



# THARBOGANG RECYCLING AND WASTE DISPOSAL FACILITY

*(WASTE MINIMIZATION AND MANAGEMENT  
ACT, 1995)*

## **LANDFILL ENVIRONMENTAL MANAGEMENT PLAN**

LOT PORTION 202, DP756035  
PARISH OF BALLINGAL  
COUNTY OF STURT

PREPARED BY: RE BARTON  
31 DECEMBER, 1997

REVISED BY: BOB CRAWFORD  
MANAGER, HEALTH SERVICES  
23 MARCH 1999

GRIFFITH CITY COUNCIL  
PO BOX 485  
GRIFFITH NSW 2680  
PHONE: 02 69 621 277  
02 69 644 368

Email: [admin@griffith.nsw.gov.au](mailto:admin@griffith.nsw.gov.au)

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## 1.0 INTRODUCTION AND SITE OVERVIEW

### 1.1 INTRODUCTION

The Griffith City Council operates two (2) Waste Depot facilities in its Local Government area. This Landfill Environment Management Plan (LEMP) is for the major facility located at Portion 202, Hillside Drive, Tharbogang.

The site comprises:-

Lot 280, DP44532	- 1477m <sup>2</sup>
Lot Portion 202, DP756035	- 122ha
and additional crown land boundary adjustment for roadway	- 1.778ha
Total	123.9257ha

The lands are located in the Parish of Ballinal within the County of Sturt and within the Local Government area of the City of Griffith.

Map 1 =	The location of the land
Map 2 =	Portion identification and dimensions
Map 3 =	Lot 280 dimensions

The lands are located 12 kilometres west of Griffith on the MacPherson Range (off the Kidman Way Tharbogang). The nearest urban centre is the Tharbogang village, four (4) kilometres from the site. The site is not visible from the village.

The Waste Depot was established on Crown Land reserved for Municipal Purposes - Reserve Number R.97172 on 16 March, 1984 (Government Gazette) with Council being created as the Trustee on the same gazettal date. The additional land for the access road was gazetted on the 16 November, 1984. Refer to Map 3.

The Portion has a sub lease for a Speedway Circuit granted on the 11 September, 1984 that is current to 10 September, 2004 to the Griffith Speedway Club.

The dimensions of the land, speedway location and current contours are shown on Map 4 and occupies an area of 7.5ha on the north eastern portion.

Council currently is acquiring freehold title to the land under the Just Terms Compensation Act.

The site is also operated as a Council quarry extracting hard rock for road sub-base, with crushing activities as needed.

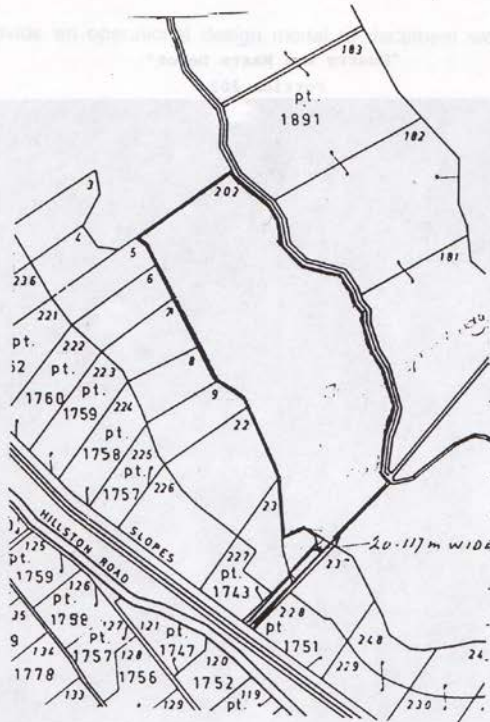
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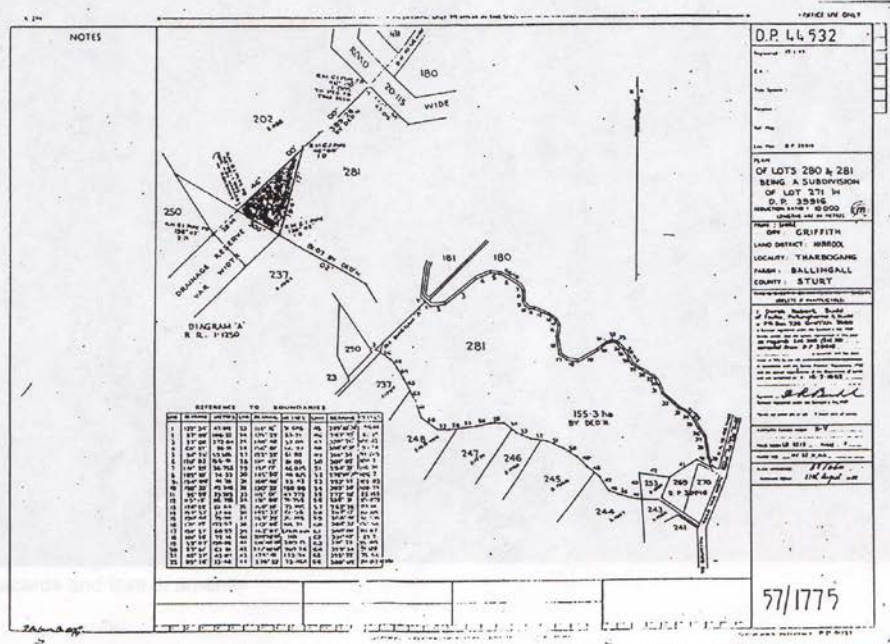
MAP COMPILED FROM 1:50 000  
CADASTRAL SERIES  
TABBITA  
SCALE 1:50 000



MAP 2



MAP 3





Quarry and Waste Depot  
Portion 202





## 1.2 PURPOSE OF THE LEMP

The plan is intended to provide an operational design model to document work practices and priorities towards achieving:-

- Environmental goals
- Compliance with statutory obligations
- Public Safety
- Waste Minimisation and to encourage recycling
- conserving of land resources
- A quality service facility operated in a cost effective manner.
- Monitoring of operations and impacts upon the immediate environment.
- Progressive site rehabilitation and post closure development of the site.

The LEMP is intended for use of the depot for the reception and disposal of wastes classified as “Class 1 Inert Waste” and “Class 1 Solid Waste “ Landfills. The depot is also intended for the reception of recyclables, tyres and “hazardous waste” to be redirected to other approved reprocessing outlets.



## 1.3 ENVIRONMENTAL GOALS

The environmental goals intended are to address management objectives for issues such as:-

- Water pollution
- Air pollution
- Land Management and Conservation
- Hazards and loss of amenity

## 1.4 SITE OVERVIEW

### 1.4.1 Property Title and Improvements

The property titles and ownership status has been stated in the introduction. Services available to the site are:-

- Town water supply
- Electricity
- Telephone land line (Analogue mobile phone coverage is also available)
- CB radio installations on plant

A bitumen sealed roadway within the site 1.4kms long accesses physically the Quarry and Waste Disposal/Recycling platforms.

Structures upon the site are:-

a Waste Depot

- caretakers cottage
- depot amenities, lunchroom and plant garage

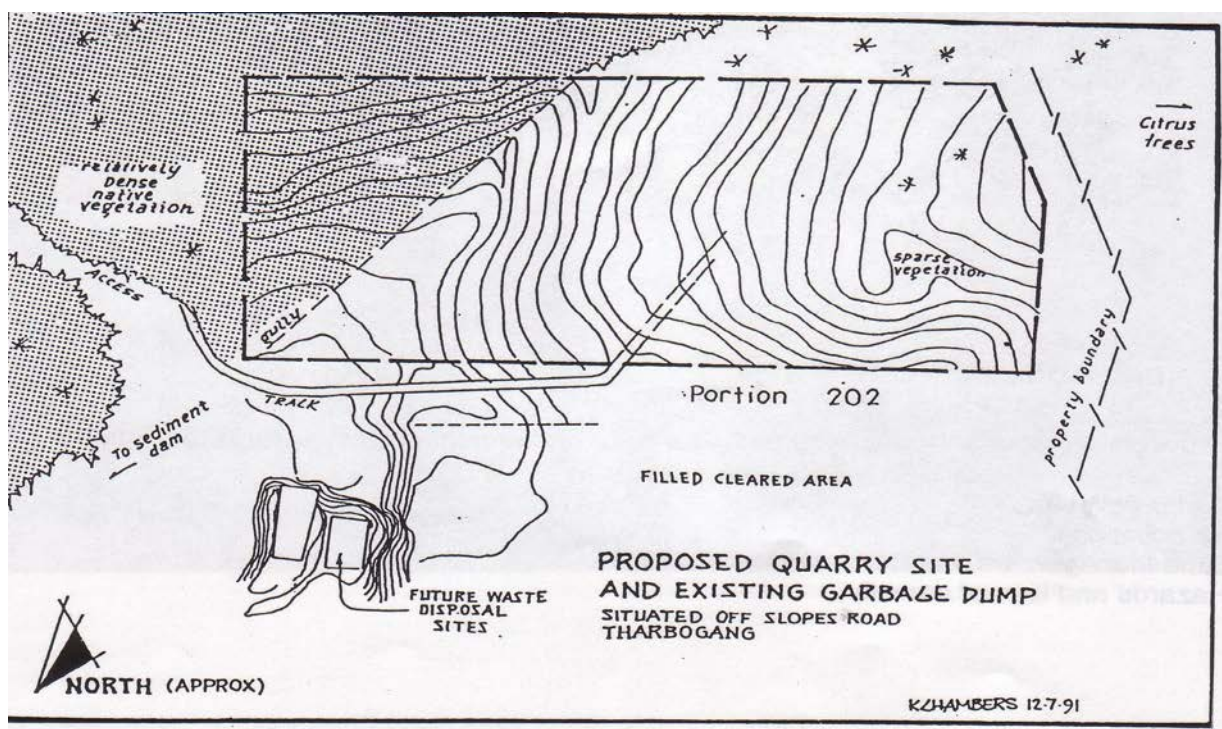
b Speedway

- canteen
- amenities
- miscellaneous assortment of garages and shelters
- stockproof fencing and gates
- signage on operating conditions and recyclable material locations

c Quarry

Quarrying is an open cut operation of a defined portion shown on Map 4.

Crushing activities are conducted by a portable equipment operated on the floor of the quarry. Materials are also stockpiled on the floor of the quarry.



### 1.4.2 Land Use Controls

The site is located upon Zoning 1(a) Rural General under Griffith Local Environmental Plan 1994 gazetted on 9 December, 1994. The land location to adjacent zonings are depicted in Map 5 and identified by the attached index. Map 6.

The features of the zoning are:-

- 7V Environmental Protection - Scenic Protection - MacPherson Range  
Visual escapement (Environmentally sensitive land)
- 7W Environmental Protection - Wetlands - Tharbogang Swamp  
A “perched” drainage catchment degraded by salinity and rising water tables (Environmentally sensitive land)
- 1(C) Rural Residential - Future Subdivision potential of denuded MacPherson Range Ridgeline  
(Environmentally sensitive land)
- 1(F) Rural Forestry - Escarpment Ridgeline

The “environmentally sensitive” land restrictions excludes the clearing of vegetation of more than 1ha or more than 5% of the area of the holding. Under the zoning for 1(a) a landfill depot or a quarry is not a prohibited activity. Development Consent however is required. Prior to the introductions of that environmental Planning Instrument the Shire of Griffith Interim Development Order No. 2 prevailed during 1984 which also required a Development Consent for such activities.

The objectives of the respective zonings are attached in Appendix 7. The main feature of the objectives are that they are performance based and the activity is permissible with consent for the site zoning (Rural 1(a)).

### 1.4.3 Land Use Activities

The surrounding land use activities are shown in the attached matrix of Land use activity.

LOT	ZONING	FEATURE	DIRECTION	DISTANCE
226 DP73035	Rural 1(a)	Orchard and House	S	700m
3 DP73035	Rural 1(a)	Orchard and House	W	600m
187 DP73035	Zone 7W (ESL)	Tharbogang Swamp	N	720m
201 DP73035 (part)	Zone 7V (ESL)	Escarpment	NW	800m
201 DP73035 (part)	Rural 1(f)	Escarpment	NW	0m (500m to Current Activity)
281 DP44532	Rural 1[c]	Rural Land	E	0m (500m to Current Activity)

### 1.4.4 Environmental Characteristics

#### Topography

The site is upon the northern slopes of the MacPherson Ranges and is traversed by two (2) spurs and slopes to the north. The waste depot disposal is within the re-entrant depression between the spurs.

The quarry is located and has extracted material on the eastern spur adjacent to the Landfill.

The cross section from the east/west ridgeline to the northern boundary has a 40 metre fall. The slopes range from 3° to 16°. The drainage catchment is mainly to the “perched” Tharbogang Swamp.



## Soils and Geology

Griffith is within a geological transition zone. The MacPherson's Range comprise older rocks with younger deposits of colluvial and windblown (aeolian) sandy deposits near the range. Upon the ranges, the soils are well aggregated, crumbly and subplastic in nature, usually with a high lime content.

The southern part of the MacPherson's Range which traverses the site shows evidence of folding with well developed cols. These cols were responsible for directing calcareous clays into the Lake Wyangan and Tharbogang area, by acting as wind funnels.

The Range displays structural features which are common to upper Devonian formations and its unusual alignment is evidence that extensive faulting has occurred. The geology rocks include conglomerate, sandstone and quartzite with thin beds of argillaceous sequence.

The massive conglomerate contains rounded water worn pebbles which are siliceous in nature. They consist of white quartz often coated with reddish iron oxide, fine and coarse grained quartzites bright red jaspilite and coarse siliceous grit, black siliceous hornfels and dark tourmaline-rich rock. Many of the pebbles are like quartz but are metamorphosed products of colloidal deposits. Pebbles of pink colour which appeared to consist of quartz but are found to contain sponge like structures common in chalcedony. Many of the sandstones contain kaolinite materials. (1)

Soils are described as "Gradational (Non-Calcareous) soils of the MacPherson Range.

Soils are not calcareous throughout; surface textures commonly range from sandy loam to clayey loam, less commonly loamy sand, clayey sand and sand, and occasionally sandy clay, silty clay or light clay. There is a gradual increase in texture grade (clayiness) with depth, sometimes followed by a decrease below the B Horizon; acid, neutral and alkaline soil reaction trends occur. (1)

The soils would appear to result from mainly physical and chemical weathering of the parent material and from aeolian deposition. The parent material is sedimentary, primarily conglomerate and siliceous sandstone. (1) The soil has tendencies towards mod-high permeability with implications for plant growth and recharge.

The site has extensive removal of soil and gravel on the slopes prior to its occupation by the Council. Most of the slopes on site are bedrock with a mantle of yellow coarse textured colluvial material overlaying the bedrock in the re-entrants and slope to a depth of 3 metres.

In a geotechnical investigation of the site commissioned by the Council in January, 1996, Coffey Partners found:-

- The geology as being part of the Cocoparra and Griffith Synclines and comprising sandstones and siltstone with conglomerate bands. The overlying surficial soil generally comprised:-
  - Slopewash and residual sandy clay, clayey sands; Gravelly sandy clays and clayey sandy gravels
  - The plasticity of the surficial soils ranged from low to medium
  - The depth of surficial soil over the basement rock ranged from 0.2 metres on the upper hill slopes to 3 metres in the lower foot slope area.
- The soil has tendencies towards mod-high permeability with implications for plant growth and recharge.

A soil analysis made upon a sample from the site is attached. Appendix 8.

(1) Kelly Tyson - Scenic Hill Plan of Management.

An extensive boring program was conducted by the Water Resources Commission (1977) upon surface drainage investigations by the Department of Conservation and Land Management (1992), and by Coffey and partners in 1996 Bedrock was found at the surface and extending to a depth in the re-entrant colluvium at a 3 metre depth along the northern boundary. No groundwater was found at the time of the drilling.

## Groundwater and Surface Waters

The soils have been identified in the Calm report as having poor to marginal water holding ability. The soils are susceptible to tunnelling and water erosion. Erosion was evident prior to landfill commencing.



Erosion and Shallow Topsoil



The catchment is limited to the ridgeline of the terrain which coincides with the Southern lot boundary. The lot is traversed by three natural drainage depressions i.e. the east boundary, west boundary and the quarry/the current landfill platform and drains to the “perched” drainage depression - The Tharbogang Swamp.

This pondage is affected by marked salinity degradation from rising watertables.

The major source of water catchment in this locality is from aerial irrigation of pastures growing lucerne and grains on lands to the north and east of the basin.

Surface waters from the quarry floor/catchment runoff is diverted to a detention basin to the east of the garbage depot leachate detention basis. A further 3rd stormwater siltration basin is located downstream of the quarry and leachate detention basins. The 3rd basin is filled infrequently and is usually dry.

Surface intercept and diversion berms have been provided to the east of the landfill. Further bunding has also been provided, inconjunction with trenches to the northern alignment of the “old” putrescible pits (trenches) in the western slopes of the Waste Depot.



Bottom  
catchpit  
below  
putrescible  
area



The attached photographs show the retention properties of soil and effects of high evaporation in the climate.



A pattern of ground water piezometers have been located downstream of the landfill and “old putrescible pit” area, in the northern part of the Depot between the northern boundary. See Map 9 for locations.

The monitoring has encountered over the past 10 years no ground water flows. The depth of any infrequent groundwater has been relative to sporadic incidents of preceding heavy rainfall.

The salinity in groundwaters generally in the locality can vary from 1.5 dS/m to 16 dS/m. In the Tharbogang swamp basin the salinity of the groundwater could range from 10-20 dS/m.

An adjacent basin at Lake Wyangan liquid salinity readings of 1,200-1,800 E.C. s/cm have been obtained in comparison to the ANZECC Guidelines of 1,500 E.C. (Protection of freshwater ecosystems) and 1,750 E.C. (Direct adverse effects in freshwater wetlands).

#### Local Meteorology

##### 1 Air Movements

Strong prevailing winds patterns do exist - south westerly in the afternoon and northern easterly to easterly in the morning.

Specific directions for summer are the north-east and south to south-west. Winter has westerly influences ranging from the south-west to north-west.

Very limited impact therefore exists with the existing environment in the absence of nearby residents. Wind directions are shown in Appendix 10.

Temperature inversions are likely to occur between May and October with an average of six (6) mornings/month. The highest recording of surface temperature inversion having been recorded as 15 days in July, 1987.

Atmospheric inversion usually do not last beyond 9.00 am. The winds usually dissipate the air pockets and pollutants.

##### 2 Climate

The climate is described as warm temperate. The summers are hot and dry and the winters mild with a few frosty nights. The rainfall is slightly winter dominant, with a mean annual precipitate of approximately 400 mm. The mean annual class A pan evaporation is 1,870 mm. A positive evaporation influence prevails at all times, including the marginal months from May to August.

This is significant when coupled to the soil and vegetation types.

MEAN MONTHLY CLIMATIC DATA FOR GRIFFITH NSW						
	Mean Maximum Temp. (°C)	Mean Minimum Temp. (°C)	Mean Rainfall (mm)	Mean 9am Humidity (%)	Class “A” Evaporation (mm)	Mean Rain Days
January	33.3	17.7	27.9	44.9	279	1.9
February	32.1	16.5	27.5	51.8	236	1.4
March	29.3	14.2	41.4	56.5	206	1.8
April	23.9	9.7	34.2	65.9	114	2.2
May	19.4	6.3	33.8	77.1	66	3.4
June	15.8	4.3	34.4	83.0	46	3.7
July	15.0	3.3	31.3	83.2	48	4.3
August	17.1	4.3	36.9	76.1	74	4.2
September	20.8	6.3	23.3	63.9	124	3.1
October	24.4	9.6	45.2	56.7	175	2.7
November	28.2	12.6	29.9	47.1	234	1.9
December	31.2	15.3	29.9	45.5	269	1.8

Source: CSIRO Division of Irrigation Research.



## Appendix No 1

Summary of Climatic Data for CSIRO Research Station, Griffith													
	J	F	M	A	M	J	J	A	S	O	N	D	TOTAL
<b>Temperatures</b>													
Mean daily max °C	31.5	31.5	28.1	22.9	18.4	14.9	14.3	16.2	19.6	22.2	27.0	30.7	23.1
Mean daily min °C	19.2	18.4	14.8	9.4	6.4	4.0	2.9	4.0	6.0	6.1	11.8	14.7	9.6
Mean daily °C	25.9	25.5	20.0	16.2	12.4	9.4	8.6	10.1	12.8	14.2	19.5	22.1	16.4
Mean days <22°C				0.6	4.6	11.3	16.0	9.8	5.7	0.9			47.7
Mean days <10°C				0.1	1.1	5.2	7.8	2.8	0.9				19.1
<b>Humidity</b>													
Mean daily %	39.0	42.0	46.0	53.5	54.0	70.5	68.0	64.6	53.6	48.0	43.0	37.0	52.1
<b>Wind</b>													
Mean daily n.m.km	290	215	200	161	161	148	168	198	207	222	230	237	190
<b>Rain</b>													
Mean monthly mm	22.8	27.3	34.4	33.0	37.8	37.2	33.2	40.4	32.8	41.3	28.5	30.7	406.3
Mean wet days	4.0	3.6	4.4	5.7	7.3	9.3	11.0	10.2	7.5	3.9	5.0	4.7	60.8
<b>Evaporation</b>													
Mean monthly mm	294.0	248	200	116	66	48	48	78	106	159	227	289	1889
Rainfall deficit mm	234	216	166	83	27	6	15	33	72	129	188	255	1463

Based on local knowledge and the above data, a number of comments may be made, viz:-

**Temperatures.**

- \* The area is characterised by hot summers and cool to mild winters with frosting mostly in the June/July period.
- \* Summer maximum temperatures average at around 31°C with extended periods <35°C and others at <40°C being not uncommon.
- \* Winters tend to be cool to cold with a significant chill factor.

**Humidity**

- \* Summers tend to be dry and winters damp.
- \* Fogs are not unusual in winter.
- \* Overall, humidity levels are relatively low.

## APPENDIX

Evaporation at Griffith (mm per season)  
Year by season sorted into quartiles

	year	SUMMER	year	AUTUMN	year	WINTER	year	SPRING
First Quartile	1984	852.8	1984	319.3	1983	123.0	1986	412.0
	1985	689.8	1982	337.4	1973	132.1	1983	412.3
	1986	709.9	1970	340.4	1978	144.6	1976	432.8
	1988	728.2	1983	341.3	1986	147.5	1974	442.2
AVERAGE		697.8		334.8		138.0		424.8
Second Quartile	1976	756.1	1974	342.1	1988	150.4	1985	443.3
	1981	771.8	1981	349.5	1985	150.6	1975	453.9
	1971	781.2	1988	356.1	1971	156.8	1973	454.5
	1974	784.3	1985	356.2	1974	159.5	1984	457.8
AVERAGE		773.3		351.0		154.3		452.4
Third Quartile	1978	791.7	1977	359.0	1984	162.5	1981	473.8
	1983	794.2	1975	383.4	1981	166.0	1970	479.7
	1973	813.3	1973	383.5	1982	172.4	1978	485.5
	1982	815.1	1972	393.2	1970	181.6	1988	485.8
AVERAGE		803.6		379.8		170.6		481.2
Fourth Quartile	1970	821.0	1986	398.9	1975	198.6	1971	519.9
	1972	827.1	1978	411.0	1972	208.9	1982	539.5
	1976	838.7	1971	413.8	1977	209.4	1972	597.4
	1977	891.1	1978	435.4	1976	214.9	1977	610.3
AVERAGE		844.5		414.8		207.5		568.8

Note: Includes data for 16 years for which there were complete records.

## Seasonal rainfall data for Griffith (mm/season)

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## APPENDIX

Years by seasons sorted into quartiles

	year	SUMMER	year	AUTUMN	year	WINTER	year	SPRING
First Quartile	1979	11.4	1991	25.0	1977	27.0	1957	23.0
	1952	12.3	1957	29.4	1982	28.5	1982	25.4
	1967	12.5	1976	30.4	1976	30.5	1980	33.6
	1934	19.7	1948	43.2	1944	41.9	1972	38.3
	1964	22.5	1953	43.7	1946	48.4	1977	40.1
	1909	27.6	1954	44.0	1956	55.9	1946	44.7
	1982	29.1	1987	44.5	1949	58.1	1967	50.0
	1943	32.3	1946	45.6	1978	60.4	1980	51.7
	1991	38.8	1987	48.6	1943	69.1	1981	54.7
	1949	45.3	1945	50.1	1972	73.7	1989	56.6
	1951	50.8	1975	54.6	1959	76.7	1948	68.9
	1956	51.1	1971	60.0	1987	82.3	1991	70.6
	1965	51.3	1992	62.0	1970	82.9	1988	72.1
	AVERAGE	31.1		44.8		56.6		48.4
Second Quartile	1987	55.0	1972	67.2	1971	83.8	1960	73.9
	1986	55.5	1984	68.3	1979	86.3	1987	78.3
	1970	56.3	1989	70.9	1958	86.4	1945	78.6
	1958	59.5	1951	73.7	1954	89.9	1982	79.0
	1945	60.5	1985	75.5	1968	95.8	1968	79.2
	1985	61.9	1943	75.9	1985	97.6	1942	83.2
	1990	62.6	1981	86.8	1942	99.1	1983	87.4
	1950	63.0	1982	88.8	1952	103.8	1951	91.5
	1957	65.0	1960	94.7	1964	101.1	1969	93.7
	1965	71.2	1962	95.4	1980	101.8	1979	100.8
	1989	75.0	1980	99.9	1950	103.0	1965	102.7
	1983	76.6	1979	100.7	1982	103.7	1984	102.8
	1942	77.6	1993	103.4	1975	105.6	1959	105.2
	AVERAGE	64.5		84.7		98.5		88.9
Third Quartile	1947	80.8	1966	107.7	1957	106.0	1981	111.4
	1977	82.1	1947	107.9	1947	108.7	1954	111.7
	1969	87.1	1944	122.9	1960	109.4	1963	115.5
	1961	87.2	1988	123.7	1953	112.6	1947	121.0
	1953	90.0	1973	137.1	1984	113.2	1986	122.0
	1975	95.1	1964	139.1	1992	114.9	1985	125.6
	1972	101.2	1958	139.5	1951	117.6	1961	130.9
	1988	103.4	1985	139.6	1965	117.9	1955	132.9
	1948	108.2	1950	140.0	1974	119.2	1943	133.8
	1963	108.6	1942	140.3	1993	121.6	1975	134.9
	1955	108.9	1981	140.7	1988	123.8	1944	135.5
	1971	112.3	1949	145.1	1991	124.3	1950	138.6
	1978	117.8	1990	150.8	1948	129.7	1971	144.5
	AVERAGE	98.7		133.4		118.8		127.6
Fourth Quartile	1976	118.5	1963	155.7	1955	129.7	1970	147.1
	1980	123.2	1977	163.2	1983	132.8	1949	153.2
	1968	125.9	1970	167.6	1963	137.3	1952	154.2
	1993	131.8	1988	174.4	1969	137.6	1978	160.7
	1981	139.3	1983	183.6	1990	139.1	1956	160.8
	1973	159.1	1978	186.6	1973	148.3	1974	162.4
	1974	164.2	1952	206.1	1945	151.3	1966	165.5
	1969	167.5	1974	207.6	1987	152.0	1973	172.9
	1992	180.1	1989	212.3	1988	162.5	1958	173.0
	1954	181.7	1955	216.0	1981	165.4	1953	175.7
	1946	200.8	1959	218.7	1981	171.5	1976	184.5
	1950	228.9	1989	301.6	1989	176.4	1992	214.3
	1984	236.9	1956	309.9	1956	181.9	1993	234.5
	AVERAGE	166.0		208.0		151.6		173.8

## Flora

The extent of Flora, has been affected by Quarry, Landfill and Speedway activities and the previous extraction of surface soils and gravels. Much of the fauna is regrowth of hardy scrub and trees able to survive upon the limited soil types. Certain species observed include callitrus glaucophylla, acacia doratoxylum and eucalyptus populnea.



Noxious Weeds are present





Surface Gravels Extracted, Abandoned Compost Area  
and  
Future Rural Residential Zonings to the East



Typical species normally found on the MacPherson Range are:-

- White Cypress Pine
- Bimble Box
- Currawong
- Dwyers Gum
- Acacia
- Cassia
- Emu Bush
- Gargaloo
- Australian Indigo

Grass cover range from exotic to natives i.e. wild oats, mulga grass, blue crowfoot, variable speargrass, box grass, wiregrass, and soursob.

Noxious Weeds including Prickly Pear, Bathurst Burr, St John's Wort and Patterson's Curse exist on the site.

### Fauna

Typical fauna frequenting the site are:-

- Eastern Gray Kangaroo
- Swamp Wallaby
- Echinada
- Possums

Rabbits and cats are feral animals present on the site.

Common reptiles include the Eastern Brown Snake, Red bellied snake, yellow faced whip snake, goanna, shingle lizards.

The bird life includes waders, ibis, ducks, seagulls, parrots, cockatoo, galahs, plovers, finches, robins, crested pigeon, crow, magpie, piping shrike, currawong, budgerigar, sparrows, postlebirds, Indian Myner and Wagtails.

### Other Environmental Issues

Windborne litter and fire control are other issues to be managed on the site.

The visual affects of the site use can only be seen from the Northern areas which is predominantly rural. Extensive tree removal will be dominant on the slopes by the Speedway, Quarry and Landfill activities.

## 1.5 REGULATORY CONTROLS

### The Quarry

The Quarry was granted a development consent as a “designated development” (number 78/91) dated 24 December, 1991. The conditions of consent are disclosed in Attachment 11. The Quarry holds a current licence with the EPA Licence No. 004106 - File No. 235214/B01 and conditions of the licence are disclosed in Attachment 12.

The consent granted by the Council allows for extraction of up to 25,000m<sup>3</sup> p.a. The consent also requires payment of :-

1	Royalty	25¢ m <sup>3</sup> to a Rehabilitation Reserve
2	S94	22¢ m <sup>3</sup> to tip and Slopes Road maintenance

The operator has a Council contract to process 120,000 m<sup>3</sup> over a three (3) year period commencing 1995. 70,000m<sup>3</sup> of the 120,000m<sup>3</sup> contract extraction had been removed by September, 1997. In 1997, 57,000 tonnes were extracted.

The EPA licence related to a 10,000 - 50,000 tonne extraction range per annum. Other areas to the west of the landfill have been quarried by Council without approval.



### The Landfill

The Waste Depot (Landfill) site obtained an “Approval” from the Department of Health under S.283 (4) of the Local Government Act, 1919 on the 11 October, 1984. The conditions of the approval are attached in Appendix 13. Preparatory and operational conditions prepared by the Council were submitted 29 May, 1984 and are attached in Appendix 14.

A Review of Environmental Factors was prepared by the Council and submitted to the Health Commission of NSW on 4 May, 1982. This Review is attached in Appendix 15.

The Waste Depot is deemed to be an “offensive” industry for which a development consent was required under the then current Zoning Rural 1(a).

No required Development Consent has been obtained for the Waste Depot that has now been operating for the past 15 years at the site.

Anecdotal recollections infer that Council's involvement resolutions and preparatory applications and approvals by the Department of Health, with the Review of Environmental Factors was in fact a formal approval by the Council to the Development.

A Pollution Control Approval No. 002906 (file number 235451/C01) was obtained from the EPA on 19 December, 1996 under Section 17K of Pollution Control Act, 1970 for a disposal trench for putrescible matter. The conditions of the approval are attached in Appendix 16.

### The Speedway

A similar situation also exists with the Speedway, in that no formal development consent has been granted by the Council, albeit the Council has granted formal permissive occupancy to the Club. Some of the structures at the speedway have been granted building approval, when Council has required applications to be lodged.



Speedway and Rural lands to the North.

## **1.6 Waste Types and Quantities**

### **1.6.1 Projected Disposal Rates**

The design proposal submitted for the Department of Health Approval was based on population generation rate of 63 tonnes per capita for population.

1982-1985	=	21,954 persons
1986-1990	=	23,214 persons
1991-1995	=	24,545 persons
1996-2000	=	25,954 persons

to generate over the period specified, the following tonnages:-

1982-1985	=	55,473 tonnes (13,868 t/pa)
1986-1990	=	73,321 tonnes (14,664 t/pa)
1991-1995	=	77,525 tonnes (15,505 t/pa)
1996-2000	=	81,975 tonnes (16,395 t/pa)
Total	=	288,295 tonnes

The design allowed for a volumetric capacity of 2,600,00m<sup>3</sup> (see Appendix 17). The projected tonnages using a compaction ratio of 300kg/m<sup>3</sup> and a 20% cover material, converts the waste space requirement as 2,306,368 m<sup>3</sup>.

The surveys of the space usage are depicted in Drawings 14 indicates the volumes and tonnes has a lesser generation for the projected periods. This situation is influenced by:-

- Recycling of waste
- Commercial waste recycling
- Considerable amounts of the waste was putrescible not disposed of in the layers
- Operation of Yenda Depot as an alternative disposal option
- Lesser actual population growth

Nevertheless, the actual generation rates appear to be realistic to the predictions made in 1982.

Council in December 1995 adopted a Waste Management Strategy which examined generation rates relative to:-

- Increases per capital/p.a. (1 tonne/pa)
- Revised population figure
- Surveys by visual assessment

The results found were:-

Yenda	1,248 tonnes
Tharbogang	24,052 tonnes
Total	25,300 tonnes

Sources of waste were broken down to:-

Domestic	8,780 tonnes
Commercial and Industrial	11,060 tonnes
Builder's waste	4,060 tonnes
Farm waste	1,400 tonnes
Total	25,300 tonnes

These projections are now seen as too high and were distorted by:-

- Short period of survey
- Seasonal abnormalities
- Arbitrary generation rates may not be typical of the metropolitan figures (1 tonne/person)
- Putrescible waste has a high liquid content

An assessment was made of delivery sources for disposals as:-

Garbage Collection (MSW)	40%	=	10,120 tonnes
Small Domestic	35%	=	8,855 tonnes
Trade and Industry	25%	=	6,325 tonnes
Total	100%	=	25,300 tonnes

Weighing of Council's vehicles (MSW) was extrapolated for two (2) years:-

1993 - 8,840 tonnes p.a.  
1994 - 6,760 tonnes p.a.

These figures do not give a clear figure due to:-

- short period of weighing
- seasonal fluctuations
- combined collection of DWMS and tradewaste



The estimations arising from these assessments is that the generation rate could range from 15,000 tonne to 20,000 tonne per annum.

The breakup of sources by visual survey are confirmed as revelant:-

Garbage Collection (MSW)	40%
Public Access (Farms, etc.)	35%
Trade and Industry (Commercial/Trade Waste)	25%

### 1.6.2 Quarry Extraction Rates

The quarry has the quantity of 661,000 m<sup>3</sup> to be removed. In a bulking state this is equal to removable quantities of a 1.2 factor (leaving over burden stripping aside) = 769,200 m<sup>3</sup>.

Upon the terms of the Development Application consent this would amount to 30 years of extraction. In 1997, the extraction was 57,000 tonne or 68,400 m<sup>3</sup> giving an extraction life of 11.3 years.

The operation of the quarry will be carried out by overlay extraction in stages to the ultimate quarry floor. (See Drawing 18)

In terms of access for disposal of waste, the current quarry site will not be available for a further eight (8) years on present extraction rates.

### 1.6.3 Nett Site Life

Based on the current above extrapolations and potential resource use on the site, the capacity of the site for Waste Disposal Purposes can be at least for 40 years. The extraction on site is also exceeding the deposition of waste and the reality is that the site has a capacity allowing for moderate growth of at least 50 plus years.

The constraints will be environmental impacts, particularly on the Rural 1(c) zone for rural/residential subdivisions east of the land.



Recycling Contractor on Disposal Platform



#### 1.6.4 Waste Acceptance

Council accepts at this depot:-

- Municipal Waste
- Commercial/industrial tradewaste (Chemicals excluded)
- Domestic Waste
- Green Waste
- Organic and Highly putrescible waste (including dead animals and poultry)
- Builders Waste
- Clean Fill
- Recyclables
- Asbestos Waste
- Tyres (for redirection)
- Domestic Hazardous Chemicals (for redirection)
- Contaminated Waste (Medical, Veterinary, home nursing wastes)
- Liquid Wastes



Source Separation at Tipping Platforms

Council does not accept for disposal any wastes that are:-

- Chemical in nature or composition from industrial/commercial premises or operators
- Chemical drums
- Heavy metals (excluding lead)
- Intractable
- Oils and greases
- Inflammable or
- Ashes, smouldering, or heated wastes

Council has accepted and only at the direction of the EPA, spillages and contaminated wastes soils for atmospheric remediation as a community service.

## 2.0 CURRENT LANDFILL OPERATIONS

### 2.1 CURRENT APPROVALS

The current operations in the main, reflect the approvals and operating standards that were in force or compliance standards for the establishment of the depot and its legislative maintenance. For obvious reasons there are benchmark departures from the Guidelines for Solid Waste Landfills released by the EPA in 1996.

In practical and economic terms it is not possible to retrospectively apply the “self containment” benchmark philosophy to the existing and completed landfill components.

The elements of the approvals and operating standards are:-

- 1 Layers of compacted waste 1.8 metres high.
- 2 Containment to Stage 1 boundary.
- 3 Daily coverage of waste with 150mm fill.
- 4 Surface water diversion and containment.
- 5 Leachate entrapment and treatment.
- 6 Final capping and rehabilitation.
- 7 Litter containment barriers.
- 8 Stock proof fence.
- 9 Fire Control.
- 10 Leachate monitoring.
- 11 Site Supervision and access hours.

### 2.2 CURRENT DESIGN STAGES

Drawing 4 depicts the Stage 1 Landfill location. The landfill platforms are in layers equivalent to the 165 RL. Ridgeline height, to a battered elevated northern face of 40 metres above the natural ground level. The areas immediately west and east are to be capped and battered for stormwater runoff and diversion.

Stage 2 is to move into the completed quarry excavation to the south east of the existing landfill.

Stage 3 is to subsequently landfill the area to the west of the existing landfill. This area is a ridge spur proposed to be quarried in the future. No quarry development consent has been sought for this future development.

Stage 4 will be landfilled layers over the existing “old putrescible disposal areas” in the north west portion of the site (20 metre layers) on contour slopes.

Stage 5 will be a 20 metre contour layers over the eastern portions of the site to the southern crest.

Stage 6 will be a 20 metre contour layer over the existing Speedway after relocation of the speedway to other parts of the competed landfills.





Advancing "Dry Tomb" Cell



Cover to Wastes

## **2.3 CURRENT OPERATIONS**

### **2.3.1 Putrescible Waste Dump Area**

The current approved area on the northern alignment is depicted on drawing 9. The quantities accepted by the Council has been vastly reduced. The generators are now being required to develop their own waste management plans for such wastes.

### **2.3.2 Asbestos Disposal**

Asbestos wastes mainly from the building industry, i.e. compressed fibro sheeting and roofing, is disposed into an excavated trench upon the northern boundary. The area required special identification and survey.

### **2.3.3 Recycling**

#### Composting

A lease was granted to the Compostable Company (V Stead) to use land for compost production near the entry (Lot 280). This operation was intermittent and appears to have been abandoned. The lease has expired. (Refer to Page 19)

#### Salvaging

Scavenging and salvaging rights have been awarded to R Gatty (Contractor) who operates on the Waste Depot Platforms these activities are signposted for users to encourage community recycling or redirection of the waste stream. (Refer to Pages 24, 30, 31)

Salvaging of scrap metals, glass, cans and batteries has recommenced during the year.

The materials recycled include:-

- Ferrous metals
- Alloys
- Non ferrous metal
- Glass
- Builders Waste
- HDPE
- White goods
- Timber
- Batteries
- Oils

The contractor has roles of:-

- Monitoring and direction of the public and users
- Segregating the waste stream
- Completion of returns as to users
- Ranger control for illegal activities





Ferrous and Non Ferrous Material Recovery



Battery Recovery





Steel Recovery



Steel Recovery - White Good Recovery

### Metal Recycling

Council operates with “Metal Recyclers” reclamation of car bodies, engines and white goods. These items are diverted from the waste stream (see photo) for crushing by mobile equipment, baling and transportation to metal reprocessing plant. Last year an estimated 4,000 tonnes were diverted.

### Tyres

Council stockpiles tyres, which are separated from the waste stream for collection and redirection to a tyre recycler/processor operating outside West Wyalong, which shreds and landfill these products.

Council imposes a set charge according to the size of the tyre to cover processing costs with an additional disincentive charge higher than the generator source collection charge. Council made arrangements for a collection service at the main retail/commercial sources by the same agent at a cheaper cost to discourage transport of discarded tyres to the waste depot. The major tyres firms have also made arrangement for collection of discarded tyres from retail outlets.

Nevertheless, there are some operators and community need for discarded tyres to have reception arrangements at Waste Depots.

### **2.3.4 Hazardous and Contaminated Wastes**

Council provides a special collection services for clinical, medical, veterinary, dental and home nursing products. This service has disposal arrangements by landfill in a separate disposal area not accessible to the general public.

Council conducted a chemical waste collection day for domestic and farm sources using the services of CWDS Pty Ltd (EPA Licensed 4801 and 006216) for redirection of these wastes to approved disposal facilities and EPA docket procedures were observed.

Quantities collected were:-

Laboratory Chemical	1 kg
Corrosive liquids	1.5kg
Pesticides/herbicides	689kg
Cyanide	0.1kg
Oxidising Compounds	0.5kg
Total	693kg

A further 22 tonnes of materials from Commercial operators was refused due to accountability of the EPA Tracking Responsibilities to the generator and the costs involved.

### **2.3.5 Landfill Operations**

The landfill provides for disposal of an estimated tonnage of 15,000 tonnes per annum of class 1 Inert Wastes and class 1 solid wastes (total combined tonnage).

The landfill is not operated on a site located in an area listed in Table 1 as being an environmentally sensitive and inappropriate areas for landfilling.

The landfill is a combined “cut and fill” of subground layers to bedrock using an advancing cell face for in and aboveground layers (2 metres in height). Recyclables are source separated by deposition or plant operation.

Green waste is separated and stockpiled in small quantities for burning on the sealed platform layers, according to restrictions or hazards.





Tyres are stockpiled separately according to license conditions.

#### Access

The landfill operates seven (7) days a week between the hours of 7am to 5pm. The access is locked outside these hours.





### Supervision

The landfill is supervised by:-

Council Staff	Management	- Director of Environmental Services	- Functional Responsibility
		- Manager of Health Services	- Executive Responsibility
		- Overseer of Health Services	- Operational Responsibility, Staff Training, Occupation Health and Safety
		- Team Leader - Waste Depot Operation	- Field Supervision
		- 2 x Plant Operators	
Contractor		- Salvaging and Access Supervision	
Laboratory Technician		- Leachate and Piezometer monitoring	
Fire Control Officer		- Overview of Fire Hazard Management	
Noxious Weed Officer		- Control of Noxious Weeds	

Operation methods and techniques are depicted in plan 19 and the photographs below.





Leachate Containment



## Equipment

Equipment used on the operations are:-

- Landfill compactor caterpillar 578 (20 tonne)
- Caterpillar Traxacavator (4 in 1) bucket and ripper tyne
- One x 8 tonne tipper truck Acco 1990 International
- One x 1,000 litre tanker and spreader sprays
- Scraper and long reach excavators hired as required

A leachate and landfill surface water detention basin is operated in the cover material excavation. Leachate is pumped through the garbage cell layers.





Surface waters diversion berms are installed on the east and west of the landfill. A siltration basin is formed downstream of the Quarry.





A further siltation detention dam is formed to collect the surface diversion runoff.



A further collection pit is formed near the northern boundary in the drainage depression below the putrescible pits. (See Page 11)

Eleven piezometers pits has been installed along the northern boundary to monitor groundwaters.

Litter control barriers 2 metres high are portable installations placed according to prevailing winds on the landfill levels. Fire control fire breaks and fire trails are maintained on and within the site.

## **2.4 ENVIRONMENTAL ISSUES**

The operation is not located upon “Environmentally sensitive land” and the landfill is required to be licensed with the EPA for reason that it receives more than 5,000 tonne of waste per annum.

It is an existing Landfill operation.

The following matrix outlines the issues, environmental goals and responses relative to benchmark techniques or alternative solutions. The matrix has been prepared using the EPA Draft LEMP Preparation Manual as a reference.

The main issues are summarised and will be referred to in the covering statements:-

### Environmental Impact

- 1 The site is in a remote rural land location removed from having any environmental impact to any resident.
- 2 The nearest visible residence which receives any prevailing environmental influences is four (4) kilometres away.
- 3 The internal access road which is bitumen sealed is 1.3 Kilometres long which reduces the environmental impact of vehicles leaving the facility.
- 4 The site is shared by a hard rock quarry.

### Environmental Characteristics

- 5 The annual rainfall is 410 mm and annual evaporation is 1,840 mm. The climate has a positive evaporation rate for all months of the year.

### Soil Type

- 6 The soils are limited on site and use for cover is adequate for containment measures for Stage 1 operation. Future stages, particularly 2, 3 and 4 will require importation of cover materials.
- 7 The soils have a permeability rate of approximately 0.2 metres per day. Coupled with evaporation/rainfall and soil types, certain benchmark techniques can be addressed by alternative solutions. The soil characteristics are shown in Soil reports in Appendix 20. Prepared by Coffey and Partners.

### Leachate and Groundwater Monitoring

- 8 11 Piezometers have been installed and monitored. The advent of groundwater in the piezometer network is rare. The present of any leachates in the piezometers has not been found.

Monitoring of leachate within the downstream surface water and groundwater basin (as distinct from the leachate dam) has been conducted and all monitoring is well within the indicator parameters for groundwater detection. (Table 2 Guidelines)



- 9 Monitoring for pesticides in the leachate dam has shown nil pesticides.
- 10 The overall evaporation rates and soil permeability in the site, generally means there is little groundwater generated or detected on the “downstream” catchment of the site.

#### Landfill Gas Generation and Monitoring

- 11 Whilst not a typical “Dry Tomb” Landfill cell operation, the climatical conditions and permeability of the cover to the cells pose difficulties and would incur unwarranted costs to monitor landfill gases. The climatic influences of winter is more likely to cause lateral migrations of landfill gases into the older established layers. The fact exists that landfill gases are more likely to be generated in the presence of moisture or groundwater. The local circumstances are that these conditions do not prevail. (Refer to Appendix 19)
- 12 Excavation of existing layers of the landfill have confirmed there is little decomposition of wastes, comparable to areas where there is high rainfall rates.

#### Land Management and Conservation

- 13 The resource that Council operates with its landfill and quarry on the same site is providing a nett extraction balance of quantities.  
  
Alternative solutions and operating procedures have been proposed bearing in mind that concept.
- 14 Council’s operation is seen as cost effective and practical to the existing plant and site.
- 15 There is a need to have more effective screening and recycling facilities at the existing waste depot. Council is to consider, implement and redesign the existing reception arrangements.
- 16 The economics of recycling in country areas is generally not viable. It is more often the case that more economic and environmental benefits will be achieved by landfilling such material.

#### Hazard and Loss of Amenity

- 17 The landfill site and present operating factors have influenced Council to retain alternative solutions to benchmark techniques as being satisfactory performance standards to achieve the Environmental Goals.

RC3/19K

## MATRIX 1

## GRIFFITH CITY COUNCIL - THARBONGANG WASTE DEPOT

## ISSUE: WATER POLLUTION

Prevention	Reduction	Control	Containment	Remediation	Monitoring	Acceptance
<p>1. Preventing Water Pollution by Leachate. Leachate must be controlled within the landfill site, ensuring that neither groundwater nor surface water is polluted.</p>	<ul style="list-style-type: none"> <li>Compliance with Class Waters Act limits.</li> <li>Quality of the leachate.</li> <li>Leachate condition compliance.</li> <li>Minimising of groundwater for leachate.</li> <li>Quality &amp; composition of the soil in the leachate.</li> <li>Rejection of unacceptable waste.</li> </ul>	<ul style="list-style-type: none"> <li>No. 1: Leachate barrier system.</li> </ul>	<ul style="list-style-type: none"> <li>Use of leachate &amp; impermeable clay liner.</li> <li>Mainline to bottom &amp; branch on northern boundary.</li> </ul>	<ul style="list-style-type: none"> <li>Leachate barrier by alternative soil on compacted within the site.</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring of groundwater impact.</li> <li>Contaminant &amp; recycling of leachate within the landfill site.</li> </ul>	<ul style="list-style-type: none"> <li>Less future acceptance of putrescible waste.</li> <li>Tighter controls on sewage wastes generating more organic waste.</li> </ul>
		<p>No. 2: Leachate collection system.</p>	<ul style="list-style-type: none"> <li>Use containment barriers with permeability range of 2.17 - 2.67 x 10<sup>-10</sup>.</li> <li>Provide leachate detention pond to direct &amp; collect all landfill waters.</li> <li>The effect of minimal rainfall rate &amp; high evaporation - use minimal generation of leachate.</li> </ul>	<ul style="list-style-type: none"> <li>Leachate collection provided by alternative solution.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal rates.</li> <li>Evaporation rates.</li> <li>Screening of acceptable wastes.</li> <li>Maintenance of leachate ponds &amp; recycling of leachates.</li> <li>Monitoring of groundwater impact.</li> <li>Screening of waste materials.</li> </ul>	<ul style="list-style-type: none"> <li>Less future acceptance of putrescible waste.</li> <li>Tighter controls on sewage wastes generating more organic waste.</li> </ul>
		<p>No. 3: surface water controls.</p>		<ul style="list-style-type: none"> <li>Use of topmark technique No. 3.</li> </ul>	<ul style="list-style-type: none"> <li>Maintenance of stormwater diversion during &amp; before in design &amp; operation.</li> <li>Retention of query allocation pond.</li> <li>Retention of landfill stormwater basin including dredging.</li> <li>Monitoring water quality of stormwater basin.</li> </ul>	<ul style="list-style-type: none"> <li>New quarry activities.</li> </ul>
		<p>No. 4: leachate monitoring program</p>		<ul style="list-style-type: none"> <li>Use of handmark technique No. 4.</li> </ul>	<ul style="list-style-type: none"> <li>Leachate compliance &amp; comparison with standards &amp; design conditions.</li> </ul>	<ul style="list-style-type: none"> <li>Less acceptance of putrescible waste.</li> </ul>

ISSUE: WATER POLLUTION					
1	<p><b>Detecting Water Pollution</b></p> <p>(Any effective monitoring must be developed for early detection of ground-water &amp; surface water pollution)</p>	<ul style="list-style-type: none"> <li>• Comply with licence conditions.</li> <li>• Compliance with Clean Water Act rules.</li> <li>• Monitoring of leachate quality.</li> <li>• Frequent monitoring of groundwater level &amp; piezometers.</li> <li>• Quality &amp; compliance of groundwater samples.</li> <li>• Rejection of unacceptable wastes.</li> </ul>	<p>No. 4 groundwater monitoring network.</p>	<ul style="list-style-type: none"> <li>• Installation of 11 piezometers.</li> <li>• Installation of stormwater diversion.</li> <li>• Installation of trench of drainage/drainage depression.</li> <li>• Consider environmental characteristics of the site.</li> </ul>	<ul style="list-style-type: none"> <li>• Use of alternative to joints combining a range of monitoring points on likely groundwater flows.</li> </ul>
			<p>No. 5 groundwater monitoring program.</p>		<ul style="list-style-type: none"> <li>• Rejection of unacceptable wastes.</li> <li>• More effective sample retrieval methods required.</li> </ul>
			<p>No. 6 groundwater assessment program.</p>		<ul style="list-style-type: none"> <li>• Compliance with standards &amp; licence conditions.</li> <li>• Submission of monthly sampling.</li> <li>• Detection of pollution.</li> <li>• Maintenance of monitoring regime.</li> <li>• Compliance with standards &amp; licence conditions.</li> <li>• Test results according to detection.</li> </ul>
			<p>No. 7 surface water monitoring program.</p>		<ul style="list-style-type: none"> <li>• Future landfill stages.</li> <li>• Future quarry operation.</li> <li>• Staff training on erosion control.</li> </ul>
2	<p><b>Remediating Water Pollution</b></p> <p>(Any collected groundwater or surface water pollution must be removed or treated)</p>	<ul style="list-style-type: none"> <li>• Quarterly testing results.</li> <li>• Detection of abnormalities.</li> <li>• Compliance with standards &amp; licence conditions.</li> <li>• Appropriate notification.</li> <li>• Remediation plan approved &amp; implemented.</li> <li>• Water quality restriction.</li> </ul>	<p>No. 8 water contamination remediation plan.</p>		



17. Environmental Goal	18. Performance Metric	19. Benchmark	20. Evaluation	21. Comments
Preventing Landfill Gas	<ul style="list-style-type: none"> <li>Emissions Landfill Gas must be minimal in such a way that:</li> <li>It does not reach concentrations.</li> <li>Odour levels are acceptable to a C minimum.</li> <li>Landfill Gas is sustainably utilised.</li> <li>Odour &amp; emissions must remain at a non-commercial level.</li> <li>Air is in compliance with the Air Quality Act &amp; does not pose a health risk to the community.</li> </ul>	<ul style="list-style-type: none"> <li>Compliance with standards &amp; license conditions.</li> <li>Application of best practice or alternative techniques.</li> <li>No. of explosions.</li> <li>No. of complaints.</li> <li>Health of the workforce.</li> <li>No. of fire.</li> <li>Adequate firefighting equipment &amp; response.</li> <li>Approval obtained for controlled waste burning.</li> <li>Revegetation of landfill.</li> </ul>	<ul style="list-style-type: none"> <li>No. 10 landfill gas containment system</li> </ul>	<ul style="list-style-type: none"> <li>Consider environmental characteristics of rainfall &amp; evaporation.</li> <li>Involved in design &amp; operational procedures for containment.</li> <li>Complete identification.</li> </ul>
		<ul style="list-style-type: none"> <li>No. 11 extension &amp; disposal of landfill gas.</li> </ul>	<ul style="list-style-type: none"> <li>Use containment barriers with permeable cover layers to filter gases.</li> <li>Control environmental characteristics of the gas measure to generate gas production.</li> <li>Use revegetation program.</li> <li>Control quantities of waste.</li> <li>Minimal compliance on colour.</li> </ul>	<ul style="list-style-type: none"> <li>Uses containment as alternative option relative to quantities of wastes &amp; environmental characteristics.</li> </ul>
		<ul style="list-style-type: none"> <li>No. 12 the prevention</li> </ul>		<ul style="list-style-type: none"> <li>Provides adequate firefighting equipment.</li> <li>Provides response training.</li> <li>Include in operational procedures.</li> <li>Include in design.</li> <li>Screening of waste.</li> <li>Involved in operational procedures.</li> <li>Approval granted by EPA.</li> <li>Waste reduction measures.</li> </ul>
		<ul style="list-style-type: none"> <li>No. 13 controlled burning</li> </ul>		<ul style="list-style-type: none"> <li>Supervision of success.</li> <li>Equipment application.</li> <li>Staff response training.</li> <li>Segregation of waste stream.</li> <li>Incidence of burning minimised.</li> <li>Complaint level.</li> </ul>
				<ul style="list-style-type: none"> <li>Impact of recyclable collection on waste composition.</li> </ul>

## ISSUE: AIR POLLUTION (continued)

Environmental Goal	Performance Indicators	Benchmark	Alternative Approaches to Controlling Emissions		Major capital expenditure for capping landfill included in: Management Plans
			No. 14 site closure	Uses benchmark technique No. 14.	
7. <b>Leaking Landfill Gas Emissions</b> (Effective measures for detecting landfill gas emission must be put in place)	<ul style="list-style-type: none"> <li>Detection of landfill gas</li> <li>No. of complaints</li> <li>No. of excursions</li> <li>Installation of a monitoring well</li> <li>Monitoring reports</li> </ul>	No. 15 subsurface gas monitoring devices	<ul style="list-style-type: none"> <li>Consider likely gas generation relative to waste quantities &amp; environmental characteristics</li> <li>Containment of gases &amp; filtering effect of permeable cover layers</li> </ul>	Uses alternative solution of landfill layer containment	<ul style="list-style-type: none"> <li>Compliance with standards</li> <li>Included in design &amp; operational procedures</li> <li>Growth of trees</li> <li>Included in design &amp; operational procedures</li> <li>New installation</li> <li>Compliance with standards &amp; licence conditions</li> </ul>
		No. 16 subsurface gas monitoring program	<ul style="list-style-type: none"> <li>Consider likely gas generation relative to waste quantities &amp; environmental characteristics</li> <li>Containment of gases &amp; filtering effect of permeable cover layers</li> </ul>	Uses alternative solution of landfill layer containment	<ul style="list-style-type: none"> <li>Included in design &amp; operational procedures</li> <li>New installation</li> <li>Compliance with standards &amp; licence conditions</li> <li>Included in monitoring regime</li> </ul>
		No. 17 subsurface gas emission monitoring	<ul style="list-style-type: none"> <li>Consider likely gas generation relative to waste quantities &amp; environmental characteristics</li> <li>Containment of gases &amp; filtering effect of permeable cover layers</li> </ul>	Uses alternative solution of landfill layer containment	<ul style="list-style-type: none"> <li>Included in design &amp; operational procedures</li> <li>New installation</li> <li>Compliance with standards &amp; licence conditions</li> <li>Included in monitoring regime</li> </ul>
		No. 18 gas accumulation monitoring	<ul style="list-style-type: none"> <li>Consider likely gas generation relative to waste quantities &amp; environmental characteristics</li> <li>Containment of gases &amp; filtering effect of permeable cover layers</li> </ul>	Uses alternative solution of landfill layer containment	<ul style="list-style-type: none"> <li>Included in design &amp; operational procedures</li> <li>New installation</li> <li>Compliance with standards &amp; licence conditions</li> <li>Included in monitoring regime</li> </ul>
8. <b>Rawlandfill Gas Emission</b> (Any uncontrolled gas emissions detected must be effectively remediated)	<ul style="list-style-type: none"> <li>Detection of excessive raw gas</li> <li>Monitoring</li> <li>Reporting mechanism</li> </ul>	No. 19 remediation of uncontrolled landfill emissions		Uses benchmark technique No. 19.	<ul style="list-style-type: none"> <li>Detection of emission</li> <li>No explosion</li> <li>Complaints investigated</li> <li>Monitoring procedure included in operating procedures</li> </ul>



## ISSUE: LAND MANAGEMENT &amp; CONSERVATION

1. <b>Assessing Quality of Design, Construction &amp; Operation</b> (All design, construction & operation activities must be carried out in accordance with a quality system acceptable to the EPA.)	<ul style="list-style-type: none"> <li>The issue of a licence by the EPA.</li> <li>Compliance with licence conditions.</li> </ul>	<ul style="list-style-type: none"> <li>Occupation of landfill &amp; operations with design &amp; operational volumes as determined by Council and the EPA.</li> </ul>	<ul style="list-style-type: none"> <li>Use alternative solution to achieve appropriate operational standard.</li> </ul>	<ul style="list-style-type: none"> <li>License issued.</li> <li>Compliance with licence conditions.</li> <li>Engagement of Consultant for preparation of LEMP to SAA standards.</li> <li>\$100,000 increase in budget allocation.</li> <li>Dept of Local Government approval for DPA (LEMP).</li> <li>Environmental levy as an alternative to landfill levy as an alternative charge.</li> </ul>
2. <b>Assessing Quality of Incoming Waste</b> (Each site must resolve only those wastes that it is licensed to receive & dispose of in its authorised landfilling wastes).	<ul style="list-style-type: none"> <li>Acceptance of suitable waste.</li> <li>Camp use with licence conditions.</li> <li>Sorting of waste.</li> <li>Control &amp; monitoring measures.</li> </ul>	No. 21 screening of wastes received.	<ul style="list-style-type: none"> <li>Uses bench mark technique No. 21.</li> </ul>	<ul style="list-style-type: none"> <li>Manning of report.</li> <li>Acceptance of suitable waste.</li> <li>Compliance with WMAA &amp; licence.</li> <li>Illegal wastes rejected.</li> <li>Residue minimising.</li> <li>Fencing &amp; security of landfill.</li> <li>Staffing.</li> <li>Community &amp; industry education.</li> <li>Additional operating cost - Max. \$50,000 pa.</li> <li>Weightbridge &amp; control structures \$120,000.</li> <li>Additional costs \$.</li> </ul>
3. <b>Recording of Wastes Received</b> (The nature & quality of all wastes received must be known & recorded.)	<ul style="list-style-type: none"> <li>Acceptance of suitable waste.</li> <li>Compliance with licence conditions.</li> <li>Recording of wastes.</li> <li>Control &amp; monitoring measures &amp; preparation of surveyor to submit volumetric quality survey.</li> </ul>	No. 22 measurement of quantities received.	<ul style="list-style-type: none"> <li>Uses benchmark technique No. 22.</li> </ul>	<ul style="list-style-type: none"> <li>Additional operating cost - Max. \$50,000 pa.</li> <li>Weightbridge &amp; control structures \$120,000.</li> <li>Additional costs \$.</li> <li>\$10,000 surveyor costs.</li> </ul>
4. <b>Minimising Landfill Space Used</b> (Landfill space must be used efficiently & valued as a scarce resource).	<ul style="list-style-type: none"> <li>Competition rate of 600 kg/m<sup>3</sup>.</li> <li>Weightbridge installed.</li> <li>Surveys completed.</li> <li>Controlled waste recorded.</li> </ul>	No. 24 comparison of waste.	<ul style="list-style-type: none"> <li>Uses of existing equipment.</li> <li>Reclassification of output.</li> <li>Reclassification rates exceed deposit rates.</li> <li>Reclassification of current upgrading costs of service facility.</li> </ul>	<ul style="list-style-type: none"> <li>Monthly report submitted to EPA.</li> <li>Annual survey submitted of quantities deposited.</li> <li>Weightbridge installation.</li> <li>Annual reports.</li> <li>Additional staff required (1).</li> </ul>
	No. 27 filling parameters.	No. 27 filling parameters.	<ul style="list-style-type: none"> <li>Uses benchmark technique No. 27.</li> </ul>	<ul style="list-style-type: none"> <li>Additional survey costs \$5,000 pa.</li> </ul>

Sl. No.	Environmental Objective	Activity	Methodology	Expected Outcome	Key Performance Indicators	Responsible Agency	Timeline	Estimated Cost
1.	Maximisation of Recycling	Preparation of recycling plan, identification of recycling facilities, sorting of waste into recyclable products, recovered & price recovered.	Preparation of recycling plan, identification of recycling facilities, sorting of waste into recyclable products, recovered & price recovered.	Preparation of recycling plan, identification of recycling facilities, sorting of waste into recyclable products, recovered & price recovered.	Preparation of recycling plan, identification of recycling facilities, sorting of waste into recyclable products, recovered & price recovered.	Preparation of recycling plan, identification of recycling facilities, sorting of waste into recyclable products, recovered & price recovered.	Preparation of recycling plan, identification of recycling facilities, sorting of waste into recyclable products, recovered & price recovered.	Preparation of recycling plan, identification of recycling facilities, sorting of waste into recyclable products, recovered & price recovered.
2.	Remediation of Landfill after Closure	Preparation of a plan for the closure of the landfill, identification of the landfill site, preparation of a plan for the closure of the landfill, identification of the landfill site, preparation of a plan for the closure of the landfill, identification of the landfill site.	Preparation of a plan for the closure of the landfill, identification of the landfill site, preparation of a plan for the closure of the landfill, identification of the landfill site, preparation of a plan for the closure of the landfill, identification of the landfill site.	Preparation of a plan for the closure of the landfill, identification of the landfill site, preparation of a plan for the closure of the landfill, identification of the landfill site, preparation of a plan for the closure of the landfill, identification of the landfill site.	Preparation of a plan for the closure of the landfill, identification of the landfill site, preparation of a plan for the closure of the landfill, identification of the landfill site, preparation of a plan for the closure of the landfill, identification of the landfill site.	Preparation of a plan for the closure of the landfill, identification of the landfill site, preparation of a plan for the closure of the landfill, identification of the landfill site, preparation of a plan for the closure of the landfill, identification of the landfill site.	Preparation of a plan for the closure of the landfill, identification of the landfill site, preparation of a plan for the closure of the landfill, identification of the landfill site, preparation of a plan for the closure of the landfill, identification of the landfill site.	Preparation of a plan for the closure of the landfill, identification of the landfill site, preparation of a plan for the closure of the landfill, identification of the landfill site, preparation of a plan for the closure of the landfill, identification of the landfill site.



Sl. No.	Environmental Condition	Preventive Measure	Control Measure	Monitoring Measure	Assessment Measure	Follow up Measure
1.	Preventing Unauthorized Entry • Licence for driver. • Security of depot. • Hours of operations.	No. 30 security of site.	No. 30 security of site.	No. 30 security of site.	No. 30 security of site.	No. 30 security of site.
2.	Preventing Unauthorized Entry • Licence for driver. • Security of depot. • Hours of operations.	No. 31 litter control	No. 31 litter control	No. 31 litter control	No. 31 litter control	No. 31 litter control
3.	Preventing Noise Nuisance • Noise emissions from the operation must comply with noise control legislation.	No. 27 noise control.	No. 27 noise control.	No. 27 noise control.	No. 27 noise control.	No. 27 noise control.

## Appendix No 11

## ISSUE: HAZARD &amp; LOSS OF AMENITY (Continued)

1. Environmental Goals 4. Adequate Firefighting Capacity (each landfill site must have adequate fire fighting gear, equipment & staff to adequately manage the sub risks of any part of the landfill sites).	2. Performance Indicators a. No. of res. • Adequate equipment. • Timely response. • Fire breaks maintained. • Site security & hours of operation.	3. Benchmarks No. 39 fire fighting capacity.	4. Benchmarks No. 38. Uses benchmark technique	5. Additional staff required (1).
5. Adequate Staffing & Training The level and control of staffing at each landfill site must be adequate for any emergency response & safe management of a landfill.	Job description position objectives. Compliance with licence & operating procedures. Staff training aspects.	No. 39 staffing & training requirements.	Uses benchmark technique No. 38.	Job description objectives. Operating procedures established. No accidents.

10. Refer to the 'Appendix 11' for the details of the 'Appendix 11'.

## 3.0 FUTURE MANAGEMENT

### 3.1 ENVIRONMENTAL ACTIONS

The preceding chapter gives an overview and response to the existing landfill and departures to the benchmark techniques.

A further Matrix (No. 2) has been developed to respond to issues 3-6 of the Draft LEMP Preparation Manual. (See Page 51)

Council recognises that Environmental Actions are required to address:-

- 1 Screening and quality assurance of accepted waste materials;
- 2 Recycling plan;
- 3 Quantifying tonnages and volumes; and
- 4 Litter Control.

Council in its Landfill environmental management Plan has difficulty in meeting the benchmark techniques for:-

- Leachate barriers systems
- Leachate collection systems
- Landfill gas containment systems
- Extraction and disposal of Landfill gases
- Subsurface gas monitoring
- Surface gas emissions
- Gas accumulation monitoring
- Quality Assurance Certification Systems
- Compaction standards
- Covering of waste

Council contends that the current practices are environmentally and economically sustainable in the context of:-

- The soil type on site and limited availability of dense clays
- Detection of pollution safeguards
- Local climate
- Extractions rates
- Absence of groundwater
- Costs and limited availability of cover resources
- Remoteness of the site
- Prevailing weather influences and absence of residences

Council further contends it has been fiscally responsible for establishing Landfill capital expenditure reserves for operations and post closure measures without having to raise debts or loans externally. Council believes Local Government has sufficient moral and financial accountability to allocate funds for measures or works without an embargo being applied on its funds for financial guarantees to the State Government, for discharging Local Government functions.

Council's major Environmental Actions both off and on site will be directed towards waste minimisation in providing:-

- 1 Kerbside recycling collection services.
- 2 Redesign of the Landfill Disposal Depot into a recycling and re-direction facility.



The priority Council gives to its Waste Management Service functions reflects these directions.

The Council is currently preparing tenders for competitive tendering for improved collection service and an increased range of services. Having made a decision on that priority, the development of the waste depot would be in accord with operating needs and transportation issues.

A preliminary concept plan and costings are attached and have been shown as indicative costs in Matrix (2) and in the attached drawing No. 21.

### **3.2 SITE REHABILITATION AND POTENTIAL RE-USE**

The site rehabilitation recognises three (3) potential reuses, allowing for a co-hosting use (long term) of the quarry.

- 1 Speedway circuits.
- 2 Waste reprocessing or "green" industries.
- 3 Protecting the environmental sensitivity by providing revegetation of trees and saline resistant scrubs on recharge slopes.

The use and adaptation of the site is a long term activity in excess of fifty (50) years and who knows what use and technology may appear over five (5) decades of time and aspirations.

### **3.3 POST CLOSURE CARE AND OPERATION**

The important issue is to have long term monitoring safeguard and responsibility to respond to the issues.

The site use is long term and the monitoring is a long term responsibility.

**GRIFFITH CITY COUNCIL - THARBOGANG WASTE DEPOT**

**ISSUE: WATER POLLUTION**

1	Preventing Water Pollution by Leachates	Alternative solutions to Benchmark Technique No. 1 - Leachate barriers.	No.	Low	Leachate barrier.	To contain leachate.	To collect leachate.	GCC	July '98	\$81,000	Ongoing
		Alternative solution: 1 - Benchmark Technique No. 1 - Leachate barriers.	Yes.	Low	Leachate collection.	<ul style="list-style-type: none"> <li>To prevent collection.</li> <li>To collect &amp; treat leachate.</li> </ul>	<ul style="list-style-type: none"> <li>Alternative solutions available to bedrock &amp; lower material to sep. &amp; layer from local excavation.</li> <li>No more collection barriers &amp; trench on boundary.</li> </ul>	GCC	July '98	\$81,000	Ongoing
		Alternative solution: 2 - Benchmark Technique No. 2 - Leachate collection.	Yes.	Low	Leachate collection.	<ul style="list-style-type: none"> <li>To prevent collection.</li> <li>To collect &amp; treat leachate.</li> </ul>	<ul style="list-style-type: none"> <li>Alternative solution: complete environmental characterization, low rainfall, high evaporation, limited groundwater &amp; permeability of site soil.</li> <li>Leachate containment dam provided.</li> <li>Improved soil sampling of leachate required.</li> </ul>	GCC	July '98	Pumps \$29,000 Spray Equip \$11,500	Ongoing
		Benchmark No. 3 - Surface water control.	No.	Low	Diversion berm mounds Quarry situation basin Mainlined.	To divert groundwater. To trap sediments. To trap sediments. To trap sediments.	Term & drain installation Patient on basin.	GCC	July '98	\$12,250	July '98
					Maintain surface water detention areas.	To trap sediments. Provide filter control walls. To catch leachate mounds.	Retain collection basin.	GCC	July '98	\$7,000	July '98
		Benchmark No. 8 - Leachate monitoring system.	Yes.	High	Increase monitoring frequency. Install better piezometers	Detect leachate. Detect leachate.	More frequent sampling.	B Edwards (GCC)	July '98	\$2,000	July '98 monthly
						Detect leachate. Detect leachate.	So water sample results can be obtained by easier operation sampling device.	B Edwards (GCC)	July '98	\$8,000	July '98 monthly

## ISSUE: WATER POLLUTION (Continued)

Priority	Detecting Water Pollution	Techniques proposed	Yes	High	Increase monitoring frequency	Detect leachate	More frequent sampling	B Edwards (GCC)	July '98	\$5,000	July '98 monthly
2	Detecting Water Pollution	Benchmark No. 4 - Groundwater monitoring network	Yes		Initial better piezometers	Detect leachate	So better sample results can be obtained by easier operated sampling gear	B Edwards (GCC)	July '98	\$8,000	July '98 monthly
		Benchmark No. 5 - Groundwater monitoring	Yes	High	Increase monitoring frequency	Detect leachate	More frequent sampling	B Edwards (GCC)	July '98	\$8,000	July '98 monthly
		Benchmark No. 6 - Groundwater assessment	Yes	High	Install better piezometers	Detect leachate	So better sample results can be obtained by easier operated sampling gear	B Edwards (GCC)	July '98	\$8,000	July '98 monthly
		Benchmark No. 7 - Surface water monitoring	Yes	High	Increase monitoring frequency	Detect leachate	More frequent sampling	B Edwards (GCC)	July '98		July '98 monthly
3	Detecting Water Pollution	Benchmark No. 8 - Water examination, remediation plan	No	High	Increase serial spraying of leachate	Reduce leachate level	Aerial spraying over landfill	B Edwards (GCC)	July '98 Monthly	\$5,000	Monthly
									When required	?	When required



## ISSUE: AIR POLLUTION

Preventing Landfill Gas Emissions		Low		Call containment using lesser permeable material.		To exp landfill gas collection.		GCQ		Daily		Usual operational costs.		Ongoing	
1.	Benchmark No. 10 - LG 10-11 Benchmarks 10-11 Benchmarks 10-11	No.	Unlikely to meet benchmark criteria & density. Environmental factors & influence operations.												
	Benchmark No. 11 - Extraction & disposal of landfill gas.	No.	Not warranted due to low environmental impact & environmental characteristics & quality, climate & acids.	Low		Call containment		Limited gas generation		Low moisture & dry conditions.		Usual operational costs.		Ongoing	
	Benchmark No. 12 - Gas prevention	No.	High	Expand equipment staff training		Better fit response. Fit out fit.		GCQ		GCQ		Usual operational costs.		When required 1998	
	Benchmark No. 13 - Controlled burning	No.	High	Observed benchmark		Reduced waste environmental impact of 'spoil' sites.		GCQ		GCQ		Observed costs.		Constant	
Benchmark No. 14 - Site closure		Yes (Stage 1)	Low	Closure plan.		To monitor long term effects.		Consultant		2003		\$40,000		2006	

## ISSUE: AIR POLLUTION (Continued)

Equipment/Control Technology/Procedures	Subsurface gas migration Alternative solution to confinement relative to environmental factor & waste quantity	No. (Not warranted due to cost, low environmental impact, environmental characteristics or climate, quantify & settle)	Low	Waste containment	Minimise gas emission	Cover layers	GOC	Ongoing	Operational costs	Ongoing
2 Detecting Landfill Gas Emissions	Gas accumulation monitoring	No. (Not warranted due to cost, low environmental impact, environmental characteristics or climate, quantify & settle)	Low	Nil warranted						
	Landfill gas remediation	No. (Not warranted due to cost, low environmental impact, environmental characteristics or climate, quantify & settle)	Low							

[illegible]



## ISSUE: LAND MANAGEMENT &amp; CONSERVATION (Continued)

5. Remediation of Recycling	Benchmark No. 25 - Recycling management plan.	Yes.	Medium.	Recycling area.	Maximize recycling of.	Segregate recycling prior to waste disposal.	GCC.	July '99	\$140,000	July '99
a. Remediated Landfill after Closure.	Council creates reserve - leasehold from Ben's mark 25 - Flamingo/Sealances.	Yes.	Medium.	Engage recycling contractor.	Specialised marketing equipment.	Operates recycling service.	Contractor GCC	July '99	\$50,000	July '99
				Contractor engaged to prepare closure plan.	Prepare closure plan.	Engaged in 2003 near closure of stage 1.	GCC Consultant.	JUN 2003	\$50,000	JULY 2003
				Tip levy imposed.	Provide monies for rehabilitation.	July '98	GCC.	July '98	\$40,000	July '98
	Benchmark No. 26 - Site grading & revegetation.	Yes.	Medium.	Contractor engaged to prepare closure plan.	Prepare closure plan.	Engaged in 2003 near closure of stage 1.	GCC Consultant.	July 2003	\$40,000	July 2003
				Tip levy imposed.	Provide monies for rehabilitation.	July '98	GCC.	July '98	\$10,000	July '98
				Monitoring.	Debit problem.	Standard operational procedures.	GCC.	July 2003	\$5,000	July 2003 Ongoing.
	Benchmark No. 25 - Landfill closure & East maintenance of maintenance.	No.	Low.							

[illegible]

## ISSUE: HAZARDS &amp; LOSS OF AMENITY (Continued)

Item	Environmental Issue	Technical Problem	Priority	Low	High	Investigation	Investigate source	Field Investigation & mass interviews	GOC	WFO	Operational costs	As required
3	Preventing Noise Nuisance	Benchmark No. 37 - Noise control	No			Respond to complaint	Investigate source	Field Investigation & mass interviews	GOC	WFO	Operational costs	As required
4	Adequate Fire Fighting Capacity	Benchmark No. 36 - Fire fighting capacity	Yes			Acquire large tanker	Better response	Large volume of water	GOC	WFO	Operational costs	As required
						Maintain fire breaks	Reduce loss of wildlife & flora	Operational procedures	GOC	Ongoing	Operational costs	Ongoing
						Staff training response	Better fire response	Training & adequate equipment	Oversee	July '98	Operational costs	July '98
						Source segregation, tyre & greenhouse	Limit fire hazard	Operational procedures	Team leader	July '98	Operational costs	Ongoing
						Chow etc.	Limit to scopes	Lock gates, Operational procedures	Team leader	July '98	Operational costs	Ongoing
5	Adequate Staff Training	Benchmark No. 38 - Staffing & training requirements	Yes			Additional waste handling	More advice & supervision required	Additional person training level	Manager of Health Services	July '98	\$50,000	July '98
						Training of staff	Better control & indication	Staff instruction	Director & Team leader	Ongoing	Operational costs	Ongoing
						Accidents due to direction & safeguards training	Reduce hazard & increase indication	Staff instruction	Oversee & Team leader	July '98	\$7,000	July '98



## **4.0 ATTACHMENTS**

### **4.1 STANDARD OPERATION PROCEDURES**

(Future insertion as developed)

### **4.2 APPROVALS**

#### **4.2.1 Review of Environmental Factors**

(See Appendix 15)

#### **4.2.2 Health Commission Approval**

(See Appendix 13)

#### **4.2.3 Plan Stage 1**

(see Appendix 17)

#### **4.2.4 EPA Approval**

(See Appendix 16)

#### **4.2.5 Contour Plan**

(See Appendix 4)

### **4.3 LICENCES AND CONDITIONS**

### **4.4 MONITORING RESULTS**

(See Appendix 22)

### **4.5 NOTICES**

(See Appendix 23)

### **4.6 NON BENCHMARK TECHNIQUES**

(Future insertion as negotiated)

### **4.7 CERTIFICATES**

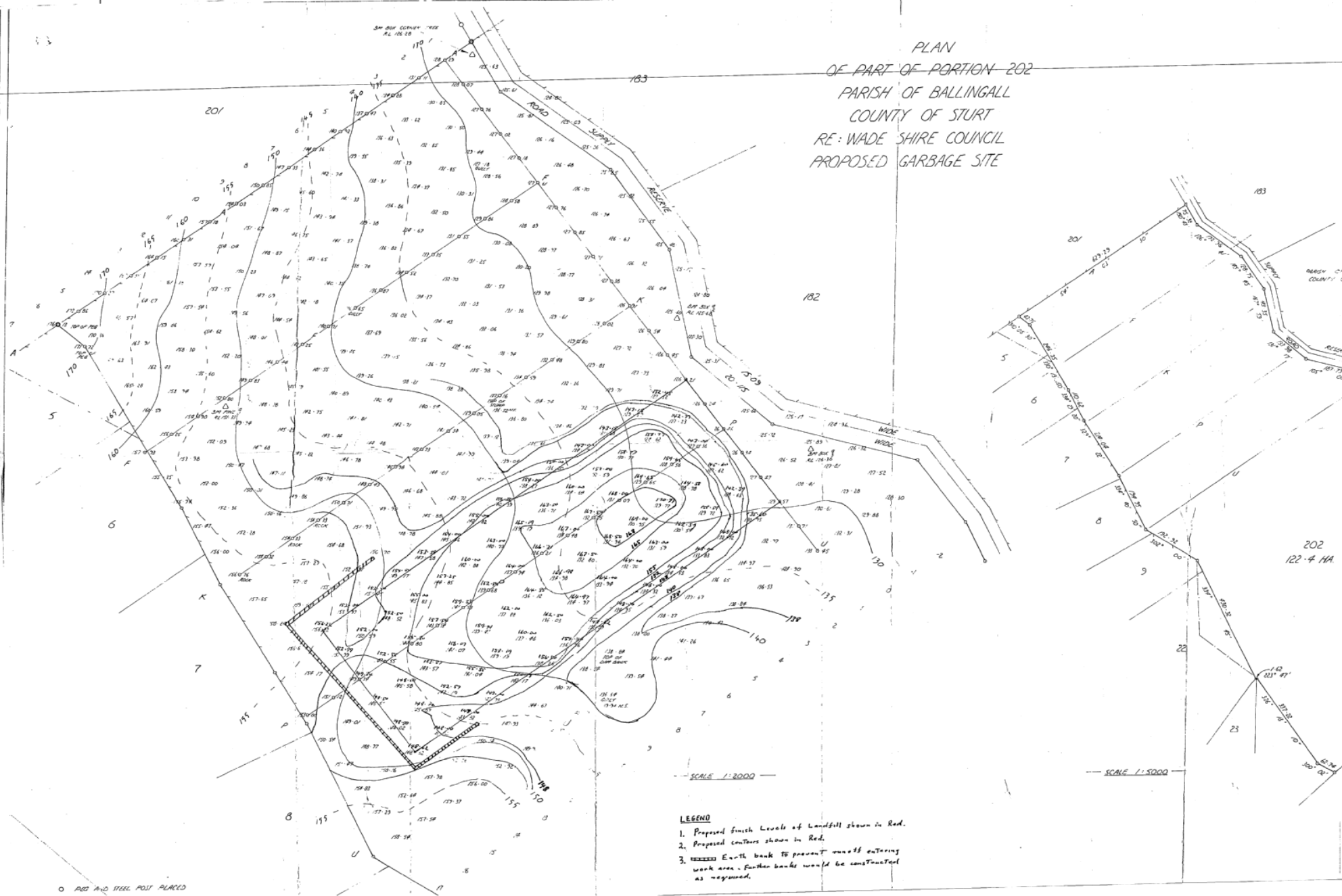
(Future insertion)

## **SUMMARY OF MAPS AND ATTACHMENTS**

Map 1	- Locality Map
Map 2	- Portions and Reserves
Map 3	- Site Dimensions
Map 4	- Contour Plan
Map 5	- Zonings
Map 6	- Zoning Index
Appendix 7	- Planning Objectives
Table 8	- Soil Analysis
Drawing 9	- Putrescible Pit and Piezometers
Table 10	- Wind Flows
Appendix 11	- Development Application Consent Quarry
Appendix 12	- Quarry Licence
Appendix 13	- Department of Health Approval
Appendix 14	- Council Proposed Operating Procedures
Appendix 15	- Review of Environmental Factor
Appendix 16	- EPA Approval
Map 17	- Volumetric Design
Drawing 18	- Quarry Extraction
Drawing 19	- Stage 1 - Current Profiles
Appendix 20	- Soil Tests
Drawing 21	- Re-Development Plans
Appendix 22	- Leachate and Surface Water Monitoring
Appendix 23	- EPA Notice issued 1996/97

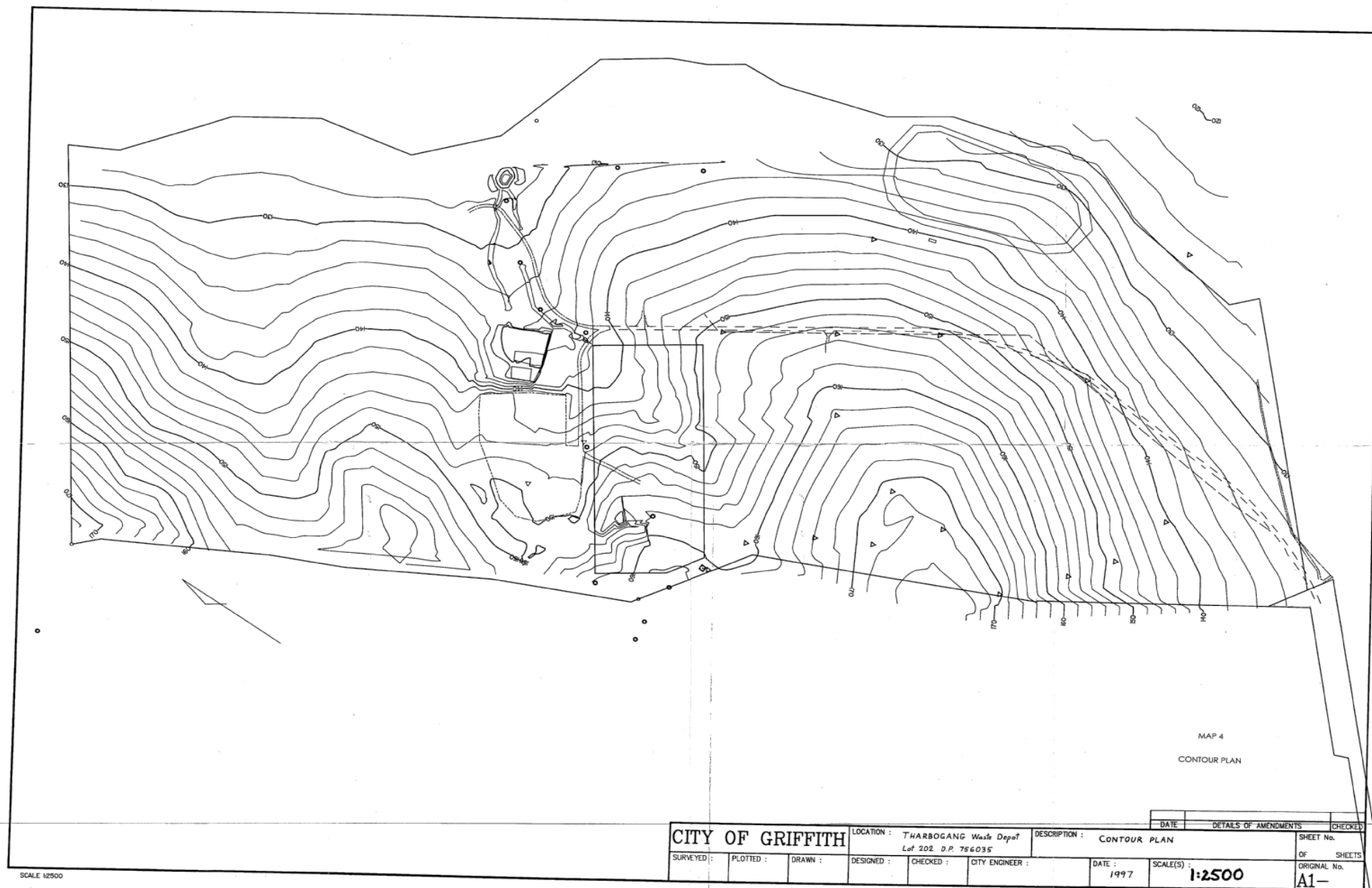
# Map 3 Site Dimensions

PLAN  
OF PART OF PORTION 202  
PARISH OF BALLINGALL  
COUNTY OF STURT  
RE: WADE SHIRE COUNCIL  
PROPOSED GARBAGE SITE



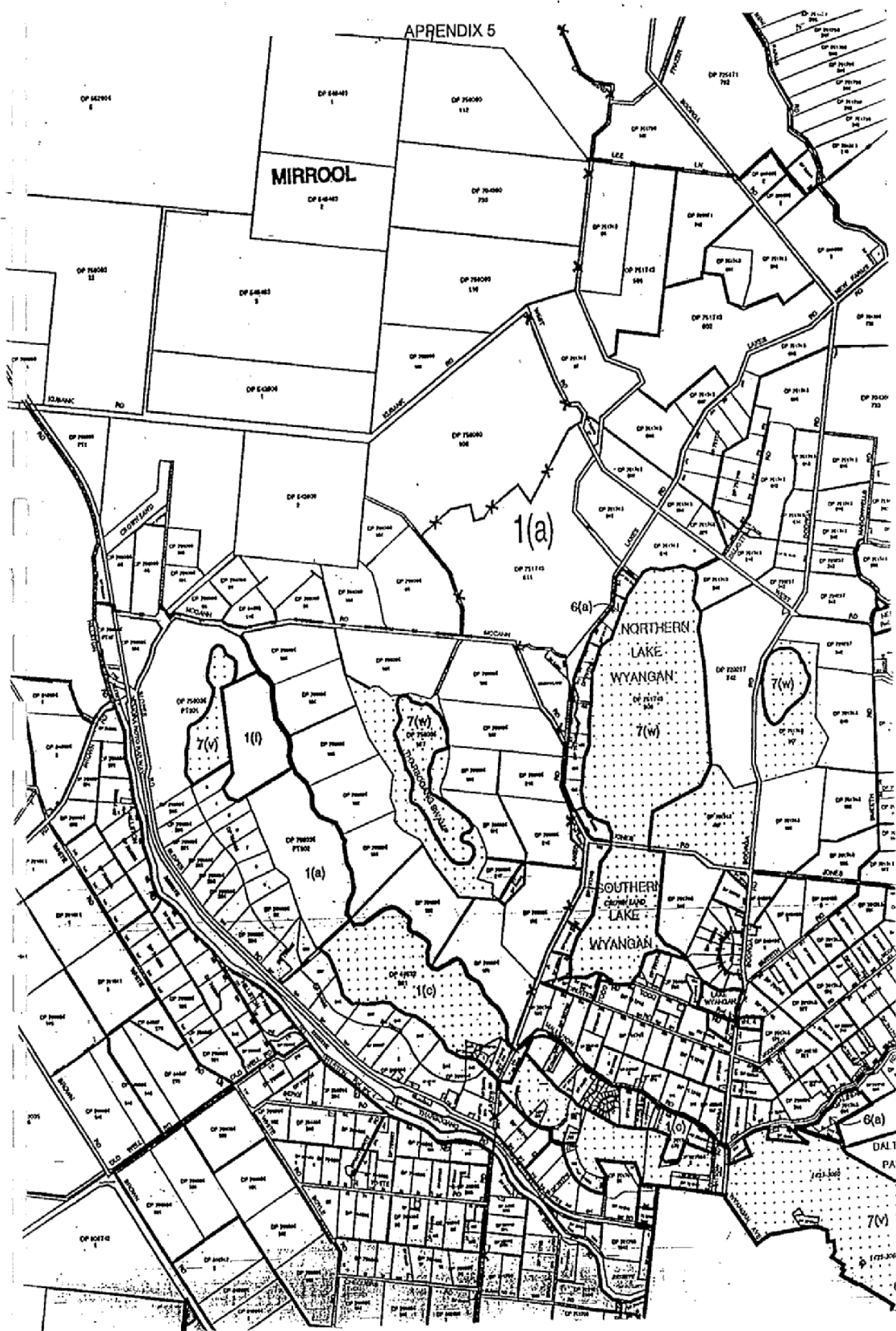
○ AND STEEL POST PLACED

# Map 4 Contour Plan





## Map 5 Zonings

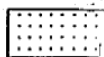

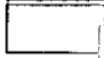



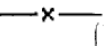



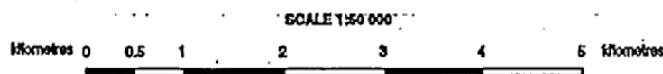
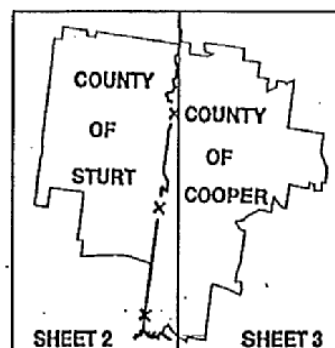
## APPENDIX 6

**ZONE INDEX**

- |          |   |      |
|----------|---|------|
| <b>1</b> | (a) RURAL (GENERAL)                                 | 1(a) |
|          | (c) RURAL (RESIDENTIAL)                             | 1(c) |
|          | (d) INVESTIGATION                                   | 1(d) |
|          | (f) RURAL (FORESTRY)                                | 1(f) |
| <b>2</b> | (a) RESIDENTIAL                                     | NIL  |
|          | (v) RESIDENTIAL VILLAGE                             | NIL  |
| <b>3</b> | (a) BUSINESS  | NIL  |
| <b>4</b> | (a) INDUSTRIAL                                      | 4(a) |
| <b>6</b> | (a) OPEN SPACE                                      | 6(a) |
| <b>6</b> | (b) OPEN SPACE (PRIVATE)                            | NIL  |
| <b>7</b> | (v) ENVIRONMENTAL PROTECTION<br>(SCENIC PROTECTION) | 7(v) |
| <b>7</b> | (w) ENVIRONMENTAL PROTECTION<br>(WETLANDS)          | 7(w) |

**GENERAL INDEX**

- |                                |   |
|--------------------------------|---|
| ENVIRONMENTALLY SENSITIVE LAND |  |
| FLOOD LIABLE LAND              |  |
| HERITAGE CONSERVATION AREA     |  |
| ARTERIAL ROAD                  |  |
| LOCAL GOVERNMENT AREA BOUNDARY |  |
| COUNTY BOUNDARY                |  |
| PARISH BOUNDARY                |  |
| VILLAGE / TOWN BOUNDARY        |  |



BASE MAP SUPPLIED BY THE LAND INFORMATION CENTRE  
DEPARTMENT OF LAND AND WATER CONSERVATION  
PANORAMA AVENUE BATHURST, NSW 2795.  
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ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

**GRIFFITH**

## **Appendix 7 Planning Objectives**

### **Appendix 7**

#### **ZONE 1(a) RURAL (GENERAL) ZONE**

##### **1 Aims and Objectives of the Zone**

- (a) to retain prime crop and pasture land where possible for the purpose of agriculture;
- (b) to retain viability and productivity whilst permitting diversity and flexibility in the management of agricultural land;
- (c) to prevent fragmentation of rural land and facilitate farm adjustments;
- (d) to facilitate rural adjustment by permitting the orderly subdivision and development of rural land and controlling the erection of dwellings so as to ensure the economic base of the City is protected;
- (e) to conserve, enhance and promote rural areas of scenic, tourist or agricultural significance to the benefit of the City;
- (f) to prevent the degradation of rural and natural resources;
- (g) to protect, enhance and conserve the water resource for use in the public interest;
- (h) to enable the development of the land within this zone for purposes which do not reduce the long term agricultural production potential of the land;
- (i) to enable the development of the land for rural industries and associated activities where the Council is satisfied that the use will not detrimentally affect or be affected by nearby agricultural activities; and
- (j) to enable the development of land for other purposes compatible with agricultural practices in the area where the Council is satisfied that the use will not detrimentally affect or be affected by nearby agricultural activities.

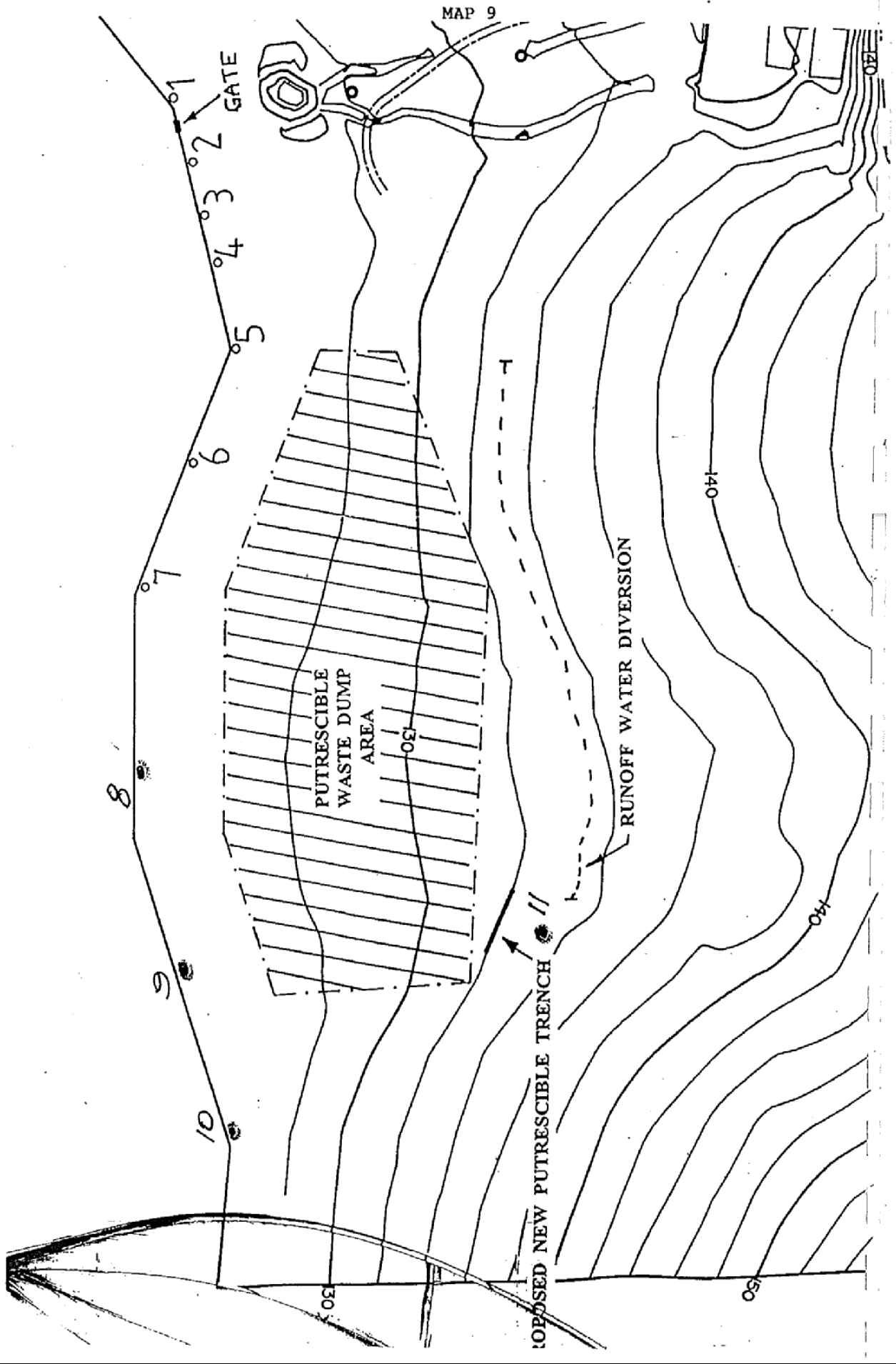
#### **ZONE 1(c) RURAL (RESIDENTIAL) ZONE**

##### **1. Aims and Objectives of the Zone**

- (a) to provide for a range of lifestyles to cater for all socio-economic groups, without causing adverse effects on the character and amenity of the City;
  - (b) to promote orderly and economic development of land identified as being suitable for rural residential development;
  - (c) to ensure that rural residential development is integrated with the rural landscape and is compatible with the capability of the site on which it is carried out to accommodate such development;
  - (d) to enable the development of land within this zone for rural residential purposes; and
  - (e) to enable the development of land within this zone for purposes which are appropriate land uses within the surrounding rural residential area where the scale, height, type and traffic-generating characteristics of the development are compatible with the character and amenity of the surrounding rural residential area and the existing or proposed nearby development.
-







APPENDIX 10

PERCENTAGE OCCURRENCE OF WIND DIRECTION IN THE  
MORNING AND AFTERNOON FOR EACH MONTH  
FOR GRIFFITH, N.S.W. BASED ON EIGHTEEN YEARS OF RECORDS

WIND DIRECTION	JAN		FEB		MAR		APRIL		MAY		JUNE		JULY		AUG		SEPT		OCT		NOV		DEC	
	900	1500	900	1500	900	1500	900	1500	900	1500	900	1500	900	1500	900	1500	900	1500	900	1500	900	1500	900	1500
North	4	8	13	6	8	6	7	4	7	6	9	7	11	9	10	9	13	10	13	8	11	6	14	7
North East	22	11	29	15	26	16	24	9	19	9	16	7	18	7	15	9	16	9	15	8	15	5	19	7
East	14	11	13	12	15	13	13	8	11	7	12	16	9	7	8	5	9	6	8	7	8	5	7	5
South East	8	10	9	12	9	11	7	10	7	10	7	11	5	8	4	7	5	7	7	6	9	7	7	8
South	18	22	17	20	16	19	13	18	11	14	8	16	6	13	8	14	14	14	16	20	20	20	18	20
South West	10	18	6	17	8	18	9	20	12	18	8	15	10	17	13	19	15	23	16	22	16	27	14	24
West	3	10	3	8	3	8	5	13	6	13	11	12	11	14	13	17	9	15	7	11	8	15	8	15
North West	8	8	6	8	9	10	10	13	16	16	16	16	18	21	17	17	12	15	13	14	9	11	10	11

SOURCE: BUREAU OF METEOROLOGY

# Appendix 11 Development Application Consent Quarry

## ATTACHMENT 11 DEVELOPMENT APPROVAL

### ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

#### NOTICE TO APPLICANT OF DETERMINATION OF A DEVELOPMENT APPLICATION

To: RHJ Faulkner, Town Clerk/General Manager  
of Griffith City Council, PO Box 485, Griffith

being the applicant in respect of Development Application No. 78/91 to develop a hard rock quarry with an anticipated annual yield of 20,000 to 25,000 cubic metres.

Pursuant to Section 92 of the Act notice is hereby given of the determination by the consent authority of the Development Application No. relating to the land described as follows:-

The Development Application has been determined by:-

- (b) granting of consent subject to the conditions specified in this notice;

The conditions of the consent are set out as follows:-

1. Council seeks and obtain approval from the State Pollution Control Commission under Section 17K of the State Pollution Control Commission Act, 1970 for the proposed quarry and crushing plant.
2. Council seeks and obtain any necessary approvals from the Department of Mineral Resources.
3. Dust Control
  - (a) In dry periods the whole quarry area must be comprehensively watered at regular intervals during operations.
  - (b) Prior to blasting both the area of ground to be blasted and the area of ground receiving the blast must be comprehensively watered.
  - (c) The crusher and screening plant must have banks of fire water sprays over:-
    - (i) rock receiving bins and hoppers.
    - (ii) at transfer points between crushers, conveyors and screens and the plant must not be operated without the sprays being turned on.
4. Blasting Operations
  - (i) During blasting operations the Griffith Waste Disposal Depot shall be closed.
  - (ii) The following blasting vibration and over pressure level to avoid disturbance to nearby residents shall be observed:-
 

Vibration 5 mm/second  
Over pressure 115 dBL
  - (iii) These limits are to apply between 9.00 am and 5.00 pm Monday to Saturday with lower levels required at other times.
  - (iv) The operation of blasting, design of firing patterns, types of explosive delays and methods of initiation, etc. should only be carried out by a qualified and experienced powderman.
  - (v) Impulsive noise restrictions apply to the site.

### Management Plan

Prior to the commencement of operations, Council shall prepare a Site Management Plan detailing Conceptual Development Plan of the quarry indicating crushing plant, stock piles, overburden material.

Details of erosion/stormwater systems to include:-

- control measures for internal drainage
- batter slopes, soil erodability
- erosion/sediment control measures
- lining of sedimentation ponds to prevent infiltration

Rehabilitation program.

Monitoring program and report mechanisms.

Operational management of the site.

6. Any leachate from the rubbish depot to be kept separate from run-off which will be dispersed downstream.
7. If any suspect Aboriginal archaeological relics are located during any works, works are to cease and the National Parks and Wildlife Service is to be notified.
8. Council to allocate \$ 0-25¢ per cubic metre to be paid to a Rehabilitation Reserve. Such reserve and amount/m<sup>2</sup> to be reviewed by the consent authority three (3) years from the date of consent.
9. A Section 94 Contribution be paid at \$0-22/m<sup>3</sup> to be towards road maintenance of the Tip and Slopes Road.
10. Council to ensure whoever crushes the rock shall hold the appropriate licences.
11. Council shall ensure that the general public does not have unrestricted access to the quarry site.
12. The applicant shall ensure that no nuisance emanates from the proposed activity to adjoining development or development within the locality.
13. The industry being conducted only between the hours of 7.30 am and 6.00 pm daily Monday to Friday, and from 7.30 am to 1.00 pm Saturdays.
14. The applicant shall provide staff amenities in accordance with the requirements of the Department of Industrial Relations. The applicant shall at his own cost make provision for an adequate water supply to undertake dust suppression activities.

The reasons for the imposition of the conditions are set out as follows:-

1. Preservation of the amenity.
2. Circumstances of the case.



PAGE 3

- Note (1) To ascertain the date upon which the consent becomes effective refer to Section 93 of the Act.
- (2) To ascertain the extent to which the consent is liable to lapse refer to Section 99 of the Act.
- (3) Section 97 of the Act confers on an applicant who is dissatisfied with the determination of a consent authority a right of appeal to the Land and Environment Court exercisable within 12 months after receipt of this notice.

R H J FAULKNER  
TOWN CLERK/GENERAL MANAGER

Per: 

R K STEWART  
CHIEF TOWN PLANNER

24-12-91  
.....  
DATE

Appendix 12 Quarry Licence

## ATTACHMENT 12

ENVIRONMENT PROTECTION AUTHORITY  
NEW SOUTH WALES  
Pollution Control Act, 1970.

**LICENCE****ORIGINAL**

Licence Number: 004106  
File Number: 235214/B01  
In Force From: 5 November, 1997  
In Force Until: 5 November, 1998

Name and Address of Licensee:  
GRIFFITH CITY COUNCIL  
PO BOX 485  
GRIFFITH NSW 2680

Name and Address of Premises, the subject of this Licence:  
ARD ROCK QUARRY OFF SLOPES ROAD  
LOT 202 DP756013, PARISH OF BALLINGAL  
THARBONGANG NSW 2680

This licence under the Pollution Control Act 1970 ("the Act") is granted to: GRIFFITH CITY COUNCIL ("the licensee") in respect of premises situated at: LOT 202 DP756013, PARISH OF BALLINGAL, THARBONGANG ("the premises") subject to the conditions specified below:

Other than in accordance with section 17B of the Act this licence is not transferable.

The conditions of this licence may be varied or revoked, or new conditions attached, at any time by notice in writing given to the licensee.

**DEFINITIONS**

In this licence except in so far as the context or subject matter otherwise indicates or requires -  
"EPA" means the Environment Protection Authority.

"regional office" means

Environment Protection Authority  
SOUTH WEST Regional Office  
130 - 140 BANNA AVENUE  
GRIFFITH NSW 2680  
Phone (069) 641880

Fax (069) 641885  
After Hours 131 555

Postal Address  
PO BOX 397  
GRIFFITH NSW 2680

"environment" includes all aspects of the surroundings of human beings, including:

- (a) the physical factors of those surroundings, such as the land, the waters and the atmosphere; and
- (b) the biological factors of those surroundings, such as the animals, plants and other forms of life; and
- (c) the aesthetic factors of those surroundings, such as their appearance, sounds, smells, tastes and textures.



ENVIRONMENT PROTECTION AUTHORITY  
NEW SOUTH WALES  
Pollution Control Act, 1970.  
**LICENCE**

ORIGINAL

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"harm" in relation to the environment, includes any direct or indirect alteration to the environment that has the effect of degrading the environment and, without limiting the generality of the foregoing, includes:

- (a) any act or omission that results in air pollution, within the meaning of the Clean Air Act 1961; and
- (b) any act or omission that results in the pollution of any water, within the meaning of the Clean Waters Act 1970.

"dry weather conditions" means less than ten millimetres of rain falling within a 24 hour period.

#### Pollution of waters

- S1. The licensee must not pollute waters except as expressly permitted by this licence. (That is, the defence in section 16 (6) of the Clean Waters Act 1970 is available only if the licensee pollutes waters as expressly permitted by this licence.)

In this condition, the terms "pollute" and "waters" have the same meaning as in the Clean Waters Act 1970.

#### Activities must be carried out competently

- S2. All activities carried out on the premises must be carried out in a competent manner.

In this condition, "activities" includes:

- (a) the processing, handling, movement and storage of materials and substances; and
- (b) the treatment, storage and disposal of wastes (including solid and liquid wastes).

#### Maintenance of plant and equipment

- S3. All plant and equipment installed or used in or on the premises:
- (a) must be maintained in a proper and efficient condition; and
  - (b) must be operated in a proper and efficient manner.

In this condition, "plant and equipment" includes drainage systems, infrastructure, pollution control equipment and fuel burning equipment.

#### Testing methods

- S4. Any monitoring required by this licence must be carried out:
- (a) in accordance with any relevant testing methods set out in the New South Wales Clean Air (Plant and Equipment) Regulation 1997, the Clean Waters Regulations 1972 or the



ENVIRONMENT PROTECTION AUTHORITY  
NEW SOUTH WALES  
Pollution Control Act, 1970.  
**LICENCE**

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Licence Number: 004106

In Force Until: 5 November, 1998

- (b) Noise Control Regulation 1975; or
- (b) in accordance with any method set out in any condition of this licence; or
- (c) if no compulsory method is set out in those Regulations or in this licence, in a manner approved by the EPA in writing before any tests are conducted.

**Record of pollution complaints**

5.1 The licensee must keep a legible record of all complaints received by the licensee or by any employee or agent of the licensee, in relation to pollution from or on the premises.

5.2 The record must include details of the following:

- (a) the date and time of the complaint;
- (b) the method by which the complaint was lodged;
- (c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
- (d) the nature of the complaint;
- (e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant.

5.3 The record of each complaint must be kept for at least 2 years after the complaint was received.

5.4 The records must be produced to any officer of the EPA who asks to see them.

**Records**

6.1 The results of any monitoring required by this licence must be recorded.

6.2 All records required to be kept by this licence must be kept in a legible form or in a form that can readily be reduced to a legible form.

6.3 The records must be kept for at least 3 years after the monitoring or event to which they relate took place.

6.4 The records must be produced in a legible form to any officer of the EPA who asks to see them.

**Reporting of environmental harm**

7.1 If anything happens on the premises that has caused, is causing or is likely to cause harm to the environment, whether the harm occurs on or off the premises, the licensee must report the event to the EPA as soon as practicable after it becomes known to the licensee or to one of the licensee's employees or agents.





ENVIRONMENT PROTECTION AUTHORITY  
NEW SOUTH WALES  
Pollution Control Act, 1970.  
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In Force Until: 5 November, 1978

- S7.2 The event must be reported by telephoning:
- (a) the regional office of the EPA on the phone number specified on the front of this licence, if the event is reported during office hours;
  - (b) the after hours telephone number specified on the front of this licence, if after office hours;
  - (c) in the event that an EPA officer cannot be contacted at either of those numbers, the EPA's "Pollution Line" service on 131 555.

- S7.3 This condition does not apply when the harm caused or likely to be caused to the environment is expressly permitted by this licence.

**Written report.**

- S8.1 The EPA may make a written request that the licensee prepare a written report of any event on the premises that, in the opinion of the EPA, has caused, is causing or is likely to cause harm to the environment, whether the harm occurs on or off the premises.
- S8.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within 21 days of the request, or within such shorter time as may be specified in the request.
- S8.3 The report must include the following information:
- (a) all details known to the licensee of the cause, time and duration of the event;
  - (b) all details known to the licensee of the type, volume and concentration of every pollutant released as a result of the event;
  - (c) the name, address and telephone number of every employee or agent of the licensee who witnessed the event;
  - (d) the name, address and telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
  - (e) details of any remedial action taken by the licensee or any other person in relation to the event;
  - (f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event.
- S8.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.



ENVIRONMENT PROTECTION AUTHORITY  
NEW SOUTH WALES  
Pollution Control Act, 1970.  
**LICENCE**

ORIGINAL

Licence Number: 004106

In Force Until: 5 November, 1998

**Certificate of compliance**

89.1 The licensee must supply the following particulars to the EPA, and must provide a certificate to the EPA, certifying that those particulars are correct:

**Monitoring conditions**

- (a) whether all monitoring required by this licence has been carried out;
- (b) if all the monitoring has not been carried out, what monitoring has not been carried out and the reasons why the monitoring has not been carried out;
- (c) whether all the monitoring data required to be reported to the EPA by this licence has been reported to the EPA;
- (d) whether all that monitoring data was reported within the time specified by this licence;
- (e) if all the monitoring data has not been reported to the EPA, or has not been reported within the time specified, the reasons why the monitoring data has not been so reported;
- (f) whether all the monitoring data reported to the EPA was derived from monitoring carried out in accordance with this licence;
- (g) if any of the monitoring data reported to the EPA was not derived from monitoring carried out in accordance with this licence, what monitoring data was not so derived and the reasons why the monitoring data was not so derived;

**Compliance with conditions**

- (h) whether every condition of this licence has been complied with;
- (i) if one or more conditions have not been complied with, in relation to each such condition:
  - (i) the nature of the non-compliance; and
  - (ii) the reasons for that non-compliance; and
  - (iii) any action taken to prevent, control or mitigate the non-compliance; and
  - (iv) any action that has been or will be taken to prevent a recurrence of the non-compliance.

89.2 The certificate must be in the form entitled "Pollution Control Act 1970 - Certificate of Compliance" available from any office of the EPA.

89.3 The certificate must be provided to the EPA no later than 6 weeks



ENVIRONMENT PROTECTION AUTHORITY  
NEW SOUTH WALES  
Pollution Control Act, 1970.  
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Licence Number: 004106

In Force Until: 5 November, 1998

after the date of expiry of this licence.

- S9.4 If this licence is a renewed licence, the certificate required by any previous licence held by the licensee must be provided to the EPA no later than 6 weeks after the date of expiry of the previous licence.
- S9.5 If the licensee is a natural person, the certificate must be signed by the licensee.
- S9.6 If the licensee is a corporation, the certificate may, as an alternative to the affixing of the corporate seal, be signed:
- (a) by the chief executive officer of the corporation; or
  - (b) by any other person approved by the EPA in writing.

**NOTE:** The certificate must not be completed or signed before the licence expires, as you must report your compliance with licence conditions for the entire licence period.

Licence must be kept at premises

S10.1 A copy of this licence must be kept at the premises.

S10.2 The licence must be produced to any officer of the EPA who asks to see it.

S10.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

Responsible employees

S11.1 This condition does not apply if the licensee is a natural person who conducts the operation by himself or herself.

S11.2 The licensee must authorise at least two of the licensee's senior employees or agents:

- (a) to speak on behalf of the licensee; and
- (b) to provide any information or document required under this licence.

S11.3 The licensee must authorise those persons, and inform the EPA of the names and telephone numbers of those authorised persons, within 14 days of the date of this licence coming into force.

S11.4 If this licence is a renewed licence, and the licensee has previously authorised persons and informed the EPA of their names and addresses, the licensee is not required to again inform the EPA if those people continue to be authorised and their telephone numbers have not changed.



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Pollution Control Act, 1970.  
**LICENCE**

**ORIGINAL**

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- S11.5 The licensee must inform the EPA of any change in the information provided under this condition within 14 days of the change.
- S .6 Any person authorised by the licensee must be readily contactable on the person's nominated telephone number during regular working hours.
- P1. Noise emanating from blasting operations must not exceed an over-pressure level of 115dB (linear peak) for more than 5% of the total number of blasts over a period of 12 months when measured at any noise sensitive locations (such as residential premises).
2. Noise emanating from blasting operations must not exceed an over-pressure level of 120dB (linear peak) at any time when measured at any noise sensitive location.
3. Ground vibration caused by blasting operations carried out between 0900 hours and 1700 hours on Mondays to Saturdays inclusive, must not exceed a peak particle velocity of 5mm/s for more than 5% of the total number of blasts over a 12 month period when measured or computed at any point within one metre of any residential boundary or in or on any noise sensitive areas (such as residential premises, schools or hospitals).
- P4. Blasting operations must not be carried out on Sundays or Public Holidays.
- P5. Ground vibration caused by blasting operations must not exceed a peak particle velocity of 10mm/s at any time when measured at any noise sensitive location.
- P6. When temperature inversions are present, blasting operations must be avoided.





ENVIRONMENT PROTECTION AUTHORITY  
NEW SOUTH WALES  
Pollution Control Act, 1970.  
**LICENCE**

ORIGINAL

Further conditions with respect to the Clean Air Act 1961  
Licence Number: 004106 In Force Until: 5 November, 1998

Prescribed Use Classification: GRINDING AND MILLING WORKS PROCESSING  
MORE THAN 50 TONNES PER ANNUM

Operational Scale: more than 10 kilotonnes but not more than 50  
kilotonnes per annum

- A1. All sealed surfaces intended to carry vehicular traffic must be kept clean.
- A2. Water sprays must be operated to suppress dust emissions from crushers, screens and material transfer points at all times when material is being crushed and/or screened.
- A3. Trucks transporting material from the premises must be covered immediately after loading to prevent wind blown emissions and spillage. The covering must be maintained until immediately before unloading the trucks.
- A4. The tailgates of all trucks leaving the premises must be securely fixed prior to loading or immediately after unloading to prevent loss of materials.

Appendix 13 Department of Health Approval

New South Wales Government

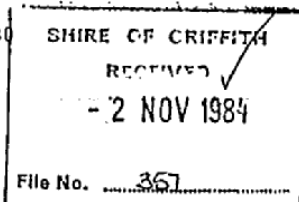
**Department of Health**

Reply to: Regional Director of Health  
 P.O. Box 59, Wagga Wagga, N.S.W. 2650  
 Phone: 23 0601 S.T.D. 069  
 Telex: 69784

Our reference: .....NSL:CN.....SW.....6235

Your reference: .....

The Shire Clerk  
 Griffith Shire Council  
 PO Box 485  
 GRIFFITH NSW 2680




30 October 1984

SANITARY DEPOT FOR GARBAGE AT GRIFFITH APPROVAL IN TERMS OF SECTION  
 283(4) LOCAL GOVERNMENT ACT, 1919

1. I refer to the lengthy negotiations regarding the approval of an area of land at Griffith as a depot for the disposal of garbage. Attached for your information is a copy of the formal approval by the Secretary of the Department of Health.
2. Your attention is drawn to the list of preparatory and operating conditions which were agreed to by Council and noted in your letter of 29 May 1984.

Yours faithfully

  
 Neil R Stubbs  
 for K R Brown  
 Regional Director of Health

enc 1

Copy CHS 2-11-84

DEPARTMENT OF HEALTH, N.S.W.C 18474  
EC:dkf

Sanitary Depot for the Disposal of Garbage at Griffith  
Application by Griffith Shire Council for approval of Site

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Approval Delegation

The Chief Health Officer may recommend the approval of a recommendation to the Secretary concerning the situation of a sanitary depot. Vide, Delegations of Authority, Department of Health, Number 50, Page 2-22, Delegations Manual No. (M.A.) 83-164 of the 15 February, 1984.

Note The reference in the Delegation to Minister is incorrect by virtue of the Local Government (Amendment Act No. 199, 1979. Schedule 2, Clause 8 (d)).

This amendment states:

(d) Section 283 (4) -

Omit "Minister of Health" insert instead "Health Commission".

Recommended for approval

*59/100 8/10/84.*  
Director,  
Institute of Public Health Bio-Sciences

Submitted for approval

*(Signature)*  
Chief Health Officer

Approved

*(Signature)*  
D.T. Richmond,  
Secretary.

*11/10/84*

Sanitary Depot for the Disposal of Garbage at Griffith -  
Griffith Shire Council.

---

Application by Griffith Shire Council for Approval of Site

1. Application has been received from the Griffith Shire Council for approval of a site for use as a sanitary depot for the disposal of garbage at Griffith.
2. The Regional Director, South West Region, has recommended approval and this is supported by Health Surveying Branch subject to compliance with the following conditions:

Conditions

- 2.1 The Depot site shall be surveyed by a registered Surveyor, the corners and angles in boundaries shall be marked by 75mm galvanised steel piping set in concrete and standing at least 1.500m above ground level.
  - 2.2 Upon completion of disposal operations at the depot, Council shall make application to the Department of Health to have the depot declared Unhealthy Building Land pursuant to Section 55, Public Health Act, 1902 as amended.
  - 2.3 As the operational planning data as supplied relates only to one valley, disposal operations shall not proceed beyond that area until suitable supplementary information has been supplied to the Department of Health.
  - 2.4 All fences, signs, access roads and drainage structures shall be maintained in good order.
  - 2.5 The depot shall be conducted in accordance with the "Review of Environmental Factors" which accompanied Council's letter of 4 May 1982 and the supplementary data supplied in Council's letter of 22 July 1982.
  - 2.6 The depot shall be operated by the Area Sanitary Landfill method whereby garbage, after being spread in thin layers (not exceeding 600mm in depth) be effectively compacted by a suitable machine before the next layer of garbage is deposited thereon.
  - 2.7 All putrescable material deposited at the depot shall be completely covered with a minimum of 150mm of soil within twelve hours of deposit at the depot.
  - 2.8 The garbage shall be placed in compacted layers not exceeding 1 800mm in depth.
  - 2.9 The working face shall be kept as narrow as practicable.
  - 2.10 Sufficient supplies of soil shall be available at the depot for daily covering purposes.
  - 2.11 After completion of disposal operations, a final cover of not less than 300mm of impervious clay (or equivalent) shall be provided over each garbage filled area.
-

- 2.12 The final surface of each area shall be graded and drained and otherwise treated and/or grassed to shed surface water in such a way as to prevent scouring or erosion or the ponding of water over garbage filled areas.
- 2.13 A suitable machine shall be maintained full-time at the depot for the purpose of compacting and covering the garbage.
- 2.14 Sufficient and competent operators shall be employed to supervise the depot operation and to operate the plant.
- 2.15 The depot shall be enclosed with a stock proof fence.
- 2.16 Suitable wire netting fences, at least 1 800mm in height shall be provided to collect wind-blown material.
- 2.17 Fires at the depot shall be prohibited. Should fire occur, prompt action shall be taken to extinguish the fire and to prevent a recurrence.
- 2.18 An adequate water supply for fire fighting purposes shall be provided at the depot.
- 2.19 Adequate measures shall be taken to control rodent, fly and other vermin infestations.
- 2.20 Adequate measures shall be taken to prevent any dust or odour nuisances during tipping and covering operations.
- 2.21 The salvaging of materials from refuse deposited on the site shall not be permitted without the consent of the Department of Health.
- 2.22 Trees and shrubs on the buffer areas shall be maintained undisturbed and revegetation of filled areas shall proceed progressively.
- 2.23 The collection, storage, treatment and/or disposal of leachate shall be carried out to the requirements of the State Pollution Control Commission.
- 2.24 All stormwater and seepage from higher levels shall be effectively collected and diverted away from the refuse disposal area.

### 3. Recommendation

Submitted for approval of the site described hereunder as a sanitary depot for the disposal of garbage at Griffith subject to compliance with the conditions aforementioned. Such approval being in terms of Section 283(4), Local Government Act, 1919, as amended by the Local Government (Amendment) Act, 1979.



-3-

DEPARTMENT OF HEALTH, N.S.W.

3.1 Description of Site (continued)

All those pieces or parcels of land situated in the Shire of Griffith, Parish of Ballingall, County of Sturt and State of New South Wales, being Portions 202 and lot 280, containing an area of 122 hectares or thereabout.

*E. Charker* 5/10/64  
E. CHARKER,  
Chief Health Surveyor.

Appendix 14 Council Proposed Operating Procedures

APPENDIX 14

84/357

RJF:AJA

29th May, 1984.

The Regional Director for Health,  
Department of Health,  
Box 59, Post Office,  
WAGGA WAGGA. N.S.W. 2650

Dear Sir,

Re: Proposed Garbage Depot - Portion 202,  
Parish of Ballingall - Your Reference  
NS:MM SW6235

---

I refer to your letter received in this Office on 13th April, 1984, and enclose, as requested, a signed copy of the schedule of property and operating conditions and advise that in respect of Depot Operation clause 17, Council had granted scavenging rights for the old garbage depot and extended these rights to the new site.

Council would appreciate the consent of the Department for this action.

Yours faithfully,

R.H.J. FAULKNER,  
SHIRE CLERK

ENCL.

PREPARATORY AND OPERATING CONDITIONS

PROPOSED GARBAGE DEPOT

PORTION 202

PARISH OF BALLINGAL, COUNTY OF STURT.

General:

1. The Depot site shall be surveyed by a registered Surveyor, the corners and angles in boundaries shall be marked by 75mm. galvanised steel piping set in concrete and standing at least 1.500m above ground level.
2. Upon completion of disposal operations at the depot, Council shall make application to the Department of Health to have the depot declared Unhealthy Building Land pursuant to Section 55, Public Health Act 1902 as amended.
3. As the operational planning data as supplied relates only to one valley, disposal operations shall not proceed beyond that area until suitable supplementary information has been supplied to the Department of Health.
4. All fences, signs, access roads and drainage structures shall be maintained in good order.

Depot Operation:

1. The depot shall be conducted in accordance with the "Review of Environmental Factors" which accompanied Council's letter of 4 May 1982 and the supplementary data supplied in Council's letter of 22 July 1982.
2. The depot shall be operated by the Area Sanitary Landfill method whereby garbage, after being spread in thin layers (not exceeding 600mm in depth) be effectively compacted by a suitable machine before the next layer of garbage is deposited thereon.
3. All putrescable material deposited at the depot shall be completely covered with a minimum of 150mm of soil within twelve hours of deposit at the depot.
4. The garbage shall be placed in compacted layers not exceeding 1 800mm in depth.
5. The working face shall be kept as narrow as practicable.
6. Sufficient supplies of soil shall be available at the depot for daily covering purposes.
7. After completion of disposal operations, a final cover of not less than 300mm of impervious clay (or equivalent) shall be provided over each garbage filled area.
8. The final surface of each area shall be graded and drained and otherwise treated and/or grassed to shed surface water in such a way as to prevent scouring or erosion or the ponding of water over garbage filled areas.
9. A suitable machine shall be maintained full-time at the depot for the purpose of compacting and covering the garbage.
10. Sufficient and competent operators shall be employed to supervise the depot operation and to operate the plant.
11. The depot shall be enclosed with a stock proof fence.


- 2 -

12. Suitable wire netting fences, at least 1800mm in height shall be provided to collect wind-blown material.
13. Fires at the depot shall be prohibited. Should fire occur, prompt action shall be taken to extinguish the fire and to prevent a recurrence.
14. An adequate water supply for fire fighting purposes shall be provided at the depot.
15. Adequate measures shall be taken to control rodent, fly and other vermin infestations.
16. Adequate measures shall be taken to prevent any dust or odour nuisances during tipping and covering operations.
17. The salvaging of materials from refuse deposited on the site shall not be permitted without the consent of the Department of Health.
18. Trees and shrubs on the buffer areas shall be maintained undisturbed and revegetation of filled areas shall proceed progressively.

Drainage:

1. The collection, storage, treatment and/or disposal of leachate shall be carried out to the requirements of the State Pollution Control Commission.
2. All stormwater and seepage from higher levels shall be effectively collected and diverted away from the refuse disposal area.

GRIFFITH SHIRE COUNCIL

  
SHIRE CLERK

29th May, 1984.

Appendix 15 Review of Environmental Factor

BE ADDRESSED TO SHIRE CLERK

APPENDIX 15

PHONE GRIFFITH No. 62 1277

P O BOX 485

GRIFFITH, N S W 2680

TELEX No. AAG9049



No 82/116 (357)

COUNCIL CHAMBERS  
GRIFFITH

JBM:DM

4th May, 1982

The Secretary,  
Health Commission of  
New South Wales,  
Riverina Region,  
Post Office Box 59,  
WAGGA WAGGA. NSW 2650

Dear Sir,

re: Portion 202, Waste Disposal Site

Council has selected Portion 202, Parish of Ballingall as its next waste disposal site. This site was first investigated in the early seventies and the Water Resources Commission was approached in 1977 for approval to use the area.

Preliminary inspections of the site were carried out by Officers from the Health Commission and State Pollution Control Commission in 1977.

The Water Resources Commission has approved that Portion 202 becomes a reserve for the public purpose of "Local Government Purposes" and Council will be appointed Trustees. This reserve should be gazetted in the near future.

This site will be used to receive the following wastes:-

1. Putrescible Solid Waste;
2. Non-putrescible Solid Waste;
3. Building and Demolition Solid Waste;
4. Household non-putrescible waste;
5. Tyres.

It is anticipated that this site will be needed for the receipt of wastes in February 1983.

Your formal approval to this site being used for the purpose of waste disposal is requested.

Yours faithfully,

SHIRE CLERK.



REVIEW OF ENVIRONMENTAL FACTORS ON PROPOSED  
WASTE DISPOSAL DEPOT FOR SHIRE OF GRIFFITH

PART A - GENERAL INFORMATION

INTRODUCTION

The Shire of Griffith, with an area of 1605.5km<sup>2</sup> is located north of the Murrumbidgee River with the main forces of population being centred at Griffith 13,500. The area being part of the Murrumbidgee Irrigation Area is a closely settled area with eight smaller urban settlements. The area has a consistent growth rate.

The present waste disposal depot is located 6.5km to the north-east of the town. A relocation of the depot is required because of the declining capacity and because of the planned extensions of the town in this direction.

Because of the intensified land use sites for waste disposal are limited and in the main this limitation is restricted to areas along the McPherson Ranges.

SITE - PORTION 202

This site is located 10.6km west of Griffith on the northern side of the McPherson Ranges and has been selected as the waste disposal depot based on the following considerations:- (Annexure (A))

1. The site is to the north of the ridge line of the McPherson Ranges which will screen operations from the nearest road and farm residents;
2. The site is far enough away from Griffith not to interfere with any projected expansion in the foreseeable future.
3. The access will be from Slopes Road. The existing unsealed portion of Slopes Road and the access road to the site will be bitumen sealed.
4. There is sufficient area and corresponding available volume for fill at the site to utilise the site as a long term depot for approximately 50 years.
5. All surface drainage from the area discharge into two hollows which form a basin just to the north of the area. (Annexure (B)).
6. Town water will be extended to the site.

DEVELOPMENT OF PORTION 202

The following describes in broad outline the proposed development of the area proposed for the waste disposal depot. Stage 1 of the development is shown on Annexure (C).

While the overall development of the site will follow the State Pollution Control Commission "Environmental Criteria for Landfill Waste Disposal in N.S.W." particular work to be carried out in this development is as follows:-

1. All surface drainage from the proposed work area leaves the site at one point and ponds in a basin to the north of the site. Should it be necessary a holding dam could be constructed at the exit point.

DM

- 2 -

3. Firebreaks will be cut around the adjacent boundaries. Also town water will be reticulated to the site.

4. The site will be worked from the ridge line down the valley.

5. The site will be excavated as it proceeds to provide covering materials also to make maximum use of the area. From test borings excavation will be able to be carried out to a depth of 2 to 3 metres.

6. It is intended to raise the valley floor to create a spur jutting out from the ridge. The floor would be raised some 40 metres at the bottom of the grid tapering to nothing so that it is below the ridge line. Section Drawings Annexure (D).

7. At the completion of each stage and where possible at the completion of a particular area, this area shall be suitably vegetated to inhibit erosion and blend its appearance as quickly as possible with the surrounding countryside. The ridge line and physical features of the site will not be touched.

### DESCRIPTION OF SITE

The ridge line of the McPherson Ranges forms the southern boundary of the site. The western half of the site will be used for disposal and this area consists of three valleys which have an approximate fall of 25 metres. A 40 metre grid survey has been carried out and this is included as Annexure (C).

There is only light timber growth in the valley areas as shown on the attached aerial photo. Annexure (B) the overlay indicates disposal areas.

The geology of the site was investigated by the Water Resources Commission and the results are attached as Annexure (E), this survey also indicates no movement of sub-soil waters.

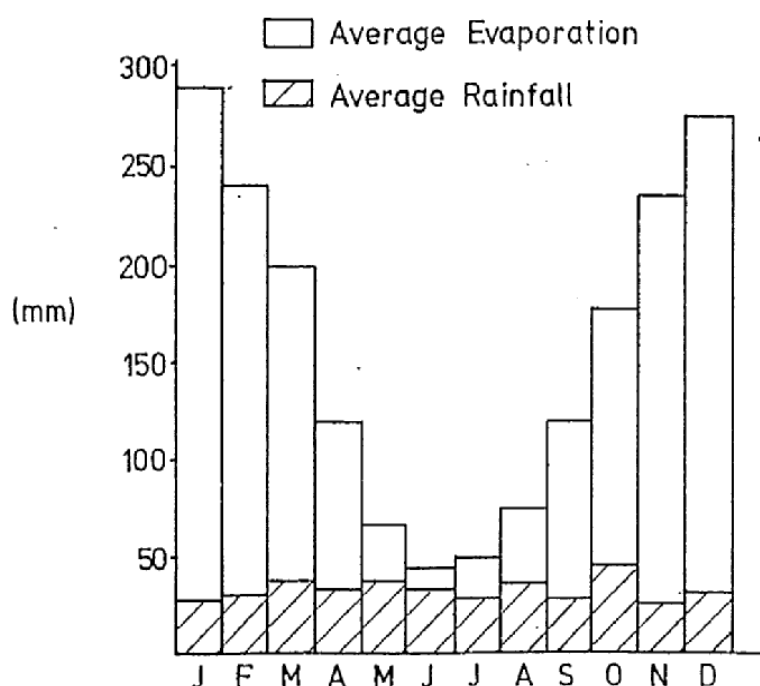
Surface drainage has been previously discussed.

### CLIMATIC CONDITIONS

The graph indicates the average rainfall and evaporation for Griffith. It is evident from this that evaporation exceeds rainfall all year on average.

Temperatures in the area are warm to hot in summer, with cold winters. Frosts also occur during the winter months. The winds in the area are generally assumed to be prevailing from the west. To ascertain definite wind direction readings taken by the C.S.I.R.O. Division of Irrigation Research have been analysed. These figures indicate the percentage of the time that the winds blow from the site to the closest dwellings. The figures analysed are shown below in the table:-

Time	E. TO E.N.E.	S.E.	S.S.W.
9.00 a.m.	17%	5%	3%
3.00 p.m.	8%	7%	6%



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- 4 -

DESCRIPTION OF REGION SURROUNDING THE SITE

- North of Site - Cleared undulating grazing country and used for dry area cropping.
- East of Site - Light timber cover, a continuation of the McPherson Range, used for grazing.
- West of Site - Ballingal trig point sighted just to the west highest point in surrounding area. This area has a medium cover of timber and is also a continuation of the range and is not used.
- South of Site - The area south of the ridge line is horticultural land used for citrus growing.

ZONING OF SITE

The area is zoned Non Urban "A" and it is proposed that this zoning will remain.

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- 5 -

PART C - CHANGES IN ENVIRONMENT

The method of disposal will be by controlled landfill using the area method which will be modified to suit. To reduce and minimise undesirable aspects of the operation, development will proceed in clearly defined stages. As each stage or area is completed it will be covered with good fill material, topsoiled and vegetated or otherwise treated in accordance with the intended public use of the land. Trees in the valley areas will be removed, all other trees will remain. As this site is a long term project areas will only be cleared as used and completed areas will be vegetated. This will minimise the impact.

The impact on the natural features of the land will be the general raising of the elevation of the valley floors. Fill levels will be such that all surface waters flow to the basins immediately north of the site.

Control measures will be implemented to prevent any increase in flies and rodents.



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- 6 -

## PART D - EFFECT OF PROJECT ON ENVIRONMENT

### GENERAL

In discussing this section it is to be borne in mind that the waste disposal depot must and will be operated by the Griffith Shire Council in accordance with the requirements of the State Pollution Control Commission Environmental Criteria for Landfill Waste Disposal in New South Wales (Environmental Guide W.D.2).

### WASTE PRODUCTS

1. A by product of the solid waste disposal depot could be leachate. It is impossible at this stage to determine its exact volume or nature. Leachate has not been a problem at our existing landfill depot which is to be expected due to our low rainfall and lack of sub-soil water. This will also apply to the proposed depot. Bore holes below the working area will be sunk to monitor any production of leachate caused by the landfill.

The project will not generate any solid waste products. Some gases, non-toxic will be produced by rotting and decay of putrescible materials but these will not seriously affect the surrounding areas.

2. Whilst no burning of the waste products during or after operations will be permitted, the possibility of spontaneous combustion of the fill exists. Fire fighting and earthmoving equipment and adequate water supply will be provided also a firebreak will be provided for each stage of the operation.

3. Operations at the site will produce limited noise to the nearest dwellings due to having the hill between them. Increase traffic flow to and from the site will increase noise along the access routes.

4. The existing unsealed portion of Slopes Road to the entrance of the waste disposal area will be sealed also the access road into the disposal area will be sealed. This will prevent any dust problem being caused by traffic. Dust produced by site operations will not cause a nuisance, this is due to prevailing winds distance from residents and site operations will be situated on the northern side of the range.

5. Fencing will be provided to contain all wind blown material within the area of operations.

6. The two lane bitumen sealed access road will ensure that adverse effects from traffic, noise and dust are kept to a minimum.

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- 7 -

PART E - SUMMARY

The location of the proposed waste disposal depot for the Shire of Griffith has been selected at Portion 202, Ballingall as this site is the only site with long term capacity situated a reasonable distance to the main areas of population.

The areas of operation are on the northern side of the ranges so there will be no visual impact to the public.

Traffic on Slopes Road will be increased but as it will be bitumen sealed, noise and dust will be kept to a minimum. there are dwellings with frontage to Slopes Road.

Site operations due to existing ridges which are lightly timbered will always have buffer zones around the areas in use.

Due to the long term use of the area, say 50years, it is not feasible at this stage to forecast a use for the completed area. It may be possible for Council to offer areas, because of the total size, to the public for various sporting uses.

---

The Regional Director of Health,  
Health Commission of N.S.W.,  
P.O. Box 59,  
WAGGA WAGGA N.S.W. 2650

Our reference: 240 208A AJC:08

Your reference:

Telephone: 206677  
431111

Dear Sir,

Re : Proposed Garbage Depot - Griffith

Thank you for the opportunity of having an early input into the Griffith Garbage Depot relocation proposal. We have the following comments to make on the proposal :

1. Noise Pollution

Because of the increased volume of traffic to the rural outskirts of Griffith, particularly at weekends, the hours that the depot is open to the Public and other organisations need to be carefully considered and controlled. While the report acknowledges that increased traffic flow will increase noise along the access routes for some farmers and residents, no mention has been made of the following two points -

- 1.1 Whether the depot will be manned by responsible personnel or not during the hours that the depot is open to the general public.
- 1.2 The hours that the depot will be open to the general public has not been mentioned.

2. Fencing

This facet needs to be expanded as to what type of fencing is proposed and what areas of the site are to be fully enclosed.

3. Revegetation

No mention has been made as to how this will be carried out and with what species of vegetation. We recommend that replanting of trees and sowing of grasses be in keeping with those already existing on similar areas of the ranges.

4. Drum collection and Disposal site

There is a need for responsible action to be taken concerning the proper disposal of empty pesticide containers. Griffith Shire Council has indicated at a meeting convened by the Department of Agriculture that it was willing to accept such containers for disposal at its garbage tip. Disposal of such pesticide drums needs to be included in the report as regards to likely numbers and method of collection and disposal on site. The number of drums could vary from a few to thousand (about 10,000 20 litre rice herbicide drums are sold in the MIA area alone per year). Disposing of these drums, if collected, presents a large handling problem in itself.

5. Leachate

The report stated that bore holes below the working area will be sunk to monitor any production of leachate caused by the landfill. No indications have been given as to what water quality parameters will be selected for the determination of leachate infiltration or production and how often the tests will be conducted.

.../2

- 2 -

- 6. All surface drainage from the proposed work area leaves the site at one point and collects in a basin to the north of the site. We consider it necessary that a holding dam be constructed at the exit point. Any leachate and surface drainage collected in the basin or holding dam should be recirculated to a reclaimed and revegetated area of the landfill site.
7. Each cell or working pit should be lined with a suitably impermeable clay to entrap leachate and prevent it from penetrating underlying strata.
8. The length of the working face of each pit should be less than forty metres. The length of the proposed working face of each pit is not clearly outlined in the report.
9. Adequate firefighting equipment and water supply must be on hand at all times to quickly suppress any spontaneous combustion of the fill.

We hope these comments assist you in your assessment of the proposal.

If you have any further verbal enquiries in the matter please do not hesitate to contact Mr A. Christy on (060) 431111.

Yours faithfully

*D.A. Hepple* 17 June 1982.  
D.A. HEPPLE  
For Secretary

P.O. BOX 485  
GRIFFITH, N.S.W. 2680  
TELEX No. AAG9048



COUNCIL CHAMBERS  
GRIFFITH

JBM.HD

Copy S.P.C.C. Albury 22nd July, 1982.

The Regional Director of Health,  
Health Commission of N.S.W.,  
Box 59, Post Office,  
WAGGA WAGGA. N.S.W. 2650

Dear Sir,

Re: Waste Disposal Site - Portion 202  
Your Ref. NRS:AHA:R:1994 dated 31.5.82  
and 22.6.82

Information required by the above references is listed below.

(a) Portion 202 is situated in the Parish of Ballingall, County of Sturt.

(b) Total area of site is 122.4 ha of which approximately 55ha would be available for waste disposal.

(c) It is confirmed that we will be operating the site in accordance with the environmental criteria for Landfill Waste Disposal in N.S.W. (Environmental Guide WD-2) using the area method of sanitary landfilling. The exception being that the site will remain open to the public 24 hours a day seven days a week. Our present site is under the control of staff during the following periods.

Monday to Friday 6.00 a.m. - 5.00 p.m.

Saturday and Sundays 7.00 a.m. - 5.00 p.m.

this will continue at the new site. Also, a caretaker's residence is being established at the new site.

(d) Items of plant located at the site are:

(i) Massey Ferguson 400C Dozer fitted with Bull Blade and rippers.

(ii) Case W20 Front End Loader fitted with a 2 cu yd bucket.

(iii) Ford D1211 8 Tonne Truck with tipper body.

Should the need arise additional plant would be available from the Engineering Department.

(e) The existing perimeter fence (normal type country fence) will remain. The fence on the southern boundary adjacent the work area will be increased in height to contain wind blown litter. Temporary fencing will be used around the work area to contain wind blown litter. The type of fence has not been finalised as we are looking for a type that is secure, adequate and easily relocated, your suggestions in this regard would be appreciated. Correspondence is being forwarded to the Metropolitan Waste Disposal Authority Sydney and the Environmental Protection Agency Melbourne to obtain their specifications for temporary fencing to control wind blown litter.

2/...



(f) Car bodies are at present stored at a separate depot in Rifle Range Road, this may be retained, if not this storage will be relocated at the new depot in a separate area from the landfill area.

(g) Bottle scavenging is authorised at our present site and will continue at the new site. It is not anticipated that any other scavenging will be authorised.

(h) Earth banks will be formed to direct all surface water away from the areas being worked. Contour plan with surface drains marked is attached.

(i) The area will always be worked on a slope to allow runoff. Earth banks will be erected above the area to prevent runoff water passing through the working area. The contours in the area will always allow the runoff water to be diverted around the working area, this water being collected in a holding dam at the northern boundary of the site. Drainage pattern shown on the attached plan.

(j) Littering of roads leading to the disposal site will be controlled in the normal manner by signposting and patrolling. Council is also investigating the introduction of a Total Waste Collection using the 240 litre Mobile Garbage Bin. If this service is introduced it will coincide with the commissioning of the new site. This service greatly reduces the number of trips residents make to the tip thus eliminating a percentage of road littering.

(k) The permanent staff will be two. Amenities provided will consist of lunchroom, changeroom, shower, W.C., office and storeroom. Also a dwelling will be relocated on the site for a caretaker.

(l) No design has been prepared for the lesser valley as it is proposed the larger valley will operate for approximately twenty years.

Questions raised by the State Pollution Control Commission are:

1. Noise Pollution - Answer as for (c)
2. Fencing - Answer as for (e)
3. Revegetation - It is intended that all areas once reaching their finished level will be revegetated with grasses and trees that are similar to those existing there at present.
4. Drum Collection & Disposal - Council will only be involved with the disposal of the drums. Initially the intention is to stock pile the drums in an area set aside for the purpose, this will enable an assessment to be made regarding:
  - (a) Number of containers to be disposed
  - (b) Contents if any to be disposed
  - (c) Nature of contents, is it allowable to landfill this material.

Correspondence is being directed to the M.W.D.A. Sydney listing types of Pesticides used in this area and asking their advice on disposal methods. May be in the final analysis acceptance of pesticide containers will not be allowed. It is requested that this matter be treated separately and the approval of the site not be held up due to this side issue.

22nd July, 1982

5. Leachate - The results of test borings carried out by the Water Resources Commission indicate that downslope ground water seepage in a north easterly direction during periods of high rainfall is possible but it is unlikely that any undesirable constituents moving into groundwater would extend beyond the immediate area. From our existing experience and because of the low rainfall and high evaporation and the nature of the soil it is considered leachate will not be present in the new site.

Holes will be sunk after 6 months of operation, these holes will be sunk below the work area, also in areas not affected by the landfill, this will enable comparisons to be made, and should any problem with leachate be present, action will be taken in accordance with the requirements of the S.P.C.C.

6. Answer as for (c)

7 & 8 - As previously mentioned the landfill will be conducted in accordance with the requirements as outlined in Environmental Guide WD-2.

9. The site is being serviced with a 100mm water main which is connected to the town supply. This will provide an adequate fire fighting water supply, also the earth moving plant as previously mentioned will be on hand to prevent and assist in fire fighting.

Should you require any further information, please contact Council's Chief Health and Building Surveyor.

Yours faithfully,

SHIRE CLERK

APPENDIX 16

ENVIRONMENT PROTECTION AUTHORITY (EPA)

POLLUTION CONTROL ACT, 1970

Pollution Control Approval

Approval Number : 002906

File Number : 235451/C01

Date of application : 25 November, 1996

Date of issue : 19 December, 1996

Approval is hereby given to : GRIFFITH CITY COUNCIL

of : PO BOX 485  
GRIFFITH  
NSW 2680

under the provisions of Section 17K  
of the Pollution Control Act, 1970  
to carry out the following work

: EXCAVATION OF TRENCH FOR DISPOSAL  
OF PUTRESCIBLE MATTER, USING  
NATURAL GEOLOGY

For stage number : 001

SINGLE STAGE ONLY

at : GRIFFITH THARBOGANG WASTE  
DISPOSAL SITE  
PORTION 202, DP756035  
GRIFFITH  
NSW 2680

subject to the following conditions:

CATEGORY I

- 1 The work must be carried out in accordance with this approval and in accordance with the information supplied in the application dated 25 November, 1996 and with any supplementary documentation which has been supplied to support the application.

GENERAL CONDITIONS

- 2 The putrescible waste disposal trench must not be located within 20 metres of a natural watercourse or drain.
- 3 Effective and appropriate pollution and erosion control facilities must be installed before any construction takes place. These works must be installed to the satisfaction of the NSW

Department of Land and Water Conservation.

- 4 The working face of the putrescible waste disposal trench must not exceed 40 metres in length at any time.
- 5 Partition walls, if any, between cells within the putrescible waste disposal trench must be lowered to ensure liquid waste does not fill to the natural ground surface before overflowing.
- 6 Completed areas of the putrescible waste disposal trench must be stabilised by landscaping or revegetation as soon as practicable to the satisfaction of the EPA.
- 7 An adequate water supply and fire fighting equipment must be provided on the premises for the purpose of extinguishing any fire.

#### LEACHATE CONTROL

- 8 The proposed trench site must be surrounded by a bunded wall on at least three sides and designed to prevent any liquid waste from escaping from the trench.
- 9 The putrescible waste disposal trench on the premises must be provided with earthen stormwater diversion banks to prevent the ingress of uncontaminated upslope surface run-off waters entering the trench.

#### MONITORING CONDITIONS

- 10 Existing groundwater sampling points must be monitored every 90 days, for the purpose of establishing the level of pollutant intrusion to the groundwater.
- 11 Piezometers designed to monitor groundwater depth and the level of pollutant intrusion to the groundwater must be installed to a depth of not less than nine metres or to the underlying bedrock at the following locations -
  - 11.1 north-east of the old putrescible waste area adjacent to the fenceline and to the north-west of BORE#7 (referred to as BORE#8)
  - 11.2 north-east of the old putrescible waste area adjacent to the fenceline and to the north-west of BORE#8 (referred to as BORE#9)
  - 11.3 north-east of the old putrescible waste area adjacent to the fenceline and to the north-west of BORE#9 (referred to as BORE#10)
  - 11.4 South-west and upslope of the proposed putrescible trench and located between the trench site and the runoff water diversion bank. (referred to as BORE#11)
- 12 Water, if any, in the groundwater monitoring piezometers must be

sampled every 90 days at sites BORE#1 to BORE#11 inclusive and must be analysed for, but is not limited to, the following -

- (a) pH
- (b) sulphate
- (c) chloride
- (d) nitrate
- (e) ammonia
- (f) nitrogen
- (g) phosphorus
- (h) Total Organic Carbon
- (i) Adsorbable Organic Halogens
- (j) Total Dissolved Solids
- (k) Alkalinity
- (l) Faecal Coliforms
- (m) Grease and oil

Results of the tests must be forwarded to the EPA's Regional Manager at this office, within 30 days of the sample being taken.

#### CATEGORY II

- 13 The applicant must certify, by means of the form titled Certificate of Compliance with Pollution Control Approval -

- 13.1 the extent to which the conditions under Category I and any requirements as specified in subsequent correspondence between applicant and the EPA have been complied with; and
- 13.2 identify any conditions not complied with; and
- 13.3 the reasons for any non compliance referred to in paragraph 13.2.

The applicant must forward the completed form to the EPA within fourteen days of the completion of the work and/or before the plant, equipment or construction is put into regular operation.

NEIL SHEPHERD  
Director-General

Per ... *[Signature]* .....  
Darryl Clift  
Head, Regional Operations  
Unit  
SOUTH WEST  
(by Authorisation)



DM

ANNEXURE (D)EXPECTED REQUIREMENTS FOR WASTE DISPOSAL1982-2000 SHIRE OF GRIFFITH

APPENDIX 17

1. Expected average yearly population based on a 1.14% growth rate:-

Year	Population
1982 - 1985	21,954
1986 - 1990	23,214
1991 - 1995	24,545
1996 - 2000	25,954

2. Expected total waste generated per five year period.

Year	Waste
1982 - 1985	55473.367
1986 - 1990	73321.415
1991 - 1995	77525.383
1996 - 2000	81975.705
Total	<u>288295.87 tonnes</u>

These figures are based on .63 tonnes per capita per year.

The figure used was recorded by the Metropolitan Waste Disposal Authority and is based on 1980 figures.

The above figures do not allow for an increase as it is anticipated that recycling of materials will account for the projected increase.

Stage 1 will account for wastes produced until the year 2000.

The proposed diagram on Annexure (D) show that the area allows for approximately 2,600,000m<sup>3</sup> of wastes to be landfilled.

Wastes generated for the period to the year 2000 are:-

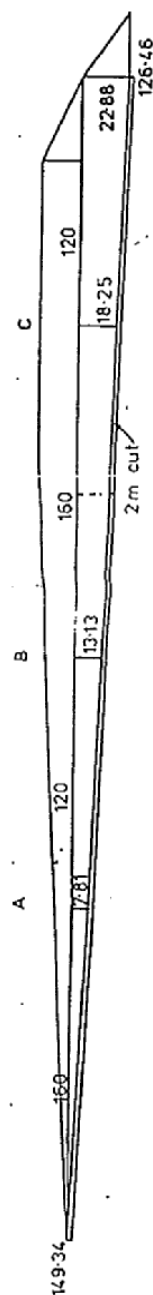
288295.87 tonnes  
576,591,740 kilograms.

The compaction density for the wastes is assumed to be 300kg/m<sup>3</sup>. This will require the following:-

1,921,972m <sup>3</sup>	of area
384,396m <sup>3</sup>	Allow 20% fill
<u>2,306,368m<sup>3</sup></u>	Total area required

This shows that Stage 1 will adequately take care of the wastes generated until the year 2000.

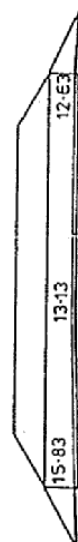
## APPENDIX 17



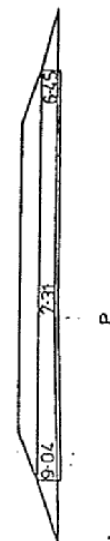
LONG SECTION



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CROSS SECTIONS

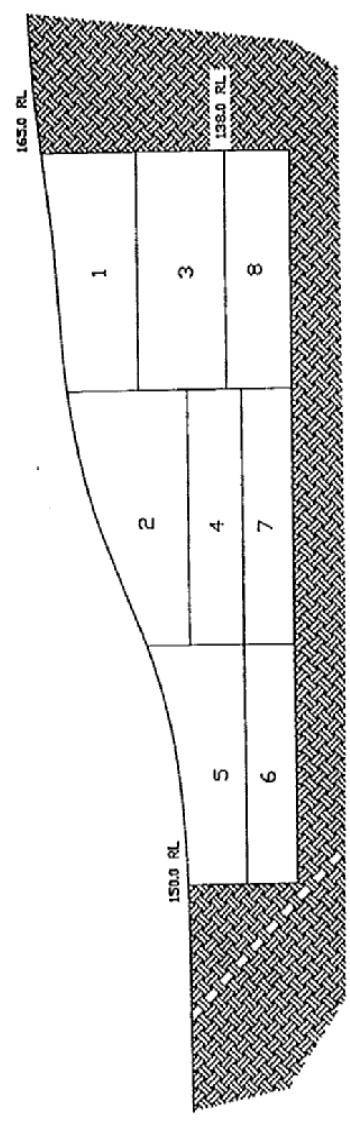


A

SECTIONS OF PROPOSED  
GARBAGE SITE

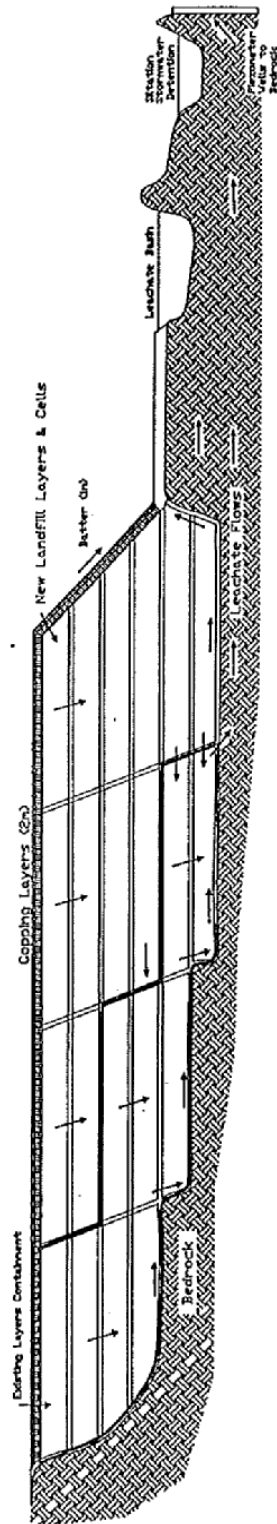
SHIRE OF GRIFFITH

APPENDIX 18



QUARRY EXTRACTION STAGES

APPENDIX 19



LANDFILL LAYERS - EXISTING AND FUTURE CELLS  
,  
LEACHATE HYDROLOGICAL FLOWS  
&  
MONITORING RESPONSE

## Appendix 20 Soil Test

## APPENDIX 20

## Coffey Partners International Pty Ltd

A.C.N. 003 692 019

Consulting Engineers, Managers and Scientists

Environment • Geotechnics • Mining • Water Resources

12 Waterloo Road, North Ryde, NSW, 2113, Ph: (02) 888 7444, Fax: (02) 888 9977



## test results

client : GRIFFITH CITY COUNCIL

job no : AWL5182

principal :

laboratory : SYDNEY

project : WASTE DISPOSAL SITE

report date : 30/11/95

location : GRIFFITH, NEW SOUTH WALES

test report : -

test procedure : as per LABORATORY TESTING IN SOIL ENGINEERING - CH8  
by T.N.W Akroyd

test date : 20/11/95

SAMPLE IDENTIFICATION	REMOULDED DRY DENSITY	REMOULDED MOISTURE CONTENT	FALLING HEAD PERMEABILITY
	$\frac{3}{t/m}$	%	k = cm/sec
(Lab No. 5955) BH40 (0.2 to 1.0m)	1.92	8.7	-7 2.17 X 10
(Lab No. 5956) BH29 (0.1 to 0.8m)	1.93	9.4	-7 2.67 X 10

Note: 1. Samples remoulded to a target 95% of Standard Maximum Dry

Density and at Standard Optimum Moisture Content.

2. Tested with Distilled (Potable) Water

3. Samples and Compaction Data received from CPI (Albury)

on the 17/11/95

remarks :



This laboratory is registered by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with the terms of registration. This document shall not be reproduced except in full without the prior approval of the laboratory.

G.K. COLLINS 30/11/95

 Authorised Signature  
 NATA Reg. No. 431


Form Number L1.001 Version 1.0

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# EMERSON/DISPERSION TEST RESULTS

SAMPLE NUMBER	LOCATION AND DEPTH	DISTILLED WATER EMERSON CLASS NUMBER	SALINE SOLUTION EMERSON CLASS NUMBER
5955	Borehole 40 0.2 - 1.0m	3	5
5956	Borehole 29 0.1 - 0.8m	2	3
5957	Borehole 46 0.0 - 1.2m	3	3
5958	Borehole 34	5	5
5959	Borehole 31	3	3

*Relatively stable for dispersion*



**Coffey Partners International Pty Ltd**

A.C.N. 003 692 019

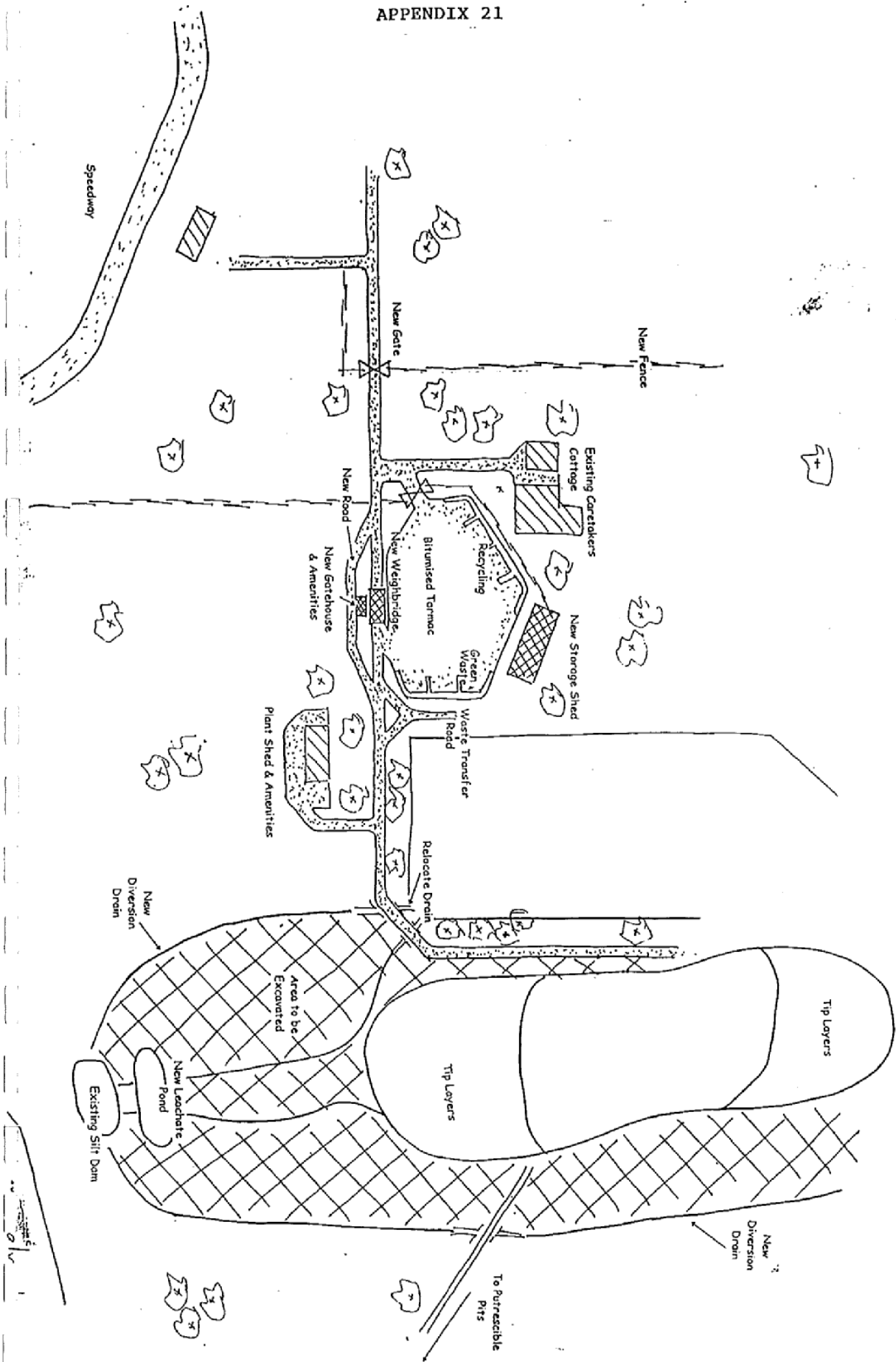
Managers, Consulting Engineers and Scientists  
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# Drawing 21 Re-Development Plans

## APPENDIX 21



**Appendix 22 Leachate and Surface Water Monitoring**

REB:CS

**APPENDIX 22****GRIFFITH CITY COUNCIL****THARBOGANG WASTE DISPOSAL DEPOT  
PIEZOMETER LOG**

- Bores installed 05/06/91
- See drawings for locations

#1-7 #8-#11 installed '97

Depth 2 metre rock

BORE #/I	
05/06/91	Dry
06/06/91	Dry
18/06/91	Dry
25/07/91	Dry
17/09/91	Dry
01/10/91	Dry
09/03/92	Dry
04/06/92	Dry
06/07/92	Dry
03/09/92	Dry
14/09/92	Dry
16/11/92	Dry
09/02/93	Dry
02/06/93	Dry
08/04/94	Dry
22/08/94	Dry
18/10/94	Dry
28/02/95	Dry
30/05/95	Dry
29/08/95	Dry
28/11/95	1 cm moist mud
27/02/96	Damp but no liquid
12/03/96	Damp but no liquid
28/05/96	Moist mud
27/08/96	Moist < 1.0 cm
17/09/96	Dry
29/10/96	<1.0 cm damp
20/11/96	2.0 cm liquid
24.03.97	Dry
30.09.97	Dry

Depth of Rock 3.5 metres

BORE # 2	
05/06/91	Dry
06/06/91	Dry
18/06/91	Dry
25/07/91	Dry
17/09/91	Dry
01/10/91	Dry
09/03/92	Dry
04/06/92	Dry
06/07/92	Dry
03/09/92	Dry
14/09/92	Dry
16/11/92	Dry
09/02/93	Dry
02/06/93	Dry
08/04/94	Dry
22/08/94	Dry
18/10/94	Dry
28/02/95	Dry
30/05/95	Dry
29/08/95	Dry
28/11/95	Dry
27/02/96	Dry
12/03/96	Dry
28/05/96	Dry
27/08/96	Dry
17/09/96	Dry
29/10/96	Dry
20/11/96	Dry
24/03/97	Dry
30/09/97	Dry

Depth of Rock 3 metres

BORE #3	
05/06/91	Dry
06/06/91	Dry
18/06/91	Dry
25/07/91	Dry
17/09/91	Dry
01/11/91	Dry
09/03/92	Dry
04/06/92	Dry
06/07/92	Dry
03/09/92	Dry
14/09/92	Dry
16/11/92	Dry
09/02/93	Dry
02/06/93	Dry
08/04/94	Dry
22/08/94	Dry
18/10/94	Dry
28/02/95	Dry
30/05/95	Dry
29/08/95	Dry
28/11/95	Dry
27/02/96	Dry
12/03/96	Dry
28/05/96	Dry
27/08/96	Dry
17/09/96	Dry
29/10/96	Dry
20/11/96	Dry
24/03/97	Dry
30/09/97	Dry

Depth to Rock 4 metres

BORE #4	
05/06/91	Dry
06/06/91	Dry
18/06/91	1.0 cm of mud - clay
25/07/91	1.0 cm of muddy water
17/09/91	2.0 cm of muddy water
01/11/91	5.0 cm of muddy water
09/03/92	2.0 cm of muddy water
04/06/92	2.0 cm of muddy water
06/07/92	2.0 cm of muddy water
03/09/92	4.0 cm of muddy water
14/09/92	2.0 cm of muddy water
16/11/92	1.0 cm of muddy water
09/02/93	2.0 cm of muddy water
02/06/93	Dry
08/04/94	Dry
22/08/94	Dry
18/10/94	Dry
28/02/95	1.0 cm muddy water
30/05/95	<2.0 cm muddy water
29/08/95	Dry
28/11/95	Dry
27/02/96	Dry
12/03/96	Dry
28/05/96	Dry
27/08/96	Dry
17/09/96	Dry
29/10/96	Dry
20/11/96	Dry
24/03/97	Dry
30/09/97	Dry

Depth of Rock 7 metres

BORE #5	
05/06/91	Dry
06/06/91	Dry
18/06/91	Dry
25/07/91	Dry
17/09/91	Dry
01/11/91	Dry
09/03/92	Dry
04/06/92	Dry
06/07/92	Dry
03/09/92	Dry
14/09/92	Dry
16/11/92	Dry
09/02/93	Dry
02/06/93	Dry
04/08/94	Damage - no test
22/08/94	Damage - no test
28/08/96	Damage - no test
18/10/94	Damage - no test
28/02/95	Dry
30/05/95	Dry
29/08/95	Dry
28/11/95	Dry
27/02/96	Dry
12/03/96	Dry
28/05/96	Dry
27/08/96	Dry
17/09/96	Dry
29/10/96	Dry
20/11/96	Dry
24/03/97	Dry
30/09/97	Dry



Depth to Rock 3.6 metres

BORE # 5	
05/06/91	Dry
06/06/91	Dry
18/06/91	Dry
25/07/91	Dry
17/09/91	Dry
01/11/91	Dry
09/03/92	Dry
04/06/92	Dry
06/07/92	Dry
03/09/92	Dry
14/09/92	Dry
16/11/92	Dry
09/02/93	Dry
02/06/93	Dry
08/04/94	2.0 cm muddy water
22/08/94	Dry
18/10/94	Dry
28/02/95	Dry
30/05/95	Dry
29/08/95	Dry
28/11/95	Dry
27/02/96	Dry
12/03/96	Dry
28/05/96	Dry
27/08/96	Dry
17/09/96	Dry
29/10/96	Dry
20/11/96	Dry
24/03/97	Dry
30/09/97	Dry

Depth to Rock 5.0 metres

BORE # 7	
05/06/91	Dry
06/06/91	Dry
18/06/91	Dry
27/07/91	Dry
17/09/91	Dry
01/11/91	<1.0 cm of mud
09/03/92	Dry
04/06/92	Dry
06/07/92	Dry
03/09/92	Dry
14/09/92	Dry
16/11/92	Dry
09/02/93	Dry
02/06/93	Dry
08/04/94	Dry
22/08/94	Dry
18/10/94	Dry
28/02/95	Dry
30/05/95	Dry
29/08/95	Dry
28/11/95	Dry
27/02/96	Dry
12/03/96	Dry
28/05/96	Dry
27/08/96	Dry
17/09/96	Dry
29/10/96	Dry
20/11/96	Dry
24/03/97	Dry
30/09/97	Dry
16/12/97	Dry

GROUND WATER AND SURFACE WATER DETENTION BASIN	
28/02/95	Dry
30/05/95	Dry
29/08/95	1/4 full
28/11/95	1/8 full
12/03/96	1/4 full
28/05/96	1/8 full
27/08/96	1/8 full
17/08/96	1/8 full
29/10/96	1/8 full
20/11/96	1/4 full
30/09/97	1/8 full

BORE # 9 Installed 1997	
24/03/97	Dry
30/09/97	Dry
16/12/97	Dry

BORE # 10 Installed 1997	
24/03/97	Dry
30/09/97	Dry
16/12/97	Dry

BORE # 11 Installed 1997	
24/03/97	Dry
30/09/97	Dry
16/12/97	Dry

Pesticide Testing of Leachates	
DATE	TEST RESULT
26/08/94	Nil
30/08/95	Nil

LEACHATE TESTINGS			
CHEMICAL/ANALYSIS	1994	1995	1996
Colour Apparent	180	62	<200
Turbidity	91	43	32
UV % Transmittance @ 254nm		33	
Specific Conductance	1460	455	415
pH	7.8	7.8	8.2
Fluoride	0.4		
Alkalinity, as CaCO <sub>3</sub>	320	155	155
Chloride	260	54	26
Nitrite, as N	0.03	0.11	<0.5
Nitrate, as N	1.9	<0.5	
Sulphate	1	18	12
Sodium	170	41	26
Ammonium as N	0.8	0.24	0.1
Potassium		30	41
Magnesium	29	9	10
Calcium	44	20	23
Ca Hardness, as CaCO <sub>3</sub>	110	49	58
Total Hardness, as CaCO <sub>3</sub>	230	86	99
Iron	4.1	1.2	1.0
Manganese	0.2	0.14	0.11
Copper	<0.02	<0.05	<0.05
Zinc	<0.05	<0.05	<0.05
Aluminium		800	0.3
Silica	9		12
Cadmium	<1		
Chromium	<10		
Lead	10		
Arsenic	5		
Selenium	<5		
Phosphorus, reactive, as P	<0.01	0.02	
Total Phosphorus, as P	0.4	0.38	
Total Organic Nitrogen, as N	9.2	2.0	
Total Nitrogen		2.4	



Environment  
Protection  
Authority  
New South Wales

The General Manager  
Griffith City Council  
PO Box 485  
Griffith NSW 2680

<b>GRIFFITH CITY COUNCIL</b> "Progress with Pride"		
Suite 1, Level 1, 130-140 Banna Ave Griffith City Plaza P.O. Box 397 Griffith NSW 2680 Tel .069. 64 1880 Fax .069. 64 1885		
- 5 AUG 1996		
File No: 357 / 511 186		
DEPT.	ACTION	INFO
MAYOR		
G.MOR		
D.CORP		
D.ENG		
D.ENV	✓	
INFO.CNCL		

Our Reference: GF46

Your Reference:

Contact: Anne Woodard

Attention: John Porter

Dear Mr Behl

#### RE WASTE MANAGEMENT AT GRIFFITH LANDFILL

I refer to a site inspection on 4 July 1996 at the Griffith Landfill with your Bob Barton and officers of the Environment Protection Authority (EPA).

I would like to confirm the advice given to Bob Barton by the EPA as follows.

#### Burning Tyres

1. During the inspection it was noted that a large area of tyres had been alight and were smouldering.
2. I would like to advise you that to burn matter otherwise than by such practicable means as may be necessary to prevent or minimise air pollution is an offence under Clause 8 of the Clean Air Act (Control of refuse burning) Regulation, 1988, and can attract a Penalty.
3. The EPA has issued several penalty notices pursuant to the Clean Air Regulation 1988 within the Griffith area for similar offences involving the burning of tyres.
4. In this particular instance it was explained to the EPA that an explosion of foreign material in the green waste area had unintentionally ignited the tyre area. The EPA is also aware that tyre and green waste areas have since been separated to alleviate the tyre burning

problem. However, should Council's landfills be found to be in breach of this regulation in future, the EPA will not hesitate to issue a Penalty Infringement Notice.

5. The EPA considers reuse/recycling of this material the best management option and is aware that Council is pursuing contractors to implement such an option. In future Council should also ensure that green waste is treated according to the Solid Waste Landfill Guidelines (pages 27 and 28).

#### Putrescible waste trenches

During the inspection it was noted that the management of Council's existing putrescible waste trenches is extremely unsatisfactory. The main concerns of the EPA in relation to these trenches are as follows.

1. The unsatisfactory siting of the trenches. They are positioned immediately adjacent to a natural drainage line and are lying in a north-south direction, which is not on the contour of the slope. As a result all of the liquid waste in these trenches fall to the most northerly end which discharges to the adjacent drainage course. There is evidence at the site that liquid waste from the waste trenches has discharged and is still leaching into the drainage line. This represents a breach of the Clean Waters Act 1970, and would normally attract a penalty.
2. The design of the trench system is highly unsatisfactory in that each cell within the trench is constructed in a way which causes liquid waste to pond up to the existing ground surface thereby increasing the potential for liquid waste to discharge to waters.
3. The EPA is also aware that future extensions to the putrescible waste trench system is to advance up the slope. It was noted that the soil material was changing from a loam to soil with a higher limestone content. The EPA has concerns that as the soil increases in limestone content, it will become more permeable thereby increasing the potential for pollution of groundwaters.
4. The EPA therefore requires that in future;
  - a) any new trenches be located well away from existing drainage lines (40 metres), and excavated on the contour.
  - b) the new trenches be fully lined to achieve a permeability of  $1 \times 10^{-9}$  m in order to stop leachates reaching the groundwater system or leaching downhill.



problem. However, should Council's landfills be found to be in breach of this regulation in future, the EPA will not hesitate to issue a Penalty Infringement Notice.

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REB:WK

F. 357--

GRIFFITH CITY COUNCIL

REPORT OF THE SITE INSPECTION BY EPA OFFICERS AND COUNCIL'S PROJECT  
MANAGER, R BARTON AT COUNCIL'S THARBOGANG WASTE DISPOSAL DEPOT ON  
FRIDAY, 19 JULY, 1996 AT 9.00 A.M.

---

PRESENT: D Cliff, C Robertson and A Woodard (EPA) and R Barton (GCC).

Discussions occurred with the EPA outlining their dissatisfaction with the operation of Council's Waste Depot.

1. An Order for compliance will be issued upon the Council seeking improved management practices for:-

- (a) No rubber tyre burning.
- (b) Improved signage.
- (c) Better segregation of materials.
- (d) Improved coverage of waste.
- (e) Better litter control.
- (f) Measures to reduce windborne litter.
- (g) Incidents to be reported immediately to the EPA by the Council.

R Barton responded indicating that:-

- ⇒ Rubber tyre fire was unintentional.
- ⇒ That considerable costs had been incurred recently by the Council in removing a deep seated fire that had been burning for 5 years within the tip layers.
- ⇒ Signs for better directions on segregation of materials have been fabricated and shortly to be erected.
- ⇒ That "no fire" signs had already been erected.
- ⇒ Litter control measures are being placed in operation.
- ⇒ There is a revised operating procedures being introduced to achieve better compaction and less fire potential.
- ⇒ Approximately 400 tonnes of metal had been removed within the past 2 months and whilst the Depot may appear unsightly it has an operational activity.
- ⇒ That greenwaste would be disposed of by burning in separated piles at the appropriate time.
- ⇒ That Consultants have been engaged in preparing a Waste Depot Management Plan in conjunction with quarry activities but the delay had been encountered in ascertaining the standards to be set for waste depots.
- ⇒ The Management Plan would have an emphasis on restricting public access to the landfill operation.

The EPA noted Council's advice concerning the burning of greenwaste.