ACT Heritage Council

BACKGROUND INFORMATION

Honeysuckle Creek Tracking Station

(Block 120 Tennent)

At its meeting of 11 February 2016 the ACT Heritage Council decided that the Honeysuckle Creek Tracking Station was eligible for provisional registration.

The information contained in this report was considered by the ACT Heritage Council in assessing the nomination for the Honeysuckle Creek Tracking Station against the heritage significance criteria outlined in s10 of the *Heritage Act 2004*.

HISTORY

In considering the history of the Honeysuckle Creek Tracking Station, the ACT Heritage Council acknowledges that the Ngunnawal people are traditionally affiliated with the lands in the Canberra region within and beyond contemporary ACT borders. In this citation, 'Aboriginal community' refers to the Ngunnawal people and other Aboriginal groups within the ACT for whom places within the Canberra region are significant. These places attest to a rich history of Aboriginal occupation extending from 25, 000 years ago, as indicated by the Birrigai Rock Shelter, into the 19th century colonial period. They show that Aboriginal people continued living traditionally in the region through to the 1870s-80s. During the 19th century, traditional Aboriginal society in colonised areas suffered dramatic de-population and alienation from traditional land-based resources. In the Canberra region some important institutions such as intertribal gatherings were retained in some degree at least until the 1860s.

Australia played an important role in twentieth century space tracking and communications. In 1960 the United States (US) and Australia signed an agreement under which Australia established and operated a number of tracking stations which would form part of worldwide networks under the control of the National Aeronautics and Space Administration, or NASA (Egloff 1988; Fabricius 1995; Ramsay et al 1995). By 1967 three of these new tracking stations were located in the ACT, at Tennent, Paddys River, and Rendezvous Creek, ACT (Gorman 2012: 23). These were:

- Tidbinbilla Tracking Station (active, now called Canberra Deep Space Communication Complex, or CDSCC) for DSN: Deep Space Network;
- Honeysuckle Creek Tracking Station (no longer active) for MSFN: Manned Spaceflight Network; and
- Orroral Valley Tracking Station[1] (no longer active) for STADAN: Space Tracking and Data Acquisition Network

Honeysuckle Creek Tracking Station was a key component of MSFN and was specially designed to support the lunar phase of NASA's Apollo crewed lunar-landing missions. It provided additional tracking and communication support for the Apollo program from 1967 to 1972, and Skylab from 1973 to 1974. It was a purpose built facility with only one dish, unlike Orroral and Tidbinbilla tracking stations which both performed multiple functions (ACT Heritage File 2000).

Honeysuckle Creek Tracking Station was opened by Prime Minister Harold Holt on 17 March 1967. It encompassed 14 acres of land beside Honeysuckle Creek within what is now known as Namadgi National Park. Like the Orroral Valley Tracking Station, the site was selected because it was close enough for staff to commute but also protected from radio

[1]'Orroral' could come from the Aboriginal word 'Urongal,' meaning, 'tomorrow,' indicated as such in sir Thomas L. Mitchell's 1834 map of the area.

noise (Mackellar 2015a).

The site was acquired in September 1965, and it housed a characteristic MSFN 26m antenna (Fabricius 1995; Ramsay et. al 1995). It participated in the first Apollo mission non-crewed test flight (Apollo 4) on 9 November 1967. In October 1968 the station helped track Apollo's first crewed space mission, Apollo 7, when the Command Module, a component of the Saturn V Moon Rocket was tested in orbit (Fabricius 1995; Lindsay 2000; H. Lindsay personal communication 11 October 2015; Ramsay et. al 1995).

The facility was managed by the Goddard Space Flight Centre in Maryland, US, and was run by a private contractor on behalf of the Commonwealth Department of Supply. During the Apollo program about 90 people worked at Honeysuckle Creek Tracking Station. The station's equipment was shipped from NASA in the US, although Australian employees operated the facility (Mackellar 2015b).

DSN

The Deep Space Network – or DSN – is NASA's international array of radio antennae that supports interplanetary spacecraft missions, and some that orbit Earth. It originated in 1958 when NASA was formed and took over plans to develop a deep space observation network already in progress by other agencies in the US (Gorman 2012: 6). The DSN also provides radar and radio astronomy observations that aid in understanding of the solar system and the larger universe. The DSN consists of three facilities spaced equidistant from each other – approximately 120 degrees apart in longitude – around the world. These sites are at Goldstone, near Barstow, California; near Madrid, Spain; and Tidbinbilla, Canberra, Australia (NASA 2015).

The Manned Space Flight Network (MSFN)

Among other missions, MSFN supported NASA's Apollo and Skylab programs. MSFN was based at the Goddard Space Flight Centre, Maryland, US, and, as part of the program, three 26 m antennae were equally spaced around the world to track Apollo. These were:

- Goldstone, US;
- Honeysuckle Creek, Australia; and
- Fresnedillas (near Madrid), Spain.

NASA's MSFN originated in Project Mercury, a network of stations positioned around the world to maintain communications with manned spacecraft in low Earth orbit (Mackellar 2015c).

Mercury required continuous coverage by all tracking systems from launch to orbital insertion and again during re-entry. It needed two-way voice communications and telemetry[2] trajectory measurements around the planet. A network of 17 tracking stations was required, some of which already in existed as part of military ranges. New sites would connect the Pacific Missile Range with the Atlantic Missile Range, continue the net across Africa, the Indian Ocean, Australia, and the Pacific. MSFN was operating by July 1961 (Neuman Ezell 1985a).

STADAN

The Satellite Tracking and Data Acquisition Network (STADAN) arose as NASA began to launch satellites that needed a tracking, telemetry, and command network to track spacecraft 24 hours a day. STADAN tracked unmanned scientific satellites that were mostly in Earth's orbit. The orbits of these spacecraft ranged from circular and fairly close to the Earth, to highly elliptical, moving out to distances even further than the moon. Satellites tracked by STADAN provided crucial data that enabled later manned space exploration, and also provided the first ultraviolet maps of the sky, and new information on solar flares (Clark 2012).

MSFN expanded during Project Gemini, which followed Mercury, and engaging in longer flights with two-man crews and rendezvous operations in Earth's orbit with two spacecraft. A move toward increased computerisation and decreased voice support made possible a more centralized network with fewer primary stations and more secondary stations for Gemini, although those major facilities had to be better equipped. Some Mercury stations were dropped; many were supplemented with new hardware. All was ready in 1965 for the first manned Gemini flight (Neuman Ezell 1985a).

Apollo, NASA's manned lunar exploration program, would include operations near Earth, in cislunar[3] space, in lunar orbit, and on the moon's surface, most of which was beyond MSFN's grasp as it was configured for Gemini. But NASA began to consult with deep space tracking experts regarding Apollo's requirements as early as 1961. The Jet

[2] Telemetry is the signal that transmits data from a spacecraft back to earth. It is received by an antenna on the ground, which is tuned to a certain frequency (in MHz). Some antennae can receive multiple frequencies, and others only a specific band. Once raw signals from spacecraft are received, cables in the antenna feed them to data-handling machines, usually inside operations buildings (Gorman 2012: 2).

[3] Cislunar means the space between the Earth and the Moon.

Propulsion Laboratory (JPL) in Pasadena, California (US) had been in the tracking and data acquisition business since the early 1950s and had begun construction of its first 26-meter-diameter dish antenna for tracking lunar probes before NASA was established. The Mercury-Gemini stations could be adopted for Apollo's near-Earth operations, and JPL's 26-meter antennas or ones like them could reach out to Apollo spacecraft on the Moon. However, since there was some doubt as to whether or not there were enough conventional MSFN stations and because Apollo spacecraft would be sending back more telemetry than existing stations could receive, NASA uprated the equipment at its stations and augmented the ground communications system to ready the network for lunar missions (Neuman Ezell 1985a).

For Apollo, NASA introduced a unified frequency band, the S-band (USB), for communications. Existing Gemini stations were equipped with 9-meter USB antennas, and three 26-meter USB stations were constructed roughly 120 degrees apart around the world: Goldstone, Honeysuckle Creek, and Fresnedillas (Neuman Ezell 1985a).

Although the MSFN stations could track two spacecraft simultaneously providing they were within the antenna bandwidth, the three Apollo 26 metre stations were located beside the existing DSN stations to provide a second antenna with receiving and transmitting equipment to track two spacecraft simultaneously, such as when the Lunar Module separated from the Command Module to land on the Moon, The additional equipment at the DSN site was called the Wing. The data from the Wing site at Tidbinbilla was sent to Honeysuckle Creek for processing and forwarding to the relevant centres in the USA. Commands were sent from Honeysuckle Creek to the Tidbinbilla Wing site for transmission to the spacecraft. The Wing also provided a back-up in the event of a failure of the prime stations antenna. Because of its bigger and more sensitive antenna, the CSIRO's radio telescope at Parkes was called in at times to be another Wing of Honeysuckle Creek Tracking Station, though Parkes could only receive signals as it had no transmitters to communicate with the spacecraft(H. Lindsay personal communication 15 October 2015).

Apollo 8

In December 1968, the first manned flight around the moon was completed with Apollo 8, generating scientific and engineering telemetry, photographic images, and voice communications, all of which were received on Earth (Neuman Ezell 1985a).

Apollo 8 was a triumph for the navigation systems at Honeysuckle Creek Tracking Station, which had a prime role in the mission. The launch was only 0.6 seconds late, with Lunar arrival barely off target, and a record-breaking voyage of 933, 419 km was achieved with the spacecraft landing only 2.6 km from the planned target point (Lindsay 2000: 193).

On Apollo 8, Hamish Lindsay (2001: 178-186) notes:

> *The first of the manned lunar missions, Apollo 8, was regarded by many as being significant, if not more significant than Apollo 11, when everything had been done except an actual landing ... Flight Director Glynn Lunney said, "I thought Apollo 8 was the decision which opened the gate and let us slide down the hill to the landing. We knew we could go to the Moon, go into and come out of an orbit around the Moon, do all the navigating, and Get the Command Module back home.*

[For Apollo 8, Honeysuckle Creek Tracking Station tracked the] *trailing edge of the Moon, pinpointing the spot where Apollo 8 should emerge...the Moon showed up clearly on the screen, the cross-hair aimed right on the edge of the crescent – steady as a rock, waiting ... The receiver operators were anxiously clamped to their controls watching the noise from the receivers, spring loaded to grab the first signal on their displays. Suddenly there it was – the receivers locked up, and signals flooded through the station equipment, filling all the meters and dials with meaningful figures. Houston received the output from Honeysuckle Creek.*

Apollo 11[4]

The most significant event undertaken at Honeysuckle Creek Tracking Station was support for the Apollo 11 mission which made the first crewed landing on the moon on 21 July 1969. The famed dish at Parkes, NSW, and the DSN station at Tidbinbilla – despite a fire at the facility days before the Moon landing – acted as Wings (see above) to Honeysuckle Creek Tracking Station (Lindsay 2001: 203, 218). Prior to the Moon landing, as there was no provision to transmit a television picture from Honeysuckle Tracking Station to the rest of the world, it was decided to install a television link from Honeysuckle Creek to Canberra, which went from Honeysuckle Creek to Williamsdale, then back to Red Hill (Lindsay 2001: 204). The footage of Neil Armstrong's first steps was relayed to the Honeysuckle Creek Tracking Station via a lunar camera, where it was then filmed from the monitor using a standard camera, and able to be broadcast around the world (ACT Heritage File 2000).

The television camera taken to the lunar surface was a slow-scan black and white camera, chosen because the available bandwidth from the Moon (500kHz) was not sufficient for a standard TV signal. On Earth and at Honeysuckle Creek Tracking Station, the received slow scan signal was converted to a standard TV picture using specially built scan converters (Mackellar 2015d).

On the day of the Moon landing, Lindsay (2001: 230) recalls the sense of anticipation:

> *Honeysuckle Creek had finished all the testing and setting up, begun over five hours earlier at 6 am, and went into the H-30 count, 30 minutes to the signal from the spacecraft appearing on the horizon with moonrise. While a freezing-cold westerly wind dragged sleet showers over the valley, the 26 metre antenna dropped down to the horizon and waited, servos whining. Everybody and everything in the station was ready waiting, waiting for the first signs of a signal from the lunar spacecraft.*

As Neil Armstrong made his way down the ladder of the Lunar Module, he deployed the TV camera. Goldstone and Honeysuckle were monitoring the FM portion of the signal from the Lunar Module, waiting for a TV signal. Buzz Aldrin put the TV circuit-breaker in, and both Goldstone and Honeysuckle simultaneously reported they were receiving video. Viewers around the world saw fuzzy images – upside-down for a few seconds – coming from Goldstone. The image was high contrast because the scan converter at Goldstone had apparently been set incorrectly. This compressed most of the video information into the black, making it almost impossible to discern what was happening. Just before Neil Armstrong set foot on the moon, Houston selected the clearer video coming from Honeysuckle Creek (Mackellar 2015d).

The requirement of Honeysuckle Creek Tracking Station, as distinct from the sensitivity of Tidbinbilla and the flexibility of Orroral, was reliability coupled with sufficient sensitivity to handle communications with astronauts on or near the moon to receive their television and other transmissions. The station had the capacity to handle simultaneous communications with astronauts on the Moon and with an astronaut in orbit around the moon, together with command, data reception and range and velocity measurement for two spacecraft (Fabricius 1995; Neild et al 1992; Ramsay et. al 1995).

The equipment used was a very advanced-electronic digital system, which was one of the several outstanding scientific and technical achievements of the Apollo program (Fabricius 1995; Ramsay et. al 1995), including the S-Band (USB) and 26 metre dish antenna, as discussed above. Honeysuckle Creek Tracking Station was the only one of the three world wide MSFN tracking stations to implement an Apollo simulation system, which replicated spacecraft consoles and configurations, used to train staff and help overcome the increased technological complexity of the Apollo missions (Mackellar 2015e).

Apollo 13, Apollo 15, and other missions

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[4] Lindsay (2001) provides a highly regarded and detailed essay of the Apollo 11 mission, with specific focus on the role of Honeysuckle Creek Tracking Station. The essay expands on the Apollo 11 chapter in Lindsay's 2001 volume titled *Tracking Apollo to the Moon*, the definitive record of the life and importance of Honeysuckle Creek Tracking Station.

The third mission intended to land on the Moon, and the seventh manned mission in the Apollo program, was the infamous Apollo 13. That mission launched in April 1970, but the lunar landing was cancelled after faulty wires inside an oxygen tank caused it to explode, crippling the spacecraft, resulting in loss of cabin heat and damage to the carbon dioxide removal system. Honeysuckle Creek Tracking Station played an important role in this mission, as, although it encountered difficulties holding signal with the spacecraft, it was the last site to track the re-entry phase of the mission when it entered the Earth's atmosphere (Lindsay 2001: 290).

Apollo 15 was the first mission to use the Lunar Roving Vehicle, which enabled astronauts to explore the geology of the Hadley Rille/Apennine region of the Moon, further away from the Lunar Module than ever before. Between the Apollo 14 and 15 Missions (Apollo 15 was the first of the new, so-called scientific 'J' missions) Lindsay (2001: 303) notes:

> *...[T]he data end of the [MSFN] tracking stations were ripped apart and modified to accommodate the much greater demands of the new scientific 'J' missions. There was so much overtime demanded to meet the deadlines that some staff members begged for a break.*

Lindsay quotes the Operations Supervisor at Honeysuckle Creek Tracking Station, John Saxon:

> *Again we had the lion's share of that mission – we had all the walks on the Moon, all the bringing up of the first lunar rover down link to the ground – all the critical parts of that mission we were prime. Although we went into the mission with quite a bit of trepidation, it was quite amazing, it all went by the book.* (303)

Lindsay also quotes astronaut Jim Irwin, who noted the following about the Apollo 15 Mission:

> *Communications between us ... on the lunar surface were so clear that it was hard to believe we were really on the Moon ... the radio signal suffered minimal loss going through space. It was sent from Honeysuckle Creek, Australia, our prime station* (310)..

Honeysuckle Creek Tracking Station also supported significant Deep Space missions (H. Lindsay. Personal communication 11 October 2015), including:

- Helios circling the sun (launched 1974 and 1976)
- Pioneer 10 (launched 1972) and 11 (launched 1973) to Jupiter and Saturn
- Pioneer Venus (launched 1978)
- Viking Landings on Mars (launched 1976)
- Voyager missions to the giant outer planets (launched 1977)

Skylab

The last mission supported by Honeysuckle Creek Tracking Station as part of NASA's MSFN was Skylab. For this, the staff at Honeysuckle had to be increased to over 100 cater for the long mission periods (Fabricius 1995; Johnston 2013; Ramsay et. al 1995).

Again quoting John Saxon, Lindsay notes:

> *Honeysuckle became a twenty four hour a day, seven day a week station, which marked the difference between Skylab and Apollo, and we were very efficient at operations – at times the back end of the station was doing something totally different to the front end. While we were doing tape playbacks between Skylab passes of the data, voice and television back to Houston, the front end – that is the antenna and receivers – were tracking deep space probes and sending the data over to Tidbinbilla. We have never done anything like that since.* (344)

Skylab was an orbital space station project. An orbital space station, from which man could launch spacecraft to the moon and the planets or at which scientists could perform investigations and observations over sustained periods, had been a goal of the international space-exploration community since before NASA was established. NASA Headquarters established a Saturn/Apollo Applications Office in August 1965 within the Office of Manned Spaceflight

to investigate the many plans that had been offered by its research centers and industry to modify Apollo era hardware to form orbiting laboratories and to evaluate possible follow-on Apollo missions (Neuman Ezell 1985b).

Skylab 1 launched May 14, 1973. Deployment of the meteor shield failed, one solar panel jammed, the other tore. It reached desired near-circular orbit, but without the panels the internal temperature was too high for the crews that were to follow. The launch of Skylab 2, scheduled for the next day, was postponed while engineers designed a "parasol" of aluminized Mylar-nylon laminate to protect the workshop from the sun (Neuman Ezell 1985b).

Skylab aimed to study the long-term effects of weightlessness on man. The first Skylab crew lived and worked in the orbiting lab for 28 days, the second for 59 days, and the third for 84 days. The crews evaluated exercise techniques, performed scientific investigations (solar astronomy, life sciences, earth resources, astrophysics, engineering and technology), and learned to relax, eat, and work in space day after day (Neuman Ezell 1985b).

Most of the data returned during the missions was medical, allowing the flight physicians to continually monitor the health of the crewmen. Other scientific investigators had to wait for many of the results to return to Earth from the flown experiments, but for most the wait was worth it. Astronomers alone received 103 000 photographs and spectra for their evaluation; earth resources specialists received thousands of images. The research outcomes of Skylab were a success, proving that a future space station crew would not suffer from long stays and could be occupied with scientific, engineering, and materials processing tasks (Neuman Ezell 1985b).

At Honeysuckle Creek Tracking Station a transportable van was set up in the car park next to the main operations building for Skylab. Inside the van was a large Klystron (a specialised linear beam vacuum tube) which provided a high powered uplink signal to the orbiting spacecraft. During passes, commands were sent from this van to Skylab (McKellar 2015f).

Skylab concluded in 1974 after its final crew left after an 84 day flight, the longest stay of the three Skylab crews (Fabricius 1995; Johnston 2013; Ramsay et. al 1995). After the last crew left Skylab, the station continued to orbit Earth, but it was not intended to remain derelict. NASA maintained contact with the empty outpost in the hope it would soon be brought back to life. Regular Space Shuttle flights were expected to begin in 1977 and there was a general belief that visiting Shuttle missions could easily refurbish and expand Skylab. However, solar activity caused the Earth's atmosphere to expand, so the space station met increasing drag as it circled Earth. Skylab's orbit was decaying and although plans were made to redirect one of the Space Shuttle test flights to rendezvous with Skylab to boost it into a higher orbit, the empty Skylab spacecraft famously fell to Earth on 11 July 1979, scattering debris over the Indian Ocean and Western Australia (Johnston 2013).

In 1974 at the conclusion of the Skylab and Manned Space Flight activities, Honeysuckle Creek joined the DSN as Deep Space Station 44. By the late 1970s the workload had decreased and by 1981 the facility's function was transferred to Tidbinbilla Tracking Station along with its antenna. NASA demobilised the complex in 1983 and in 1984 it was handed back to the Commonwealth (Fabricius 1995; Ramsay et. al 1995).

With self government in 1989, administrative control of the tracking stations within Namadgi passed to the Legislative Assembly of the ACT. An inquiry was held into the future use of the site which, since its closure, had been vandalised. The Standing Committee of Conservation Heritage and the Environment recommended that the tracking station be removed (Fabricius 1995; Ramsay et. al 1995).

Thomas Reid, MBE, managed Honeysuckle Creek Tracking Station for a time. He moved to Canberra in 1964 to become the first director at Orroral Valley Tracking Station where he remained until 1967 when he moved to Honeysuckle Creek Tracking Station and was the director there during the first moon landing. In 1970 he became director of the two NASA DSN stations located at Tidbinbilla. For his contribution to the manned flight program he was awarded an MBE in the New Year Honours List in 1970. He was awarded the NASA Public Service Medal in 1975, and actually presented with it by visiting Vice President Dan Quayle in April 1989 (Parliament of Australia 2010).In his book Uplink-Downlink: A History of the Deep Space Network from 1957 Doug Mudgway says of Tom Reid:

His crisp management style and penchant for clear lines of authority, particularly in his relations with JPL (Jet Propulsion Laboratory) and NASA personnel, made a visit to 'his' complex a memorable experience for many Americans. He ran the stations in a disciplined, formally organized way that attracted and retained the best technical staff available. As a direct result of their teamwork and his leadership, the DSN station at Tidbinbilla played a critical

role in all of NASA's deep space missions in the years 1970-1988 (Mudgway 2001).

While Honeysuckle Creek Tracking Station, and after it, Orroral Valley Tracking Station, were closed, Tidbinbilla Tracking Station remains open and operational, and continues to receive and track data for the Deep Space Network, continuing NASA's connection with the ACT, and the ACT's involvement in international space exploration. Most recently, in July 2015, Tidbinbilla Tracking Station (SDSCC), received some of the first images of Pluto as part of NASA's New Horizons mission.

The place is also active in public memory. The 2013 *Shaping Canberra* exhibition by the School of Art Gallery, Australian National University, featured a video animation by artist Ursula Frederick, using a record of the Honeysuckle Creek Tracking Stations site.

DESCRIPTION

Before decommissioning, Honeysuckle Creek Tracking Station consisted of the following buildings:

1. Operations building.

This remains as a concrete slab but was originally a two storey concrete frame structure with an internal staircase. The external fabric was profile metal cladding on its long elevations, face brickwork on its ends. All its operations, communications training and administrative functions were conducted on level 2. Level 1 housed the mechanical plant, staff recreation and cafeteria (Neild et al 1992).

2. Power building

A concrete slab as of 2015, this was originally a metal clad steel frame building, rectangular in plan, 37.3m by 13.4m, located on the lower western sector of the facility. It housed generators and switching gear, a workshop, diesel workshop, an office and store (Neild et al 1992).

3. Antenna transmission building and antenna pad

Indicated by concrete foundations as of 2015, the pad originally represented the antenna and building which were located on the north eastern boundary of the site. The building stood under the transmission antenna, in the centre of the circular antenna pad store (Neild et al 1992).

4. Petrol shed, heat exchanger shed, and guard house.

Remaining foundations indicate the original footprints of what were small, partially enclosed, metal, brick, and fibreglass structures (Neild et al 1992).

<u>Physical condition and integrity</u>

The former Honeysuckle Creek Tracking Station site is located in a small clearing on a mountain ridge surrounded by natural bush, the original plan is at Image 2. The approach road is lined with exotic trees and there are a small number of other introduced species across the site (see below for species list store (Neild et al 1992)).

A large concrete footing remains from the former two storey operations building, above which are two terraces. The top terrace is the site of the former dish marked by a circular footing and road. Below the operations building are the remains of various support structures. Stone retaining walls and garden edging remain in situ in several areas. The original road network and building foundations remaining at the facility indicate its former layout, enabling ongoing interpretation (Neild et al 1992).

The remaining concrete slabs indicate the:

- Operations building (see Image 3)
- Power building (see Image 4)
- Antenna transmitter (see Image 5)
- Petrol shed and facilities area (see Image 6) heat exchanger shed, and guardhouse.

The site contains a number of introduced tree and shrub species which were included in the building's landscape design (see Image 7) These include:

- A row of Cedrus (*Cedrus deodara* and *C.atlantica)*
- Liquidambers (*Liquidamber styraciflua*)
- Silver birches (*Betula pendula*)
- Golden Cypress (*Cupressus macroparpa Brunniana Aurea*)
- maples including the Japanese Maple (*Acer palmatum*)
- tortured willow (*Salix matsudana Tortuosa*)
- Small junipers (*Juniperis communis*) near the main operations building slab; and

Stone walls, and the original road network with kerbs (see Image 9) and building foundations remain at the site and indicate its former layout, demonstrating the relationship between the facility's components.

SITE PLAN

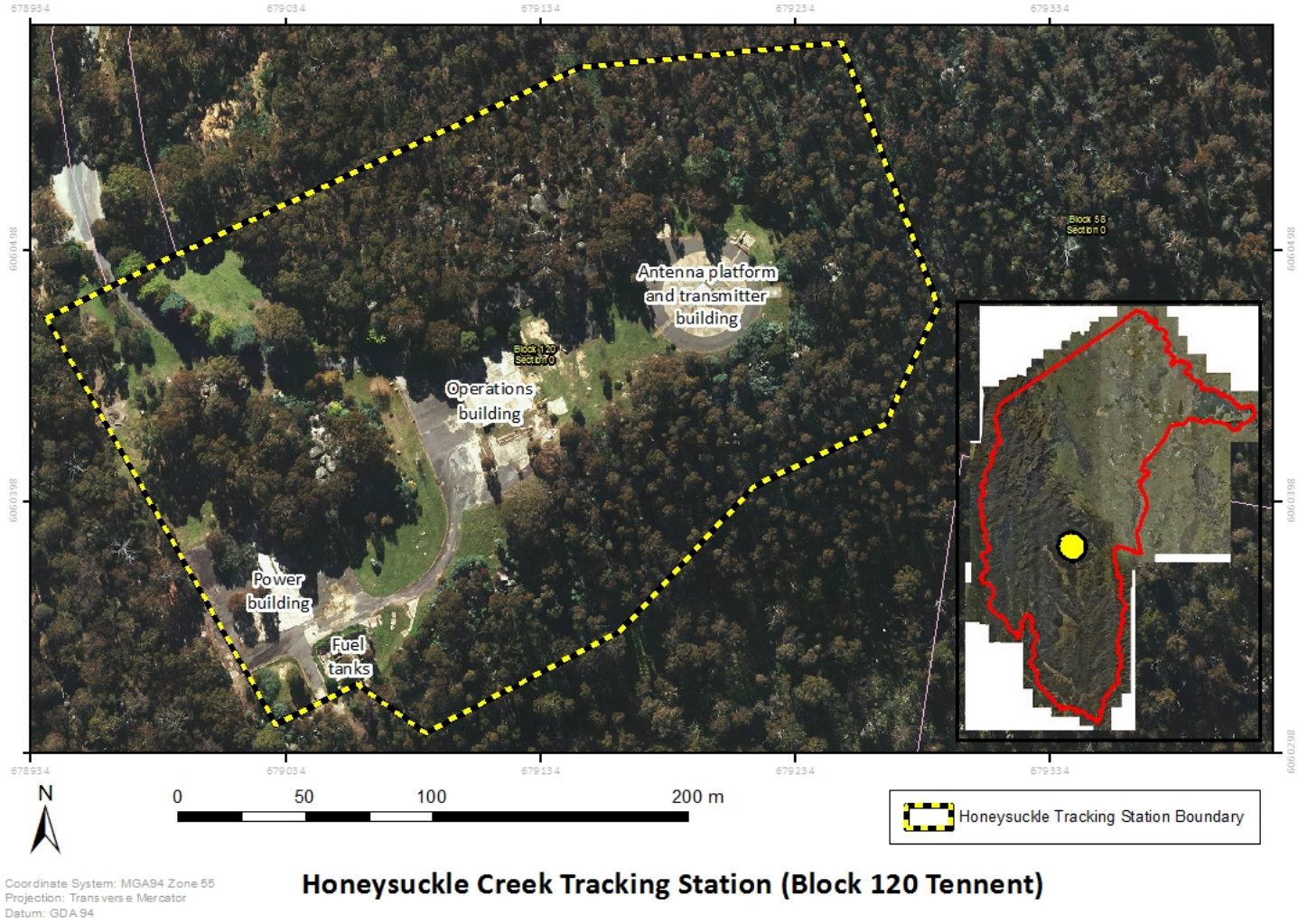

Image 1 Honeysuckle Creek Tracking Station Site Boundary

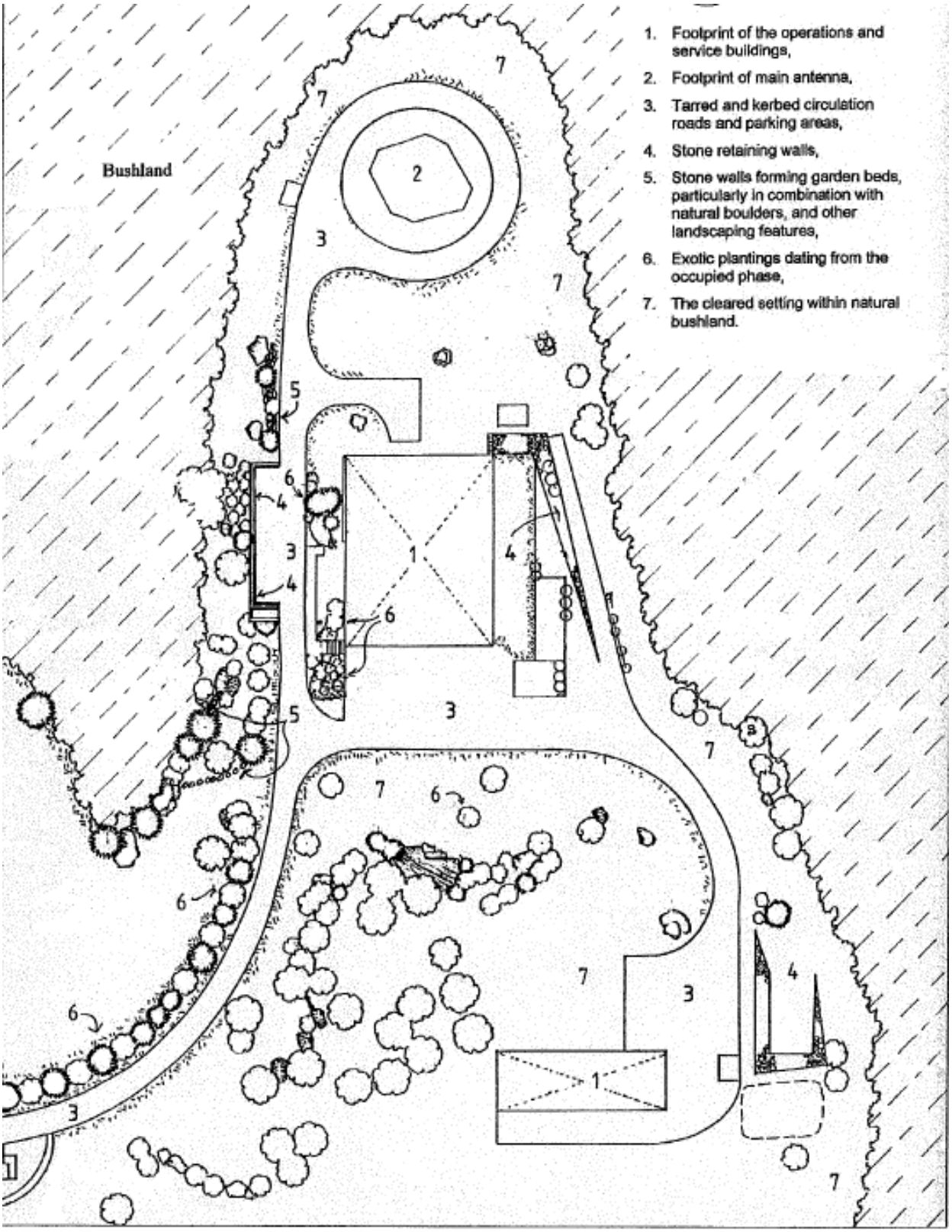

Image 2 Original layout of facility (Ramsay 1994)

IMAGES

Image 3 Operations area concrete pad
(ACT Heritage 2015)

Image 4 26m dish concrete pad (ACT Heritage 2015)

Image 5 Facilities area concrete pad
(ACT Heritage 2015)

Image 6 petrol tank area (ACT Heritage 2015)

Image 7 Exotic trees (ACT Heritage 2015)

Image 8 internal roads and kerbs
(ACT Heritage 2015)

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