly disturbed and land use modification was evident.

2.5.2 RESULTS

A thorough inspection of the area that was accessible was undertaken. No newly identified archaeological material or sites were identified during the survey.

Ground surface visibility (GSV) was moderate throughout the study area. GSV was rated at 30% overall. No raw material sources were identified within the study area. The entire study area had been completely modified and the land surface built up and disturbed through past land use activities.

The proposed sedimentation basin area has been considerably disturbed due to past recyclables drop off activities and reworking of the soils with imported road base materials. The car park and entrance area to the SRC has similarly had wholesale landscape modification occur.

Plate 1: General view looking east from the top of the Canal Road reserve.

Plate 2: General view looking north across haul road next to the Canal Road reserve.

Plate 3: General view looking down into the Canal Road reserve (vegetative regrowth is extreme).

Plate 4: General view looking east down into the Canal Road reserve (vegetative regrowth is extreme).

Plate 5: Looking north east down into the Canal Road reserve

Plate 6: General view looking north east into the Canal Road reserve.

Plate 7: View looking north along the top edge of the Canal Road reserve.

Plate 8: View north east across the top of the Canal Road reserve.

Plate 9: View looking east along the southern border of the SRC just east of the Canal Road reserve.

Plate 10: View looking west across stockpile area east of the Canal Road reserve.

Plate 11: View looking east showing level of landscape modification in relation to original land surface

Plate 12: View looking south up embankment from northern border of SRC. Note the level of earth built up.

Plate 13: View looking south into the Canal Road reserve from the northern boundary.

Plate 14: View north overlooking the proposed sedimentation basin location.

Plate 15: View looking east from the SRC entrance towards the car park upgrade area.

Plate 16: View looking east into the SRC from the main entrance upgrade area.

2.5.3 DISCUSSION

The areas were noted to be consistently disturbed through the construction of the existing SRC and from previous clearance and earthworks activities. The aerial view of the study area from 1930 (Figure 5) shows that much of the area was utilised as farm land and it was not until the early 90s that various earth moving activities began taking place to modify the landscape to an almost unrecognizable level from its original state.

While ploughing and clearance has occurred in many areas of the Cumberland Plain, this only affects the deposit up to 30-40cm deep, and even then ploughed knapping floors have been located which are still relatively intact (McDonald 1998). However, in this instance the wholesale removal and landscape modification of the site would reduce the potential for any intact archaeological sub-surface deposits to nil.

The study area was utilised as a landfill for a number of years in the late 1970s and 1980s, and when this ceased, the landfill was capped with a layer of clay approximately 1m deep. The introduction of refuse, and then capping this with clay, would make identifying any archaeological deposits which may have been present on the natural ground surface essentially impossible.

3.0 Conclusions and Recommendations

3.1 Conclusions

- No previously recorded Aboriginal sites are located within the study area.
- No archaeological material was identified on the ground surface within the study area.
- The study area is assessed as having no potential for subsurface archaeological deposits and this is confirmed by the site inspection.
- This assessment was based on identification of landform elements, previous archaeological work undertaken within the wider Wetherill Park region, and a visual inspection of the study area.

3.2 Recommendations

- No further Aboriginal archaeological assessment is required prior to the commencement of upgrade works as described in this report.
- The results of this assessment fulfil the requirement for Due Diligence in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (Code of Practice). Works may proceed with caution.
- The proposed works must be contained to the area assessed during this due diligence assessment, as shown on Figure 2. If the proposed location is amended, further archaeological assessment may be necessary to determine if the proposed works will impact any Aboriginal objects or archaeological deposits.
- Should unanticipated archaeological material be encountered during site works, all work must cease and an archaeologist contacted to make an assessment of the find. Further archaeological assessment and Aboriginal community consultation may be required prior to the recommencement of works. Any objects confirmed to be Aboriginal in origin must be reported to the OEH under Division 1, Section 89A of the NPW Act.

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Appendix A: AHIMS Extensive Results