

ABORIGINAL HERITAGE

DUE DILIGENCE ASSESSMENT REPORT

PROPOSED SMART POLES

Lot 20, DP: 1092147 & Lot 21, DP: 1092147, 153, Old Castlereagh Road, Castlereagh, (Penrith Lakes Regatta Centre),

Penrith Local Government Area

For

Lend Lease Services Pty Ltd

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Prepared by

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I acknowledge the Traditional Custodians of the lands on which I work and pay my respects to Elders past, present and emerging.

This Aboriginal Heritage Due Diligence Assessment report provides a true and fair review of the proposal and its impact on Aboriginal objects or sites in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010). It addresses to the fullest extent possible all matters affecting or likely to affect Aboriginal objects and sites as defined under the *National Parks & Wildlife Act, 1974*.

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Contents

ACRONYMS

EXECUTIVE SUMMARY

1	INTRODUCTION & BACKGROUND	8
2	THE PROPOSAL	11
3	AIMS	13
4	ENVIRONMENTAL CONTEXT	13
Table 1	Ethnobotanical Resources	
5	THE GENERIC DUE DILIGENCE PROCESS	
6	CONCLUSIONS & RECOMMENDATIONS	
7	REFERENCES	

APPENDIX 1 AHIMS Web Services Search. Dated 10th October, 2021.

APPENDIX 2 AHIMS Site Cards.

- #45-5-0591 (Open Camp Site)
- #45-5-0589 (Open Camp Site)
- #45-5-0332 (Open Camp Site)

APPENDIX 3 SITE PLANS OF PROPOSED SMART POLES

PHOTOGRAPHIC SUPPLEMENTS

GLOSSARY OF TERMS

ATTACHMENT 1 CURRICULUM VITAE & SELECTED PROJECTS

-DANNY O'BRIEN

ACRONYMS

ACHA	Aboriginal Cultural Heritage Assessment
ACHMP	Aboriginal Cultural Heritage Management Plan
AHIMS	Aboriginal Heritage Information Management Systems
AHIP	Aboriginal Heritage Impact Permit
DLALC	Deerubbin Local Aboriginal Land Council
LALC	Local Aboriginal Land Council
NPWA	National Parks & Wildlife Act, 1974
NPWS	National Parks & Wildlife Service
OEH	Office of Environment & Heritage
PAD/s	Potential Archaeological Deposit/s

EXECUTIVE SUMMARY

Lend Lease Services Pty Ltd commissioned Environmental Assessments Pty Ltd to prepare an Aboriginal Heritage Due Diligence Assessment report, Lend Lease Services has since been acquired by Service Stream Mobile Communications however still operate under the same ABN. The Aboriginal Heritage Due Diligence Assessment report is required for proposed two (2) 'smart poles' to be located in two separate parcels of land consisting of Lot 20 and Lot 21, DP: 1092147, No.153, Old Castlereagh Road at Castlereagh within the Penrith Lakes Regatta Centre area within the Penrith Local Government Area. The smart-poles are referred to in the design plans as '**smart-pole 1' (Optus Site-S3122) and 'smart-pole 2' (Optus Site-S3165)**'. These parcels of lands will be referred to hereafter as 'the subject site' or to either Lot or smart-pole location where appropriate. Smart-pole No.1 is to be established on the northern side of the competition lake whereas smart-pole No.2 is to be established on the southern side of the competition lake. It is proposed that a solitary 'smart pole' be established within each Lot; the Development Application for the proposed smart poles would be formally lodged within the one Development Application to the NSW Department of Planning, Industry & Environment. The deployment of the smart-poles within the Penrith Lakes Regatta Centre are required to alleviate mobile voice and data coverage barriers which currently exist within the Penrith Lakes Regatta Centre precinct.

The Penrith Lakes Regatta Centre is governed by the State Environmental Planning Policy (Penrith Lakes Scheme), 1989. Clause 24 (d) of the Penrith Lakes SEPP requires '*an Aboriginal cultural heritage assessment for the land (being a written report detailing the results of the assessment and recommendations for actions to be taken before, during and after an activity to manage and protect Aboriginal objects and declared Aboriginal places identified by the investigation and assessment) that has been prepared by a suitably qualified person*'.

This Aboriginal Heritage Due Diligence assessment was undertaken and prepared in accordance with the former Office of Environment & Heritage's *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (2010c). This Aboriginal Heritage Due Diligence Assessment report is to ascertain if there is, or likely to be any Aboriginal heritage impediments to any future development of the subject site with the establishment of the proposed smart-poles within the nominated smart-pole locations.

The subject site's two smart-pole site locations are zoned 'P' (Parkland) under the State Environmental Planning Policy (Penrith Lakes Scheme), 1989. The subject site lies within the Deerubbin Local Aboriginal Land Council jurisdiction within the Western Metropolitan area in Sydney as defined under the NSW *Aboriginal Land Rights Act, 1983*.

The entire area of the subject site has been cleared of its original natural native vegetation although some large indigenous trees have been planted in landscaped rows to the south of smart-pole No. 2. This is likely to be as a result of preparing for the year 2000 Sydney Olympic Games. The subject site (both Lots combined) now consist of highly modified and reclaimed or intensely modified disturbed land that is now primarily mown and highly maintained and managed areas. Existing improvements established pathways, drainage systems, car-parking areas etc.

The ground surface of the subject site has been significantly disturbed throughout the entirety of the subject site by the initial historical clearing of the entirety of the original Cumberland Plain Woodland vegetation and trees followed by various initially rural followed by extensive quarrying activities resulting in extensive and intensive disturbance to soils. All areas of the subject site viz: the two smart-pole locations have been significantly disturbed including top-soils and sub-surface soil profiles (including the A-horizon) in the past (and currently) by various land-use activities; these land-use activities and subsequently substantial and extensive landscaping works for the Regatta Centre

precinct has culminated in the overall archaeological visibility of the subject site being very low virtually less than 1% (<1%) archaeological visibility in this instance.

The Due Diligence Assessment is to determine whether Aboriginal objects or Aboriginal sites (including Aboriginal Places as defined under the *National Parks & Wildlife Act, 1974*) are present within or adjacent to the subject site that may be impacted by the proposed deployment of the smart-poles, and if Aboriginal sites or objects are present, or likely to be present to develop mitigation measures or strategies to avoid or minimise impacts. Steps 1-5 of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (op. cit.) were followed in the due diligence assessment process and the production of this Aboriginal Heritage Due Diligence Assessment report.

As part of the initial Aboriginal heritage due diligence investigation process, a basic Office of Environment & Heritage (OEH) Aboriginal Heritage Information Management Systems (AHIMS) search was undertaken for the subject site and environs on the 10th of October, 2021 with a 200m search buffer area. The results of this AHIMS search states '*A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that: 3 Aboriginal sites are recorded in or near the above location and that no (0) Aboriginal places have been declared in or near the above location**' [sic] (see Appendix 1). The AHIMS site-cards of the above 3 AHIMS sites were subsequently obtained and are included within this Aboriginal Heritage Due Diligence Assessment report (see Appendix 2).

As a requirement in the undertaking of the Aboriginal heritage due diligence assessment process, a site assessment and inspection of the subject site was undertaken on the 26th of October, 2021; the site assessment was carried out in both smart-pole locations and immediate environs of each pole site. No surface or sub-surface Aboriginal objects or sites were recorded within the subject site and no areas of PADs (Potential Archaeological Deposits) were identified within or adjacent the subject site's two smart-pole locations. In regards to above-ground Aboriginal objects (i.e. dendroglyphs/ scarred trees/culturally modified trees) no (0) dendroglyphs or scarified trees are present within the subject site's smart-pole locations being totally cleared micro-site environments; therefore eliminating the possibility of scarred or culturally modified trees.

This Aboriginal heritage due diligence assessment report indicates that Aboriginal objects are unlikely to be present within the subject site's areas of smart-pole sites as no areas potentially containing Aboriginal objects were identified within or adjacent to the subject site during the field assessment of the sites. **Aboriginal 'objects' (including PADs) are unlikely to be affected by any future development of the two smart-poles sites as 'objects' including stone artefacts or isolated finds or sub-surface deposits are unlikely to be present in this instance due to the high intensity, widespread and prolonged period of the disturbances to the grounds surface and sub-surface soils throughout the entirety of the subject site's two smart-pole locations and immediate and wider environs.**

In regards to the three (3) known registered AHIMS sites located within the 200m buffer area, all of these three AHIMS sites are located to the north of the subject site and north of the warm up lake and all three AHIMS sites are distant to the two sites of the smart-poles site locations. Moreover, all three AHIMS sites had been issued 'Consent to Destroy' permits and all three sites are now 'destroyed' (see Appendix 2 for each site-card respectively for details).

It is considered that further Aboriginal heritage assessment of the subject site is not required and that an AHIP (Aboriginal Heritage Impact Permit) is not necessary (nor sought) in relation to the establishment of either smart-poles within the subject site at Lot 20 and Lot 21, DP: 1092147, No.153, Old Castlereagh Road at Castlereagh within the Penrith Lakes Regatta Centre based on the findings of this Aboriginal Heritage Due Diligence Assessment Report. It is considered the subject site's

proposed smart-poles locations are highly likely to be of low archaeological potential and the detection of any sub-surface Aboriginal objects is highly unlikely in this instance.

Step 5 of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010c) indicates that if the *Code* is followed, and it has been reasonably decided that an AHIP application is not necessary either because Aboriginal objects are not present, or harm to those objects can be avoided, therefore the proponent can proceed with the development of the subject site with caution. Nonetheless, the following recommendation is made in relation to the proposed establishment of the two smart-poles within Lot 20 and Lot 21, DP: 1092147, No.153, Old Castlereagh Road at Castlereagh.

Recommendation No. 1: In the unlikelyhood that any Aboriginal objects be located during any future works within the subject site's two nominated smart-pole locations at Lot 20 and Lot 21, DP: 1092147, No.153, Old Castlereagh Road at Castlereagh within the Penrith Lakes Regatta Centre, then all works immediately cease and contact be made with Heritage NSW (previously the Office of Environment & Heritage (OEH) to seek further advice. Should any Aboriginal objects be located during any site works in the future, then an application for an AHIP (Aboriginal Heritage Impact Permit) should be made to Heritage NSW.

Caution: It is an offence under Section 89A of the *National Parks & Wildlife Act, 1974* once a person becomes aware of the presence of Aboriginal objects not to notify the OEH of the location of Aboriginal objects as soon as possible unless the objects are already recorded on the AHIMS register.

1.0 INTRODUCTION & BACKGROUND

Lend Lease Services Pty Ltd commissioned Environmental Assessments Pty Ltd to prepare an Aboriginal Heritage Due Diligence Assessment report, Lend Lease Services has since been acquired by Service Stream Mobile Communications however still operate under the same ABN. This Aboriginal Heritage Due Diligence Assessment report is required to be prepared for proposed two (2) 'smart poles' to be located in two separate parcels of land. The cadastral details of the subject site are Lot 20 and Lot 21, DP: 1092147, No.153, Old Castlereagh Road at Castlereagh, Parish of Castlereagh, County of Cumberland within the Penrith Local Government Area. These parcels of lands will be referred to hereafter as 'the subject site' or to either Lot where appropriate and are two smart-pole locations are situated within the Penrith Lakes Regatta Centre site. The subject site lies within the Deerubbin Local Aboriginal Land Council jurisdiction within the Western Metropolitan area in Sydney as defined under the NSW *Aboriginal Land Rights Act, 1983*.

The subject site and the wider study area can be found on the Springwood 1:25,000 topographical map (Series 9030-4S), 3rd Edition, 2000. The subject site's two smart-pole micro-site locations are located more or less centrally within the Penrith Lakes Regatta Centre precinct.

The subject site's two smart-pole site locations within the Penrith Lakes Regatta Centre are zoned 'P' (Parkland) under the State Environmental Planning Policy (Penrith Lakes Scheme), 1989. The smart-poles are referred to in the design plans as 'smart-pole No. 1' (Optus Site-S3122) and 'smart-pole No. 2' (Optus Site-S3165). These parcels of lands will be referred to hereafter as 'the subject site' or to either Lot or smart-pole location where appropriate. It is proposed that a solitary 'smart pole' be established within each Lot; Development Application for the proposed smart poles would be formally lodged within the one Development Application to the NSW Department of Planning, Industry & Environment for the establishment and deployment of the two smart-poles (**see Figure 1**).

The Penrith Lakes Regatta Centre is governed by the State Environmental Planning Policy (Penrith Lakes Scheme), 1989. Clause 24 (d) of the Penrith Lakes SEPP requires '*an Aboriginal cultural heritage assessment for the land (being a written report detailing the results of the assessment and recommendations for actions to be taken before, during and after an activity to manage and protect Aboriginal objects and declared Aboriginal places identified by the investigation and assessment) that has been prepared by a suitably qualified person*'. Consequently, this Aboriginal Heritage Due Diligence Assessment report has been prepared to be lodged with the Development Application for the two proposed smart-poles. **The CV of the author of this Aboriginal Heritage Due Diligence Assessment report is attached to this Due Diligence assessment report (see Attachment 1).**

A site assessment for the detection and the identification of any areas that may potentially contain Aboriginal objects including PADs (Potential Archaeological Deposits) within the subject site at 153, Old Castlereagh Road at Castlereagh was undertaken on the 26th of October, 2021. The weather conditions during the site assessment had been favourable (mostly sunny and partially cloudy conditions) and had been adequately suitable for the detection of any Aboriginal objects within exposed surface areas within the subject site's two smart-pole locations (including PADs) or areas that may contain archaeological or cultural material ie: isolated finds and open camp sites etc.

This Aboriginal Heritage Due Diligence Assessment report applies to the both smart-pole locations at 153, Old Castlereagh Road at Castlereagh. This Aboriginal Heritage Due Diligence Assessment report is prepared purely for due diligence purposes only. This assessment was undertaken and prepared in accordance with, and in the spirit of the former Office of Environment & Heritage [OE] *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (2010c) and forms part of the due diligence of the subject site's two smart-pole locations as described within this Aboriginal Heritage Due Diligence Assessment report. The Due Diligence Assessment is to determine whether Aboriginal objects or Aboriginal sites (including Aboriginal Places as defined under the *National Parks & Wildlife Act, 1974*) are present within or adjacent to the subject site's two smart-pole locations that may be impacted by the proposal, and if sites or objects are present, or are likely to be present to develop mitigation measures to avoid or minimise impacts. Aboriginal objects also include 'Aboriginal remains' under the *National Parks & Wildlife Act, 1974*.

Finally, there are no Section 14 lands present within or adjacent to the subject site listed on Schedule 14 of the *National Parks & Wildlife Act, 1974* being 'Lands of cultural significance to Aboriginal persons'. These lands may be jointly managed by the NSW National Parks & Wildlife Service and the Aboriginal Owners in accordance with the Act (NSW Government Land & Property Information and *Aboriginal Land Rights Act, 1983*). The National Parks & Wildlife Service is a division of the Department of Planning, Industry and Environment (formerly the Office of Environment & Heritage).

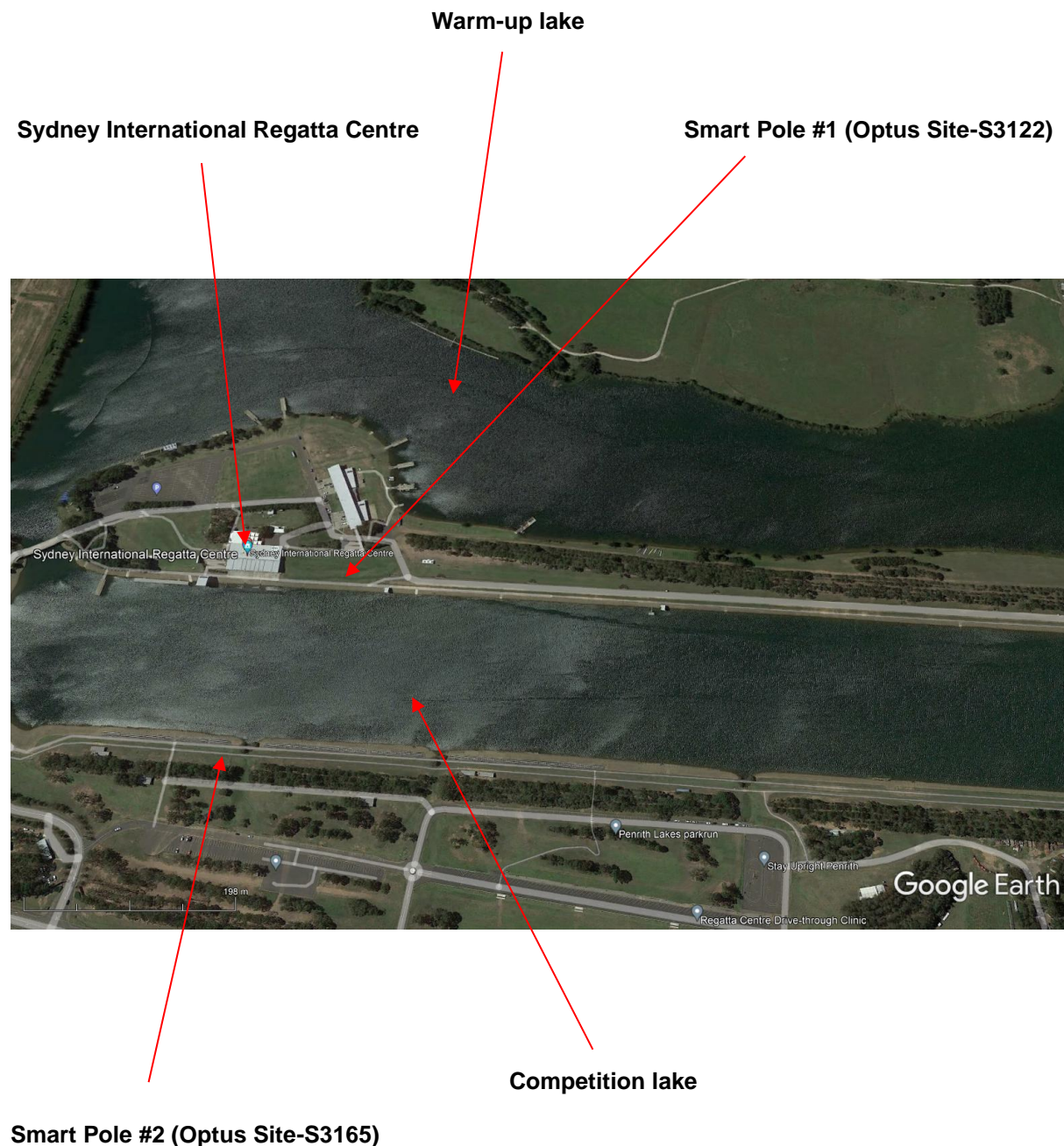


Figure 1. Aerial View of the Subject Site & Approximate Locations of Smart Poles.

Source: Google Earth, 2021



Figure 2. Aerial View of the Subject Site & Environs indicating the existing environment & key geographic features in the locality of the subject site.

Source: Google Earth, 2021.

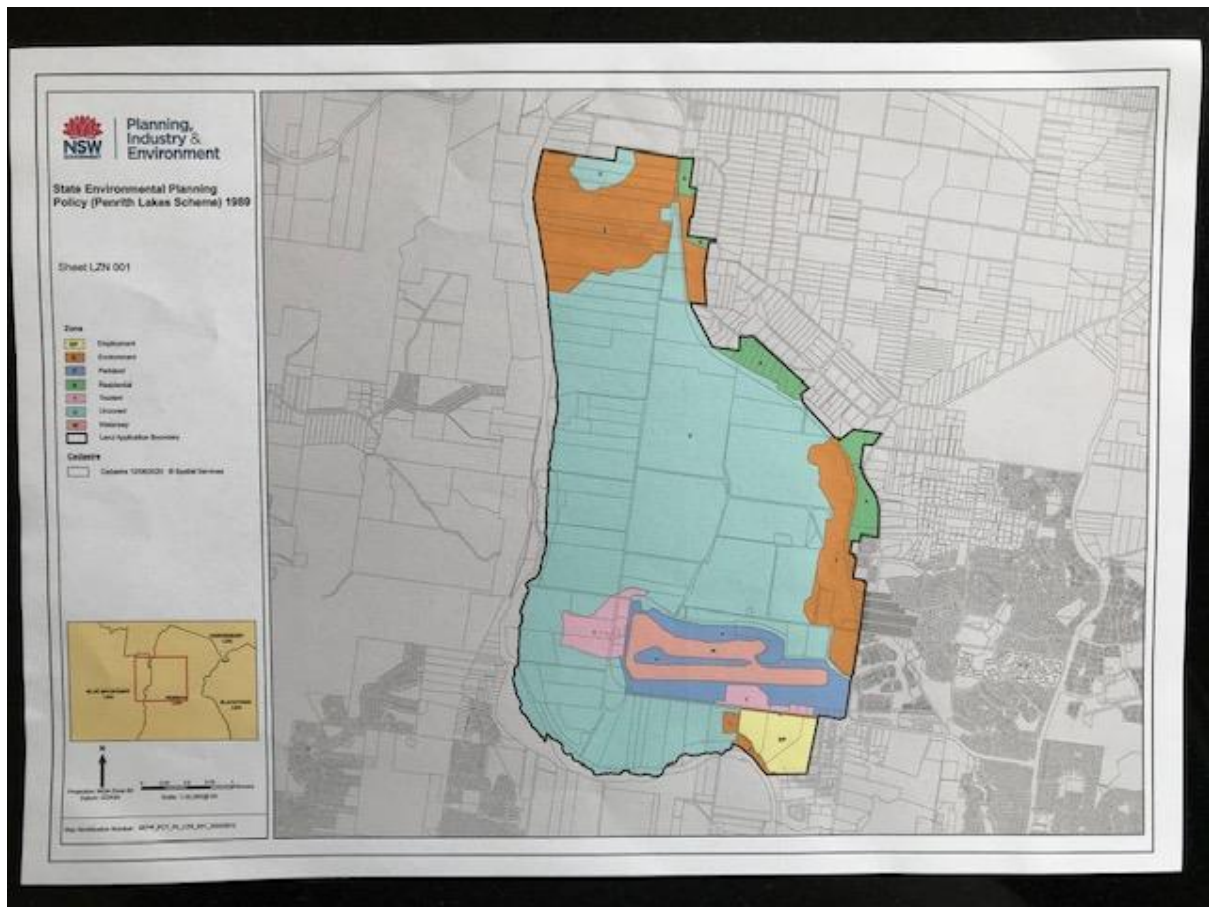


Figure 3. Zoning Plan. State Environmental Planning Policy (Penrith Lakes Scheme), 1989.

Source: NSW Department of Planning Industry & Environment.

2.0 THE PROPOSAL

The deployment of the smart-poles within the Penrith Lakes Regatta Centre are required to alleviate mobile voice and data coverage barriers which currently exist within the Penrith Lakes Regatta Centre. Refer to Appendix 3 (Site Plans of the Proposed Smart Poles).

AHIMS Site 45-5-0332



AHIMS Site 45-5-0591

AHIMS Site 45-5-0589

Figure 4. Location of the three (3) AHIMS Sites located within 200m of the subject site. Note that all three (3) AHIMS sites are now destroyed (**see Appendix 2-AHIMS Site Cards for details**).

Source: Google Earth, 2021.

3.0 AIMS

The aims of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (2010c) process are broadly as follows:

- To determine whether or not Aboriginal objects are, or likely to be present,
- To determine whether or not the proposed activities (in this case the establishment of the proposed two smart-poles) is likely to harm Aboriginal objects (including burials and Potential Archaeological Deposits) if present,
- Determine whether an AHIP (Aboriginal Heritage Impact Permit) is required.

4.0 ENVIRONMENTAL CONTEXT

Site Description

The entirety of the subject site's two smart-pole locations are cleared of its original native vegetation although there are some replanting of Cumberland Plain Woodland (CPW) trees in rows are located to the south of the subject site's smart-pole No.2.

Smart-pole No. 1 (Optus Site-S3122):

Smart-pole location No. 1 is totally cleared of its original vegetation and is situated on the northern side of the competition lake within what is referred to by the site managers as 'the island' which is part of the Penrith Lakes Regatta Centre. This parcel of land also contains several facilities and infrastructure including the Sydney International Regatta Centre building and various other structures relating to regatta and other aquatic sporting activities. A pedestrian pathway is also present extending along the northern edge of the competition lake; there is also a podium present adjacent to the Regatta Centre. A large grassy slightly hilly area is present which has views downslope facing southwards into the competition lake. It is at the base of this hilly grassed area that smart-pole No. 1 is proposed to be established.

Smart-pole No. 2 (Optus Site-S3165):

Smart-pole location No. 2 is also totally cleared of its original vegetation and is situated on the southern side of the competition lake. This site location contains an extensive shared pedestrian/ cycleway pathway, rows of planted locally indigenous planted trees as landscape works for the initial year 2000 Sydney Olympic Games. This vicinity of smart-pole location No. 2 also contains outdoor spectator seating and drainage facilities.

For both smart-pole locations No. 1 and No. 2, both site locations have a very low or zero (0) archaeological visibility whereas the overall archaeological visibility of the subject site's two smart-pole locations is less than <1% visibility due to the density and extensive coverage of mown/slashed lawns and pathed areas etc. Nonetheless, there are a few minor patches of bare-ground/exposures present. These soil exposure areas are relatively small and irregular and have been created by a range of agents including minor soil erosion etc. **(see Photographic Supplements).**

All areas of the subject site's two smart-pole locations have been previously disturbed, initially as a result of widespread clearing activities with the removal of the entire area of the original vegetation including trees. The clearing activities has grossly disturbed the ground surface throughout all areas of the subject site resulting in extensive and intensive disturbance to soils throughout the subject site including sub-surface soil profiles including the A-horizon profiles of the entire area of the subject site including the removal of underground tree roots and tree stumps etc. Quarrying activities have been prolonged and extensive throughout much of the vicinity of the subject site.

Geology and soils:

Geology:

The Sydney 1:250,000 Geological Series Sheets S1 56-5 (Geological Survey of New South Wales, 3rd Ed, 1965) maps the geology of the subject site at No.153, Old Castlereagh Road at Castlereagh as 'Qa' being Quaternary Alluvium, gravel, sand, silt and clay.

Soils:

The Penrith 1:100,000 Soil Landscape Series 9030 describes the soil landscape of the subject site and environs and is mapped as 'ri' denoting the Richmond Soil Landscape Group which are characterised as Landscape--Quaternary terraces of the Nepean and Georges Rivers. Relatively flat (slopes <1%) and level. Splays, levees provide local relief of <3m. Tree cover almost completely cleared, formally a low open woodland (dry sclerophyll).

Soil—poorly structured orange to red clay loams, clays, and sands. Texture may increase with depth. Ironstone nodules may be present. Plastic clays (Uf6.12) in drainage lines. Krasnozems (Gn3.14, Gn4.34), red earths (Gn2.11) and red podzolic soils (Dr2.41), occur on terrace surfaces, with earthy sand (Uc5.21,Uc1.23) on terrace edges. Limitations—high erosion hazard on terrace edges. Minor localised flooding. (*Soil Conservation Service of NSW, 1989*) (see screen-shot below indicating the wider vicinity of the subject site).



Ethnobotanical Resources Currently Present within the Wider Locality Today:

The ethnobotanical resources likely to be present within the locality of the wider locality were considered during this Aboriginal Heritage Due Diligence assessment. The indigenous plants and animals (flora and fauna) would have played a significant role in sustaining Aboriginal populations in the region. Notable potential food plants or exploitable ethnobotanical resources remaining today in the locality and include various species of indigenous plants including trees, shrubs, ground covers, climbers etc. These species considered to be botanical resources to Aboriginal groups are outlined in the following table indicating the species likely to be present in the locality and their reputed uses by various historical ethnographical accounts in the region.

TABLE 1
ETHNOBOTANICAL RESOURCES

Plant species	Plant parts or uses
Bangalow Palm <i>Archontophoenix cunninghamiana</i>	Growing tip of apical bud is edible. Leaf sheaf base used as a collection basin and to wrap newborn infants
Tuckeroo <i>Cupaniopsis anacardioides</i>	Edible fruits when ripe
Narrow-leaved Geebung <i>Persoonia linearis</i>	Edible fruits when ripe
Native Cherry <i>Exocarpos cupressiformis</i>	Edible fruits when ripe
Lilly Pilly <i>Syzygium australis</i>	Edible fruits when ripe
Sandpaper Fig <i>Ficus coronata</i>	Edible fruits when fully ripe. The leaves were used as a 'sandpaper' to smooth weapons to obtain a fine finish. The leaves have silica crystals on the surface of the leaves to create a medium-fine sandpaper quality
Orange Thorn <i>Citriobatus pauciflorus</i>	Edible fruits when ripe
Appleberry <i>Billardiera scandens</i>	Edible fruits when ripe
Whip Vine <i>Flagellaria indica</i>	This extensive climber is found in rainforests in the region where the stems have a highly flexible 'cane' quality and were used to weave fish-traps and nets and to tie ends of bark canoes etc. (Leiper, 1985)
Wombat Berry <i>Eustrephus latifolius</i>	Edible tubers
<i>Melaleuca lineariifolia</i>	Nectar supplies
Mountain Devil <i>Lambertia formosa</i>	Nectar supplies
Hair-pin Banksia <i>Banksia spinulosa</i>	Nectar supplies
Sweet Sarsaparilla <i>Smilax glycyphylla</i>	Chewable leaves for sweet taste
Native Yam <i>Dioscorea transversa</i>	Edible tubers after cooking in ashes
Bracken Fern <i>Pteridium esculentum</i>	Edible rhizomes when treated

Gymea Lily <i>Doryanthes excelsa</i>	Edible roots after roasting in ashes
Bulrush <i>Typha orientalis</i>	Edible rhizomes (roots)
Lomandra sp.	Edible apical bud
Yellow Tea Tree <i>Leptospermum flavescens</i>	Spear shafts produces from main stems
Sydney Golden Wattle <i>Acacia longifolia</i> var. <i>longifolia</i>	Leaves and stems pounded and used as a 'fish poison'-plant has a high saponin content. Saponins form soapy foams that affect fish gills and respiration
Rock (Lily) Orchid <i>Dendrobium speciosum</i>	The pseudo-bulbs (swollen stems) were pulverised and cooked on hot stones and eaten (Leiper, 1985)
Blue Flax Lily <i>Dianella caerulea</i>	Edible fruits when ripe
Grass Tree <i>Xanthorrhoea australis</i>	Fish spears were made from the flowering stems
Grass Tree <i>Xanthorrhoea resinosa</i>	Resin was extracted from this species of Grass Tree where the resin was used to bond implements together

Note: None of the above listed flora species are present within the subject site.

Plant foods would have also been in abundant supply especially in ecotonal areas of localised creeks and open forests and woodlands. Plant foods likely to have been exploited in the area are likely to include the reeds Bulrush *Typha orientalis* and the Common Reed *Phragmites australis* etc. Both Bulrush and Common Reed occur in dense communities and are valuable sheltering and nesting habitat for a range of aquatic birds including various species of waterfowl such as ducks, grebes and bitterns etc. which would have been hunted by local Aboriginal populations in the vicinity including along Kemps Creek to the west of the subject site. A range of exploitable tuberous climbers likely to be present in the vicinity may include Native Yam *Dioscorea transversa* and the Wombat Berry *Eustrephus latifolius*. Other exploitable food plants likely to have (and probably still) occurred in nearby forest margins includes the Kangaroo Vine *Cissus antarctica*, Giant Water Vine *Cissus hypoglauca* and the Lilly Pilly *Acmena smithii*. Many of these botanical and faunal resources may well still persist today in the locality including within the Wianammatta Nature Reserve to the north of the subject site and other national park estate and similar conservation reserves in western Sydney.

Faunal Resources:

The broader locality surrounding the subject site at Castlereagh and the overall Cumberland Plain region would have been a highly exploitable resource area for local Aboriginal people with the localised woodlands, forests, creeks, streams and swamps would have contained bountiful supplies of fishes, eels, tortoises, macropods, molluscs (bivalves), crayfish (yabbies), waterbirds (including

ducks), monitors (goannas), flying foxes, possums and pythons etc. The macropods include the Eastern Grey Kangaroo and the Swamp Wallaby are both common in the region (*personal observation*) and would have been hunted in the area by the local Aboriginal people prior to European settlement in the area. There are several creeks and streams present within the locality of the wider study area; aquatic faunal resources would include crayfish, eels, tortoise etc. Localised creeks within the 'sphere-of-influence' of the biota of the subject site include (but not limited to) the Nepean River, Cranebrook Creek, Yarramundi Lagoon, Rickabys Creek, South Creek, Ropes Creek, Eastern Creek and Kemps Creek.

There is also numerous unnamed drainage lines present in the locality including within the wider study area at Castlereagh. Cranebrook Creek was probably the most closest 'water's to the subject site prior to the development of the Penrith Lakes Scheme in this instance, however the Nepean River is the nearest major waterway to the subject site being located approximately 750m to the south of the subject site.

The aforementioned creeks and other waterways in the locality along with the extensive areas on the Cumberland Plain floodplain and wetlands collectively would have been a high biodiversity of indigenous plants and animals which would have been major hunting and gathering resource areas to local Aborigines especially with associated floodplains and billabongs located in juxtaposition the major creeks. These resource areas would have been a rich sustainable foraging resource area to Aboriginal people in the area and would have a higher archaeological potential.

5.0 THE GENERIC DUE DILIGENCE PROCESS

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

Yes, although the subject site's two smart-poles locations are zoned P (Parkland) under the *State Environmental Planning Policy (Penrith Lakes Scheme)*, 1989; it is proposed that the two smart-poles be established within the nominated site locations. The establishment of the two smart-poles would disturb the ground surface as the establishment of such structures underground services etc. inherently results in the disturbance of the ground surface. However, the entirety of the subject site's locations of the smart-poles are already highly and grossly disturbed by previously extensive and intensively and repetitive initially rural followed by quarrying and later infrastructure development as well as intensive landscaping activities and the overall development of the Penrith Lakes Scheme development. The initial clearing, stump-removal and major underground roots of the original natural vegetation (Cumberland Plain Woodland) and subsequent activities over a number of decades would have resulted in all areas of the subject site having been subjected to prolonged and extensive disturbances to the ground surface and sub-surfaces in the past.

Any artefact material would no longer be *in-situ* and any meaningful archaeological context has long been decimated from all areas of the subject site primarily as a result of the aforementioned series of land-use activities over a prolonged period of many decades. **Importantly, no Aboriginal objects or PADs are likely to be present at any location within the subject site's proposed two smart-pole locations and none were identified accordingly.**

Step 1 of the Due Diligence process also requires that the AHIMS database be checked. This action of checking the AHIMS database was carried out on the 10th of October, 2021 (**see Appendix 1**).

Culturally modified trees:

In regards to above-ground Aboriginal objects (i.e. dendroglyphs/ scarred trees/culturally modified trees) no (0) dendroglyphs or culturally scarred trees are present within the subject site's locations of the proposed two smart-poles. Importantly, there are no 'old-growth' indigenous trees present at any location within the subject site; the presence of old-growth indigenous trees is crucial for the presence of any culturally scarred trees as indigenous trees need to be of considerable age ie: being old-growth trees to be considered as containing any potentially culturally scarred trees and contain physical 'scars'.

Step 2a: *Search the AHIMS database and use any other sources of information of which you are already aware.*

The basic Aboriginal Heritage Information Management System (AHIMS) database search was conducted for the subject site (and environs) on the 10th October, 2021 via the Office of Environment & Heritage's Basic AHIMS Web Services. The AHIMS search details were as follows: Zone 56, Lot Lot 21, DP:1092147 with a 200 metre wide buffer. The results of this AHIMS search states '*A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that: 3 Aboriginal sites are recorded in or near the above location and that no (0) Aboriginal places have been declared in or near the above location*' [sic] (**see Appendix 1**). An AHIMS search was also carried out for Lot 20, DP:1092147, however that search indicated that no (0) Aboriginal sites were located within that search criteria. Therefore, according to the AHIMS search, all three (3) registered Aboriginal sites are located within 200m of Lot 21, DP:1092147.

The subject site is located within 200 metres of waters; 'water' consist of various water bodies or potential water bodies including creeks, streams, ephemeral drainage lines etc. which fall under the definition of 'waters' as defined and in accordance with the OEH's *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New south Wales* guidelines (2010c) that indicate the likely presence of Aboriginal 'objects'. Although previously occurring natural 'waters' within or adjacent to the subject site are likely to have been obliterated from the immediate vicinity of the subject site by quarrying activities and the development of the Penrith Lakes Scheme, the wider environs of the subject site would have contained 'waters' that would have drained into the Nepean River to the south and west of the subject site, therefore pre-historically and at the point of European settlement in the area there would have been 'waters' present within 200m of the subject site at some location whether in the form of creeks or at least in the form of drainage lines etc. The three AHIMS site-cards outlined in Appendix 2 and summarised in Table 1 indicate these AHIMS sites were located on the eastern or western bank of Cranbrook Creek to the north of the subject site; therefore Cranebrook Creek is most likely closest 'water's to the subject site which now drains into the Penrith Lakes Scheme.

In relation to other landscape features, the subject site is not considered to be located on a 'ridge top or ridgeline' but is considered to be partially located on an undulating plain environmental context. The subject site is likely to be affiliated or associated with an archaeologically sensitive landscape feature being within 200m of 'waters'.

Following the basic AHIMS search undertaken on the 10th October, 2021 via the Office of Environment & Heritage's Basic AHIMS Web Services, an Extensive search request was made which produced copies of the site cards of the above registered Aboriginal sites were then obtained from the OEH (**see Appendix 2**); a detailed review of these site cards were carried as part of this due diligence assessment process. A brief summary of these AHIMS site-cards are outlined in Table 1 below:

TABLE 1

REGISTERED AHIMS SITE/S LOCATED WITHIN THE VICINITY OF THE SUBJECT SITE

SITE CARD No & Site Name (if applicable)	SITE TYPE	GRID COORDINATES	LOCATION & COMMENTS
#45-5-0332. Penrith Lakes 21.	Open Camp Site	284514:E 6266528:N	Site initially located on the terrace on the eastern bank of Cranbrook Creek. Site destroyed. (Refer to the relevant site-card in Appendix 2 of this Aboriginal Heritage Due Diligence Assessment report for details).
45-5-0589. Penrith Lakes 29.	Open Camp Site	284300:E 6266280:N	Site initially located on the terrace on the eastern bank of Cranbrook Creek. Site destroyed. (Refer to the relevant site-card in Appendix 2 of this Aboriginal Heritage Due Diligence Assessment report for details).
45-5-0591. Penrith Lakes 30.	Open Camp Site	284230:E 62266400:N	Site initially located on the terrace on the western bank of Cranbrook Creek. Site destroyed. (Refer to the relevant site-card in Appendix 2 of this Aboriginal Heritage Due Diligence Assessment report for details).

Step 2b: *Activities in areas where landscape features indicate the presence of Aboriginal objects.*

This step in the Due Diligence process is to determine if the impact area (i.e. the subject site's two smart-pole locations) are located in an archaeologically sensitive landscape area where known AHIMS sites or Aboriginal objects are known or predicted to be present. The following landscape features indicate the likely presence of Aboriginal objects where Aboriginal people utilised these landscape areas as part of their everyday activities (DECCW, 2010c).

- **Within 200 metres of waters, or**
- Located within a sand dune system, or
- Located on a ridge top, ridge line or headland, or
- Located within 200 metres below or above a cliff face, or
- Within 20 metres of or a cave, rock shelter, or a cave mouth

..... **and is on land that is not disturbed land.**

The subject site contains a 'landscape feature' area that would indicate that Aboriginal objects are likely to occur as defined in the Office of Environment & Heritage *Due Diligence Code of Practice for the Protection of Aboriginal Objects* (2010c) viz: **within 200m of 'waters'**, (Cranbrook Creek) being located in an archaeologically sensitive landscape area. However, the final point of the above landscape features and 'archaeologically sensitive landscape areas' being '**on land that is not disturbed land**', the entire area of the subject site's proposed smart-pole locations are highly disturbed as a result of historical and recent development activities viz: initially land-clearing activities (including stump and large-root removal) and other previous rural activities and later intensive quarrying and mining activities. These activities were then replaced with the development of the Penrith Lakes Scheme and subsequent large-scale landscaping and recontouring activities for the overall development of the Penrith Lakes Scheme. **The subject site's locations for the two smart-poles has a 'very low' archaeological potential and low archaeological exposure or visibility with the overall archaeological visibility of the subject site considered to be <1% archaeological visibility.**

Moreover, the entirety of the subject site's former original indigenous Cumberland Plain Woodland (CPW) vegetation and trees has been removed many decades previously from the subject site. 'Clearing of vegetation' is a form of disturbance as defined in 'Definitions' of the Code of Practice (2010c) and has significantly impacted on the soil profiles throughout the subject site by uplifting and removal of tree roots etc. and it is unlikely that there are any of the original soils profiles being in an undisturbed state at any location within the subject site especially within the two locations where the smarty-poles are to be established.

No Aboriginal objects were considered likely to be present at any location within the subject site's smart-pole location sites and no areas likely to contain lithic material e.g. stone tools and isolated finds and no areas of PADs (Potential Archaeological Deposits) were identified within the subject site's areas of proposed smart-poles or their immediate environs; finally, no PADs are considered likely to occur within the subject site's proposed smart-pole locations in this instance.

Step 3: *Can you avoid harm to the object or disturbance of the landscape feature?*

The entirety of the subject site's locations of the two smart-poles has been subjected to prolonged and extensive and repetitive ground disturbance by past rural activities primarily initially land clearing and quarrying activities followed by major re-contouring works (**refer to the photographic supplements**).

This Step of the Due Diligence assessment process applies to the land that is not disturbed land or contains 'known' Aboriginal objects. It is emphasised that the entirety of the subject site has been disturbed likely repetitively over many decades. Finally, there are no 'known Aboriginal objects' present within or adjacent to the subject site's location of the two smart-poles, the locations of the three known AHIMS Aboriginal sites are distant to the two smart-pole locations (**refer to Appendix 1**) and no additional Aboriginal objects are considered likely to occur within or adjacent the subject site's two smart-pole locations in this instance.

Step 4: *Desktop assessment and visual inspection.*

As part of the Aboriginal heritage due diligence assessment process, a desktop assessment (AHIMS register) had been undertaken on the 10th of October, 2021 and the results of this AHIMS search indicates the locations of the three (3) AHIMS sites which are not located within or adjacent to the to the subject site's two smart-pole locations (**refer to Appendix 1**).

A visual assessment was also undertaken throughout the subject site's locations of the two smart-pole sites and the immediate environs where the smart-poles are to be established; no areas likely to contain Aboriginal sites or objects were observed or identified at these two locations including any areas of PADs or isolated finds etc. and none are considered likely to be present.

The subject site's two smart-pole locations presents a low degree of archaeological visibility (viz <1%) and exposure of the ground surface within the above locations. The degree and depth of the ground disturbances from past land clearing and recontouring works would destroy any likelihood of any surface or subsurface (below-ground) Aboriginal objects including lithic scatters, open camp sites and isolated finds etc. being detected at any of the smart-pole locations as a result of the above activities.

As a result of the desktop assessments, visual inspections and site assessments, there is no indication that Aboriginal objects (including Potential Archaeological Deposits) are likely to be present within the smart-pole locations within the subject site and the detection of any Aboriginal objects has low likelihood of detection in those smart-pole site locations or within the vicinity of those site locations.

Step 5: *Further investigations and impact assessment*

It is considered that further investigation and impact assessment of the subject site's smart-pole locations is not warranted in this instance as it is considered that the two smart-pole locations within the subject site are likely to be a 'low archaeological sensitive area' based on historical and current land-use practices that has highly modified and decimated the soil landscape profiles of virtually the entire area of the subject site primarily as a result of the initial land-clearing works followed by quarrying and followed by recontouring and major landscaping works throughout much of the subject site. Such land-use activities applied to the subject site has resulted in the decimating any meaningful archaeological sensitive landscape areas within the subject site two smart-pole locations.

The majority of the subject site appears to have been recontoured further resulting in the mixing of the soil landscape profiles of the subject site over time. It is unlikely that further archaeological assessment and investigation would result in the detection of Aboriginal objects including Potential Archaeological Deposits (PADs).

6.0 CONCLUSIONS & RECOMMENDATIONS

Step 5 of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010c) indicates that if the *Code* is followed, and it has been reasonably decided that an AHIP (Aboriginal Heritage Impact Permit) application is not necessary either because Aboriginal objects are not present, or harm to those objects can be avoided, the proponent can proceed with caution. It is considered the detection of Aboriginal 'objects' at any location within the subject site's two smart-pole locations at 153, Old Castlereagh Road at Castlereagh is highly unlikely to result in the detection of additional Aboriginal objects in this instance. There no AHIMS sites located within or immediately adjacent to the smart-pole locations within the subject site; the three registered AHIMS sites viz: 45-5-0591, 45-5-0589 and 45-5-0332 are distant to the locations of the smart-pole sites. Moreover, all of the above three AHIMS sites are now destroyed (**see Appendix 2**), **therefore** an AHIP (Aboriginal Heritage Impact Permit) is not sought based on the review of the AHIMS database and the findings of the Aboriginal heritage due diligence assessment report.

During the field assessment of the subject site, no areas likely to contain Aboriginal objects were observed at either of the smart-pole locations. Moreover, due to the historical/ past land-use practices applied throughout the subject site, the presence of sub-surface Aboriginal objects including lithic scatters, open camp sites, isolated finds and Potential Archaeological Deposits (PADS) etc. is highly unlikely to be present as any of the above Aboriginal objects (if present) would have long been decimated as a result of the initial vegetation clearing followed by quarrying and recontouring and major landscaping works applied throughout the subject site including the two smart-pole locations.

As a result of this Aboriginal heritage due diligence process, it is considered that further archaeological assessment is not required and that further field assessment of the subject site's two smart-pole locations is highly unlikely to reveal any Aboriginal objects. Therefore, an application for an AHIP (Aboriginal Heritage Impact Permit) is not necessary in relation to the establishment of the two smart-poles within the subject site based on the findings of this Aboriginal Heritage Due Diligence Assessment Report as the subject site's two smart-pole locations are likely to be of 'low archaeological sensitive area' and low archaeological potential.

In regards to above-ground Aboriginal objects (i.e. dendroglyphs/ scarred trees/culturally modified trees), there are no indigenous trees present at any location within the subject site's two smart-pole locations; the presence of indigenous trees is crucial for the presence of any Aboriginal culturally scarred trees, moreover indigenous trees need to be of considerable age ie: being old-growth trees to be of sufficient age to qualify as potential culturally scarred trees; finally these trees need to contain cultural 'scars'.

This Aboriginal Heritage due diligence assessment report indicates that the subject site to be of low archaeological potential. Aboriginal objects are unlikely to be impacted with the establishment of the two smart-poles within the nominated smart-pole locations and it is considered that further assessment is not warranted. Nonetheless, the following recommendation is made in relation to the proposed establishment of the two smart-poles within the nominated smart-pole locations at 153, Old Castlereagh Road at Castlereagh within the Penrith Local Government Area.

Recommendation No. 1: In the unlikelyhood that any Aboriginal objects be located during any future works within the subject site's two nominated smart-pole locations at Lot 20 and Lot 21, DP: 1092147, No.153, Old Castlereagh Road at Castlereagh within the Penrith Lakes Regatta Centre, then all works immediately cease and contact be made with Heritage NSW (previously the Office of Environment & Heritage (OEH) to seek further advice. Should any Aboriginal objects be located during any site works in the future, then an application for an AHIP (Aboriginal Heritage Impact Permit) should be made to Heritage NSW.

Caution: It is an offence under Section 89A of the *National Parks & Wildlife Act, 1974* once a person becomes aware of the presence of Aboriginal objects not to notify the OEH of the location of Aboriginal objects as soon as possible unless the objects are already recorded on the AHIMS register.

7.0 REFERENCES

Department of Environment, Climate Change and Water (DECCW). *Code of Practice for Archaeological Investigation of Objects in NSW*, 2010a.

Department of Environment, Climate Change and Water (DECCW). *Aboriginal Cultural Heritage Community Consultation requirements for Proponents Part 6, National Parks & Wildlife Act, 1974*. 2010b.

Department of Environment, Climate Change and Water (DECCW). *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*. 2010c.

Department of Environment and Conservation (NSW). *Aboriginal Scarred Trees in New South Wales. A Filed Manual* (Andrew Long), 2005.

Geological Survey of New South Wales. *Sydney 1:250,000 Geological Series Sheets S1 56-5*, 3rd Ed, 1965).

Penrith Local Environmental Plan (2010)

NSW Aboriginal Land Rights Act, 1983.

NSW Government. Land & Property Information. Springwood 1:25,000 topographical map (Series 9030-4S) [3rd Edition], 2000.


NSW National Parks & Wildlife Act, 1974.

Soil Conservation Service of New South Wales. *Penrith 1:100,000 Soil Landscape Series 9030*, 1989.

State Environmental Planning Policy (Penrith Lakes Scheme), 1989.

APPENDIX 1

AHIMS Web Services Search. Dated 10th October, 2021.

 **AHIMS Web Services (AWS)**
Search Result


Environmental Assessments Pty Ltd
PO Box 314
Gosford, New South Wales 2250
Attention: Daniel O'Brien
Email: environmental@ozemail.com.au

Your RefPO Number : Penrith Lakes
Client Service ID : 628951
Date: 10 October 2021

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot: 21, DP: DP1092147, Section: - with a Buffer of 200 meters, conducted by Daniel O'Brien on 10 October 2021.

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 Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

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

APPENDIX 2

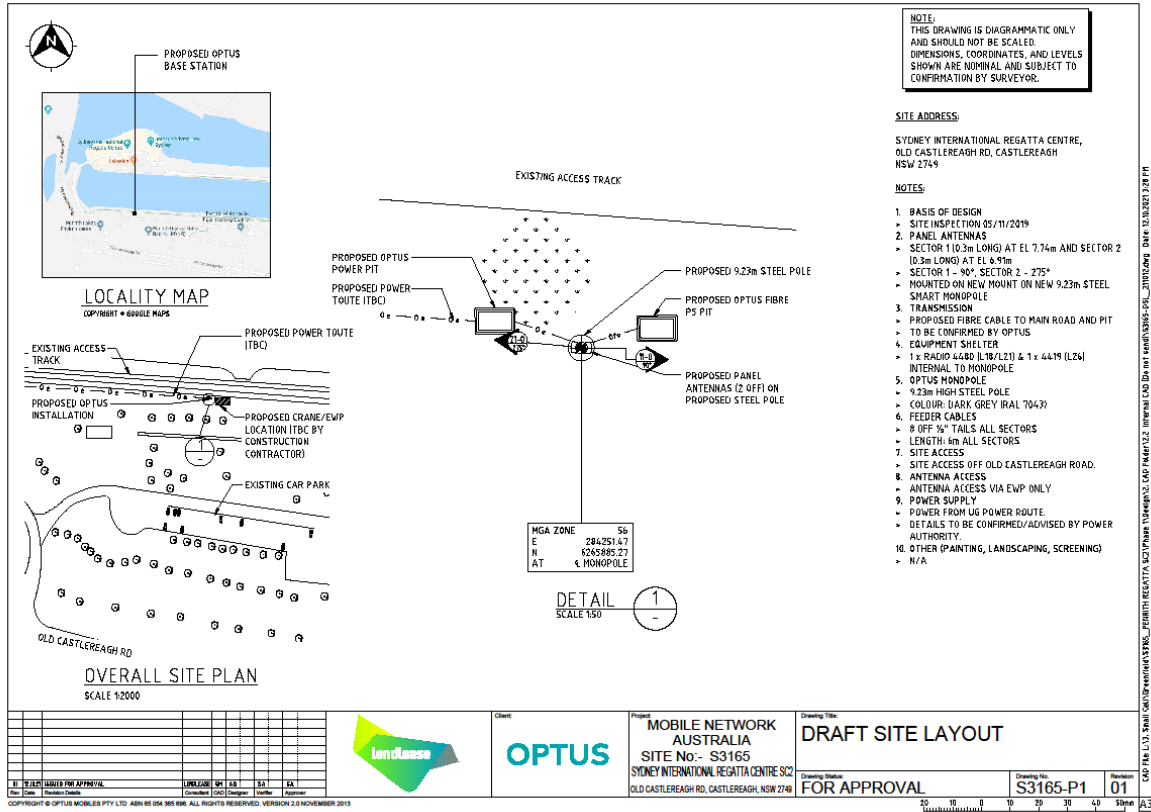
AHIMS Site Cards

AHIMS Web Services (AWS)											
Extensive search - Site list report											
Year (lat/lon) Number: 1 (Pulse)											
Client Service ID: 6345588											
SiteID	SiteName	Deliver	State	Serial	Serial	Serial	Serial	Serial	Serial	Serial	Serial
40-0-0101	Peninsula Station 30	DELIVER	WA	000101	000101	000101	000101	000101	000101	000101	000101
[Details]											
40-0-0102	Peninsula Station 31	DELIVER	WA	000102	000102	000102	000102	000102	000102	000102	000102
[Details]											
40-0-0103	Peninsula Station 32	DELIVER	WA	000103	000103	000103	000103	000103	000103	000103	000103
[Details]											

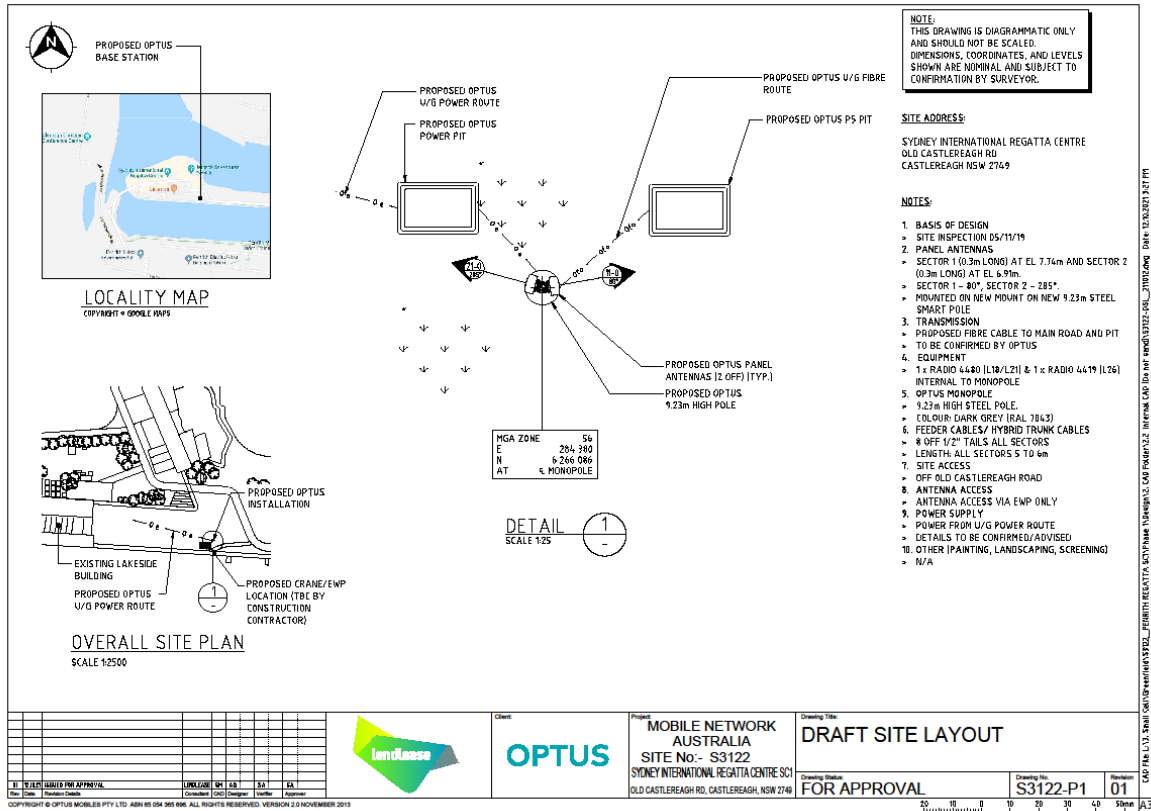
- **#45-5-0591 (Open Camp Site)**
- **#45-5-0589 (Open Camp Site)**
- **#45-5-0332 (Open Camp Site)**

APPENDIX 3

Site Plans of the Proposed Smart Poles



Above: Site Plan #1



Above: Site Plan #2

Photographic Supplements

Smart Pole Site No.S3122 (Smart-pole No.1)



Above: Facing south-east. Wider view of proposed location of smart-pole No.1. This area has been recontoured in the past in addition to the complete removal of all natural vegetation in the past and significant disturbances to the grounds surface and sub-surface soil profiles.



Above: Facing west. Wider view of proposed location of smart-pole No.1. Note archaeological visibility is virtually zero or less than 1% at best.



Above: Facing north. View of the site of the proposed smart-pole No.1.



Above: Small area of soil exposure adjacent to the location of smart-pole No.1. No cultural material has been detected at any location within the subject site including isolated finds or lithic scatters.



Above: Facing east towards the nominated location of smart-pole No.1



Above: Facing west with the nominated location of smart-pole No.1 in the foreground.



Above: Facing west towards the nominated location of smart-pole No.1. Note existing infrastructure such as the pedestrian pathway, pebbly foreshore along the competition lake and grassy slope where the proposed smart-pole No.1 is to be established.

Smart Pole Site No.S3165 (Smart-pole No.2)



Approximate location of smart-pole No.2

Above: Facing west. Location of proposed smart-pole No. 2.



Sydney International Regatta Centre

Competition lake

Above: Facing north across the competition lake with a view to the 'island'. Image taken from the immediate vicinity of smart-pole No.2.



Above: Facing west in the vicinity of smart-pole No.2 indicating existing pathway and other infrastructure facility in the immediate vicinity.



Approximate location of smart-pole No.2

Above: Facing south-west. Note drainage pipes and minor areas of soil exposure.



Approximate location of smart-pole No.2

Above: View from the northern side of the competition lake facing south towards the location of smart-pole No.2 indicating site context



Above: Facing south. View of small exposure area adjacent to the drainage pipes adjacent to the nominated site for smart-pole No.2. No Aboriginal objects were located or observed within this small exposure including any lithic material such as isolated finds, lithic scatters or shell materials in this instance.



Above: Facing east. View of planted rows of Cumberland Woodland trees adjacent to smart-pole No.2 site location. No culturally 'scarred' trees were observed within the subject site. There are no 'old-growth' trees present within the subject site, culturally scarred trees need to be old-growth trees in the first instance to qualify as culturally scarred trees.



Above: Facing south towards the location of the proposed site for smart-pole No.2 in the background. Note gravel and pebbly material present at this location in the foreground. These pebbly materials have been introduced to the site during major landscaping works for the Penrith Lakes Regatta site.

Glossary of Terms

Anthropogenic waste	Waste materials eg: dumped bricks, tyres, household rubbish, bottles etc.
Anticline	Upward folded beds, strata dipping away from a central crest (after Branagan & Packham, 2000).
Archaeological deposit	Sediment deposits that contain evidence of Aboriginal use of a locality in the past. Archaeological deposits may contain artefacts, burials, hearths or fauna remains such as shellfish.
Archaeological visibility	The degree to which past human presence or activity is evident from observable archaeological remains (after Mulvaney & Kamminga, 1999).
Artefact	An object that shows physical evidence of use or manufacture by human hands or as a consequence of human activity. Stone artefacts may include flakes, cores, hammerstones, axe heads, seed grinders, scrapers etc.
Backed blade	A stone tool that has been manufactured from a flake in which one margin has been modified by the removal of small flakes to blunt the edge or margin opposite the cutting edge.
Basalt	Fine grained, dark mafic volcanic rock (after Branagan & Packham, 2000). Frequently used by Aboriginal people for the manufacture of stone axes.
Biota:	The flora and fauna of a given region.
Bora ground	A ceremonial site comprising one or two connected circles of raised or compacted earth, generally used in male initiation rites.
BP:	Before Present.
Bioregional	A regional perspective of plant and animal assemblages.
Bulb of percussion	The rounded or conchoidal prominence on the cleavage or inner face of a knapped piece which swells and radiates from the point of percussion (after Lowe).
Carved Tree	The bark of the tree was used for constructing, canoes, shelters, coolamons and shields. Distinctive scars are left from bark removed and can usually be differentiated from natural scars. Carved trees are more distinctive exhibiting patterns etched into the wood of the tree. Carved and scarred trees occur throughout the state although clearing and forestry practices have greatly reduced their numbers (NPWS, 1997). The scarred tree within the subject site has characteristics of both carved and scarred tree.
Chert	Hard, dense, compact, very fine grained sedimentary rock, mainly composed of quartz or amorphous silica, sometimes of partly organic origin, usually breaks with conchoidal fracture (after Branagan & Packham, 2000). A raw stone material frequently utilised for the manufacture of stone tools or artefacts by the Australian Aborigines.

Core	A piece of stone where flake pieces are produced that have been struck from the core that are intended to be utilised as a stone tool.
Cortex	The natural weathering on the exterior of a rock's surface.
Dreaming	An Aboriginal concept of an era in the past, normally remote, when creation activities took place (after Mulvaney & Kamminga, 1999).
Eraillure scar	The scar remaining following the removal of a scale on the bulb of percussion of a knapped piece of stone. Also known as the bulbar scar.
Ethnography	An anthropological description of 'traditional' or non-industrial cultural and society (after Mulvaney and Kamminga, 1999).
Exotic:	An introduced plant or animal not native or indigenous.
Fish Traps	Stones that have been arranged to entrap fish, usually during the ebb of a tide at a river mouth or along the coast but also in inland creeks and rivers.
Flake	A fragment of raw stone material that has been removed from a stone core as a result of deliberate knapping activities. Flakes contain a platform, bulb-of percussion and an eraillure scar.
Grinding grooves	Grooves are located on flat rock exposures close to a stream or rock hole. They vary in size but are generally long (about 30-40 cm in length) and elliptical in shape. Stone axes were ground into the softer stone allowing a working edge to be created or sharpened. Deeper grooves may have been used to work spears or other thin implements (NPWS, 1997).
Holocene Period	The period from about 10,000 years ago to the present.
Indigenous:	A native plant or animal to any given area.
<i>In situ</i>	In its original place of rest [usually referring to the occurrences of stone artefacts].
Isolated find (IF)	A solitary artefact recorded or observed <i>in situ</i> on its own. A solitary stone artefact that is at least 50 metres away from the nearest artefact. Two artefacts within 50 metres constitute a 'site'.
Lithics	Stone artefacts and tools.
Midden	A rubbish dump-site where usually pieces of shell are discarded often resulting in accumulated mounds of shells.
Natural sacred/ mythological sites	Many features of the landscape, such as mountains, rocks, waterholes etc, are regarded as sacred sites by Aborigines. These are places associated with the Dreamtime ancestors and usually can only be identified by Aboriginal people. They retain a high significance to Aborigines (NPWS, 1997).
Obsidian	Volcanic glass-sharpest natural material occurring in nature.

Open camp site	Open camp sites are situated in open areas and usually contain evidence of Aboriginal activities such as evidence of knapping of stone raw materials for the manufacture of stone tools or artefacts. Scatters of artefacts may be associated with charcoal, shell or bone.
PADs	PAD (Potential Archaeological Deposit). A site location that has the potential to contain archaeological material although none is visible from the surface.
Palaeochannel	A former 'old' channel that no longer acts as a drainage channel due to a change in localised geomorphic drainage patterns.
Pleistocene Period	The period from about 10,000 years ago to 2,000,000 years ago.
Rank grassland:	Severely overgrown grassland that has a thick impenetrable mat at ground level that has not been mowed or grazed for some time.
Retouch:	A remodification of a stone tool where 'fine tuning' of the tool is required. Secondary flaking is usually the result of 'retouching' the artefact/tool.
Rock engraving	Rock engravings are often pictures engraved onto the surface of rocks.
Rock shelter	Rock shelters are rock overhangs that provided shelter for Aborigines. Often rock shelters contain evidence of art and or archaeological deposits in the form of stone artefacts, charcoal, bone or shell etc.
Scarred Tree	Trees that show evidence of Aboriginal use. Many scarred trees had been used for the manufacture of coolamons, shields or even canoes.
Syncline	A downward fold, with the youngest rock in the centre (after Branagan & Packham, 2000).
Taphonomy	The study of processes in which relics accumulate and preserve after deposition (after Mulvaney & Kamminga, 1999).
Tillage	The agricultural preparation of soils by mechanical agitation of soils such as digging, stirring and overturning of soils.

Addendum: Schedule 14 of the *National Parks & Wildlife Act, 1974* being '*Lands of cultural significance to Aboriginal persons*'. These lands may be jointly managed by the NSW National Parks & Wildlife Service and the Aboriginal Owners in accordance with the Act (NSW Government Land & Property Information and *Aboriginal Land Rights Act, 1983*).

ATTACHMENT 1

CURRICULUM VITAE & SELECTED PROJECTS

DANNY O'BRIEN

(Flora, Fauna, Biodiversity, Endangered Species, Ecological, Bushfire Hazard, Aboriginal archaeological & Cultural Heritage Resource & Wetland/ Marine Impact Assessment, EIS, REF, SIS, EMP, VMP consultant)

Phone: M: 0405 585 557

Email: environmental@ozemail.com.au

Alma mater:

- ***University of New England (UNE),***
- ***Australian National University (ANU),***
- ***University of Technology Sydney (UTS).***

Qualifications:

University units undertaken for a Degree of Bachelor of Arts at the University of New England (UNE) at Armidale, NSW and the Australian National University (ANU), Canberra. (Major world archaeology, prehistoric archaeology and paleoanthropology, sub-majors botany & zoology).

Relevant university course units undertaken are as follows:

ARCHAEOLOGY & PALAEOANTHROPOLOGY (University of New England, Armidale)

- World Archaeology & palaeoanthropology (Professor Graham Connor (now emeritus), Dr. Mike Morwood, Dr. Peter Brown, Dr. Jane Balme, Dr. Ian Davidson and Dr. Wendy Beck).
- Australian Aboriginal Archaeology & Prehistory (Dr. Mike Morwood-founder of neo-species of hominid *Homo floresensis* on Flores Island within the Indonesian Archipelago in the year 2004).
- Laboratory Methods in Archaeology (Dr. Mike Morwood *et al*/ UNE lecturers)
- Hunter-gatherer-Fisher Ecology. Dr. Ian Davidson).

- Field Methods in Archaeology (Dr. Mike Morwood, *et al*/ UNE lecturers)
- Public Archaeology (Dr. Jane Balme and various staff of the Archaeology Department, UNE).
- Prehistoric Rock Art (Dr. Mike Morwood).
- Masterclass: Lithics (Artefact Identification & Analysis at the ANU-(Australian National University, Canberra), 2015. A 6 day intensive masterclass course conducted by Dr. Oliver Macgregor.

I am a regular contributor to the recording of various Aboriginal sites across the state of NSW including numerous Aboriginal sites within the Sydney basin; site types include rock engravings, rock shelters with art, scarred trees isolated finds and lithic scatters (open camp sites) and axe-grinding grooves and have produced numerous Aboriginal Heritage Due Diligence Assessment reports throughout the Sydney basin, Central Coast and Hunter Valley regions and have worked with a number of Local Aboriginal Land Councils in NSW.

(Refer to the 'Selected Projects' section of this CV for details).

BOTANY, ZOOLOGY & WILDLIFE MANAGEMENT

- Plant & Animal Biology (Zoology and Botany Departments), University of New England, Armidale.
- Biology
- Aquatic Ecology. (Dr. Margaret Brock, Department of Botany U.N.E).
- Australian Wetlands. (Dr. Margaret Brock, Department of Botany U.N.E).
- Australian Rainforests. (Various staff-Botany Department)
- Plants & Plant Products (Prof. N. Prakash and various staff-Botany Department)
- Identification of Australian Plants. (Dr. Peter Clarke)
- Animal Behaviour. (Dr. Hugh Ford)

- Wildlife Management. Department of Ecosystem Management, U.N.E., Armidale. Professor Peter Jarman, Course coordinator.

This *curriculum vitae* is arranged in a chronological order. Considerable experience in recording native fauna typical of the Bassian, Torresian and Eyrean faunal assemblages. Forty-five years experience in mammalian, avian (birds) and herptofauna (reptiles & amphibians) identification and habitat requirements.

1981-83

Animal keeper at the Eric Worrell's Australian Reptile Park, Gosford.

Keeper of Australian wildlife, other duties included collection of injured/sick wildlife from the district, venturing into the field to climb eucalypt tree to cut branches for the Park's Koala colony. Animal captures to transfer animals to new cages including team work in capturing large adult American Alligators for transfer to other large holding ponds.

1983-84

Travelled throughout Australia in tropical (Torresian) and arid zone (Eyrean) to gain extensive knowledge of Australian natural history. Worked at the Orange Gap Camel Farm, Alice Springs within the Northern Territory. Caring, keeping, husbandry and First Aid and medical duties of maintaining large herd of camels (Dromedary). Conducted tour operations of camels rides where camel 'trains' of up to fifteen camels were used to take tourists for tours to local winery.

Ad hoc construction work enroute to other parts of Australia (mainly trench excavation and digging for pipelines or building sites).

1984-86

Part time natural history writer, featuring vertebrate fauna, including recommendations on management to private land owners.

Professional Experience

1985-89

Seasonal Ranger for the Hawkesbury District National Parks and Wildlife Service. Designed and conducted the seasonal ranger holiday program during most school holidays part time between these years, on cultural and natural history interpretation.

Wildlife lecturer for WEA Adult Education, Wyong. Part time. Self employed as an Education consultant on wildlife. Conducted school excursions into local forests on the Central Coast on a part time basis.

Education Officer for the "Forest Of Tranquillity". Engaged to tutor school groups into rainforest community to interpret the botanical and zoological aspects of the park. Preparation of working sheets for school excursions. Wildlife tutor and school excursion guide for "Myall Shores" throughout Myall Lakes National Park.

National Parks & Wildlife Service/OEH:

Commenced in 1989. N.P.W.S. Quarantine Station, Sydney Harbour National Park at North Head. Firstly as Ranger and assistant manager to the Training School and periodically acting manager. Interpretation officer NPWS, Quarantine Station, North Head, Sydney.

Jan-April, 1990

Archaeologist/ Cultural Resource Officer, Cultural Resources Department (archaeology) at the Central Regional Office of the NPWS at Valentine Street, Parramatta. Duties included archaeological site searches, reviewing of archaeological reports for development application prepared by consultant archaeologists, writing submissions to various departmental stakeholders on archaeological matters. Investigation on archaeological sites likely to be impacted by development. Reviewing draft Plans of Management (POM) on pre-historic and historic archaeological matters.

Apr-Dec 1990

NPWS Environmental Appraisals Officer, Central Region at Parramatta. Duties included reviewing Environmental Impact Statements (EIS), Statements of Environmental Effects and Review of Environmental Factors. Other technical reviews included submissions made by developers, consultants and service staff on the natural and cultural environment. Liaison with both Commonwealth and State Government departments on development proposals and land acquisition primarily for the acquisition and protection of Cumberland Plain Woodland Remnants. Writing submissions on environmental policies for various levels of the organisation including for the Regional Manager, Director and the Minister.

Other duties included to aid in establishing nature reserves and additions to national parks estate. Reviewing of Environmental Impact Statements which included studies on environmental issues of local, regional and national significance. NPWS representative for the 3rd Runway proposal including the production of the report 'Submission to the 3rd Runway Proposal'-NPWS.

Dec-September, 1991

Ranger, NPWS Central Coast District, Yengo National Park & Dharug National Park.

Duties include:

- Receiving and responding to EIS.

- Wildlife enquires.
- Firefighting - local and remote areas.
- Weed control.
- Wildlife mapping.
- Liaison with community groups.
- Cultural Resource protection works.
- Law Enforcement of the NP&W Act, 1974.
- Wildlife Licensing.
- Writing and production of "Review of Environmental Factors" in Service estate.
- Design and preparation of newly proposed camping areas.
- Writing of ministerial submissions.
- Recording of rare, endangered or regionally significant fauna species in the region and placed results in the 'Wildata' NPWS database.

Sept 1991-April 1992

Combined private work to incorporate EIS submissions.

April 1992-March 1993

NPWS/OEH: Ranger for Yengo and Dharug National Parks and Munmorah State Recreation Area.

- Ranger patrols.
- In Service review of Environmental factors submissions and reports.
- Review of EIS and investigation of NPWS statutory responsibilities concerning development proposals.
- Law enforcement activities both on and off NPWS estate.
- Rehabilitation works part Hawkesbury River Wetlands-Sydney Regional Environmental Plan No. 20.
- Part of coordinating team for the July 1992 False Killer Whale mass stranding at Seal Rocks.
- Submission for the South Somersby Precinct for the Proposed Strickland Nature Reserve.

March 1993

- Environmental constancy.
- Tutor in Bushland Regeneration & Management for the Gosford City Skillshare Group.
- Fauna survey and report of the Wyrabalong National Park for the NPWS.

NPWS/OEH: In-house Courses completed

Four Wheel Drive Course

Firefighting and Hazchem Modules

Helicopter Winching & Safety Course

Law-Enforcement: 'On The Spot Fine' Course

Radio Communication Operator Course.

Other Courses completed outside of NPWS.

* Rescue Course operated by Gosford State Emergency Service.

* Coastal Navigation Course I

* Coastal Navigation Course II

- Member of the Australasian Archaeological Association (AAA)
- Former member of the Gosford District Chamber of Commerce.

Selected projects

- Faunal assessment and Management Study of the Bayswater - Sydney West 330 kV Transmission Line in the Wollemi-Yengo National Parks, for Pacific Power. A 75-80 kilometre faunal transect survey through the above parks. A Seven Part Test of Significance was applied to all threatened species recorded.
- Preliminary Flora, Faunal Assessment (including SEPP-14 'Coastal Wetlands', SEPP-29 'Littoral Rainforest' & SEPP-44 'Koala Habitat Protection' studies for proposed 132kV Transmission Line; Kempsey-Nambucca-Coffs Harbour. Three corridor route (120 kilometers) options report for TransGrid.
- Review of Environmental Factors Report for the proposed Loop Road, Wyrabalong National Park. Undertaken as a ranger for the Wyrabalong National Park.
- Flora Survey of proposed Telecommunications Tower and facilities, Forster for OPTUS Communications within the Port Stephens LGA.

- Fauna and flora study for Lots 6 and D, Cabbage Tree Road, Bayview.
- Koala Survey of the Brisbane Water National Park for the National Parks and Wildlife Service.
- Faunal Survey of the Irrawang Spillway, Raymond Terrace for the Shortland Wetland Centre for the Hunter Water Corporation.
- Faunal Survey of the Wyrabalong National Park, for the N.S.W. National Parks and Wildlife Service. (Information and recommendations arising from this study is utilised for the proposed draft Plan of Management for the Wyrabalong National Park).
- Review of Environmental Factors Report for the Proposed Fire Radiation Zone, near Kariong, Brisbane Waters National Park. For Landcom & Benjamin Chow & Associates. (An overall assessment of the study areas environmental significance and cost benefit analysis of the fire radiation zone proposal).
- Faunal Assessment of the Bayswater-Sydney West 330kV Transmission Line in the Wollemi-Yengo National Parks, for Pacific Power. (A 75-80 kilometre faunal survey through the above parks. Five (5) Schedule 12 Endangered Species were recorded during this survey and a Seven-Point Test of Significance was applied to all five species. In addition, many wildlife management recommendations were made during this study.
- Gosford Coastal Open Space System (C.O.S.S.) Ecological Study. Commissioned by Gosford City Council and ERM Mitchell McCotter to undertake the faunal study component throughout the City's 'residue' areas; thirty six (36) study areas were investigated. The study areas were ranked on a priority basis for acquisition and incorporation into the C.O.S.S. The ranking system considered sites containing endangered species as 'high' priority for acquisition. In all, seven (7) endangered species were recorded during the study including nine new colonies of the Yellow-bellied Glider *Petaurus australis*, five new localities of the Sooty Owl *Tyto tenebricosa*, three new localities of the Powerful Owl *Ninox strenua* and two new colonies of the Red-Crowned Toadlet *Pseudophryne australis*.
- Member of the committee of the Tuggerah Lake Catchment Management Committee Taskforce. Two major aims of the Taskforce is to identify and address problem areas in ecosystems and their effect on wildlife; and to develop a plan for the management the biodiversity in the Tuggerah Lakes Catchment.
- Flora Survey of Proposed Telecommunications Tower and Facilities, Forster.
- Fauna and Flora Study for Lots 6 and D, Cabbage Tree Road, Bayview.
- Faunal Survey-Pre-roading access, Mount Boss State Forest for the N.S.W. State Forests, near Wauchope, NSW. Study brief to locate and identify fauna with special reference to Schedule 12 endangered fauna (Endangered Fauna, Interim Protection Act, 1991).

- Microbat (insectivorous bat) Survey of the Proposed Hard Rock Quarry (basalt) Extension, North Boambee for ERM.
- Microbat and Terrestrial Faunal Survey of Proposed underground coal mining operation of Longwalls 11 and 12, Wyee for Powercoal and for ERM.
- Fauna and Flora Survey of Proposed Subdivision at Laurie Road, Dural.
- Faunal Study for Proposed Sydney 2000 Olympic Games, Mountain Bike Track Facility, Fairfield City Farm. For the year 2000 proposed international mountain-bike racing event as part of the Sydney year 2000 Olympics. For ERM Mitchell McCotter.
- Fauna and Flora Survey for Proposed Extension of Buttonderry Waste Management Centre, Wyong Shire Council.
- Faunal and Flora Study and assessment for Local Environmental Study, Warnervale.
- Review of Faunal Impact Statement of Proposed Cross Runway development, Warnervale Airport, Wyong Shire Council.
- Fauna and Flora Assessment for proposed hardrock quarry Cessnock, for Maunsels Pty Ltd.
- Koala Survey of the Brisbane Waters National Park for the National Parks and Wildlife Service. Paper delivered to the Koala Conference, Coolangatta, QLD, 1995.
- Faunal survey for Ephraim Pty Ltd, Clarencetown, N.S.W.
- SEPP-44 Koala Habitat Protection Study for HLA Envirosciences Pty Ltd for Weston Aluminum Pty Ltd at Kurri Kurri.
- SEPP-44 Koala Habitat Protection study for proposed Crematorium, Greta, N.S.W.
- Microbat and general faunal survey for proposed extension of open-cut coal mine for HLA Envirosciences for Cumnock Coal.
- Microbat, flora, fauna & SEPP-44 (Koala Habitat Protection) studies for Proposed Underground Coal Extraction for HLA Envirosciences for Nardell Coal.
- Flora and fauna survey for proposed Rail Loop facility, HLA Envirosciences for Macquarie Generation.

- Conservation Plan for the Endangered Somersby Mint Bush *Prostanthera junonis* (Schedule 1 of the Threatened Species Conservation Act, 1995) for proposed private vehicle high performance race track for former Chairman for Amital Mr. Dean Wills.
- Faunal survey of western Sydney Biodiversity study for the Australian Museum Business Service for the National Park & Wildlife Service.
- Faunal survey of western Sydney Biodiversity study for the National Park & Wildlife Service.
- Threatened Species Assessment for proposed powerline easement clearing for EnergyAustralia, Matcham-Holgate-Erina.
- Threatened Flora & Faunal Assessment & survey for proposed Aboriginal Housing Development for Department of Housing, Empire Bay Drive, Empire Bay.
- Species Assessment Report for Proposed drainage facilities, Kings Avenue, Terrigal for Gosford City Council.
- Faunal Survey for proposed oil refinery extension, Kurnell Peninsula for Sinclair Knight Mertz and Ampol Australia.
- Yellow-bellied Glider Corridor Assessment of Kings Avenue, Terrigal. United Pacific Properties.
- Flora and fauna study for Telecommunication tower installation proposals for Vodafone at Mt Mororo and Woodburn, north coast of NSW.
- Microbat, flora and fauna survey of proposed residential housing estate, Morisset Peninsula.
- Bushfire, flora and fauna Assessment for proposed tourist resort, Townsend Avenue, Avoca Beach. Wayne Ritchie & Associates.
- Review of Environmental Factors (REF) Report for Proposed Sewerage Pump Station B1, Long Jetty for Wyong Shire Council.
- Flora and faunal assessment for proposed ANI Steel making facility, Kooragang Island for HLA Envirosiences Pty Ltd.
- Endangered Ecological Community: Eastern Suburbs Banksia Scrub Assessment for the Aboriginal Land Development Corporation, Port Botany.

- Seagrass (*Posidonia australis*) study for proposed Marina extension for the Lake Macquarie Yacht Club, Lake Macquarie.
- Seagrass study for proposed Marina extension of the Marks Point Marina, Lake Macquarie.
- Flora and Faunal Assessment for Proposed Residential Area Precinct 7 & 8, Mataram Ridge Estate, near Warnervale for A.V. Jennings and Sinclair Knight Mertz.
- Endangered Ecological Community: Cumberland Plain Woodland & Flora and Faunal Assessment, Green Valley for proposed subdivision.
- Addendum Extension for Proposed Vehicle High Performance Track (Motor Racing) Facility, Mangrove Mountain for PPK Environment & Infrastructure for Dean Wills.
- Flora and Faunal Assessment for Proposed Road Widening, Lisarow for the RTA.
- Flora and Faunal Assessment for Proposed Road Widening, Narara for the RTA.
- Flora, Fauna and Eight Part Test of Significance. Proposed Beresfield Bypass for the Roads & Traffic Authority, Newcastle.
- Flora, Fauna and Eight Part Test of Significance assessments. Proposed Road-widening, New England Highway for Rust PPK for the Roads & Traffic Authority.
- Cumberland Plain Woodland, Flora and faunal assessment, proposed subdivision, Malvern Road, Glenwood.
- Flora and faunal assessment-Endangered Ecological Community-Blue Gum High Forest, Castle Hill. Proposed subdivision for Group Development Services Pty Ltd.
- Systematic Faunal Survey of the Nepean Catchment. For Sydney Water, 1999. (28,000 Ha).
- Systematic Faunal Survey of the Avon Catchment. For Sydney Water, 1999. (17,500 Ha).
- Vegetation Management Plan. 'No-nett loss of trees and shrubs assessment' and overall flora and faunal assessment of Proposed Vineyard & Tourist Accommodation, De Beyers Road, Pokolbin for Pokolbin Holdings Pty Limited.

- Flora, fauna and marine study of proposed sewerage of Goat Island, Sydney Harbour National Park, 2000.
- Project manager for various Management Plans for proposed Wildlife Sanctuary and tourist development for the Hon. Mr. Barry Cohen, Peats Ridge Road, Calga. Management plans include Aboriginal Site & Archaeological Management Plan, Vegetation Management Plan and a Nutrient Management Plan. Report submitted to Gosford City Council.
- Ecological Management Plan (EMP). Proposed 37-lot Residential Subdivision, Lots 28 & 29, Rouse Road, Rouse Hill, Blacktown Local Government Area. Report to Summer Holdings Pty Ltd.
- Environmental Management Plan (EMP). Proposed Alterations & Additions to Existing Pharmaceutical Facility, Mandoon Road, Girraween, Cumberland Local Government Area.
- Vegetation Management Plan (VMP). Proposed Offset Area. Lot 19, Averys Lane, Heddon Greta, Cessnock Local Government Area.
- Vegetation Management Plan (VMP). 24, Kiogle Street, Wahroonga, Ku-ring Gai Local Government Area.
- Comprehensive Rehabilitation & Revegetation Management Plan for AIRM2, Townsend Avenue, Avoca Beach for the Gosford City Council, 2013.
- Flora, Fauna & Eight Part Test of Significance Assessment for proposed underground coal mining operation extensions, Wambo Coal, for HLA Envirosciences P/L.
- Flora and Faunal assessments/surveys for proposed open-cut coal mining operation for Camberwell Coal for HLA Envirosciences P/L.
- Flora and Fauna Survey and Vegetation Remnant studies for proposed underground coal mining operation for Dartbrook Coal (Joint Venture) for HLA Envirosciences Pty Ltd.
- Species Impact Statement (SIS) 'Duffys Forest'-Endangered Ecological Community, for proposed factory and administration buildings. Lot 503, Minna Close, Belrose for Leimei Nature's Care Manufacture (Mr. Alex Wu). Issues include the impact by the removal of Duffys Forest Vegetation Community from the subject site and its effect on Duffys Forest vegetation community on other vegetation within the environs of the subject site. Concurrence granted February, 2001 from NPWS.
- Member of the Working Party team to develop a conservation strategy to resolve impasse of Duffys Forest endangered ecological community, Austlink Corporate Park, Belrose.

- Vegetation & Site Rehabilitation Management Plan, Prescribed Stream (Erina Creek) & associated drainage channel. Matcham Road, Holgate.
- Flora, fauna, SEPP-44 & microbat studies for proposed aeolian sand extraction, Wallaby Scrub Road, Warkworth for C& M Hawkes.
- Rehabilitation & Management Plan: Endangered Ecological Community: Norah Head low woodland with heath on indurated sand. Breach of the TSC Act, 1995 arising from incursion and destruction of the EEC at Norah Head.
- Flora and faunal study. Proposed Extension to Retirement Village, Salamander Bay.
- Eight Part Test of Significance & Bushfire Hazard Assessment. Proposed Subdivision, Anne Crescent, Blaxland. For Mr.& Mrs. I Menzies.
- Aboriginal archaeological survey and anthropological assessment (in relation to a Wommens-site), Salamander Bay, Port Stephens LGA. Liaison and consultation with Maiaangal Aboriginal Community and the Woromi Local Aboriginal Land Council. Extension to existing SEPP-5 development.
- Bushfire Hazard, Flora, Fauna & Eight Part Test of Significance assessment for proposed subdivision, Sue Place Mount Colah.
- Tree habitat, SULE and arboricultural significance assessment. Proposed tourist resort, Kangy Angy for EJE Architecture.
- Flora, Fauna & Eight Part Test of Significance. Proposed Dwelling, Lot 1, Cattai Ridge Road, Glenorie.
- Flora, Fauna, Eight Part Test of Significance and Bushfire Hazard assessment of Proposed Subdivision, Murralong Road, Mount Colah.
- Preliminary Flora and Fauna Statement of Issues. Proposed Factory, Emu Plains.
- Flora, Fauna & Blue Gum High Forest Eight Part Test of Significance. Proposed SEPP-5 Development, Fraser Road, Normanhurst.
- Flora, Fauna & Eight Part test of Significance for proposed rail expansion at Glenfield for Cardno Willing Consulting Group for Rail Infrastructure Corp.
- Species Impact Statement. Duffys Forest Endangered Ecological Community. Christie Rental Centres. Lot 104, Narabang Way, Austlink Corporate Park. For Christies Rentals.

- Systematic and Targeted Rare Plant Survey-*Zieria involucreata*, *Velleia perfoliata*, *Melaleuca groveana* and *Persoonia hirsuta* subsp. Yengo. (Threatened Species Conservation Act, 1995). For the NSW National Parks & Wildlife Service. Commissioned to obtain ecological data on the above species for management purposes. Also to collect voucher specimens of *Persoonia hirsuta* subsp. Yengo for the Royal Botanic Gardens to determine if this species is a 'new' species as not enough plant material of this species has been collected to fully classify this species.
- Flora & fauna study for rezoning. For Blacktown City Council.
- Flora, fauna & Eight Part Test of Significance for proposed Separated Rail Junction Project for Cardno-Willing and the Rail Infrastructure Corp.
- Aboriginal Archaeology, Bushfire Hazard, Flora, Fauna, Eight Part Test of Significance and Threatened Microbat Surveys. Proposed Subdivision, Hue Hue Rd, Jilliby. For Impala Homes & Covercopy.
- Flora, fauna & Eight Part Test of Significance. Proposed Subdivision. Allambie Heights. For the Department of Public Works & Services.
- Species Impact Statement, Proposed development for Multiple Light Industrial Site, Kuring Gai Industrial Area.
- Review of Environmental Factors & Biodiversity survey (including native freshwater fish). Proposed Fish Ladders, Upper Weir, Ourimbah Creek, Ourimbah for the Wyong Shire Council. Scientific Licence & Research Permit for trapping of fish species for aquatic survey of fish & invertebrate species; Ourimbah Creek. Licenced by the NSW Fisheries Department.
- Review of Environmental Factors & Biodiversity survey (including native freshwater fish). Proposed Fish Ladders, Lower Weir, Ourimbah Creek, Chittaway for the Wyong Shire Council. Scientific Licence & Research Permit for trapping of fish species for aquatic survey of fish & invertebrate species; Ourimbah Creek. Licenced by the NSW Fisheries Department.
- Review of Species Impact Statement and re-appraisal of *Pimelia spicata* (E1, Threatened Species Conservation Act, 1995 in Relation to Rex Road, Georges Hall. Mediation to Resolve Issues Regarding the Translocation of the Rare Plants into Council Reserves from Private Lands.
- Bushfire hazard & flora and fauna ecological assessment. Collins Rd, Kulnura.
- Flora and Faunal Assessment and Eight Part Test of Significance. Proposed Extension of Shirley Street, Ourimbah, For the Wyong Shire Council.

- Statement of Environmental Effects. Proposed Bed & Breakfast facility. The Scenic Rd, Killcare Heights.
- Flora, fauna Eight Part Test of Significance. Proposed 8 Lot subdivision & dwellings, The Entrance Rd, Forresters Beach. O.L.O.R. Catholic Parish, The Entrance.
- Bushfire hazard assessment. Proposed 8 Lot subdivision & dwellings, The Entrance Rd, Forresters Beach. O.L.O.R. Catholic Parish, The Entrance.
- Ecological Study. Proposed construction of road and sea-wall, Hardys Bay Parade, Hardys Bay. For the Gosford City Council.
- Catadromous fish survey, seagrass & mangrove studies, marine plant community mapping and aquatic study (crustaceans & molluscs). Proposed seawall, dredging and reclamation of the Hardys Bay Parade, Hardys Bay, Brisbane Water, Gosford Local Government Area. For the Gosford City Council.
- Flora, Fauna & Eight Part Test of Significance. For Proposed Pipelines Mardi Dam. For GHD & the Wyong Shire Council & Gosford-Wyong Joint Water Supply Authority.
- Review of Environmental Factors. (REF) (including species assessment report). Proposed Reconstruction of Pheasants Nest Bridge, Pheasants Nest. For The Wollondilly Shire Council.
- Microbat Assessment for threatened species of microbats potentially utilising Existing 'old' bridge. Bridge over Dry Creek, Pheasants Nest Road, Pheasants Nest. For the Wollondilly Shire Council.
- Flora, Fauna, Eight Part Tests of Significance & Bushfire Hazard Assessment report. Proposed Subdivision, Galston.
- Flora, fauna, microbat, 8 Part Test of Significance, RAMSAR, CAMBA & JAMBA assessment. Proposed Rezoning for Residential Dwellings. Minmi, Newcastle Local Government Area.
- Flora, Fauna, Eight Part Test of Significance & Landscape Plan. Proposed Extension to Poultry Facilities, Peats Ridge Road, Peats Ridge.
- Flora, Fauna & Eight Part Test of Significance. Proposed Industrial Facility, Chivers Road, Somersby Industrial Park, 2003.
- Proposed Redevelopment of the Beacon Hill High School. Preliminary Flora & Fauna Assessments. For Xenith Project Services & Landcom.

- Flora, Fauna & Eight Part Tests of Significance. For Proposed Redevelopment of the Beacon Hill High School. For Landcom.
- Plan of Management of Bushfire Hazard Protection, Aboriginal Cultural Relics, Flora and Fauna. For Proposed Monastery, Lower Mangrove. For Pantanassa Greek Orthodox Monastery.
- Review of Environmental Factors (REF). Proposed Construction of Sewer Effluent Rising Main (SERM) for Tertiary Water Irrigation Purposes. Bateau Bay Sewer Treatment Works to the Tuggerah Lakes Golf Course. For the Wyong Shire Council, 2003.
- Establishing Rare Plants Monitoring Plots for Threatened Species-Yengo National Park & Parr SRA & Rare Plants within the Gosford LGA. For the NSW National Parks & Wildlife Service (now the DECC).
- Assessment of the population status of the endangered plant *Zieria involucrata* within the Marramarra National Park & Environs. For the NSW National Parks & Wildlife Service (now DECC).
- Survey of the Tranquillity Mint Bush *Prostanthera askania* (Endangered 1) and establishment of monitoring plots. For the NSW National Parks & Wildlife Service (now DECC).
- Threatened Species Assessment Report. Peer Review of 'Potential Significant Habitat Area'. For Taperell Rutledge Lawyers Vs Wyong Shire Council. Land & Environment Court.
- Preparation of Evidence for Taperell Rutledge Lawyers in the Land & Environment Court of New South Wales. (Land Acquisition, Just Term Compensation Act)
- Flora, Fauna & Eight Part Test of Significance. Impacts of Raising The Mardi Dam Wall on Surrounding Threatened Species, Populations & Endangered Ecological Communities.
- Threatened Species Assessment. Proposed Reconstruction of the Wyoming Road, Narara. For the Gosford City Council.
- Marine Impact Assessment. Proposed Jetty, The Point Road, Woolwich. For Waterlink P/L.
- Marine Impact Assessment. Proposed Jetty, Wharf Road, Birchgrove. For Waterlink P/L.
- Environmental Impact Statement. Proposed Replacement of the Gunderman Creek Bridge and road widening. For the Gosford City Council.

- Review of Environmental Factors (REF). Proposed Fire Radiation Zone (Asset Protection Zone). Maximum Security Fence & Facility. Kariong Juvenile Justice Centre, Kariong.
- Marine Impact Assessment. Proposed Slipway, Mosman. For Waterlink P/L.
- Bushfire Management Plan. Proposed Concrete Batching Facility, West Gosford. For Readymix Holdings Pty Limited.
- Fauna & Flora & Eight Part Tests of Significance. Proposed Concrete Batching Facility, West Gosford. For Readymix Holdings Pty Limited.
- Bushfire Hazard Assessment, Banksia Pde, Warriewood.
- Flora, Fauna & Eight Part Test of Significance. Proposed dwelling, Curlew Avenue, Pindimar, Great Lakes LGA.
- Flora, Fauna & Eight Part Tests of Significance. Proposed Six Lots Multi- Residential Development, Chase Avenue Roseville Chase. For Gumland Property Holdings.
- Subdivision Ridgmont Close, Cherrybrook. Flora, Fauna & Eight Part Test of Significance Report.
- Site Rehabilitation Management Plan. Large-scale Land Clearing, Mangrove Mountain.
- Marine Impact Assessment. Proposed Slipway. Wharf Rd, Vaucluse. For Waterlink P/L.
- Preventative Action Management Plan. Gosford City Council's Direction to Undertaken Preventative Action.
- Flora, Fauna & Eight Part Test of Significance. Proposed Deep Water Recovery Project. Warragamba Dam.
- Aboriginal Archaeological Assessment. Proposed Deep Water Recovery Project. Warragamba Dam.
- Aboriginal Archaeological Site Assessment. Presidents Hill, Gosford CBD.
- Bushfire Management Plan & Compliance Report. Woolworths Regional Distribution Centre. Warnervale Industrial Park, Warnervale, Wyong LGA (2005).

- Proposed Translocation of Seed Propagules & Extraction of Soil Seedbank from Donor to Recipient Sites. Duffys Forest Endangered Ecological Community. Proposed Development of Lot 104, Narabang way, Austlink Corporate Park, Belrose, Sydney.
- Proposed Ecological Restoration and Reconstruction of Duffys Forest Endangered Ecological Community. Proposed Development of Lot 104, Narabang way, Austlink Corporate Park, Belrose, Sydney.
- Proposed Implementation and Establishment of Fire Regimes from Donor to Recipient Sites. Duffys Forest Endangered Ecological Community. Proposed Development of Lot 104, Narabang Way, Austlink Corporate Park, Belrose, Sydney
- Bushland Management Plan. Proposed Development. Wisemans Ferry Road, Somersby.
- Aboriginal Cultural Heritage Assessment Report. Proposed Tourist Development at Wollombi for Keld Conradson, Cessnock.
- Flora, Fauna & Seven Part Tests of Significance. Proposed Extension to the Cessnock Waste Management Centre for the Cessnock City Council.
- Flora, Fauna & Seven Part Tests of Significance. Proposed Industrial Subdivision for the Cessnock City Council.
- Preliminary Flora and Fauna Assessment of Environmental Protection Zone for the Industrial Subdivision, Cessnock LGA.
- Flora, Fauna & Series of Seven Part Tests of Significance. Proposed Rezoning from residential to Medium Density Housing of Numbers 1234-1274, Pacific Highway, Pymble-Turramurra. Blue Gum High Forest issues as well as Gang Gang Cockatoo Endangered Population.
- Aboriginal Archaeological & Cultural Heritage Assessment Study. Proposed Rezoning of the Gosford Horticultural Research Station for the Dept of Commerce, 2007.
- Environmental Impact Statement. Proposed Replacement of the Gunderman Bridge, Gunderman. For the Gosford City Council, 2007.
- Flora, Fauna & Seven Part Test of Significance. Proposed Rezoning, Place of Worship, Foxall Road, Kellyville. For Saints in Sydney Inc, 2007.

- Flora, Fauna & Seven Part Test of Significance. Proposed development, Racecourse Road, Bungwahl, Great Lakes Local Government Area. For Kendale Homes, 2007.
- Bushfire Hazard/Risk Assessment. Proposed Rezoning, Place of Worship, Foxall Road, Kellyville. For Saints in Sydney Inc, 2007.
- Bushfire Hazard Assessment Report. Proposed Integral Energy Training Centre, West Hoxton.
- Bushfire Hazard/Risk Assessment Study. Proposed Masonic Centre redevelopment, Gwynneville, Wollongong LGA, 2007.
- Aboriginal Archaeological Survey & Cultural Heritage Assessment Report. Site surveys & assessment in association of the Bora Ridge Ceremonial Ground Sacred Site. Proposed Bioenergy Facility, Bora Ridge, Richmond River LGA.
- Aboriginal Archaeological Assessment. Proposed Rural Residential Subdivision, Stone Road, Naughtons Gap, Richmond River Local Government Area, 2007.
- Aboriginal Archaeological Assessment Study. Proposed Chicken facilities. Lot 2, Mongogarrie Road, Mongogarrie, Richmond River Local Government Area, 2007.
- Aboriginal Archaeological Assessment Report. Proposed Rural Residential Subdivision, Readons Lane, Swan Bay, Richmond River Local Government Area, 2007.
- Aboriginal Archaeological Assessment report. Proposed Byron Bay Hospital. Ewingsdale Road, Ewingsdale, Byron Bay Local Government Area, 2007.
- Aboriginal Archaeological Assessment report. Proposed Hard Rock (basalt) Quarry, Lot 19, Kights Road, Dyraaba (near Casino), Richmond River Local Government Area, 2007.
- Vegetation Management Plan. Proposed Residential Development. Farragher and Crouch Land, Thornton, Maitland LGA, 2007.
- Peer Review and Update of Environmental Management Matters. Proposed Residential Development. Farragher and Crouch Land, Thornton, Maitland LGA, 2007.
- Review of Environmental Factors Study: Proposed Development (interim early works) Part Stage 3, Pacific Highway, Lisarow Upgrade. Roads & Traffic Authority. Specialist studies commissioned by Environmental Assessments include Ground Penetrating Radar, Soil Contamination study, Noise Impact Assessment and water quality undertaken by HLA ENSR.

- Species Impact Statement. Proposed Residential Development. Lots 1-8, The Entrance Road, Forresters Beach.
- Constraints & Opportunities Study. Stage 3, Glen Road Ourimbah to Railway Overpass and Intersection of Railway Crescent, Pacific Highway Ourimbah-Lisarow. For the NSW Roads & Traffic Authority.
- Species Impact Statement. Proposed Kincumber Fire Station, The Scenic Road, Kincumber. For the NSW Fire Brigades, 2008.
- Environmental File Notes. Proposed Crossovers. F3 Freeway, from north of Wyong in the north to south of the Hawkesbury River Bridge in the south. For the NSW Roads & Traffic Authority, 2009.
- Review of Environmental Factors. Proposed Access Road, Narellan Road to Cunningham Drive, Mount Annan, for the NSW Roads & Traffic Authority and the Mount Annan Botanic Gardens (Sydney), 2009.
- Aboriginal Archaeological & Cultural Heritage Assessment Report, Proposed Access Road, Narellan Road to Cunningham Drive, Mount Annan, for the NSW Roads & Traffic Authority and the Mount Annan Botanic Gardens (Sydney), 2009.
- Targeted Threatened Flora & Fauna Surveys. Proposed Multiple Residential Subdivisions, John Road, Wadalba. Targeted threatened flora species included the orchids *Caladenia tessellata*, *Thelymitra adorata*, *Rhizanthella slateri*, *Diuris bracteata* and *Microtis angusii*. Other species also targeted included *Grevillea parviflora* ssp. *parviflora* and *Eucalyptus parramattensis* ssp. *decadens*.

Land & Environment Court: Expert Witness/Testimony.

I have provided both written and verbal expert evidence in several Land & Environment Court proceedings including both Section 34 Conciliation and Full Hearings including the following proceedings.

- Expert Witness. (SEPP-5 (Aged Care facility) Development Proposal. (Client Vs Hornsby Shire Council, Sydney). Key issues: Impacts on adjacent Blue Gum High Forest-Endangered Ecological Community (now federally listed 'Critically endangered, EPBC Act, 1999.

- *Land Acquisition 'Just Terms' Compensation Act, 1991*. (Client Vs. Wyong Shire Council). Key issues: Allegedly significant vegetation community and threatened species of flora and fauna. Just Terms Compensation Act, under Compulsory Land Acquisition Act.
- Preparation of Evidence for Taperell Rutledge Lawyers in the Land & Environment Court of New South Wales. (*Land Acquisition, Just Terms Compensation Act, 1991*).
- Section 34, *Land & Environment Court Act, 1979*. Conciliation Conference Proposed Motel, Pindima, Port Stephens LGA.
- Section 34, *Land & Environment Court Act, 1979*. Conciliation Conference. Proposed residential subdivision, Chapman Avenue, Beecroft. Hornsby LGA.
- Joint Expert Report-Ecological Issues. Scully Vs Hornsby Shire Council. Proposed Subdivision, Chapman Avenue, Beecroft, Hornsby Local Government Area, July, 2020.
- Expert Witness, Land & Environment Court. Scully Vs Hornsby Shire Council. Proposed Subdivision, Chapman Avenue, Beecroft, Hornsby Local Government Area, 22nd of July, 2020.

EXPERIENCE IN ENDANGERED ECOLOGICAL COMMUNITIES

- * Shale/sandstone Transition Forest in the Sydney Basin Bioregion-endangered ecological community. Review of Environmental Factors report. Proposed Bridge and road widening, Pheasants Nest. For the Wollondilly Shire Council.
- * Lower Hunter Spotted Gum-Ironbark Forest in the Sydney Basin Bioregion, endangered ecological community. Various studies for the Cessnock City Council. Including Flora, Fauna & Seven Part Tests of Significance. Proposed Landfill and Access Road, Neath, Cessnock LGA, 2007.
- * Blue Gum High Forest in the Sydney Basin Bioregion-endangered ecological community. Expert witness, Land & Environment Court, Blue Gum High Forest. Hornsby Council Vs. Masterbuilt Pty Limited.
- * Sydney Coastal Estuary Swamp Forest (now Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner

Bioregions)-endangered ecological community. For the Wyong Shire Council and various private development enterprises.

- * Species Impact Statement. Duffys Forest Endangered Ecological Community. Austlink Corporate Park. For Leimei Natures Care, Minna Close and Narabang Constructions on Narabang Way. Species Impact Statements for both sites were prepared by the Consultant. Other studies included a Vegetation & Bushland Management Plan (Duffys Forest), Works Environmental Protection Plan & SEPP-19 (Urban Bushland Protection).
- * Norah Head Low Woodland with Heath on Indurated Sand-endangered ecological community. Preparation of a Rehabilitation Management Plan for the site following incursion by heavy machinery by the Norah Head Bowling Club. Rehabilitation Management Plan submitted to the Wyong Shire Council.
- * Warkworth Sand Woodland of the Sydney Basin Bioregion-endangered ecological community. Proposed Sandmining Operations. For HLA Envirosciences.
- * Cumberland Plain Woodland in the Sydney Basin Bioregion-endangered ecological community. For the NSW National Parks & Wildlife Service as the Services regional Environmental Appraisal Officer (EAO), Central Region, Valentine St, Parramatta.
- * Eastern Suburbs Banksia Scrub in the Sydney Basin Bioregion-endangered ecological community. For a Sydney-based engineering firm and the Aboriginal Development Corporation.
- Kincumber Scribbly Gum Forest-Critically Endangered Ecological Community.
- Kurri Sand Swamp Woodland in the Sydney Basin-endangered ecological community.

PAPERS/PUBLICATIONS

O'Brien, D. *Koala Survey of the Brisbane Water National Park*. A report to the NSW National Parks & Wildlife Service, 1995.

O'Brien, D. 'Koalas in the Gosford District'. In *Proceedings of a Conference on the Status of the Koala in 1995*. Conference held at Coolongata, Queensland. Hosted by the Australian Koala Foundation, Brisbane, Queensland.

O'Brien, D. 'Owls & Nightjars of the New South Wales Central Coast'. Australian Birds Vol. 24, p9-19, 1990.

O'Brien, D. 'Four Rare Plants of the Yengo National Park, Parr State Conservation Area and Environs. *Persoonia hirsuta* ssp. Yengo, *Melaleuca groveana*, *Velleia perfoliata* and *Zieria involucrata*' (In-prep).

SELECTED PROJECTS

Danny O'Brien

(Biodiversity, Flora, Fauna, Threatened Species, Ecological Communities, Aboriginal Archaeological & Cultural Heritage, AHIPs, Heritage, Bushfire Hazard, & Wetland/ Marine Impact Assessment, POM, EMP, BMP, RMP, EIS, REF & SIS consultancy)

ARCHAEOLOGICAL / & CULTURAL HERITAGE ASSESSMENTS, SURVEYS, SITE RECORDINGS, REPORTS & ABORIGINAL COMMUNITY CONSULTATIONS/ PART 6 CONSULTATIVE APPROVALS PROCESS

Cultural Resource Officer, Cultural Resources Department (archaeology) at the Central Regional Office of the NPWS (now OEH) at Valentine Street, Parramatta. Duties included archaeological site searches, reviewing of archaeological reports prepared by archaeological consultants for compliance, writing submissions to various departmental stakeholders on archaeological matters. Field investigation on archaeological sites likely to be impacted by development confirmation of sites impacted by development or development activities. Reviewing draft plans of management on archaeological matters.

- Preparation of AHIP (Aboriginal Heritage Impact Permit) for proposed sewer pipeline route, North Avoca. The AHIP includes meetings with community stakeholders and negotiation between the various parties including Darkinjung Local Aboriginal Land Council (DLALC), Pottery Minbee Aboriginal Elders Group and Guringai Tribal Link Aboriginal Corporation. For Gosford City Council and the NSW Department of Finance & Services.
- Aboriginal archaeological survey and anthropological assessment (in relation to a Women's-site), Salamander Bay, Port Stephens LGA. Liaison and consultation with Maiaangal Aboriginal Community and the Woromi Local Aboriginal Land Council. Extension to existing SEPP-5 development. Survey was primarily undertaken on Pleistocene sand deposit landscape units to survey for Potential Archaeological Deposits (PADs), shell midden deposits and open camp sites.
- Aboriginal Archaeological & Cultural Heritage Assessment Report & Part 6 Approvals. Proposed Tourist Development, Cedar Street Wollombi, Cessnock LGA. Survey undertaken on Hawkesbury Sandstone upper slopes and ridge landscape units. Both the Koombahtoo Local Aboriginal Land Council and the Ungooroo Aboriginal Corporation were contracted and consulted in the assessment phase of the study and that both 'men's' and 'women's' sites were considered during the assessment phase of the study. A water hole and its immediate precinct had been identified as a possible 'women's site' by the Ungooroo Aboriginal Corporation. The archaeological results of this survey that a rock shelter with PADs and Axe-grinding grooves were recorded. An ethnobotanical assessment had also been undertaken for the site.
- Aboriginal Archaeological Heritage Assessment. Proposed Deep Water Recovery Project, Warragamba Dam. For NSW Dept of Commerce & Sydney Catchment Authority. The Tharawal Local Aboriginal Land Council were contracted to assist the Consultant (Danny O'Brien) in the field assessment process and provided their own independent cultural heritage advice for the proposed works.

- Aboriginal Archaeological Site Assessment. Presidents Hill, COSS, Gosford CBD. Site types recorded and analysis of shellfish species composition included rock shelters with shell midden deposits consisting of bivalves and univalves including *Anadara trapezia*, *Pyrazus ebenina* and various other species of bivalves.
- Aboriginal archaeological site survey, Mount Pleasant, COSS, Saratoga, NSW. Landscape units surveyed included forest slopes and ridges. Site types recorded included rock shelters with shell midden deposits (dominated by *Anadara trapezia*) and rock shelter with deposits.
- Aboriginal Archaeological & Cultural Heritage Assessment Study. Proposed Rezoning of the Gosford Horticultural Research Station for the Dept of Commerce and the Dept of Primary Industries. This was a large scale survey of Aboriginal archaeological sites surveying a broad range of landscape units including ridges, slopes, valley floors and riparian zones. Numerous sites were recorded including a broad range of sites types including rock shelters with art, rock shelters with deposits, PADs, axe-grinding grooves, spear-sharpening grooves, scarred trees and stone arrangements. An ethnobotanical and resource assessment had also been undertaken by the Consultant for the site. The surveys were also assisted by the Darkinjung Local Aboriginal Land Council.
- Aboriginal Archaeological Survey & Cultural Heritage Assessment Report. Site surveys & assessment in association of the Bora Ridge Ceremonial Ground Site. Proposed Bioenergy Facility, Bora Ridge, Richmond River LGA. Landscape units assessed included open forests on upper slopes and ridges, cleared open pastures on coastal floodplains. Site types included the bora ring Aboriginal site and several scarred trees including dendroglyphs. The Bogal Local Aboriginal Land Council was also commissioned to provide their own cultural heritage report of the proposal and had assisted the Consultant during the field surveys.
- Aboriginal Archaeological Assessment. Proposed Rural Residential Subdivision, Stones Road, Naughtons Gap, (near Lismore), Richmond River Local Government Area. Landscape units included open pastures on slopes and coastal floodplains.
- Aboriginal Archaeological Assessment Study. Proposed Poultry facilities. Lot 2, Mongogarrie Road, Mongogarrie, near Lismore, Richmond River Local Government Area, 2007. Landscape units included floodplains, slope and ridgelines.
- Aboriginal Archaeological Assessment Report. Proposed Rural Residential Subdivision, Readons Lane, Swan Bay, near Lismore, Richmond River Local Government Area, 2007. Coastal floodplain landscape units.
- Aboriginal Archaeological Assessment report. Proposed Byron Bay Hospital. Ewingsdale Road, Ewingsdale, Byron Bay Local Government Area, for North Coast Area Health. Riparian landscape unit.
- Aboriginal Archaeological Survey and Assessment. Proposed large-scale residential subdivision, Hue Hue Road, Jiliby. For Impala Homes & Covercopy. Surveys undertaken on woodland, open pasture and coastal floodplain landscape units.

- Aboriginal Archaeological Assessment report. Proposed Hard Rock (basalt) Quarry, Lot 19, Knights Road, Dyraaba (near Casino), Richmond River Local Government Area.
- Site assessment, lithic scatters. The Entrance Road, Forresters Beach. Landscape units surveyed-coastal floodplain.
- Conservation Plan Submission to Gosford City Council. Protection & amelioration measures. Significant Aboriginal archaeological and cultural heritage relics including rock engravings of anthropomorphs, zoomorphs including cetacean/dugong and macropods, axe-grinding grooves and open camp site (scattered surface lithics and potential archaeological deposit [PADs]). Mangrove Road, Narara within the Gosford LGA, 2008.
- Conservation Plan. Rock shelter with art, Mangrove Road, Narara, Gosford Local Government Area.
- Preliminary archaeological investigation. Pacific Highway, Ourimbah to Lisarow. Proposed upgrade works from two lanes to four lanes, for the RTA. The site surveys were assisted by the Darkinjung Local Aboriginal Land Council.
- Aboriginal Archaeological & Cultural Heritage Assessment Report. Proposed access road, Narellan Road to Cunningham Drive, Mount Annan, for the NSW Roads & Traffic Authority, 2009. The site assessment and surveys was also assisted by both the Tharawal Local Aboriginal land Council and the Cubbitch Barta Native Title Claimants Aboriginal Corporation.
- Aboriginal Archaeological Assessment. Proposed clearing works for 132kV powerline easements, Peats Ridge Road, Brieses Road and Old Pacific Highway for EnergyAustralia. Sites recorded included rock engravings, stone arrangements, rock shelters with art and Potential Archaeological Deposits (PADs).
- Aboriginal Archaeological assessment. Proposed Kincumber Fire Station, The Scenic Road, Kincumber. A review of non-indigenous heritage (European) site for the Kincumber Locality, Gosford Local Government Area, Review of Environmental Factors, 2009. The site assessment in consultation with the Darkinjung Local Aboriginal Land Council and the Guringai Tribal Link Aboriginal Corporation, 2009.
- The consultant (Danny O'Brien) continues to undertake numerous recordings of Aboriginal sites throughout the region and submission of site recordings to the OEH for including into their AHIMS database. Sites recorded include in private land holdings, National Park (OEH) estate, state forests and Local Government bushland areas including the Coastal Open Space System (COSS). New site recording include all forms of palaeoart including rock engravings depicting anthropomorphs, zoomorphs, site complexes, rock shelters with art, shelters with deposits and art, PADs, shelters with middens, coastal shell midden deposits (including analysis of surface shell species present), lithic scatters, isolated finds, open camp sites, axe-grinding groove sites and dendroglyphs (culturally scarred trees).
- Site recordings. Arid Zone, Broken Hill-Menindee Lakes and environs. Recordings of hearths, lithic scatters, open camp sites, dendroglyphs, isolated finds etc.
- Aboriginal Archaeological Assessment & Survey. Proposed 132kV Powerline, White Rock Wind Farm, Inverell LGA, July, 2012.

- Aboriginal Archaeological Assessment & Survey & Aboriginal Cultural Heritage Community Engagement Process. Proposed 132kV Powerline, White Rock Wind Farm, Inverell LGA, November, 2016. In association with the Anaiwan Local Aboriginal Land Council. Coordination for Aboriginal Cultural Heritage and Community Stakeholder Consultation requirement including preparation of local advertisement in print media outlets and preparation of Aboriginal Stakeholder Community Register of Stakeholders interests in the proposal, Liaison and Consultation with various Northern Tableland Aboriginal Stakeholders, Tribal Elders (including Aunty Hilda Connors from the Kwieambal Traditional Owners and Colin Ahoy of the Nunawanna Aboriginal Corporation of Armidale) and various Native Title Claimants including Gomeroi Native Title Claim & Applicant Group.
- Development of Chance Finds Procedure. Proposed 132kV Powerline, White Rock Wind Farm, Inverell LGA.
- Review and research of evidence of human (Aboriginal) skeletal remains and burial site, Booker Bay Road, Booker Bay, 2010.
- Aboriginal archaeological site survey & report. Proposed Events Trail & Tourist Facility. Glenworth Valley, Glenworth Valley, Calga, Gosford LGA.
- Masterclass: Lithics (Artefact Identification & Analysis at the ANU-(Australian National University, Canberra), 2013. A 6 day intensive course conducted by Dr. Oliver Macgregor at the ANU.
- Aboriginal Due Diligence Assessment Report. Massacre/burial site. Proposed Skydive Facility. Stuart Park, Aboriginal Burial Ground, North Wollongong, 2014.
- Monitoring of potential human (Aboriginal) skeletal remains, Booker Bay Road, Booker Bay.
- Aboriginal Archaeological Assessment. Proposed Quarry Extension, Middle Creek Quarries, Oberon, Oberon LGA.
- Aboriginal Cultural Heritage Management Plan. Proposed Housing Estate, Warnervale Road, Warnervale. For Thomas Paul Property Group, September, 2017.
- Aboriginal Heritage Due Diligence Assessment Report. Aboriginal Skeletal Remains & Coastal Midden Site and in association with the Metropolitan Local Aboriginal Land Council. Proposed Inclinator, Seaforth Crescent, Seaforth. For Lin Lin, 2017.
- Aboriginal Heritage Due Diligence Assessment Report. Proposed Upgrade to the Woy Woy Wharf & Seawall Reconstruction, The Boulevarde, Woy Woy for the Central Coast Council, 2017.
- Preliminary Aboriginal Heritage Investigation. SM2-SM6 Surface to Air Missile Acquisition and Storage Facility Proposal. For Department of Defence, 2018.
- Aboriginal Heritage Due Diligence Assessment report. Proposed Boat Repair & Storage Facility, Streamside Street, Woollamia near Huskisson, Shoalhaven LGA, 2019.
- Aboriginal Heritage Due Diligence Assessment reports. Proposed Residential Subdivisions, Austral, Blacktown Local Government Area, March, 2019.

HERITAGE IMPACT STATEMENTS (NON-INDIGENOUS)

- Heritage Impact Statement. Development within the Vicinity of a Heritage Item (Old Oak Factory) as listed under Schedule 5 of the Newcastle LEP. Proposed Hungry Jacks Restaurant, 'The Oaks Centre', Maitland Road, Hexham. For Hungry Jacks Australia Pty Limited.
- Heritage Impact Statement. Non-indigenous Heritage. Proposed telecommunications Facility Tower & Ancillary Facilities. Impacts on Collington House [Cottage]. Hornsby Ku-ring Gai Hospital, Palmerston Road, Hornsby, Hornsby LGA for Service Stream Mobile Communications Limited.
- Heritage Impact Statement. Proposed Multi-storey Medium Density Residential Development within the Vicinity of Heritage Item. Veron Street, Wentworthville, Holroyd LGA.
- Heritage Impact Statement. Proposed Commercial Development in Heritage Conservation Area, New England Highway Greta, Cessnock LGA, Hunter Valley, NSW.
- Statement of Heritage Impact. Stanford Main No. 2 Colliery, Elrington, Paxton in support of Proposed 13 Lot subdivision, Millfield Road, Paxton-Millfield, Cessnock Local Government Area.
- European (non-indigenous) Heritage Assessments and Archaeological Resource Assessments. Alternative Pipeline Route, Avoca Drive Gravity Main (ADGM), Avoca-Kincumber, Gosford Local Government Area. For the Gosford City Council and the NSW Department of Finance & Services.
- Non-indigenous heritage assessment. Proposed road works, Glen Road, Ourimbah to Railway Crescent, Lisarow, Central Coast LGA for the RMS. This assessment was undertaken by the Consultant as part of the Constraints & Opportunities Study prepared by the Consultant for the RMS. Heritage Sites included items of local and state heritage items. This assessment also considered the potential presence of unmarked graves within the Lisarow Cemetery; to this end the Consultant had commissioned a Ground Penetrating Radar survey of the site to detect the presence of any unmarked graves that may be affected by the proposed road-widening works.
- Non-indigenous Heritage Assessment. Proposed Kincumber Fire Station, The Scenic Road, Kincumber. A review of non-indigenous heritage (European) site for the Kincumber locality, Gosford Local Government Area, Review of Environmental Factors. Prepared for NSW Fire & rescue and the NSW Dept of Finance.
- Heritage Impact Statement. Former South Maitland Railway System-Landscape Heritage Item (#I212) and former Collieries of South Maitland Coalfields/Greta Coal Measures (#I215)-Schedule 5, Cessnock LEP, 2011. For Proposed 93 Lot Residential Subdivision, Main Road, Heddon Greta, 2017.

BIODIVERSITY SURVEYS & FLORA & FAUNA SURVEYS & TESTS OF SIGNIFICANCE:

- Flora, fauna, microbat, Tests of Significance, SEPP-14, Ramsar, CAMBA & JAMBA assessment. Proposed Rezoning for Residential Dwellings. Minmi Road, Minmi, Newcastle Local Government Area. Outlook Estate.
- Flora, fauna & Seven Part Tests of Significance. Proposed Hazard Reduction Burn, Earnbrook Road, Mount White, for Strawberry Hills Horse Stud.
- Aboriginal Archaeology, Bushfire Hazard, Flora, Fauna, Eight Part Test of Significance and Threatened Microbat Surveys. Proposed Subdivision, Hue Hue Rd, Jilliby. For Impala Homes & Covercopy.
- Flora, Fauna & Test of Significance. For Proposed Transfer System and pipelines Mardi Dam. For GHD & the Wyong Shire Council & Gosford-Wyong Joint Water Supply Authority.
- Flora, Fauna & Test of Significance. Impacts of Raising the Mardi Dam Wall on Surrounding Threatened Species, Populations & Endangered Ecological Communities.
- Flora, Fauna & Test of Significance. Proposed Deep Water Recovery Project. Warragamba Dam, Warragamba for Dept of Commerce.
- Species Assessment Report for Proposed drainage facilities, Kings Avenue, Terrigal for Gosford City Council.
- Yellow-bellied Glider Corridor Assessment of Kings Avenue, Terrigal. United Pacific Properties.
- Microbat, flora and fauna survey of proposed residential housing estate, Morisset Peninsula.
- Flora and Faunal Assessment for Proposed Residential Area Precinct 7 & 8, Mataram Ridge Estate, near Warnervale for A.V. Jennings and Sinclair Knight Mertz.
- Endangered Ecological Community: Cumberland Plain Woodland & Flora and Faunal Assessment, Green Valley for proposed subdivision.
- Flora, Fauna and Eight Part Test of Significance. Proposed Beresfield Bypass for the Roads & Traffic Authority, Newcastle.
- Flora, Fauna and Eight Part Test of Significance assessments. Proposed Road-widening, New England Highway for Rust PPK for the Roads & Traffic Authority.
- Bushfire, flora and fauna assessment for proposed tourist resort, Townsend Avenue, Avoca Beach. Wayne Ritchie & Associates.

- Flora, fauna Eight Part Test of Significance. Proposed 8 Lot subdivision & dwellings, The Entrance Rd, Forresters Beach. O.L.O.R. Catholic Parish, The Entrance.
- Bushfire hazard assessment. Proposed 8 Lot subdivision & dwellings, The Entrance Rd, Forresters Beach. O.L.O.R. Catholic Parish, The Entrance.
- Flora and faunal assessment for proposed ANI Steel making facility, Kooragang Island for HLA Envirosciences/ENSR Pty Ltd.
- Flora, Fauna & Eight Part Test of Significance. Proposed dwelling, Curlew Avenue, Pindimar, Great Lakes LGA. For Snell Architects, Surrey Hills.
- Flora, Fauna & Test of Significance. Proposed Six Lots Multi- Residential Development, Chase Avenue Roseville Chase. For Gumland Property Holdings.
- Endangered Ecological Community: Eastern Suburbs Banksia Scrub Assessment for the Aboriginal Land Development Corporation, Port Botany.
- Faunal assessment and Management Study of the Bayswater - Sydney West 330 kV Transmission Line in the Wollemi-Yengo National Parks, for Pacific Power. A 75-80 kilometre fauna transect survey through the above parks. A Seven Part Test of Significance was applied to all threatened species recorded.
- Flora, Fauna & Eight Part Tests of Significance. For Proposed Redevelopment of the Beacon Hill High School. For Landcom & Xenith Project Services
- Flora, fauna, SEPP-44 & microbat studies for proposed aeolian sand extraction, Wallaby Scrub Road, Warkworth for C& M Hawkes.
- Flora and Fauna Assessment (including threatened species, SEPP-14 'Coastal Wetlands', SEPP-29 'Littoral Rainforest' & SEPP-44 'Koala Habitat Protection' studies for proposed 132kV Transmission Line; Kempsey-Nambucca-Coffs Harbour. Three corridor route (120 kilometers) options report for TransGrid.
- Flora, Fauna & Test of Significance Assessment for proposed underground coal mining operation extensions, Wambo Coal, for HLA Envirosciences P/L.
- Flora, Fauna & Seven Part Tests of Significance. Proposed Extension to the Cessnock Waste Management Centre for the Cessnock City Council.
- Flora, Fauna & Seven Part Tests of Significance. Proposed Industrial Subdivision for the Cessnock City Council.
- Preliminary Flora and Fauna Assessment of Environmental Protection Zone for the Industrial Subdivision, Cessnock LGA.

- Flora, Fauna & Series of Seven Part Tests of Significance. Proposed Rezoning from residential to Medium Density Housing of Numbers 1234-1274, Pacific Highway, Pymble-Turramurra. Blue Gum High Forest issues as well as Gang Gang Cockatoo Endangered Population. For Gallwey Investment Trust.
- Flora and Faunal assessments/surveys for proposed open-cut coal mining operation for Camberwell Coal for HLA Envirosiences P/L.
- Flora and Fauna Survey and Vegetation Remnant studies for proposed underground coal mining operation for Dartbrook Coal (Joint Venture) for HLA Envirosiences Pty Ltd.
- Flora, Fauna & Seven Part Test of Significance. Proposed Rezoning, Place of Worship, Foxall Road, Kellyville. For Saints in Sydney Inc, 2007.
- Flora, Fauna & Seven Part Test of Significance. Proposed development, Racecourse Road, Bungwahl, Great Lakes Local Government Area. For Kendale Homes, 2007.
- Threatened Flora & Faunal Assessment & survey for proposed Aboriginal Housing Development, Empire Bay Drive, Empire Bay for Department of Housing.
- Preliminary Flora & Fauna Assessment. Proposed Stockpile reuse area. Ridge Street, Lawson, Blue Mountains Local Government Area. For CDC Industrial Services Pty Limited.
- Assessment of the occurrence and status of *Epacris purpurascens* (Schedule 2, *Threatened Species Conservation Act, 1995*), Pellitt Lane, Dural, The Hills LGA.
- Flora and vegetation Survey & Tests of Significance. Proposed Silver Mine Deposit, Lue, Mid Western LGA. For Kingsgate Consolidated Pty Limited.
- Flora, Fauna & Seven Part Test of Significance. Proposed Hunter Industrial Ecology Park, Weston, Cessnock LGA., 2012.
- Flora, Fauna & Seven Part Tests of Significance. Proposed 132kV Powerline, White Rock Wind Farm, Inverell LGA, July, 2012.
- Biodiversity/Ecological Assessment & Seven Part Tests of Significance. Proposed Residential Subdivision. Various major lots, Heddon Greta, Cessnock Local Government Area, 2017.
- Biodiversity Assessment. Cambage Street, Pindimar, Great Lakes LGA.
- Ecological Assessment. Biodiversity Assessment & Seven Part Tests of Significance. Yamba Proposal, Scotland Island for Sekisui House Pty Limited.
- Biodiversity Assessment. Proposed Quarry Extension, Middle Creek Quarries, Oberon.
- Biodiversity Impact Assessment Report. Proposed Service Station, Pacific Highway, Coolongolook, Midcoast LGA, 2018.
- Biodiversity Impact Assessment Report. Proposed Boat Repair & Storage Facility, Streamside Street, Woollamia near Huskisson, Shoalhaven LGA, 2019.

- Ecological Management Plan (EMP). Proposed 37-lot Residential Subdivision, Rouse Road, Rouse Hill, Blacktown LGA, March, 2019.
- Preliminary Ecological Assessment. SM2-SM6 Surface to Air Missile Acquisition and Storage Proposal. For Department of Defence, 2018.

SPECIES IMPACT STATEMENTS

- Species Impact Statement. Duffys Forest Endangered Ecological Community. Christie Rental Centres. Lot 104, Narabang Way, Austlink Corporate Park. For Christies Rentals.
- Species Impact Statement, Proposed development for Multiple Light Industrial Site, Ku-ring Gai Industrial Area.
- Species Impact Statement (SIS) 'Duffys Forest'-Endangered Ecological Community, for proposed factory and administration buildings. Lot 503, Minna Close, Belrose for Leimei Nature's Care Manufacture.
- Species Impact Statement. Proposed Development, Lots 1-8, The Entrance Road, Forresters Beach.
- Species Impact Statement. Kincumber Scribbly Gum Forest-Critically Endangered Ecological Community. Proposed Kincumber Fire Station, The Scenic Road, Kincumber. For NSW Fire Brigades.

REVIEW OF ENVIRONMENTAL FACTORS:

- Review of Environmental Factors Report for the proposed Loop Road, Wyrabalong National Park. For the OEH.
- Review of Environmental Factors Report for the Proposed Fire Radiation Zone, near Kariong, Brisbane Waters National Park. For Landcom & Benjamin Chow & Associates.
- Review of Environmental Factors & Biodiversity survey (including field surveys of native freshwater fish). Proposed Fish Ladders, Upper Weir, Ourimbah Creek, Ourimbah for the Wyong Shire Council. Scientific Licence & Research Permit for trapping of fish species for aquatic survey of fish & invertebrate species; Ourimbah Creek. Licenced by the NSW Fisheries Department.
- Review of Environmental Factors & Biodiversity survey (including field surveys of native freshwater fish). Proposed Fish Ladders, Lower Weir, Ourimbah Creek, Chittaway for the Wyong Shire

Council. Scientific Licence & Research Permit for trapping of fish species for aquatic survey of fish & invertebrate species; Ourimbah Creek. Licenced by the NSW Fisheries Department.

- Review of Environmental Factors (REF) Report for Proposed Sewerage Pump Station B1, Long Jetty for Wyong Shire Council.
- Review of Environmental Factors (REF) (including species assessment report). Proposed Reconstruction of Pheasants Nest Bridge, Pheasants Nest. For The Wollondilly Shire Council.
- Review of Environmental Factors (REF). Proposed Fire Radiation Zone (Asset Protection Zone). Baxter Maximum Facility. Kariong Juvenile Justice Centre, Kariong (now NSW Dept of Corrective Services).
- Review of Environmental Factors (REF). Proposed Construction of Sewer Effluent Rising Main (SERM) for Tertiary Water Irrigation Purposes. Bateau Bay Sewer Treatment Works to the Tuggerah Lakes Golf Course. For the Wyong Shire Council.
- Review of Environmental Factors Study: Proposed Development (interim early works) Part Stage 3, Pacific Highway Lisarow Upgrade. Roads & Traffic Authority. Specialist studies commissioned include Ground Penetrating Radar, Soil Contamination study, Noise Impact Assessment and water quality undertaken by HLA ENSR.
- 7 x Review of Environmental Factors (Minor Works). Series of Proposed Crossovers (contra-flows), Stockpiles Sites & Emergency Accessway. Between Cowan to Alison near Wyong, F3 Freeway. For the NSW Roads & Traffic Authority.
- Review of Environmental Factors Report. Proposed Kincumber Fire Station, The Scenic Road, Kincumber for NSW Fire Brigades, 2009.
- Review of Environmental Factors. Minor Works. Five (5) Slope remediation Works, Old Pacific Highway, Mooney Mooney, Gosford Local Government Area. For the NSW Roads & Traffic Authority.
- Review of Environmental Factors Report. Proposed access road, Narellan Road to Cunningham Drive, Mount Annan, for the NSW Roads & Traffic Authority and the Botanic Gardens Trust.
- Review of Environmental Factors. Proposed Upgrade of The Northern Road, Cranebrook. For Delfin Lend Lease.
- Review of Environmental Factors. Proposed Skate Park, Copacabana, NSW, October, 2010 for Gosford City Council.
- Review of Environmental Factors. Proposed Intersection Upgrade. Wilfred Barrett Drive and Bungary Road, Norah Head. For the RMS.
- Review of Environmental Factors. Proposed installation of series of powerpoles and associated infrastructure, Central Coast Highway, Kariong for the NSW Roads & Maritime Services, 2013.

- Review of Environmental Factors. Proposed construction of access road, Kangoo Road, Kariong for the NSW Roads & Maritime Services, 2013.
- Review of Environmental Factors. Proposed Watermain Facility, Wangi Road Toronto, Lane Macquarie Local Government Area.
- Review of Environmental Factors (REF). Proposed pressure systems facilities, South Tacoma, Wyong Local Government Area for Wyong Shire Council.
- Review of Environmental Factors. Proposed Upgrade to the Woy Woy Wharf & Seawall Reconstruction Facility. For the Central Coast Council, 2017.

BUSHFIRE HAZARD/RISK ASSESSMENTS REPORTS:

- Bushfire Management Plan & Compliance Report. Woolworths Regional Distribution Centre. Warnervale Industrial Park, Warnervale, Wyong LGA (2005).
- Bushfire hazard & flora and fauna ecological assessment. Collins Rd, Kulnura.
- Bushfire Hazard Assessment, Housing Development, Banksia Pde, Warriewood.
- Bushfire Hazard/Risk Assessment. Proposed Rezoning, Place of Worship, Foxall Road, Kellyville. For Saints in Sydney Inc.
- Bushfire Hazard Assessment Report. Proposed Integral Energy Training Centre, West Hoxton.
- Bushfire Hazard/Risk Assessment Study. Proposed Masonic Centre Redevelopment, Gwynneville, for Kinsley Associates, Wollongong LGA.
- Bushfire Hazard/Risk Assessment Study. Proposed New Residence, Forest Way, Belrose, Warringah LGA for Michael Hilliard Architects.
- Bushfire Hazard/Risk Assessment Report. Proposed Multi-lot (13) Subdivision, Worthing Road, Erina.
- Bushfire Hazard/Risk Assessment Report. Proposed Various Facilities, Former Wyong Milk Factory, historic site, Alison Road, Wyong, 2009.
- Bushfire Hazard Risk Assessment. Land & Environment Court Orders. Proposed Medium Density Housing Development, Quakers Hill, Blacktown LGA.

- Bushfire Hazard Assessment report, proposed residence, Mona Vale Road, Belrose.
- Bushfire Hazard Assessment report. Proposed Residential Subdivision, Various Lots, Heddon Greta, Cessnock LGA, 2014-2017.
- Bushfire Hazard/Risk Assessment report. Proposed residential subdivision, Warnervale Road, Warnervale, 2017.

SPECIALISTS STUDIES/ACTIVITIES UNDERTAKEN BY DANNY O'BRIEN:

- Constraints & Opportunities Study/Preliminary Environmental Investigations Study. Stage 3, Glen Road Ourimbah to Railway Overpass and Intersection of Railway Crescent, Pacific Highway Ourimbah-Lisarow. For the NSW Roads & Traffic Authority, 2008.
- Environmental File Notes. Proposed Crossovers- F3 Freeway, from Cowan in the south to Wyong in the north. For the NSW Roads & Traffic Authority, 2008.
- Environmental Impact Statement. Proposed Replacement of the Gunderman Creek Bridge and road widening. The EIS also included revegetation management plan for a no-net loss of mangroves and other marine vegetation as described under the *Fisheries Management Act, 1994*. The consultant also prepared the application for the permit to Remove/Harm Marine Vegetation from NSW Fisheries (Dept. Of Primary Industries). For the Gosford City Council.
- Catadromous fish survey, seagrass & mangrove studies, marine plant community mapping and aquatic study (crustaceans & molluscs). Proposed seawall, dredging and reclamation of the Hardys Bay Parade, Hardys Bay, Brisbane Water, Gosford Local Government Area. For the Gosford City Council.
- Marine Survey. East Balmain to Goat Island, Sydney Harbour National Park. Proposed Sewer Pipeline Facility of Goat Island, Sydney Harbour. For the NPWS (now OEH).
- Marine Impact Assessment. Marine Biota Survey & Eight Part Test of Significance under the *Fisheries Management Act, 1994*. Proposed Jetty, The Point Road, Woolwich. For Waterlink P/L.
- Marine Impact Assessment. Marine Biota Survey & Eight Part Test of Significance under the *Fisheries Management Act, 1994*. Proposed Jetty, Wharf Road, Birchgrove. For Waterlink P/L.
- Marine Impact Assessment. Marine Biota Survey & Eight Part Test of Significance under the *Fisheries Management Act, 1994*. Proposed Slipway, Mosman. For Waterlink P/L.
- Marine Impact Assessment. Marine Biota Survey & Eight Part Test of Significance under the *Fisheries Management Act, 1994*. Proposed Slipway. Wharf Rd, Vaucluse. For Waterlink P/L.

- Seagrass (*Posidonia australis*) study and mapping for proposed Marina extension for the Lake Macquarie Yacht Club, Lake Macquarie.
- Seagrass study and mapping for proposed Marina extension of the Marks Point Marina, Lake Macquarie.
- Review of Environmental Factors & Biodiversity survey (including field surveys of native freshwater fish). Proposed Fish Ladders, Upper Weir, Ourimbah Creek, Ourimbah for the Wyong Shire Council. Scientific Licence & Research Permit for trapping of fish species for aquatic survey of fish & invertebrate species; Ourimbah Creek. Licenced by the NSW Fisheries Department.
- Review of Environmental Factors & Biodiversity survey (including field surveys of native freshwater fish). Proposed Fish Ladders, Lower Weir, Ourimbah Creek, Chittaway for the Wyong Shire Council. Scientific Licence & Research Permit for trapping of fish species for aquatic survey of fish & invertebrate species; Ourimbah Creek. Licenced by the NSW Fisheries Department.
- Plan of Management of Bushfire Hazard Protection, Aboriginal Cultural Relics, Flora and Fauna. For Proposed Pantanassa Mother of God Monastery, Lower Mangrove. For Pantanassa Greek Orthodox Monastery.
- Microbat Assessment for threatened species of microbats potentially utilising an existing dilapidated bridge. Bridge over Dry Creek, Pheasants Nest Road, Pheasants Nest, for the Wollondilly Shire Council.
- Establishing Rare Plants Monitoring Plots for Threatened Species-Yengo National Park & Parr SRA & Rare Plants within the Gosford & Cessnock LGAs. For the NSW National Parks & Wildlife Service (now the OEH).
- Assessment of the population status and establishment of permanent monitoring plots of the endangered plant *Zieria involucreta* within remote areas within the Yengo National Park, Parr Conservation Area and Marramarra National Park & Environs. For the NSW National Parks & Wildlife Service (now OEH).
- Survey of the Tranquillity Mint Bush *Prostanthera askania* (Endangered) and establishment of monitoring plots. For the NSW National Parks & Wildlife Service (now OEH).
- Survey and ecological assessment of the threatened species *Melaleuca groveana* within the Yengo National Park. For the NSW National Parks & Wildlife Service (now OEH).
- Survey, ecological assessment and population estimation of the endangered species *Persoonia hirsuta* ssp. Yengo (E, TSC Act) within the Yengo National Park. For the NSW National Parks & Wildlife Service (now OEH).
- Survey and ecological assessment and population estimation of the threatened species *Velleia perfoliata* within the Yengo National Park. For the NSW National Parks & Wildlife Service (now OEH).
- Site Rehabilitation Management Plan. Large-scale Land Clearing, Mangrove Mountain.

- Preventative Action Management Plan. Gosford City Council's Direction to Undertaken Preventative Action.
- Bushland Management Plan. Proposed Development. Wisemans Ferry Road, Somersby.
- Vegetation Management Plan. 'No-nett loss of trees and shrubs assessment' and overall flora and faunal assessment of Proposed Vineyard & Tourist Accommodation, De Beyers Road, Pokolbin for Pokolbin Holdings Pty Limited.
- Rehabilitation & Management Plan: Endangered Ecological Community: Norah Head low woodland with heath on indurated sand. Breach of the TSC Act, 1995 arising from incursion and destruction of the EEC at Norah Head.
- Vegetation Management Plan. Proposed Residential Development. Farragher and Crouch Land, Thornton, Maitland LGA.
- Comprehensive Rehabilitation & Management Strategy, North Avoca Gravity Main to focus on the rehabilitation of Green & Golden Bell Frog *Litoria aurea* habitat, wetland vegetation (including endangered ecological communities), tree replacement and weed management. For Gosford City Council, 2012.
- Peer Review and Update of Environmental Management Matters. Proposed Residential Development. Farragher and Crouch Land, Thornton, Maitland LGA.
- Koala Survey of the Brisbane Water National Park for the National Parks and Wildlife Service.
- Review of Species Impact Statement and re-appraisal of *Pimelia spicata* (E1, *Threatened Species Conservation Act, 1995* in Relation to Rex Road, Georges Hall. Mediation to Resolve Issues Regarding the Translocation of the Rare Plants into Council Reserves from Private Lands.
- Conservation and Management Plan for the Endangered Somersby Mint Bush *Prostanthera junonis* (*Schedule 1 of the Threatened Species Conservation Act, 1995*) and *Tetratheca glanduosa* (*Schedule 2, TSC Act*) for proposed private vehicle high performance race track for former Chairman for Amital Mr. Dean Wills.
- Threatened Species Assessment Report. Peer Review of 'Potential Significant Habitat Area'. For Taperell Rutledge Lawyers Vs Wyong Shire Council. Land & Environment Court.
- Perpetuity Management Plan. Proposed Offset Area, The Scenic Road Bushland Reserve, Kincumber for the NSW Fire Brigades and the Gosford City Council, 2009.
- Decision Report. Proposed Construction of Access Road, Narellan Road to Cunningham Drive, Mount Annan for the Roads & Traffic Authority, 2010.

- Little Tern (Endangered) Monitoring Program with Birding NSW: Central Coast Group, 2010-11 and 2011-12 at Karagi Point, North Entrance Peninsula.
- Senior Site Ecologist. Third Track Proposal. Maitland to Minimbah, Maitland, Cessnock and Singleton LGA's for Hunter8 Alliance (John Holland Group & GHD).
- Fauna Management & Salvaging Procedures. Demolition of Building, Maitland Road, Mardi, for the RTA.
- Ecological and Archaeological Resource Assessment, Avoca Drive Gravity Main, Kincumber for Gosford City Council.
- Contributor to the Millennium Seed Bank, Mount Annan Botanic Garden, Mount Annan, NSW.
- Comprehensive Revegetation & Rehabilitation Management Plan (CR&RMP), proposed Sewer pipeline route, North Avoca for the Gosford City Council.
- Marine Impact Assessment. Marine Biota Survey & Seven Part Test of Significance under the *Fisheries Management Act, 1994*. Part 7 Permit Application to the Dept of Primary Industries for the impact and removal of seagrasses (*Zostera capricorni*). Proposed Upgrade to the Woy Woy Wharf Facility for the Central Coast Council, 2017.
- Four Rare Plants of the Yengo National Park, Parr State Conservation Area and Environs. ***Persoonia hirsuta* ssp. Yengo, *Melaleuca groveana*, *Velleia perfoliata* and *Zieria involucrate*** (Paper In-prep).

LAND & ENVIRONMENT COURT: EXPERT WITNESS/TESTIMONY:

- Expert Witness. SEPP-5 (Aged Care facility) Development Proposal. (My client and I Vs Hornsby Shire Council, Sydney). Key issues: Council's refusal of DA based on impacts on adjacent Blue Gum High Forest-Endangered Ecological Community (now federally listed 'Critically endangered, EPBC Act, 1999). My evidence was more plausible than the opposing team including their team of four ecologists and my client's DA was upheld and approved by the L&E Court as a result.
- *Land Acquisition 'Just Terms' Compensation Act, 1991*. My client and I Vs. Wyong Shire Council. Key issues: Allegedly significant vegetation community and threatened species of flora and fauna. Just Terms Compensation under Compulsory Land Acquisition. My evidence had been more plausible than the opposing team including their five ecologists; my client was well compensated for the loss of their land as a result of the Court decision.
- Preparation of Evidence for Taperell Rutledge Lawyers in the Land & Environment Court of New South Wales. (*Land Acquisition, Just Terms Compensation Act, 1991*).
- Joint Expert Report-Ecological Issues. Scully Vs Hornsby Shire Council. Proposed Subdivision, Chapman Avenue, Beecroft, Hornsby Local Government Area, July, 2020.
- Expert Witness, Land & Environment Court. Scully Vs Hornsby Shire Council. Proposed Subdivision, Chapman Avenue, Beecroft, Hornsby Local Government Area, 22nd of July, 2020.

EXPERIENCE IN ENDANGERED ECOLOGICAL COMMUNITIES

- Lower Hunter Spotted Gum-Ironbark Forest in the Sydney Basin Bioregion, endangered ecological community. Various studies for the Cessnock City Council including proposed landfill facility, proposed industrial subdivision, proposed access roads, proposed Environmental Protection Zones. The studies included Flora, Fauna & Seven Part Tests of Significance, Neath, Cessnock LGA, 2007.
- Shale/sandstone Transition Forest in the Sydney Basin Bioregion-endangered ecological community. Review of Environmental Factors report. Proposed Bridge and road widening, Pheasants Nest. For the Wollondilly Shire Council.
- Blue Gum High Forest in the Sydney Basin Bioregion-Critically endangered ecological community. Expert witness, Land & Environment Court, Blue Gum High Forest. Hornsby Council Vs Masterbuilt Pty Limited.
- Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions)-endangered ecological community. For the Wyong Shire Council and numerous private development enterprises.
- Species Impact Statement. Duffys Forest Endangered Ecological Community. Austlink Corporate Park. For Leimei Natures Care, Minna Close and Narabang Constructions on Narabang Way. Species Impact Statements for both sites were prepared by the Consultant. Other studies included a Vegetation & Bushland Management Plan (Duffys Forest), Works Environmental Protection Plan & SEPP-19 (Urban Bushland Protection).
- Norah Head Low Woodland with Heath on Indurated Sand-endangered ecological community. Preparation of a Rehabilitation Management Plan for the site following incursion by heavy machinery by the Norah Head Bowling Club. Rehabilitation Management Plan submitted to the Wyong Shire Council.
- Warkworth Sand Woodland of the Sydney Basin Bioregion-endangered ecological community, Singleton LGA.
- Cumberland Plain Woodland in the Sydney Basin Bioregion-endangered ecological community. For the NSW National Parks & Wildlife Service as the Services regional Environmental Appraisal Officer (EAO), Central Region, Valentine St, Parramatta.
- Eastern Suburbs Banksia Scrub in the Sydney Basin Bioregion-endangered ecological community, Port Botany, NSW.
- Swamp Oak Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions)-endangered ecological community, Marlow, Kurri Kurri and Tascott NSW.
- Coastal Saltmarsh Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions)-endangered ecological community, Marlow, NSW.
- Species Impact Statement. Kincumber Scribbly Gum Forest in the Sydney Basin-Critically endangered ecological community.

- Hunter Lowland Redgum Forest- Endangered ecological community, Paxton.
- Central Hunter Ironbark Spotted Gum Grey Box Forest-Endangered ecological community throughout the Hunter Valley.
- Freshwater Wetlands on Coastal Floodplains-Endangered ecological community throughout the Sydney basin and Hunter Valley.
- White Box Yellow Box Blakely's Red Gum Woodlands-endangered ecological community- Lue and Northern Tablelands (Glen Innes) Bioregion.
- Derived Native Grasslands (as a variant to White Box Yellow Box Blakely's Red Gum Woodlands-EEC).
- Native Vegetation on Cracking Clay Soils of the Liverpool Plains-Endangered ecological community, west of Willow Tree and environs.
- Ribbon Gum-Mountain Gum-Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion-west of Glen Innes.
- Upland Wetlands of the Drainage Divide of the New England Tableland Bioregion.
- Kurri Sand Swamp Woodland in the Sydney Basin Bioregion-endangered ecological community.

PAPERS/PUBLICATIONS

O'Brien, D. *Koala Survey of the Brisbane Water National Park*. A report to the NSW National Parks & Wildlife Service, 1995.

O'Brien, D. 'Koalas in the Gosford District'. In *Proceedings of a Conference on the Status of the Koala in 1995*. Conference held at Coolongata, Queensland. Hosted by the Australian Koala Foundation, Brisbane, Queensland.

O'Brien, D. 'Owls & Nightjars of the New South Wales Central Coast'. Australian Birds Vol. 24, p9-19, 1990.

O'Brien, D. 'Four Rare Plants of the Yengo National Park, Parr State Conservation Area and Environs. ***Persoonia hirsuta* ssp. *Yengo*, *Melaleuca groveana*, *Velleia perfoliata* and *Zieria involucrata***' (In-prep).

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : PLakes
Client Service ID : 634500

<u>SiteID</u>	<u>SiteName</u>	<u>Datum</u>	<u>Zone</u>	<u>Easting</u>	<u>Northing</u>	<u>Context</u>	<u>Site Status **</u>	<u>SiteFeatures</u>	<u>SiteTypes</u>	<u>Reports</u>
45-5-0591	Penrith Lakes 30	AGD	56	284230	6266400	Open site	Valid	Artefact : -	Open Camp Site	1064,102450
	<u>Contact</u>	<u>Recorders</u>	Jim Kohen					<u>Permits</u>	28	
45-5-0589	Penrith Lakes 29	AGD	56	284300	6266280	Open site	Valid	Artefact : -	Open Camp Site	1064
	<u>Contact</u>	<u>Recorders</u>	Jim Kohen					<u>Permits</u>	28	
45-5-0332	Penrith Lakes 21	AGD	56	284514	6266528	Open site	Valid	Artefact : -	Open Camp Site	260,526,1018,102450
	<u>Contact</u>	<u>Recorders</u>	Jim Kohen					<u>Permits</u>	28	

** Site Status

Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 29/10/2021 for Daniel O'Brien for the following area at Lot : 21, DP:DP1092147, Section : - with a Buffer of 200 meters.. Number of Aboriginal sites and Aboriginal objects found is 3

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

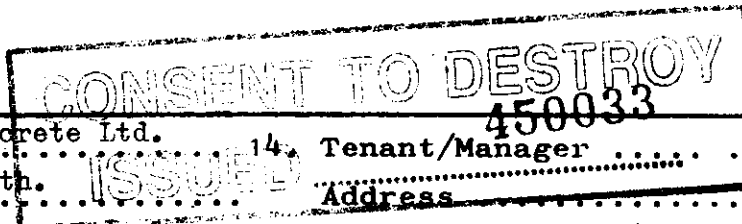
45-5-0332

1. Map Name .. Windsor Sydney 5. Site No. 45-5-332
 2. Scale 1:63360 1:250000 6. Site type 0. Surf. Scatter..
 3. Grid ref .. 671.339 367.834
 4. Site name(s) .. Penrith Lakes 21 .. PL/21 7. Classification
 8. Air photo ref
 9. Cadastral Por 297 Parish of Castlereagh, County of Cumberland.
 10. Land Status Freehold 11. 45-5-0332



12. Directions for site relocation

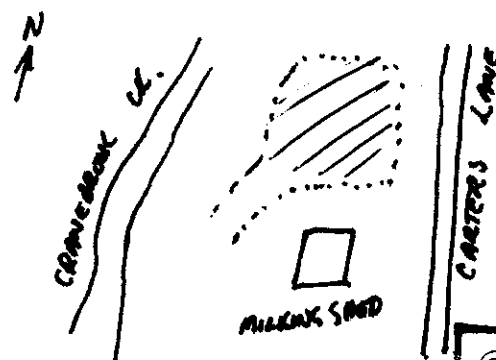
Travel north along Carters Lane at Upper Castlereagh until just before the junction with McCarthys Lane. Freevale Dairy No 4 is on the western side of the road. Artifacts were found in the main cow paddock.



13. Owner Ready Mixed Concrete Ltd. 14. Tenant/Manager
 Address c/o PLDC, Penrith. Address
 Attitude Co-operative Attitude

15. Site Description

Site is on the terrace on the eastern bank of Cranebrook Creek. The main paddock where the cows are herded prior to milking is badly disturbed. This disturbance has exposed a number of stone artifacts over an area approx. 100 meters square. They include 1 flaked basalt pebble, 1 chert core scraper, 1 utilised chert flake, 1 chert core, 3 chert flakes, 1 retouched quartzite flake, 2 quartz bipolar cores, and a quartz flake.



6. Reasons for investigation .. Penrith Lakes Survey
 Condition ... Very badly disturbed.
 8. Interpretation Scientific Research
 9. Visitation Continuous.
 10. Recommendations .. Surface collection should be carried out.

+

21. Environmental description of site locality

On alluvial terrace on the eastern side of Cranebrook Creek. Probably above flood level most of the time. Aquatic resources would have been nearby.

22. Relation to other sites in locality

Similar to other small artifact scatters along Cranebrook Creek.

SITE DESTROYED

23. Details of artifact collections

None.

24. Is plan or diagram of site attached? Yes/~~XX~~No25. Are annotated photographs attached? ~~XXXX~~Yes/No How many?

26. Other additions

27. Importance of site to Aborigines

28. Source of this information None

29. Oral sources of information

30. Written references Report of an Archaeol. Survey of the region, proposed for the Penrith Lakes Scheme. J.L. Kohen.

Recorded by J. L. Kohen
School of Biological Sciences
Macquarie University, North Ryde.
Address

Filed by

Date 1st November, 1981.

Date

CONSENT TO DESTROY
4500
ISSUED 450033



NATIONAL PARKS AND WILDLIFE SERVICE

Cultural Resources

Database Update Sheet

☒ REGISTER

Site register

☐ CATALOG

Reports catalogue

☐ FOTODEX

Photographic catalogue

CONSENT TO DESTROY

450033

Record ID

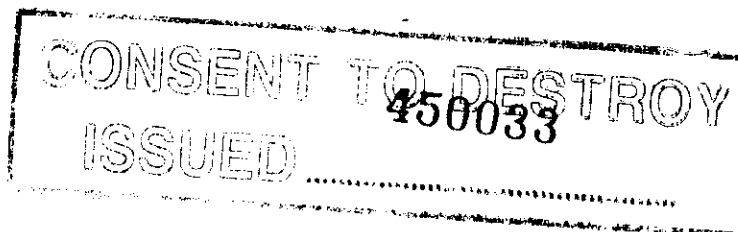
Variable

New or revised value(s)

45-5-0332

1 SITEMAME Penrith
2 SITEMAME Penrith Lakes 21
3 SITETYPE 2 = Open camp site
4 RECTYPE 2 = Standard site record
5 RECORDER Kohen, J.
6 RECDATE 1981
7 DISTRICT 8 = Blue Mountains
8 STATUS 1 = Present in N.O.
9 ZONE 56
10 ANG_E 284514
11 ANG_N 6266528
12 MAPSCALE 5 = 1:250K imperial
13 ASSOCREP C-526
14 DATEUPD 06Jan1992
15 CDESTROY YES
16 ASSOCREP
17 DATEUPD
18 CDESTROY
19 (Sub-rec)

Filled in by: JADate: 6/1/92Entered by: JSDate: 6/1/92



C O N S E N T

CONSENT TO CARRY OUT THE DESTRUCTION OF AN ABORIGINAL RELIC/PLACE

NEW SOUTH WALES GOVERNMENT

CONSENT ISSUED UNDER SECTION 90 OF THE
NATIONAL PARKS AND WILDLIFE ACT, 1974 (AS AMENDED)

WHEREAS Aboriginal relics as described in Schedule "A", are situated upon the land described in Schedule "B", and which constitute relics within the meaning of Section 90 of the National Parks and Wildlife Act, 1974 (as amended), and WHEREAS application has been made by:

DR. JIM L. KOHEN

(ON BEHALF OF PENRITH LAKES DEVELOPMENT CORPORATION)

for CONSENT to destroy those relics in the course of:

GRAVEL EXTRACTION

NOW I, JOHN_FREDERICK_WHITEHOUSE Director of National Parks and Wildlife, do HEREBY by virtue of and in pursuance of Section 90 of the said Act, and subject to the Conditions hereunder set out give my CONSENT as requested by the said applicant.

TERMS AND CONDITIONS OF THIS CONSENT

This Consent is issued subject to General Terms and Conditions covering all archaeological Permits and Consents, as well as the Specific Terms and Conditions pertaining to Consents to Destroy Aboriginal Relics all of which conditions are detailed in the attached pages.

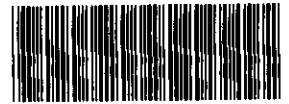
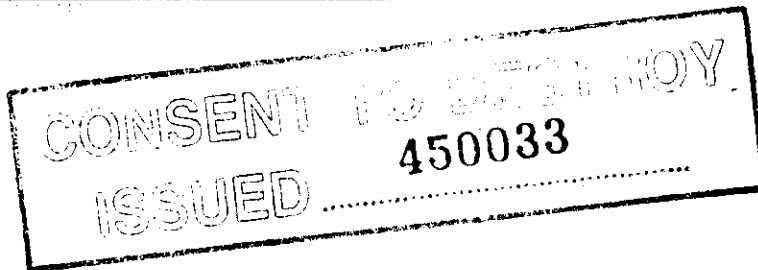
DATED at Sydney this 27th day of June, 1980

John Frederick Whitehouse

Director of National Parks
and Wildlife

0





45-5-0589

C O N S E N T**CONSENT TO CARRY OUT THE DESTRUCTION OF AN ABORIGINAL RELIC/PLACE****NEW SOUTH WALES GOVERNMENT**

CONSENT ISSUED UNDER SECTION 90 OF THE
NATIONAL PARKS AND WILDLIFE ACT, 1974 (AS AMENDED)

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DATED at Sydney this 27th day of June, 1980

John Frederick Whitehouse

Director of National Parks
and Wildlife



National Parks and Wildlife Service

BOX N189, GROSVENOR STREET POST OFFICE, SYDNEY, NSW 2000. TEL (02) 237 6500
Standard Site Recording Form

MAP NAME	EDITION	SCALE	REFERENCE	HEAD OFFICE USE ONLY:
PENRITH	1975	1:100,000	6628 8430	NWPS site no: 45-5-589
SPRINGWOOD		1:25,000	8430 6628	Site types: OPEN CAMP SITE
SYDNEY		1:250,000	3669 8331	File nos: Date 30-12-86
				Filed by: <i>Mervyn Moore</i>

Site name: *PENRITH LAKES 29* Locality/property name: *CRANE BROOK CREEK* Owner/Manager: *PENRITH LAKES DEVELOPMENT CORP*
Local post office: *PENRITH* Address: *PENRITH*
NPWS District: *SYDNEY* Region: *WESTERN*

Reason for investigation (give R.O. instruction no. where applicable):

PROPOSED DEVELOPMENT - GRAIN EXTRACTION DAZ AREA

Portion no:	Other land category:	Plan/sketch/section of site attached? Yes/No.
Parish:	County:	How many? <i>1</i>
Air photo refs. (for stereo pair)		Photos taken? Yes/No
		How many attached? <i>1</i>

How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff.
(Draw diagram on separate sheet.)

ACCESS FROM THE WESTERN END OF MCCARTHY'S LANE, CRANE BROOK

Other sites in locality? Yes/No. Site Types include: *OPEN SITES*
Are sites in NPWS Register? Yes/No. Unregistered sites — plans for future recording? Yes/No. *NA*

Have artefacts been removed from site? Yes/No/don't know. When?
By whom? Deposited where?

Is site important to local Aborigines? Yes/No/don't know.

Give contact(s) name(s) + address(es) *DARUK L.A.L.C.*

Contacted for this recording? Yes/No.

(Attach additional information separately) If not, why not?

Verbal/written reference sources (including full title of accompanying report).

J.L. KCHEN JUNE 1986. AN ARCHAEOLOGICAL SURVEY OF THE PENRITH LAKES SITE: THE DAZ DEVELOPMENT AREA C-1064

Checklist:
surface visibility,
damage/disturbance/
threat to site

Condition of site:

ARTEFACTS ON TRACK MADE BY CATTLE.

Recommendations for management & protection (attach separate sheet if necessary):

SEE REPORT

Site recorded by: *J.L. KCHEN*

Date: *AUGUST, 1986*

Address/institution: *123 KILLARNEY AVE
BLACKTOWN NSW 2148*

CONSENT TO DESTROY
450033
ISSUED
ST. MARYS

+

SITE POSITION & ENVIRONMENT

OFFICE USE ONLY: NPWS site no: 45-5-589

1. Land form a. beach/hill slope/ridge top, etc: CREEK BANK

b. site aspect: N/A

c. slope: —

d. mark on diagram provided or on your own sketch the position of the site:

e. Describe briefly:

TRACK BESIDE CREEK



f. Local rock type: N/A, ALLUVIUM

g. Land use/effect: GRAZING

2. Distance from drinking water:

0

Source:

CRANE BROOK CREEK

3. Resource Zone associated with site (estuarine, riverine, forest etc):

CREEK

4. Vegetation:

CLEARED

5. Edible plants noted:

NONE OBSERVED

6. Faunal resources (include shellfish):

NONE OBSERVED

7. Other exploitable resources (river pebbles, ochre, etc):

N/A

Site type:

OPEN
SITE

DESCRIPTION OF SITE & CONTENTS.

Note state of preservation of site & contents. Do NOT dig, disturb, damage site or contents.

CHECKLIST TO HELP:

length, width, depth,
height of site, shelter,
deposit, structure,
element eg. tree scar,
grooves in rock.DEPOSIT: colour,
texture, estimated
depth, stratigraphy,
contents-shell, bone,
stone, charcoal, density
& distribution of these,
stone types, artefact
types.ART: area of surface
decorated, motifs,
colours, wet, dry
pigment, technique of
engraving, no. of
figures, sizes,
patination.BURIALS: number &
condition of bone,
position, age, sex,
associated artefacts.TREES: number, alive,
dead, likely age, scar
shape, position, size,
patterns, axe marks,
regrowth.QUARRIES: rock type,
debris, recognisable
artefacts, percentage
quarried.OTHER SITES EG.
structures (fish traps,
stone arrangements,
bora rings, mia mias),
mythological sites, rock
holes, engraved groove
channels, contact sites
(missions massacres
cemeteries) as
appropriate

Two chert cores, a quartz core & a quartz
waste flake were found on the eastern bank
of Cranebrook Creek in an area disturbed
by cattle 200 metres south of McLothys Lane.

CONSENT TO RESEARCH
ISSUED 450033

DATE DESTROYED

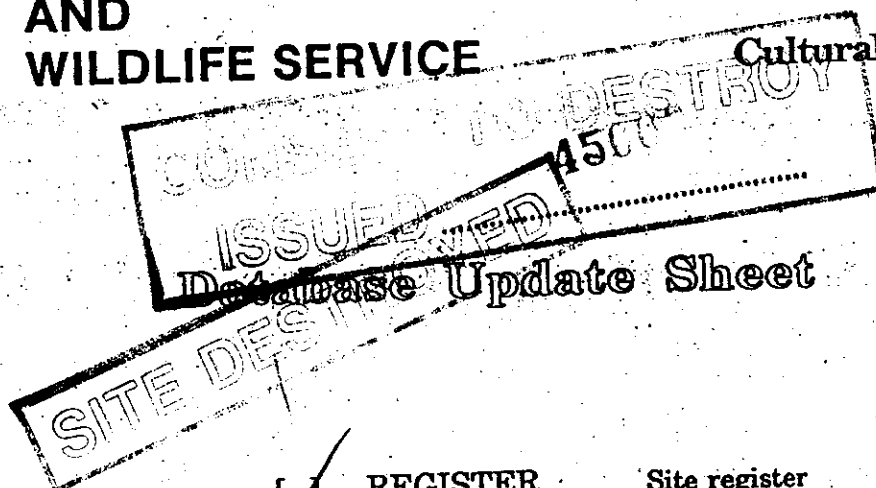
Attach sketches etc, eg. plan & section of shelter, show relation between site contents,
indicate north, show scale.

Attach annotated photos (stereo where useful) showing scale, particularly for art sites.



NATIONAL PARKS AND WILDLIFE SERVICE

Cultural Resources

☒ REGISTER

Site register

☐ CATALOG

Reports catalogue

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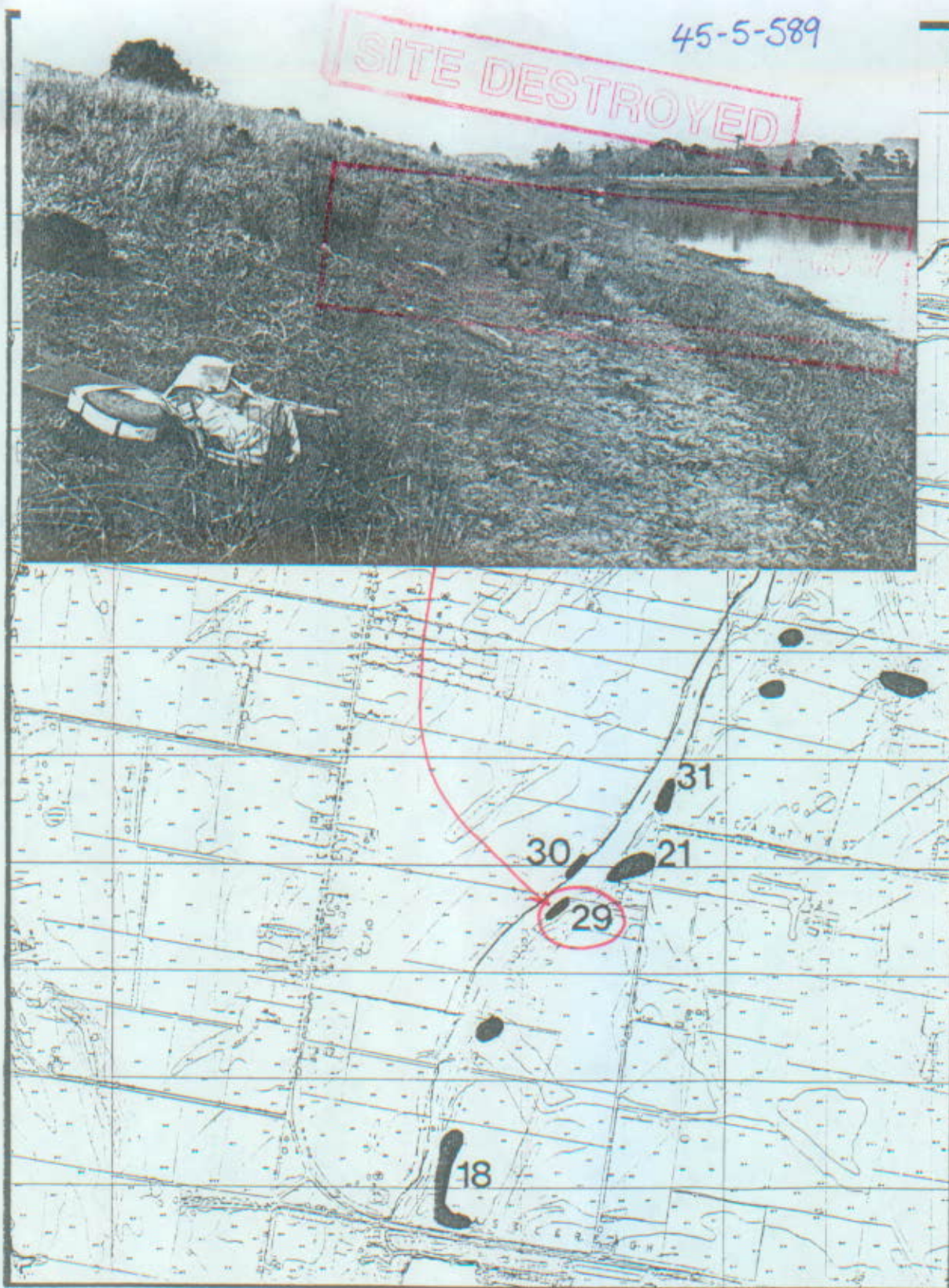
Record

45-5-0589

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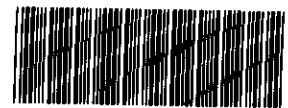
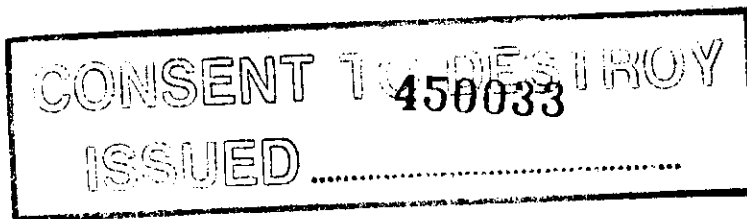
1 SITEMAME Penrith Lakes 29
 2 SITEMAME Cranebrook Creek
 3 SITEMAME P/L29
 4 SITETYPE 2 = Open camp site
 5 RECTYPE 3 = New-standard record
 6 RECORDER Kohen, J.
 7 RECDATE 00Aug1986
 8 DISTRICT 8 = Blue Mountains
 9 STATUS 1 = Present in H.O.
 10 ZONE 56 = AMG Zone 56
 11 AMG_E 284300
 12 AMG_N 6266280
 13 MAPSCALE 7 = 1:25/50/100K convrt
 14 LNDSTAT 2 = Council reserve
 15 CONDTM 2 = Disturbed
 16 ARCHWRK 1 = Surface recording
 17 ASSOCREP C-1064
 18 DATEUPD 06Jan1992
 19 CDESTROY YES
 20 COMMENT None
 21 (Sub-rec)

Filled in by: JADate: 6/1/92Entered by: ASDate: 6/1/92



30 Artefacts found

500 M



45-5-0591

C O N S E N T

CONSENT TO CARRY OUT THE DESTRUCTION OF AN ABORIGINAL RELIC/PLACE

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GRAVEL EXTRACTION

NOW I, JOHN_FREDERICK_WHITEHOUSE Director of National Parks and Wildlife, do HEREBY by virtue of and in pursuance of Section 90 of the said Act, and subject to the Conditions hereunder set out give my CONSENT as requested by the said applicant.

TERMS AND CONDITIONS OF THIS CONSENT

This Consent is issued subject to General Terms and Conditions covering all archaeological Permits and Consents, as well as the Specific Terms and Conditions pertaining to Consents to Destroy Aboriginal Relics all of which conditions are detailed in the attached pages.

DATED at Sydney this 27th day of June, 1980

Director of National Parks
and Wildlife



NATIONAL PARKS AND WILDLIFE SERVICE

Cultural Resources

Database Update Sheet

SITE DESTROYED

- ☒ REGISTER Site register
- ☐ CATALOG Reports catalogue
- ☐ FOTODEX Photographic catalogue

Record I

45-5-0591

ised value(s)

1 SITEMAME Penrith Lakes 30
 2 SITEMAME Cranebrook Creek
 3 SITEMAME P/L30
 4 SITETYPE 2 : Open camp site
 5 RECTYPE 3 : New-standard record
 6 RECORDER K...
 7 RECDATE 00Aug1986
 8 DISTRICT 2 : Blue Mountains
 9 STATUS 1 : Present in N.P.
 10 ZONE 56 : ANG Zone 56
 11 ANG_E 284230
 12 ANG_N 6266400
 13 MAPSCALE 7 : 1:25/50/100K convrt
 14 LNDSTAT 2 : Council reserve
 15 CONDITN 2 : Disturbed
 16 ARCHWRK 1 : Surface recording
 17 ASSOCREP C-1064
 18 DATEUPD
 19 CBESTROY YES
 20 COMMENT None
 21 (Sub-rec)

NO DESTRUCTION
 ISSUED 450033

Filled in by: KADate: 6/1/92Entered by: ASDate: 6/1/92



National Parks and Wildlife Service

BOX N189, GROSVENOR STREET POST OFFICE, SYDNEY, NSW 2000. TEL (02) 237 6500
Standard Site Recording Form

MAP NAME	EDITION	SCALE	REFERENCE	HEAD OFFICE USE ONLY:
PENRITH	1975	1:100,000	6640 8423	NWPS site no: 45-5-591
SPRINGWOOD	9030-IV-S	1:25,000	2/ 8423 6640	Site types: OPEN File nos: CAMP SITE Date 30-12-86
SYDNEY		1:250,000	3664 8334	Filed by: Mark Moore

Site name: PENRITH LAKES 30 Locality/property name: CRANE BROOK CREEK
Local post office: (LA/30) PENRITH
NPWS District: SYDNEY Region: WESTERN

Owner/Manager: P.D.C.
Address: PENRITH

SLICE DESTROYED

Reason for investigation (give R.O. instruction no. where applicable):

PROPOSED DEVELOPMENT - GRAVEL EXTRACTION DAZ AREA

Portion no:	Other land category:	Plan/sketch/section of site attached? Yes/No.
Parish:	County:	How many? 1
Air photo refs. (for stereo pair)		Photos taken? Yes/No
		How many attached? 0

How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff.
(Draw diagram on separate sheet.)

ACCESS FROM THE CASTLEREAGH RD, ALONG WESTERN BANK OF
CRANE BROOK CREEK.

Other sites in locality? Yes/No. Site Types include: OPEN SITES
Are sites in NPWS Register? Yes/No. Unregistered sites — plans for future recording? Yes/No.

Have artefacts been removed from site? Yes/No/don't know. When?
By whom?

Deposited where

Is site important to local Aborigines? Yes/No/don't know.

Give contact(s) name(s) + address(es)

DAROK L.A.L.C., ST.

CONSENT TO DESTROY
ISSUED 450033

Contacted for this recording? Yes/No.

(Attach additional information separately) If not, why not?

Verbal/written reference sources (including full title of accompanying report).

J.L. KOHEN, JUNE 1986. AN ARCHAEOLOGICAL SURVEY OF THE PENRITH LAKES SCHEME:
THE DAZ DEVELOPMENT AREA

Checklist: surface visibility, damage/disturbance/ threat to site	Condition of site: ARTEFACTS EXPOSED ON CATTLE TRACK.
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Recommendations for management & protection (attach separate sheet if necessary):

SEE REPORT

C-1064

Site recorded by: J.L. KOHEN
Address/institution: 123 KILLARNEY AVE
BLACKTOWN 2143

Date: AUGUST, 1986

f

SITE POSITION & ENVIRONMENT

OFFICE USE ONLY: NPWS site no: 45-5-591

1. Land form a. beach/hill slope/ridge top, etc: CREEK BANK

b. site aspect: N/A

c. slope: —

d. mark on diagram provided or on your own sketch the position of the site:

e. Describe briefly:



f. Local rock type: ALLUVIUM

g. Land use/effect: GRAZING

2. Distance from drinking water: 0

Source:

CRANE BROOK CREEK

3. Resource Zone associated with site (estuarine, riverine, forest etc):

CREEK

4. Vegetation:

CLEARED

5. Edible plants noted:

NONE

6. Faunal resources (include shellfish): AQUATIC BIRDS

7. Other exploitable resources (river pebbles, ochre, etc):

N/A

Site type:

OPEN
SITE

DESCRIPTION OF SITE & CONTENTS.

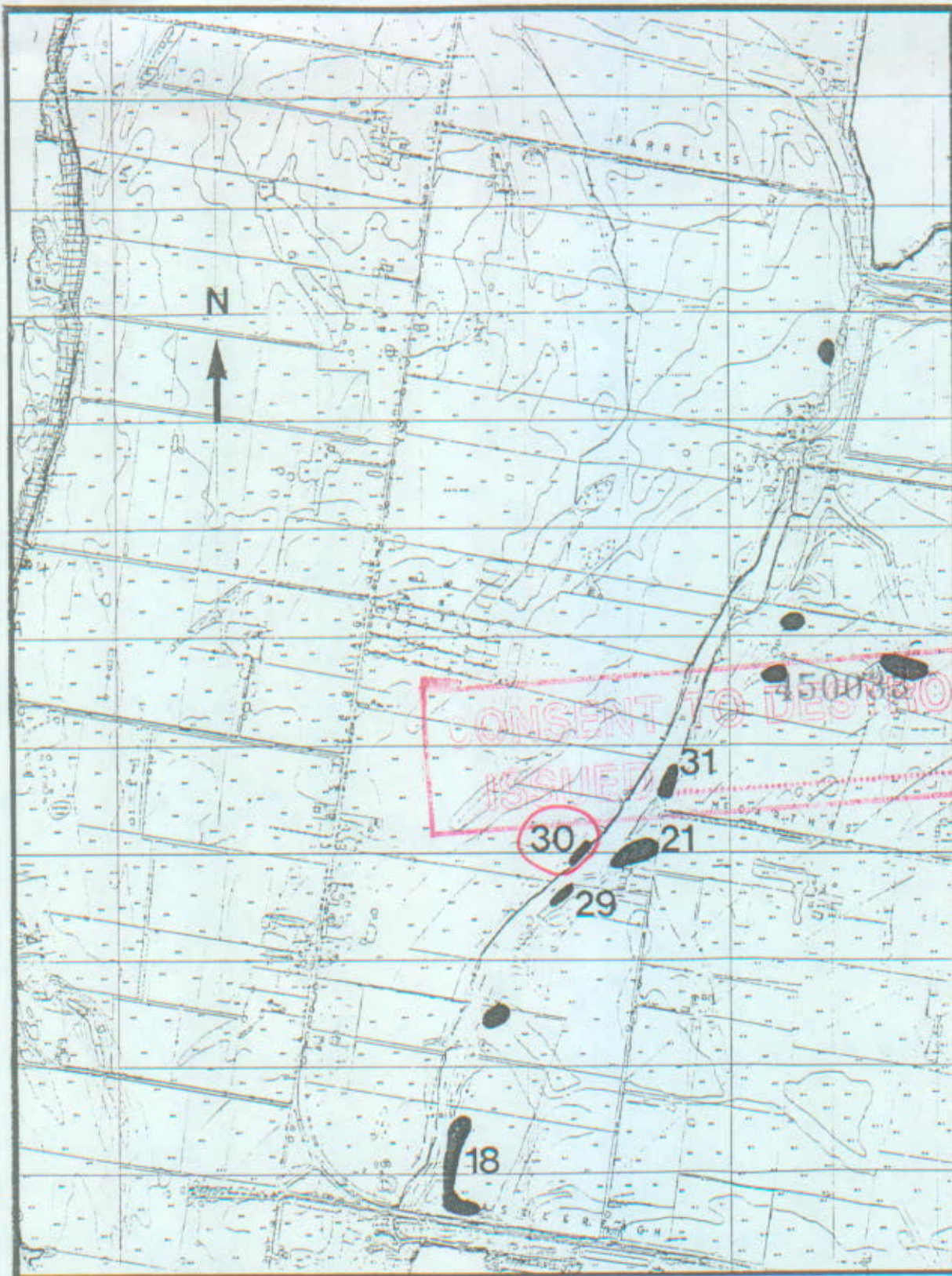
Note state of preservation of site & contents. Do NOT dig, disturb, damage site or contents.

Two small scatters of stone separated by 30 metres on the west bank of Cranebrook Creek within 1 metre of the water on a track recently exposed by cattle. The artefacts in the first cluster consisted of a quartzite core and five waste flakes of chert (2), silcrete (2) and quartz (1). The second scatter was 30 metres north, consisting of 5 chert flakes clustered within an area 50cm x 50cm. Three small flakes were made of dark grey chert, & were probably from the same core. The two others were yellow, also probably from the one core.

SITE DESTROYED

CHECKLIST TO HELP:
length, width, depth,
height of site, shelter,
deposit, structure,
element eg. tree scar,
grooves in rock.DEPOSIT: colour,
texture, estimated
depth, stratigraphy,
contents-shell, bone,
stone, charcoal, density
& distribution of these,
stone types, artefact
types.ART: area of surface
decorated, motifs,
colours, wet, dry
pigment, technique of
engraving, no. of
figures, sizes,
patination.BURIALS: number &
condition of bone,
position, age, sex,
associated artefacts.TREES: number, alive,
dead, likely age, scar
shape, position, size,
patterns, axe marks,
regrowth.QUARRIES: rock type,
debris, recognisable
artefacts, percentage
quarried.OTHER SITES EG.
structures (fish traps,
stone arrangements,
bora rings, mia mias),
mythological sites, rock
holes, engraved groove
channels, contact sites
(missions massacres
cemeteries) as
appropriateAttach sketches etc, eg. plan & section of shelter, show relation between site contents,
indicate north, show scale.

Attach annotated photos (stereo where useful) showing scale, particularly for art sites.



30 Artefacts found

500 M

SEE PAGE 5000

45-5-591

