

LEGEND

- - - CATCHMENT BOUNDARY
- MAIN SEWER
- EXISTING SEWER
- SCHOOL SITES
- COMMUNITY FACILITIES
- LOCAL / NEIGHBOURHOOD CENTRE
- PUBLIC OPEN SPACE

PLAN
1:5000

FOR INFORMATION ONLY



REV. NO.	BY	DATE	DESCRIPTION	APPROVED
A	GV	01/08/13	ISSUED FOR DISCUSSION	PF

DRG. No.	TITLE

This drawing is confidential and shall only be used for the purposes of this project. The signing of this title block confirms the design and drafting of this project have been prepared and checked in accordance with the AECOM Quality Assurance system to ISO 9001:2000.

DESIGNED	CHECKED	DATE	
DRAWN	G VIVEKANANDA	CHECKED	M MACLEAN
APPROVED	P MIRIHAGALLA	DATE	16/07/13
Datum		Survey	

AECOM

AECOM Australia Pty Ltd A.B.N. 20 093 846 925

Client
**CITY OF
GREATER
GERALDTON**

SEWAGE INFRASTRUCTURE PLANNING			
WAGGRAKINE RESIDENTIAL ESTATE SEWER LAYOUT OPTION - LOT501, 2 & 3 DEVELOPMENT			
Scale A1-1:5000	A3-1:10000	Drg No. 60297775-SKT-003	Rev. A



POTENTIAL TO SERVE INCREASED AREA BY PROVIDING RETIC TO AREA SUBJECT TO FURTHER PLANNING AND UPGRADING PUMP STATIONS AND PRESSURE MAIN?

GLENFIELD STRUCTURE PLAN INSERT OPPORTUNITIES

- LEGEND**
- CATCHMENT BOUNDARY
 - PROJECT BOUNDARY
 - MAIN SEWER
 - EXISTING SEWER
 - EXISTING RURAL LOT BOUNDARY
 - PROPOSED SUPER LOT BOUNDARY
 - SCHOOL SITES
 - COMMUNITY FACILITIES
 - LOCAL / NEIGHBOURHOOD CENTRE
 - PUBLIC OPEN SPACE

CATCHMENT	AREA (Ha)	FLOW (L/S)
1	12.0	2.02
2	11.4	1.92
3	13.3	2.23
4	6.4	1.08
5	16.6	2.79
6	22.6	3.80
7	4.9	0.82
8	15.6	2.62
9	16.8	2.82
10	10.5	1.76
11	8.4	1.41

● SERVICE POINT AT LOWEST POINT FOR EACH EXISTING LOT OR SUB CATCHMENT

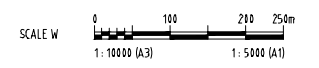
AREAS MARKED 1, 2 & 3
CAN FUTURE ROAD BE LOCATED ALONG BOUNDARY?
OR THIS SECTION MAY REQUIRE RELOCATION.

ALTERNATIVE OPTION IF PROPOSED ROAD FOLLOWED EXISTING BOUNDARY

SUB CATCHMENT BOUNDARY

PLAN
1:5000

FOR INFORMATION ONLY



No.	BY	DATE	DESCRIPTION	APPD.	DRG. No.	TITLE
B	GV	16/07/13	RE-ISSUED FOR DISCUSSION	PM		
A	GV	16/07/13	ISSUED FOR DISCUSSION	PM		

DESIGNED	CHECKED	DRAWN	CHECKED	APPROVED	DATE
G VIVEKANANDA	M MACLEAN	G VIVEKANANDA	M MACLEAN	P MIRIHAGALLA	16/07/13

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AECOM

CITY OF GREATER GERALDTON

AECOM Australia Pty Ltd A.B.N. 20 093 846 925

Client
CITY OF GREATER GERALDTON

SEWAGE INFRASTRUCTURE PLANNING
WAGGRAKINE RESIDENTIAL ESTATE
SEWER LAYOUT OPTION 1

Scale
A1-1:5000 A3-1:10000

Drawn
60297775-SKT-001

Construction of Sewer Infrastructure for the Waggrakine Development

Project No. 60297775

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**CONSTRUCTION OF SEWER RETICULATION FOR 50 LOTS
AT SEAFIELDS ESTATE**

OPINION OF PROBABLE COST

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	GRAVITY SEWERS AND MANHOLES				
1.1	Clear for sewer alignment.	Item			\$2,000.00
1.2	Excavate and backfill trench and dispose of surplus material for sewers (depth to invert):				
	0.0 - 2.0	m	1,051.0	\$50.00	\$52,550.00
	2.0 - 3.0	m	300.0	\$65.00	\$19,500.00
	3.0 - 4.0	m	150.0	\$85.00	\$12,750.00
1.3	Excavate and hand trim trench for sand bedding of sewers (including in rock).	m	1,501.0	\$12.50	\$18,762.50
1.4	Supply, lay and test Class S.E.H. sewer pipe				
	(a) 150mm uPVC sewer pipe	m	1,200.0	\$40.00	\$48,000.00
	(b) 225mm uPVC sewer pipe	m	301.0	\$55.00	\$16,555.00
1.5	Supply, lay and test bdy connections incl. excavation and Backfill 100 mm off 150 u.P.V.C. pipe.				
	In 0.6 Up 0.0 - 2.0	No.	45	\$185.00	\$8,325.00
	In 1.5 Up 0.0 - 2.0	No.	0	\$225.00	\$0.00
	In 3.6 Up 0.0 - 2.0	No.	6	\$305.00	\$1,830.00
1.6	Supply, lay and test inspection openings on 150 mm dia. sewer.	No.	4	\$85.00	\$340.00
1.7	Excavate for access chambers and construct slabs, inverts and benching.	No.	6	\$1,100.00	\$6,600.00
1.8	Construct walls of access chambers (Depth measured from cover level to invert.)	m	12.0	\$900.00	\$10,800.00
1.9	Supply and place corbels and rectangular heavy duty cast iron covers.	No.	6	\$2,250.00	\$13,500.00
1.10	Supply and install ladders, staging bars and all other items required to meet Water Corporation design criteria for manholes.	Item	6	\$1,500.00	\$9,000.00
1.11	Supply lay and test Inspection Shafts.	No.	4	\$420.00	\$1,680.00
1.12	Supply and install Maintenance Shaft bases and covers.	No.	15	\$2,020.00	\$30,300.00
1.13	Supply and install risers to Maintenance Shafts.	m	30.0	\$80.00	\$2,400.00
1.14	Connect to existing sewer, incl. supply & installation of plugs	No.	2	\$3,680.00	\$7,360.00
SUBTOTAL					\$262,252.50

**CONSTRUCTION OF SEWER RETICULATION FOR 174 LOTS
AT SEAFIELDS ESTATE**

OPINION OF PROBABLE COST

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	GRAVITY SEWERS AND MANHOLES				
1.1	Clear for sewer alignment.	Item			\$3,500.00
1.2	Excavate and backfill trench and dispose of surplus material for sewers (depth to invert):				
	0.0 - 2.0	m	2,889.0	\$50.00	\$144,450.00
	2.0 - 3.0	m	825.0	\$65.00	\$53,625.00
	3.0 - 4.0	m	743.0	\$85.00	\$63,155.00
1.3	Excavate and hand trim trench for sand bedding of sewers (including in rock).	m	4,127.0	\$12.50	\$51,587.50
1.4	Supply, lay and test Class S.E.H. sewer pipe				
	(a) 150mm uPVC sewer pipe	m	2,889.0	\$40.00	\$115,560.00
	(b) 225mm uPVC sewer pipe	m	1,568.0	\$55.00	\$86,240.00
1.5	Supply, lay and test bdy connections incl. excavation and Backfill 100 mm off 150 u.P.V.C. pipe.				
	In 0.6 Up 0.0 - 2.0	No.	0	\$185.00	\$0.00
	In 1.5 Up 0.0 - 2.0	No.	0	\$225.00	\$0.00
	In 3.6 Up 0.0 - 2.0	No.	173	\$305.00	\$52,765.00
1.6	Supply, lay and test inspection openings on 150 mm dia. sewer.	No.	13	\$85.00	\$1,105.00
1.7	Excavate for access chambers and construct slabs, inverts and benching.	No.	13	\$1,100.00	\$14,300.00
1.8	Construct walls of access chambers (Depth measured from cover level to invert.)	m	60.0	\$900.00	\$54,000.00
1.9	Supply and place corbels and rectangular heavy duty cast iron covers.	No.	13	\$2,250.00	\$29,250.00
1.10	Supply and install ladders, staging bars and all other items required to meet Water Corporation design criteria for manholes.	Item	13	\$1,500.00	\$19,500.00
1.11	Supply lay and test Inspection Shafts.	No.	45	\$420.00	\$18,900.00
1.12	Supply and install Maintenance Shaft bases and covers.	No.	45	\$2,020.00	\$90,900.00
1.13	Supply and install risers to Maintenance Shafts.	m	72.5	\$80.00	\$5,800.00
1.14	Connect to existing sewer, incl. supply & installation of plugs	No.	5	\$3,680.00	\$18,400.00
				SUBTOTAL	\$823,037.50

CONSTRUCTION OF SEWER RETICULATION FOR THE DEVELOPMENT OF EXISTING LOTS 501, 2 & 3

OPINION OF PROBABLE COST

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	GRAVITY SEWERS AND MANHOLES				
1.1	Clear for sewer alignment.	Item			\$5,000.00
1.2	Excavate and backfill trench and dispose of surplus material for sewers (depth to invert):				
	0.0 - 2.0	m	2,000.0	\$50.00	\$100,000.00
	2.0 - 3.0	m	1,991.0	\$65.00	\$129,415.00
	3.0 - 4.0	m	340.0	\$85.00	\$28,900.00
1.3	Excavate and hand trim trench for sand bedding of sewers (including in rock).	m	4,331.0	\$12.50	\$54,137.50
1.4	Supply, lay and test Class S.E.H. sewer pipe				
	(a) 150mm uPVC sewer pipe	m	2,991.0	\$40.00	\$119,640.00
	(b) 225mm uPVC sewer pipe	m	1,340.0	\$55.00	\$73,700.00
1.5	Supply, lay and test bdy connections incl. excavation and Backfill 100 mm off 150 u.P.V.C. pipe.				
	In 0.6 Up 0.0 - 2.0	No.		\$185.00	\$0.00
	In 1.5 Up 0.0 - 2.0	No.	100	\$225.00	\$22,500.00
	In 3.6 Up 0.0 - 2.0	No.	78	\$305.00	\$23,790.00
1.6	Supply, lay and test inspection openings on 150 mm dia. sewer.	No.	15	\$85.00	\$1,275.00
1.7	Excavate for access chambers and construct slabs, inverts and benching.	No.	8	\$1,100.00	\$8,800.00
1.8	Construct walls of access chambers (Depth measured from cover level to invert.)	m	24.0	\$900.00	\$21,600.00
1.9	Supply and place corbels and rectangular heavy duty cast iron covers.	No.	8	\$2,250.00	\$18,000.00
1.10	Supply and install ladders, staging bars and all other items required to meet Water Corporation design criteria for manholes.	Item	8	\$1,500.00	\$12,000.00
1.11	Supply lay and test Inspection Shafts.	No.	50	\$420.00	\$21,000.00
1.12	Supply and install Maintenance Shaft bases and covers.	No.	19	\$2,020.00	\$38,380.00
1.13	Supply and install risers to Maintenance Shafts.	m	38.0	\$80.00	\$3,040.00
1.14	Connect to existing sewer, incl. supply & installation of plugs	No.	1	\$3,680.00	\$3,680.00
1.15	Allow for directional drilling under Alexander Dr/NW Coast Hwy	Item			\$50,000.00
SUBTOTAL					\$734,857.50

CONSTRUCTION OF SEWER RETICULATION FOR THE DEVELOPMENT OF WAGGRAKINE OPTION 1

OPINION OF PROBABLE COST

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
GRAVITY SEWERS AND MANHOLES					
1.1	Clear for sewer alignment.	Item			\$50,000.00
1.2	Excavate and backfill trench and dispose of surplus material for sewers (depth to invert):				
	0.0 - 2.0	m	19,328.0	\$50.00	\$966,400.00
	2.0 - 3.0	m	0.0	\$65.00	\$0.00
	3.0 - 4.0	m	1,668.0	\$85.00	\$141,780.00
1.3	Excavate and hand trim trench for sand bedding of sewers (including in rock).	m	20,996.0	\$12.50	\$262,450.00
1.4	Supply, lay and test Class S.E.H. sewer pipe				
	(a) 150mm uPVC sewer pipe	m	19,328.0	\$40.00	\$773,120.00
	(b) 225mm uPVC sewer pipe	m	1,718.0	\$55.00	\$94,490.00
1.5	Supply, lay and test bdy connections incl. excavation and Backfill 100 mm off 150 u.P.V.C. pipe.				
	In 0.6 Up 0.0 - 2.0	No.	0.0	\$185.00	\$0.00
	In 1.5 Up 0.0 - 2.0	No.	1,053	\$225.00	\$236,925.00
	In 3.6 Up 0.0 - 2.0	No.	0.0	\$305.00	\$0.00
1.6	Supply, lay and test inspection openings on 150 mm dia. sewer.	No.	200	\$85.00	\$17,000.00
1.7	Excavate for access chambers and construct slabs, inverts and benching.	No.	50	\$1,100.00	\$55,000.00
1.8	Construct walls of access chambers (Depth measured from cover level to invert.)	m	150.0	\$900.00	\$135,000.00
1.9	Supply and place corbels and rectangular heavy duty cast iron covers.	No.	50	\$2,250.00	\$112,500.00
1.10	Supply and install ladders, staging bars and all other items required to meet Water Corporation design criteria for manholes.	Item	50	\$1,500.00	\$75,000.00
1.11	Supply lay and test Inspection Shafts.	No.	200	\$420.00	\$84,000.00
1.12	Supply and install Maintenance Shaft bases and covers.	No.	45	\$2,020.00	\$90,900.00
1.13	Supply and install risers to Maintenance Shafts.	m	135	\$80.00	\$10,800.00
1.14	Connect to existing sewer, incl. supply & installation of plugs	No.	1	\$5,000.00	\$5,000.00
1.15	Allow for directional drilling under Alexander Dr/NW Coast Hwy	Item			\$50,000.00
SUBTOTAL					\$3,160,365.00

CONSTRUCTION OF SEWER RETICULATION FOR THE DEVELOPMENT OF WAGGRAKINE OPTION 2

OPINION OF PROBABLE COST

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	GRAVITY SEWERS AND MANHOLES				
1.1	Clear for sewer alignment.	Item			\$50,000.00
1.2	Excavate and backfill trench and dispose of surplus material for sewers (depth to invert):				
	0.0 - 2.0	m	19,960.0	\$50.00	\$998,000.00
	2.0 - 3.0	m	0.0	\$65.00	\$0.00
	3.0 - 4.0	m	1,668.0	\$85.00	\$141,780.00
1.3	Excavate and hand trim trench for sand bedding of sewers (including in rock).	m	21,628.0	\$12.50	\$270,350.00
1.4	Supply, lay and test Class S.E.H. sewer pipe				
	(a) 150mm uPVC sewer pipe	m	19,960.0	\$40.00	\$798,400.00
	(b) 225mm uPVC sewer pipe	m	1,718.0	\$55.00	\$94,490.00
1.5	Supply, lay and test bdy connections incl. excavation and Backfill 100 mm off 150 u.P.V.C. pipe.				
	In 0.6 Up 0.0 - 2.0	No.	0.0	\$185.00	\$0.00
	In 1.5 Up 0.0 - 2.0	No.	1,087	\$225.00	\$244,575.00
	In 3.6 Up 0.0 - 2.0	No.	0.0	\$305.00	\$0.00
1.6	Supply, lay and test inspection openings on 150 mm dia. sewer.	No.	200	\$85.00	\$17,000.00
1.7	Excavate for access chambers and construct slabs, inverts and benching.	No.	47	\$1,100.00	\$51,700.00
1.8	Construct walls of access chambers (Depth measured from cover level to invert.)	m	141.0	\$900.00	\$126,900.00
1.9	Supply and place corbels and rectangular heavy duty cast iron covers.	No.	47	\$2,250.00	\$105,750.00
1.10	Supply and install ladders, staging bars and all other items required to meet Water Corporation design criteria for manholes.	Item	47	\$1,500.00	\$70,500.00
1.11	Supply lay and test Inspection Shafts.	No.	200	\$420.00	\$84,000.00
1.12	Supply and install Maintenance Shaft bases and covers.	No.	40	\$2,020.00	\$80,800.00
1.13	Supply and install risers to Maintenance Shafts.	m	120	\$80.00	\$9,600.00
1.14	Connect to existing sewer, incl. supply & installation of plugs	No.	1	\$5,000.00	\$5,000.00
1.15	Allow for directional drilling under Alexander Dr/NW Coast Hwy	Item			\$50,000.00
SUBTOTAL					\$3,198,845.00

**CONSTRUCTION OF DN225 SEWER UPGRADE
AT SEAFIELDS ESTATE**

OPINION OF PROBABLE COST

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	GRAVITY SEWER UPGRADE AC2378 - AC2353 and AC2347 - AC 2326 - DN300 uPVC				
1.1	Clear for sewer alignment.	Item	1	\$5,100.00	\$5,100.00
1.2	Excavate and backfill trench and dispose of surplus material for sewers (depth to invert):				
	0.0 - 2.0	m	700.0	\$50.00	\$35,000.00
	2.0 - 3.0	m	200.0	\$65.00	\$13,000.00
	3.0 - 4.0	m	100.0	\$85.00	\$8,500.00
1.3	Excavate and hand trim trench for sand bedding of sewers (including in rock) incl. agg bedding	m	1,000.0	\$150.00	\$150,000.00
1.4	Supply, lay and test Class S.E.H. sewer pipe (a) 300mm uPVC sewer pipe	m	1,000.0	\$185.00	\$185,000.00
1.5	Supply, lay and test bdy connections incl. excavation, backfill and boundary traps - 100 mm off 300 u.P.V.C. pipe.				
	In 0.6 Up 0.0 - 2.0	No.	0	\$175.00	\$0.00
	In 1.5 Up 0.0 - 2.0	No.	0	\$215.00	\$0.00
	In 3.6 Up 0.0 - 2.0	No.	4	\$800.00	\$3,200.00
1.6	Reconnect existing bdy.connections to 300mm uPVC pipe including boundary traps	No.	13	\$1,500.00	\$19,500.00
1.7	Excavate for access chambers and maintenance shafts	No.	15	Included	\$0.00
1.8	Supply and install maintenance shafts on 300mm sewer	No.	9	\$2,500.00	\$22,500.00
1.9	Supply, install and test PVC lined access chamber complete for 300mm sewer	No.	6	\$20,000.00	\$120,000.00
1.10	Supply and place corbels, frames and rectangular heavy duty covers	No.	15	\$3,000.00	\$45,000.00
1.11	Connect to existing sewer, incl. supply & installation of plugs	No.	6	\$5,000.00	\$30,000.00
1.12	Allowance for tankering during construction	Item	1	\$5,000.00	\$5,000.00
1.13	Allowance for surveying As constructed sewer.	Item	1	\$20,000.00	\$20,000.00
1.14	Allowance for compaction testing.	Item	1	\$2,000.00	\$2,000.00
1.15	Allow for dewatering of 300mm sewer	Item	1	\$50,000.00	\$50,000.00
				SUBTOTAL	\$713,800.00

OPINION OF PROBABLE COST FOR SUBDIVISION OF SEAFIELDS ESTATE - Stages 2a and 2b August 2013		COST PER LOT \$11,222	
		50 LOTS	
		EXCL. GST	INCL. GST
1	SEWER CONSTRUCTION COSTS	\$262,252.50	\$288,477.75
2	ALLOWANCE FOR OVERHEADS (20%)	\$65,563.13	\$72,119.44
3	SEWER HEADWORKS FEES (\$1,352/LOT)	\$67,600.00	\$74,360.00
4	ENGINEERING FEES (7.5% OF TOTAL COST)	\$29,656.17	\$32,621.79
		SUBTOTAL	\$467,578.98
		Contingency 20%	\$93,515.80
		TOTAL	\$561,094.77

NOTE:

- 1 THE TOTALS FOR ESTIMATES SHOWN ON THIS SHEET INCLUDE A 10% G.S.T. SURCHARGE.
- 2 Civil Engineering Fee is based on 7.5% of contract sum excluding provisional sums
- 3 Water Corporation headworks based on current rates as of 31 July 2013.
- 4 Estimate is NOT based on detailed design.
- 5 Rates used are based on works recently tendered for in the Geraldton area
- 6 This Estimate is not based on formal geotechnical information other than past experience within the area.
- 7 There is a provisional sum allowance for Rock breaking.
- 8 No allowance for travel & accomodation. Estimate assumes works completed by a local contractor
- 9 It is assumed that the existing access chambers will be able to be reused.

OPINION OF PROBABLE COST FOR SUBDIVISION OF SEAFIELDS ESTATE - Stages 2a, 2b, 3 & 4 August 2013		COST PER LOT \$17,585	
		174 LOTS	
		EXCL. GST	INCL. GST
1	SEWER CONSTRUCTION COSTS	\$823,037.50	\$905,341.25
2	SEWER UPGRADE DN225	\$713,800.00	\$785,180.00
3	ALLOWANCE FOR OVERHEADS (20%)	\$384,209.38	\$422,630.31
4	SEWER HEADWORKS FEES (\$1,352/LOT)	\$235,248.00	\$258,772.80
5	ENGINEERING FEES (7.5% OF TOTAL COST)	\$161,722.12	\$177,894.33
		SUBTOTAL	\$2,549,818.69
		Contingency 20%	\$509,963.74
		TOTAL	\$3,059,782.43

NOTE:

- 1 THE TOTALS FOR ESTIMATES SHOWN ON THIS SHEET INCLUDE A 10% G.S.T. SURCHARGE.
- 2 Civil Engineering Fee is based on 7.5% of contract sum excluding provisional sums
- 3 Water Corporation headworks based on current rates as of 31 July 2013.
- 4 Estimate is NOT based on detailed design.
- 5 Rates used are based on works recently tendered for in the Geraldton area
- 6 This Estimate is not based on formal geotechnical information other than past experience within the area.
- 7 There is a provisional sum allowance for Rock breaking.
- 8 No allowance for travel & accomodation. Estimate assumes works completed by a local contractor
- 9 It is assumed that the existing access chambers will be able to be reused.

OPINION OF PROBABLE COST FOR SUBDIVISION OF LOTS 501, 2 & 3 August 2013		COST PER LOT \$9,241	
		178 LOTS	
		EXCL. GST	INCL. GST
1	SEWER CONSTRUCTION COSTS	\$734,857.50	\$808,343.25
2	ALLOWANCE FOR OVERHEADS (20%)	\$183,714.38	\$202,085.81
3	SEWER HEADWORKS FEES (\$1,352/LOT)	\$240,656.00	\$264,721.60
4	ENGINEERING FEES (7.5% OF TOTAL COST)	\$86,942.09	\$95,636.30
		SUBTOTAL	\$1,370,786.96
		Contingency 20%	\$274,157.39
		TOTAL	\$1,644,944.35

NOTE:

- 1 THE TOTALS FOR ESTIMATES SHOWN ON THIS SHEET INCLUDE A 10% G.S.T. SURCHARGE.
- 2 Civil Engineering Fee is based on 7.5% of contract sum excluding provisional sums
- 3 Water Corporation headworks based on current rates as of 31 July 2013.
- 4 Estimate is NOT based on detailed design.
- 5 Rates used are based on works recently tendered for in the Geraldton area
- 6 This Estimate is not based on formal geotechnical information other than past experience within the area.
- 7 There is a provisional sum allowance for Rock breaking.
- 8 No allowance for travel & accomodation. Estimate assumes works completed by a local contractor
- 9 It is assumed that the existing access chambers will be able to be reused.

OPINION OF PROBABLE COST FOR SUBDIVISION OF WAGGRAKINE OPTION 1 August 2013		COST PER LOT \$7,242	
		1053 LOTS	
		EXCL. GST	INCL. GST
1 SEWER CONSTRUCTION COSTS	\$3,160,365.00	\$3,476,401.50	
2 ALLOWANCE FOR OVERHEADS (20%)	\$790,091.25	\$869,100.38	
3 SEWER HEADWORKS FEES (\$1,352/LOT)	\$1,423,656.00	\$1,566,021.60	
4 ENGINEERING FEES (7.5% OF TOTAL COST)	\$403,058.42	\$443,364.26	
SUBTOTAL		\$6,354,887.74	
Contingency 20%		\$1,270,977.55	
TOTAL		\$7,625,865.28	

NOTE:

- 1 THE TOTALS FOR ESTIMATES SHOWN ON THIS SHEET INCLUDE A 10% G.S.T. SURCHARGE.
- 2 Civil Engineering Fee is based on 7.5% of contract sum excluding provisional sums
- 3 Water Corporation headworks based on current rates as of 31 July 2013.
- 4 Estimate is NOT based on detailed design.
- 5 Rates used are based on works recently tendered for in the Geraldton area
- 6 This Estimate is not based on formal geotechnical information other than past experience within the area.
- 7 There is a provisional sum allowance for Rock breaking.
- 8 No allowance for travel & accomodation. Estimate assumes works completed by a local contractor
- 9 It is assumed that the existing access chambers will be able to be reused.

OPINION OF PROBABLE COST FOR SUBDIVISION OF WAGGRAKINE OPTION 2 August 2013		COST PER LOT \$7,138	
		1087 LOTS	
		EXCL. GST	INCL. GST
1	SEWER CONSTRUCTION COSTS	\$3,198,845.00	\$3,518,729.50
2	ALLOWANCE FOR OVERHEADS (20%)	\$799,711.25	\$879,682.38
3	SEWER HEADWORKS FEES (\$1,352/LOT)	\$1,469,624.00	\$1,616,586.40
4	ENGINEERING FEES (7.5% OF TOTAL COST)	\$410,113.52	\$451,124.87
		SUBTOTAL	\$6,466,123.15
		Contingency 20%	\$1,293,224.63
		TOTAL	\$7,759,347.77

NOTE:

- 1 THE TOTALS FOR ESTIMATES SHOWN ON THIS SHEET INCLUDE A 10% G.S.T. SURCHARGE.
- 2 Civil Engineering Fee is based on 7.5% of contract sum excluding provisional sums
- 3 Water Corporation headworks based on current rates as of 31 July 2013.
- 4 Estimate is NOT based on detailed design.
- 5 Rates used are based on works recently tendered for in the Geraldton area
- 6 This Estimate is not based on formal geotechnical information other than past experience within the area.
- 7 There is a provisional sum allowance for Rock breaking.
- 8 No allowance for travel & accomodation. Estimate assumes works completed by a local contractor
- 9 It is assumed that the existing access chambers will be able to be reused.

Adopted by Council on 21 December 2010

STRUCTURE PLAN – final

WAGGRAKINE RESIDENTIAL ESTATE
CITY OF GERALDTON-GREENOUGH



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APPENDICES

APPENDIX I STRUCTURE PLAN

1.0 Introduction

At the Ordinary Council meeting held on 15 April 2009, the City of Geraldton-Greenough ('City') resolved to revoke Town Planning Scheme No. 3, the Waggrakine Guided Development Scheme (WGDS), on the grounds that the Scheme is no longer considered to be a contemporary or relevant planning instrument. Prior to the formal revocation, it is necessary to introduce an alternate planning instrument to guide the subdivision and development of land within the Scheme area.

To this end it is proposed to convert the WGDS into a Structure Plan pursuant to the provisions of Clause 5.17 of City of Geraldton-Greenough Local Planning Scheme No. 5 ('LPS5').

Adoption of the proposed Structure Plan pursuant to the provisions of LPS5 is considered to represent the most orderly and proper way in which to introduce the required planning controls for the Scheme Area.

As soon as the Structure Plan process is complete, the City will request the Minister for Planning to repeal the WGDS pursuant to Section 74 (b) of the Planning and Development Act.

2.0 Background

The WGDS was gazetted on 6 February 1981 to guide the subdivision of land and provision of services and infrastructure in a co-ordinated manner throughout the Waggrakine residential locality.

The WGDS covers an area of approximately 267 hectares bordered by Beattie Road and the North West Coastal Highway ('NWCH') to the west, Mary Street and Collins Road to the north, Sutcliffe Road to the east and the Chapman River Regional Wildlife Corridor and Moresby to the south. The subject area is predominantly cleared land that starts at the 18m contour at its western frontage with the NWCH, and rises steadily across 2km to the 54m contour at its eastern frontage with Sutcliffe Road.

The Scheme Map of the WGDS depicts a proposed road network, school and community purpose sites, drainage and public open space, and commercial development. The Scheme Text of the WGDS contains provisions requiring subdividers to pay Scheme Costs to ensure an equitable distribution from landowners across the Scheme Area for administration of the WGDS, acquisition of roads / road widening, and the provision of drainage, public open space and community uses.

When the WDS was gazetted, the locality of Waggrakine was experiencing a period of rapid growth, and it was considered the introduction of a guided development scheme would assist with achieving the subdivision of land in an orderly and proper manner. At the time, the preparation of guided development schemes was a common and widely accepted way in which to achieve a co-ordinated pattern of subdivision and the equitable sharing of costs amongst land owners.

The current town planning system in Western Australia allows for these outcomes to be achieved by the preparation of Structure Plans and Development Contribution Plans.

Given the current zoning of the locality under LPS5, the ability to require a Structure Plan and Development Contribution Plan prior to subdivision, and the imposition of standard conditions of subdivision approval, it is considered the WGDS is no longer required.

Revocation of the WGDS is not considered to be detrimental to the orderly and proper planning of the area and will enable subdivision to take place in accordance with current planning practice and policy.

For these reasons, at its Ordinary Meeting of 15 April 2009, the Council resolved to repeal the WGDS, pursuant to Section 74 of the Planning and Development Act.

A more detailed explanation of the WGDS and problems associated with its implementation can be found in the relevant Minutes of the Ordinary Council meeting held 15 April 2009.

3.0 Town Planning Considerations

LPS5 was gazetted on 14 April 2010 and replaces former Town Planning Scheme No. 4 for the district of the (former) Shire of Greenough.

Under LPS5, the majority of land within the Scheme Area of the WGDS is zoned 'Residential' with an applicable density code of R12.5. Lot 71, at the south-east corner of Constantine Road and Hall Road, is zoned 'Development.' Various sites are set aside as Local Scheme Reserves for either 'Parks and Recreation' or 'Public Purposes'.

Clause 5.17 of LPS5 allows the City to prepare and adopt a Structure Plan for any zone, prior to the consideration of subdivision and development applications.

Clause 5.17.2.1 states that the purposes of a Structure Plan are to:

- (a) *Identify areas requiring comprehensive planning; and*
- (b) *Coordinate subdivision and development in areas requiring comprehensive planning.*

A Structure Plan is required to be advertised for public comment, following which the Council is required to consider any submissions and decide whether to adopt the Structure Plan, with or without modification. Upon adoption, the Structure Plan is to be referred to the WA Planning Commission for endorsement. The subdivision and development of land is generally required to be consistent with the provisions of an endorsed Structure Plan.

Sub-Clause 5.17.6.1 of LPS5 sets out the details that should, as deemed relevant, be included in a Structure Plan, including the following:

- » The topography and other natural features of the area;
- » The existing and proposed road network in and adjacent to the subject land;
- » Proposed land uses, including schools and other community facilities;
- » The location and amount of public open space;
- » The layout of street blocks and general pattern of subdivision;
- » Proposed residential densities and potential population;
- » Servicing arrangements, including sewerage, water, and drainage infrastructure provision;
- » If applicable, the proposed staging of subdivision and development; and
- » The proposed method of implementation, including cost sharing arrangements.

Chapter 4 of this report describes the Structure Plan for the Waggrakine residential area and elaborates on each of the above matters.

4.0 Structure Plan

A Structure Plan has been prepared to guide the subdivision and development of land in the Scheme Area of the WGDS.

The WGDS Scheme Map forms the basis of the road layout and pattern of land uses shown on the Structure Plan, which is attached in Appendix I.

4.1 Site Description

4.1.1 Topography

Contours are depicted on the Structure Plan. The topography of the Structure Plan area gently rises from west to east, from a height of approximately 15 to 17 metres AHD along the western boundary of the Structure Plan (along NWCH) to a height of approximately 55 metres along the eastern boundary of the Structure Plan (along Sutcliffe Road).

4.1.2 Vegetation

The Structure Plan area is generally cleared, commensurate with former rural land uses and existing rural-residential and low density residential land uses. Scattered trees remain over existing rural-residential properties, generally to the north of Chapman Valley Road, while limited natural vegetation remains within the established residential areas south of Chapman Valley Road. Some remnant vegetation appears to exist on the land to the west of the t-junction of Hall Road and Constantine Road, on land partially set aside for public open space.

4.2 Road Network

4.2.1 Existing Road Network

The NWCH forms the western boundary of the Structure Plan. Beattie Road is a local road that runs parallel with NWCH along the western boundary of the Structure Plan. Chapman Valley Road intersects with the NWCH at the south-west corner of the Structure Plan and travels in a north-east direction through the Structure Plan area and beyond. Chapman Valley Road intersects with Sutcliffe Road on the Structure Plan's eastern boundary. Collins Road runs along the northern boundary of the Structure Plan, between Sutcliffe Road and Mary Street, the later terminating at a t-junction with Beattie Road. In addition to Beattie Road, two other existing local roads, being Hall Road and David Road, traverse the Structure Plan in a north-south direction between Collins Road and Chapman Valley Road. Constantine Road is a local road running east-west between Hall Road and David Road. A cul-de-sac, Mary Court, runs off Hall Road to the north of Constantine Road.

All other existing roads within the Structure Plan are generally recently constructed local subdivision roads within the residential areas off Chapman Valley Road.

Chapman Valley Road provides the principal means of access to, from and within the Structure Plan. Access from the north is available from Hall Road, David Road and Sutcliffe Road, while access from the area south of the Structure Plan is limited to Sutcliffe Road at the eastern end of the Structure Plan.

All existing roads within the Structure Plan, including constructed subdivision roads, generally have a reserve width of not less than 20 metres. Adelaide Street has a reserve width of approximately 30 metres while the portion of Hall Road between Chapman Valley Road and Constantine Road is 25 metres wide. The portion of Sutcliffe Road south of Chapman Valley Road is 30 metres in width.

4.2.2 Proposed Road Network

The proposed road network is shown on the Structure Plan.

All existing roads within the Structure Plan, as described above, are proposed to be retained, except for a small section of Constantine Road to the east of David Road which is proposed to be closed upon subdivision of the abutting landholdings. The Structure Plan does not propose any widening of existing road reserves.

The Structure Plan proposes a southern extension to Hall Road, between Chapman Valley Road and the southern boundary of the Structure Plan. A reserve width of up to 30 metres is proposed for the southern extension of Hall Road, to provide for a planned staggered intersection at Chapman Valley Road. The southern extension of Hall Road is designed to link into a new major east-west road proposed along part of the southern boundary of the Structure Plan area. All other proposed roads within the Structure Plan are generally local subdivision roads which should be developed in accordance with the standards of 'Liveable Neighbourhoods'.

The proposed extension of Collins Road, to the west of Hall Road, is shown as having a reserve width in the order of 30 metres, for the purpose of a future connection to the NWCH.

Chapman Valley Road will continue to provide the primary means of access to, from and within the Structure Plan. Sutcliffe Road will be retained for local access to and from the rural and rural-residential areas north and south of the Structure Plan. Likewise, Beattie Road and Hall Road will continue to connect the Structure Plan to the rural area to the north, and to NWCH via Tramway Road, which is approximately 1.7 kilometres north of the Structure Plan.

Under the WGDS, roads were divided into two types: 'Scheme Roads' and 'Other Subdivision Roads.' It is not considered necessary for the Structure Plan to make this distinction. Likewise, under the WGDS, provision was made for half the cost of roads abutting public open space to be deducted from a subdividers Scheme Cost contribution payment, presumably because the public open space was deemed to benefit the entire Structure Plan and the subdivider was only able to create lots on one side of the road. Under the Structure Plan, this provision has been deleted, as it is considered the public open space adds value to abutting residential lots, due to the increased amenity that the public open space creates.

It is considered the road layout shown on the WGDS is outdated and not consistent with current planning and design practice, which seeks to limit the number of non-through roads and maximise permeability for vehicles, pedestrians and cyclists. Accordingly, proposed new roads in the Structure Plan have been redesigned to accord with contemporary planning and design practice.

4.3 Land Use

4.3.1 Summary

The table below provides a statistical summary of the Structure Plan.

LAND USES	LAND AREA (ha)
Gross Area of Structure Plan	267.23
Non-Residential Deductions	
Local Centre	1.75
Community Centre	2.00
Drainage Reserves	
» Reserve 48613	0.24
» Reserve 36663	0.40
» Reserve 45727	0.09
» Reserve 48690	<u>0.09</u>
Sub-Total Drainage	0.82
School Sites	
» Primary School	3.98
» High School	8.10
» Private School	<u>8.09</u>
Sub-Total School Sites	<u>20.17</u>
Sub-Total Non-Residential Deductions	24.74
Gross Subdivision Area	242.49
Public Open Space	
» Site 1	1.62
» Site 2	3.67
» Site 3	4.06
» Site 4 (Reserve 36662)	4.01
» Site 5 (Reserve 50206)	1.17
» Site 6	0.30
» Site 7 (Reserve 36545)	0.19
» Site 8 (Reserve 36082)	1.10
» Site 9 (Reserve 43314)	8.09
» Site 10 (Reserve 48689)	<u>0.04</u>
Sub-Total POS (10%)	24.25
Required POS (10%)	24.25
Net Residential Area	218.24

Note: All areas are subject to survey at time of subdivision.

4.3.2 Residential

The Gross Residential Area of the Structure Plan, after deducting non-residential sites, is 242.49 hectares.

After deducting the area of public open space and drainage, the Structure Plan achieves a Net Residential Area of 218.24 hectares, being the amount of land set aside by the Structure Plan for provision of roads and residential lots.

On the assumption approximately 8% of the Net Residential Area will be required for roads, approximately 200 hectares of land will be available within the Structure Plan for residential lots. LPS5 proposes a residential density code of R12.5 for land zoned 'Residential' within the area of the Structure Plan. State Planning Policy 3.1 - Residential Design Codes (Variation 1) stipulate an average lot size requirement of 800 square metres for land coded R12.5. On this basis, it is estimated the Structure Plan will yield in the order of 2,500 residential lots once fully subdivided.

Australian Bureau of Statistics ('ABS') 2006 Census Data indicates an average household size of 2.6 persons per dwelling for the City of Geraldton-Greenough. With 2,500 lots, an ultimate population of 6,500 persons could be expected once the Structure Plan is fully developed. This assumes the availability of 200 hectares of residential land subdivided into single house lots at a density of R12.5.

Whilst the Structure Plan proposes subdivision in accordance with LPS5, contemporary planning and design practice suggests higher densities ought to be achieved in close proximity to town centres and public transport. For example, the WAPC's 'Liveable Neighbourhoods', promotes increased residential density usually associated with centres and areas well served by public transport. The land in the 'Development' zone under LPS5 and situated adjacent to the proposed Local Centre offers the potential to introduce medium density housing. The Structure Plan requires a Detailed Area Plan to be prepared for this area.

4.3.3 Local Centre

A site of 1.75 hectares is proposed at the north-east corner of Chapman Valley Road and Hall Road for the purpose of a Local/Neighbourhood Centre, to meet the day-to-day shopping and commercial needs of the Structure Plan population.

The WAPC's 'Liveable Neighbourhoods' promotes small neighbourhood and local centres located to provide local retail, and possibly other services, in walking distance of most dwellings. These centres provide a focus for the neighbourhood and are important in generating walking trips and physical activity. Their location should be on an intersection of relatively busy streets with good through traffic levels.

Consistent with current urban design practice, the proposed Centre ought to be developed in accordance with 'main street' design principles, rather than a typical suburban 'inward facing' shopping centre. The frontage to Hall Road presents an opportunity for a 'main street' design to be achieved, at least on the east side of Hall Road. Furthermore, the Centre should incorporate a mix of land uses, including retail, employment and medium density housing.

The Centre site is located in the area zoned 'Development' under LPS5. The Structure Plan requires that a Detailed Area Plan be prepared for the 'Development' zone, pursuant to Clause 5.17.5 of LPS5, to ensure the area is subdivided and developed in a manner considered appropriate for a Local/Neighbourhood Centre. The Detailed Area Plan should demonstrate the strategic commercial planning merit of the Centre, with particular regards to the amount of Net Lettable Area and other floorspace requirements of the Centre.

4.3.4 Public Open Space

WAPC Policy DC 2.3 states:

“The Commission's normal requirement in residential areas is that, where practicable, 10 percent of the gross subdivisible area be given up free of cost by the subdivider and vested in the Crown under the provisions of Section 20A of the Town Planning and Development Act, 1928 (as amended) as a Reserve for Recreation. In determining the gross subdivisible area the Commission deducts any land which is surveyed for schools, major regional roads, public utility sites, municipal use sites, or, at its discretion, any other non-residential use site.”

The Gross Residential Area of the Structure Plan is 242.49 hectares, meaning 24.25 hectares of land (10%) is required to be set aside for public open space. The Structure Plan proposes 24.25 hectares (10%) of public open space.

In addition to the proposed public open space, it is noted that for the established residential areas in the Structure Plan, separate reserves have been created for drainage, meaning the entire area of land already set aside for public open space is available for recreation. Further, the Structure Plan contains three school sites with a total area of over 20 hectares, which suggests each school will have separate playing fields to the areas proposed to be set aside as public open space under the Structure Plan, providing further recreation opportunities for residents.

The Structure Plan proposes ten separate areas of public open space, distributed throughout the Structure Plan area to maximise access by residents. Some of the public open space sites shown on the Structure Plan have already been provided by subdividers of land on the south side of Chapman Valley Road. Six of the ten public open space sites are already reserved for the purpose of public recreation under the control and management of the City.

The remaining areas of public open space are required to be provided as and when subdivision occurs. It is not expected that areas public open space would be required at the superlot subdivision stage as further detailed in section 4.4.2.

For land where no public open space is shown on the Structure Plan, the provisions of the Planning and Development Act and WAPC Policy DC 2.3 dealing with cash-in-lieu of public open space will apply. That is, as a conditional of subdivision approval, subdividers will be required to provide cash-in-lieu of the provision of public open space. Cash-in-lieu funds will be collected by the City and set aside for the acquisition of land for, and the provision and maintenance of, public open space within the Structure Plan.

4.3.5 Community Facilities

The Structure Plan proposes a site of 2 hectares for a Community Hall. The site is already owned by the City and is located on the west side of Hall Road, opposite the proposed Local Centre and adjacent to an area of public open space (8.09 hectares) and a primary school site.

The Primary School site of 3.98 hectares is located south of the Community Hall with frontage to Chapman Valley Road and Hall Road. An area of public open space abuts the western and part of the northern boundaries of the Primary School site.

The positioning of the Primary School site adjacent to the Community Hall and an area of public open space is desirable, however, consideration should be given to the interface of the primary school with Hall Road and the

Local Centre on the east side of Hall Road. The opportunity exists to establish a ‘main street’ environment along Hall Road, fronted by the Local Centre on the east and the primary school on the west.

4.4 Subdivision

It is the underlying design philosophy of the Structure Plan that land be subdivided and developed at the R12.5 density, with proposed lots connected to sewer. To avoid the need to provide sewerage (say for low density residential of 2,000m² lots), subdivision at lower densities is not supported as it would undermine the planning for the urban development of the Waggrakine area and represents an inefficient use of the existing and planned infrastructure for the area.

However it is acknowledged that, at present, there is a need for considerable investment to extend sewer further into the Structure Plan area, which may not be viable for one individual land owner. Therefore it is proposed to allow for limited subdivision without connection to sewer as follows:

4.4.1 Existing House Lot Subdivision

The WGDS provides for the subdivision of land without connection to sewerage so as to create a new lot where a dwelling was erected prior to the operation of the WGDS. The Structure Plan provides for the retention of existing dwellings on larger lots and the City will continue to support the excision of ‘house lots’ without requiring reticulated sewer connection where those dwellings were existing prior to the date of original gazettal of the WGDS (6 February 1981). The size of the lot should have no further subdivision potential itself (generally up to 2,000m²), however, where improvements are pertinent to the dwelling or in the interests of orderly and proper planning, larger lot sizes may be approved.

4.4.2 Superlot Subdivision

Although not generally supported by WAPC policy, superlot subdivisions are not considered to be contrary to the orderly and proper planning of the land in this instance especially given the fragmented land ownership.

A superlot subdivision may be supported where each superlot is capable of the development of a minimum of 10 future residential lots to the R12.5 standard. All roads will be required to be ceded at the initial time of subdivision, however construction of those roads can occur when the superlot is further subdivided/developed for residential purposes.

By creating the road reserves at the superlot stage it enables future land owners to develop independently and avoid the situation where surrounding subdivision is stifled through a lack of road connectivity.

Given that superlots themselves do not generally create substantial residential development opportunity, it is not expected that land areas of public open space would be formally created as reserves at the superlot subdivision stage. However at the time the superlot is developed further for residential purposes public open space areas will be required to be given up in accordance with the Structure Plan.

Where there is no public open space land requirement or where the land requirement is less than the 10% requirement, cash-in-lieu for public open space will be required at the superlot subdivision stage. This will ensure that the public open space calculations remain valid by taking into account the road reserve areas and enables early contributions to be made for public open space development / land acquisition. In order to “track” which lots have made cash-in-lieu contributions and to ensure certainty for future land owners, it is recommended that

a Section 70A Notification be placed on the Certificates of Title for the superlot(s) advising that the land has fulfilled its public open space contribution and that no further public open space contributions are required for future residential subdivision/development.

To ensure that superlot subdivisions do not prejudice the orderly and proper planning of the land, it is a requirement that a subdivision guide plan be prepared (and approved by the local government) for the entire landholding to show additional access streets (if any) and the ultimate lot configuration and design for the land. These plans will form the basis for the superlot boundaries and will be used to update the Structure Plan accordingly.

4.5 Services

4.5.1 Sewerage

It is acknowledged that significant investment is needed in order to provide the sewer mains extension from the west to service the Structure Plan area. The Water Corporation considers that it is unviable for one developer to complete a significant part of the mains extension and further that the fragmented ownership of the land makes it very difficult for one developer to coordinate a mains extension.

The Structure Plan therefore allows for “Existing House Lot” and “Superlot” subdivisions without a requirement for sewer. However all other lots will be required to connect to sewer.

Sewer is provided to existing subdivided areas on the south side of Chapman Valley Road. Subdividers will be required to progressively extend sewerage northward as and when subdivision occurs. Subdividers will be responsible for the provision of sewerage at their expense, however, this does not prevent individual land owners from privately agreeing to share the cost of providing sewer.

The requirement to provide sewerage will be achieved by imposition of standard conditions of subdivision approval.

4.5.2 Water

The Structure Plan requires all proposed lots to be connected to reticulated water.

A reticulated water supply is provided to existing subdivided areas on the south side of Chapman Valley Road. Subdividers will be required to progressively extend the reticulated water system northward as and when subdivision occurs. Subdividers will be responsible for the provision of reticulated water at their expense, however, this does not prevent individual land owners from privately agreeing to share the cost of providing water.

The requirement to provide water will be achieved by imposition of standard conditions of subdivision approval.

4.5.3 Drainage

The Structure Plan requires a comprehensive drainage system to be designed and constructed at the time of subdivision. The more traditional methods such as sumps and pipes (that already exist in the Structure Plan area)

are to be avoided and redeveloped if possible. A more contemporary approach incorporating water sensitive urban design principles is required.

Land already set aside for drainage is shown on the Structure Plan. Additional land for drainage may be required at the time of subdivision. Subdividers will be responsible for the provision of a comprehensive drainage system, and provision of land for drainage, at their expense, however, this does not prevent individual land owners from privately agreeing to share the cost of providing drainage infrastructure.

Subdivision approval will be conditional upon the submission and implementation of a Local Water Management Plan demonstrating how each subdivider proposes to manage stormwater run-off from lots and roadways.

4.6 Staging

The subdivision of land within the Structure Plan will be staged in accordance with land owner requirements. Subdivision of the southern part of the Structure Plan has already commenced and it is anticipated this area will progressively be subdivided prior to the northern parts of the Structure Plan, where the availability of services is limited. That is, the natural urban front is likely to proceed from the southern to northern parts of the Structure Plan.

The City has already acquired the Community Hall site. The two public school sites are owned by the Education Department and the private school site is owned by the Roman Catholic Church. The Local Centre presently forms part of a larger, privately-owned land parcel. The Local Centre is likely to be developed, commensurate with demand, as the population of the Structure Plan increases. Given the relative proximity of the Local Centre to the established areas south of Chapman Valley Road, it is possible commencement of the Local Centre will occur sooner than later.

4.7 Development Contributions Plan

4.7.1 Existing Cost Contribution Arrangements

It is a General Objective of the WGDS to “make provision for the apportionment of Scheme Costs amongst owners in an equitable manner.” Clause 41 of the WGDS lists the Scheme Costs. These include:

- » Preparation and administration of the WGDS;
- » Drainage works and acquisition of land for drainage;
- » Sewerage works and acquisition of land for sewerage;
- » Water supply works;
- » Road works, including acquisition of land for roads (limited to half the width of roads abutting open space);
- » Compensation costs;
- » Acquisition of land for public open space and installation of a bore and pump on each open space site;
- » Interest accruing from time to time on moneys borrowed by the City for the purposes of the WGDS; and
- » Other costs and expenses the City is required to meet in order to implement and complete the WGDS.

Since the introduction of the WGDS, contributions have been paid toward the Scheme Costs by subdividers of land within the Scheme Area. Subdividers are required to contribute to the Scheme Costs based on the proportion that their land bears to the total area of the WGDS. Contributions are paid to the City at the time the subdivider seeks to clear the relevant condition(s) of subdivision approval. All subdivider cost contributions are held by the City in a separate account and expended on the various items that constitute Scheme Costs.

A schedule setting out how Scheme Cost contributions have and will be expended will be provided to the Minister for Planning when the request is made by the City to formally repeal the WGDS.

4.7.2 Proposed Cost Contribution Arrangements

The Structure Plan does not propose any provisions for the sharing of infrastructure costs amongst land owners.

Each subdivider of land in the Structure Plan area will be required to construct all proposed roads (including the upgrade and / or widening of any existing roads) in accordance with the road layout proposed by the Structure Plan. The provisions of the Planning and Development Act are available for the purpose of an original subdivider seeking to recover the cost of road construction from a subsequent subdivider.

Subdividers will be required to provide all necessary urban services (sewer, water, drainage, power), pursuant to standard conditions of subdivision approval. Any areas of public open space shown on the Structure Plan and not already provided will be required to be set aside in accordance with a standard condition of subdivision approval. For subdividers of land where the Structure Plan does not propose any public open space, cash-in-lieu of public open space will be required pursuant to standard conditions of subdivision approval.

In light of the above, it is not considered necessary for the Structure Plan to be accompanied by a formal Development Contribution Plan (or similar).

5.0 Conclusion

This report provides an explanation of the proposed Structure Plan for the Waggrakine residential area.

It is proposed to convert revoke the WGDS and adopt a Structure Plan pursuant to the provisions of Clause 5.17 of LPS5.

At the Ordinary Council meeting held 15 April 2009, the City resolved to revoke the WGDS, on the grounds the WGDS is no longer considered to be a contemporary or relevant planning instrument. Prior to revocation, an alternate planning instrument will be required to guide the subdivision of land within the Scheme Area of the WGDS.

Adoption of the Structure Plan pursuant to the provisions of LPS5 is considered to represent the most orderly and proper way in which to introduce the required planning controls for the Scheme Area of the WGDS.

The Structure Plan addresses all of the relevant matters in Clause 5.17 of LPS5 and retains the general pattern of subdivision and land uses proposed by the WGDS, including a centrally-located Local/Neighbourhood Centre, three school sites, a community hall site and various sites set aside for public open space and drainage. The school sites are already under the ownership of the applicable education authority while the hall site is owned by the City.

The existing dwelling density codes under LPS5 will remain and the subdivision and development of land within the Structure Plan will be required to accord with the applicable density code. The Structure Plan requires a Detailed Area Plan to be prepared for land within the 'Development' zone of LPS5, pursuant to Clause 5.17.5 of LPS5, to ensure the Local/Neighbourhood Centre is developed with an appropriate mix of land uses and housing opportunities.

The design of the local road network has been modified so that it accords with current planning practice and policy, with many of the no-through roads shown on the WGDS replaced by a conventional and permeable road layout.

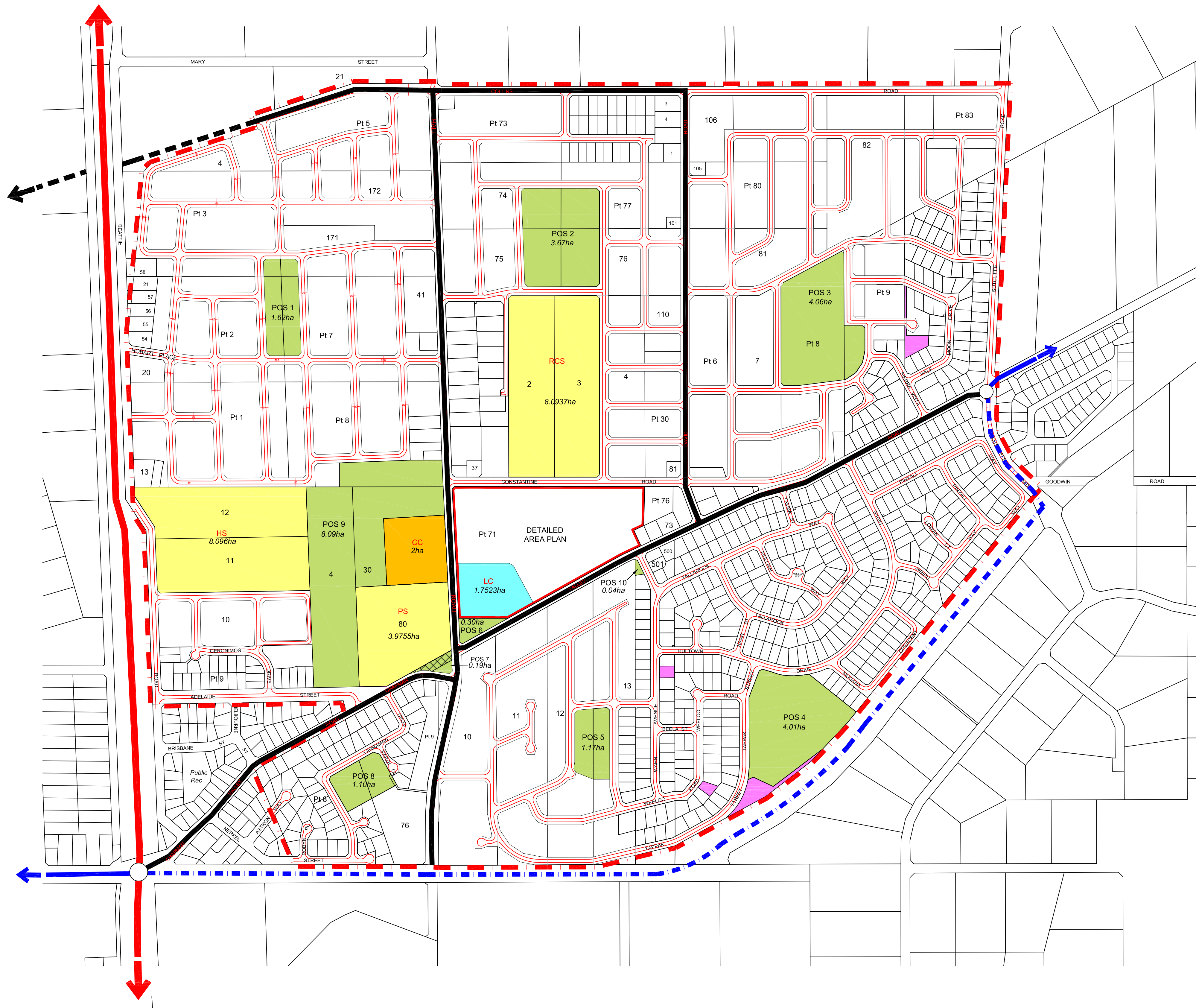
Given that significant investment is needed in order to provide the sewer mains extension from the west to service the Structure Plan area, provision has been made for "Existing House Lot" and "Superlot" subdivisions without a requirement for sewer.

The subdivision of land will be required to accord with the Structure Plan with respect to the layout of roads, lot configuration and provision of land for public open space and drainage. Normal cash-in-lieu arrangements will apply to land where public open space is not allocated by the Structure Plan.

Upon adoption of the Structure Plan, the City will request the Minister for Planning to repeal the WGDS pursuant to Section 74 (b) of the Planning and Development Act.

APPENDIX I

STRUCTURE PLAN



LEGEND

- - - - - Structure Plan Boundary
- School Sites
 - PS Primary School
 - HS High School
 - RCS Roman Catholic School
- Community Facilities
- Local/Neighbourhood Centre
- Public Open Space
- Drainage
- Hall Road Local Centre/Development Zone
Detailed Area Plan to be adopted prior to subdivision and / or development
- Roads to be Closed

LAND USES / SITES	LAND AREA (ha)
Gross Area of Structure Plan	267.23
Non-Residential Deductions	
Local Centre	1.75
Community Centre	2.00
Drainage Reserves	
» Reserve 48613	0.24
» Reserve 36663	0.40
» Reserve 45727	0.09
» Reserve 48690	0.09
Sub-Total Drainage	0.82
School Sites	
» Primary School	3.98
» High School	8.10
» Private School	8.09
Sub-Total School Sites	20.17
Sub-Total Non-Residential Deductions	24.74
Gross Residential Area	242.49
Public Open Space	
» Site 1	1.62
» Site 2	3.67
» Site 3	4.06
» Site 4 (Reserve 36662)	4.01
» Site 5 (Reserve 50206)	1.17
» Site 6	0.30
» Site 7 (Reserve 36545)	0.19
» Site 8 (Reserve 36082)	1.10
» Site 9 (Reserve 43314)	8.09
» Site 10 (Reserve 48689)	0.04
Sub-Total POS (10%)	24.25
Required POS (10%)	24.25
Net Residential Area	218.24

FINAL APPROVAL
 Adopted for the Final Approval by resolution of the City of Geraldton - Greenough of the ordinary meeting of the council held on the 21st day of December 2010 and the Common Seal of the City of Geraldton - Greenough was hereto affixed by the authority of the resolution of the Council in the presence of:

MAYOR

CHIEF EXECUTIVE OFFICER

- Primary Distributor
 - Integrator Arterial
 - Future Integrator Arterial
 - Neighbourhood Connector
 - Future Neighbourhood Connector
 - Access Street - Footpath One Side
- } Cycle lanes & Footpath both sides
- } Shared Path one side and Footpath on Opposite Verge

date	10 July 2012	job no.	5773	scale	1:5000 @ A1
designer	M Sullivan	prepared by	D McCulloch	e-ref	081002
client	City of Geraldton - Greenough				
291 Marine Terrace, Geraldton, Western Australia, 6530					
email geraldton@greg-rowe.com web www.greg-rowe.com tel +618 9956 0633 fax +618 9965 0633					

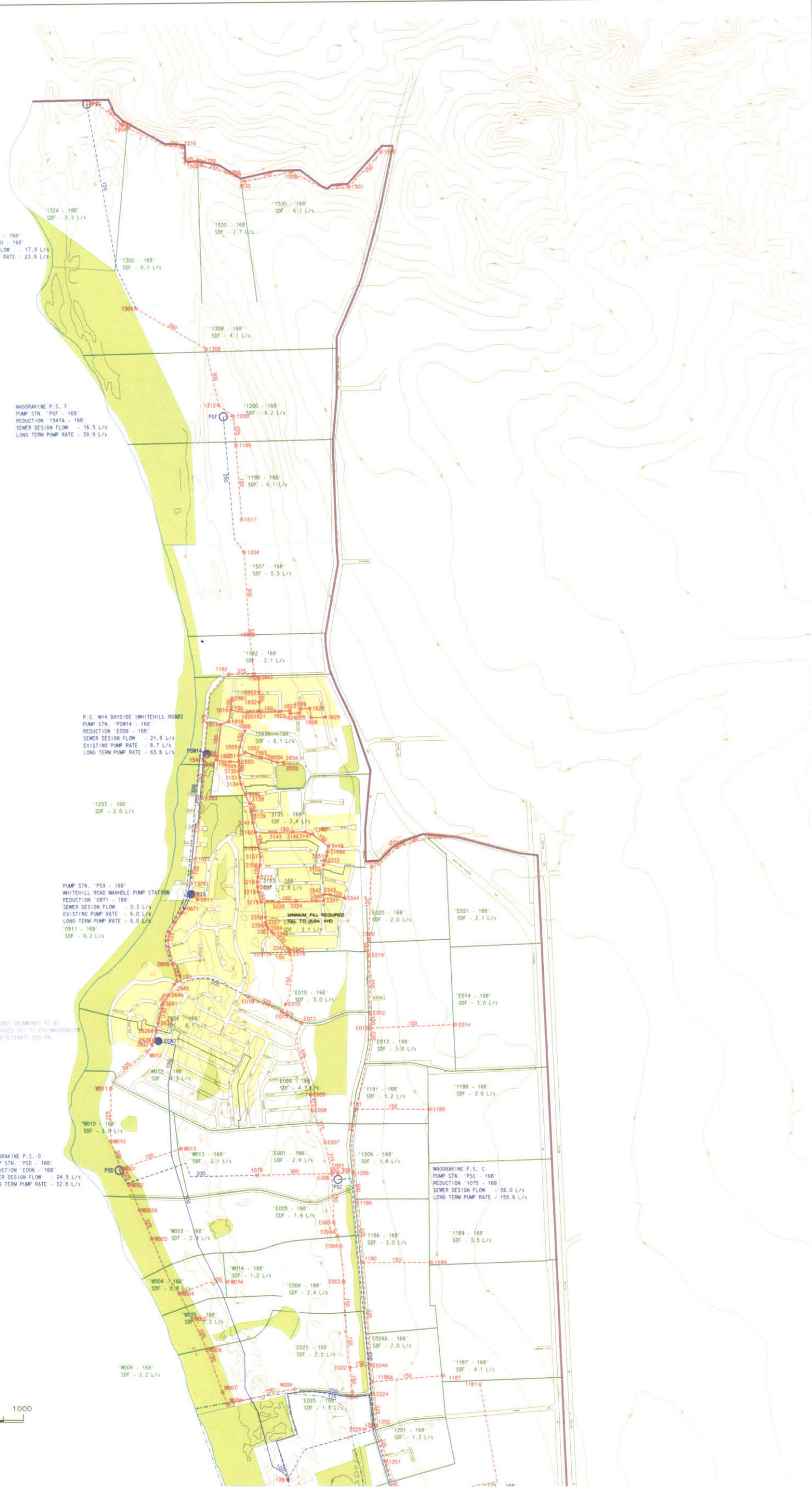
title	structure plan
address	waggrakine residential estate waggrakine
perth	tel +618 9221 1991 email gra@greg-rowe.com
peel / south west	tel +618 9582 8288 email mandurah@greg-rowe.com
pilbara	tel +618 9173 4333 email portheadland@greg-rowe.com

GREG ROWE & associates
 FOCUSED ON ACHIEVEMENT



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LEGEND		NOTATION		SHEET INDEX		WATER CORPORATION		WASTEWATER SCHEME PLANNING SERIES		
	EXISTING PUMPING STATION		PARKS AND PUBLIC OPEN SPACE		1		WAGGRAKINE - SD168		CONCEPTUAL PLANNING	
	EXISTING PRESSURE MAIN		EXISTING SEWERED AREAS			ISSUED WITH THE AUTHORITY OF THE MANAGER	INFRASTRUCTURE PLANNING BRANCH		LONG TERM SCHEME - SHEET 1 OF 2	
	EXISTING GRAVITY SEWER		SEWERED BY PRIVATE PS			609 NEWCASTLE STREET, LEEDERVILLE 6007	WESTERN AUSTRALIA		TELEPHONE (08) 9420 2420, FAX (08) 9420 3179	
	PROPOSED PUMPING STATION		NODE CATCHMENT				PLANNING BY	COMPILED BY	ACCEPTED BY	
	PROPOSED PRESSURE MAIN		PS AND SEWER CATCHMENTS				G.F.PEDERSEN	G.F.PEDERSEN	T.ZHENG	
	PROPOSED GRAVITY SEWER		SEWER DISTRICT CATCHMENT				SCALE	VERSION	FILE NO.	A1
			WTP CATCHMENT				1:10,000	6 JUNE 2008		

PUMP STN. 'PS9 - 168'
 WHITEHILL ROAD MANHOLE PUMP STATION
 REDUCTION '0871 - 168'
 SEWER DESIGN FLOW - 0.2 L/s
 EXISTING PUMP RATE - 6.0 L/s
 LONG TERM PUMP RATE - 6.0 L/s

POINT DRAWINGS TO BE
 FORWARDED TO PSD WAGGRAKINE
 IN ULTIMATE DESIGN.

WAGGRAKINE P.S. D
 PUMP STN. 'PSD - 168'
 REDUCTION 'E006 - 168'
 SEWER DESIGN FLOW - 17.5 L/s
 LONG TERM PUMP RATE - 23.5 L/s

PUMP STN. 'P.S. H - 168'
 REDUCTION 'E004A - 168'
 SEWER DESIGN FLOW - 5.2 L/s
 LONG TERM PUMP RATE - 6.9 L/s

PUMP STN. 'PSK2 - 168'
 W2 SUNSET
 REDUCTION '1075 - 168'
 SEWER DESIGN FLOW - 83.6 L/s
 EXISTING PUMP RATE - 26.0 L/s
 LONG TERM PUMP RATE - 111.4 L/s

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PCID
 DESIGN FILE

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LEGEND

- EXISTING PUMPING STATION
- EXISTING PRESSURE MAIN
- EXISTING GRAVITY SEWER
- PROPOSED PUMPING STATION
- - - PROPOSED PRESSURE MAIN
- - - PROPOSED GRAVITY SEWER
- EXISTING SEWERED AREAS
- SEWERED BY PRIVATE PS
- NODE CATCHMENT
- PS AND SEWER CATCHMENTS
- SEWER DISTRICT CATCHMENT
- WWTP CATCHMENT

NOTATION

SEWER DESIGN FLOW - 1.5 x AVERAGE DAILY FLOW RATE
 PUMP RATE - LONG TERM PUMP RATE OR
 EXISTING PUMP RATE IF LARGER

100 0 500
 METRES

SHEET INDEX

1
 2



ISSUED WITH THE AUTHORITY OF THE MANAGER
 INFRASTRUCTURE PLANNING BRANCH
 620 NEWCASTLE STREET, LEEDERVILLE 6007
 WESTERN AUSTRALIA
 TELEPHONE (08) 9420 2420, FAX (08) 9420 3179

WASTEWATER SCHEME PLANNING SERIES

WAGGRAKINE - SD168
 CONCEPTUAL PLANNING
 LONG TERM SCHEME - SHEET 2 OF 2

PLANNING BY R. APOLONI	COMPILED BY R. APOLONI	ACCEPTED BY T. ZHENG
SCALE 1:10,000	VERSION NOVEMBER 2011	FILE NO. ITI 2006 07136 V01

A1



PUMP STN. 'P59 - 168'
 WHITEHILL ROAD MANHOLE PUMP STATION
 REDUCTION '0871 - 168'
 SEWER DESIGN FLOW - 0.2 L/s
 EXISTING PUMP RATE - 6.0 L/s
 LONG TERM PUMP RATE - 6.0 L/s

POINT DRAWINGS TO BE
 CHARGED OUT TO P20 WAGGRAKINE
 IN ULTIMATE DESIGN.

WAGGRAKINE P.S. D
 PUMP STN. 'P50 - 168'
 REDUCTION 'E006 - 168'
 SEWER DESIGN FLOW - 17.5 L/s
 LONG TERM PUMP RATE - 23.5 L/s

WAGGRAKINE P.S. C
 PUMP STN. 'P5C - 168'
 REDUCTION '1075 - 168'
 SEWER DESIGN FLOW - 48.7 L/s
 LONG TERM PUMP RATE - 255.3 L/s

PUMP STN. 'P.S. H - 168'
 REDUCTION 'E004A - 168'
 SEWER DESIGN FLOW - 5.2 L/s
 EXISTING PUMP RATE - 26.0 L/s
 LONG TERM PUMP RATE - 6.9 L/s

PUMP STN. 'P5K2 - 168'
 W2 SUNSET
 REDUCTION '1075 - 168'
 SEWER DESIGN FLOW - 85.6 L/s
 EXISTING PUMP RATE - 26.0 L/s
 LONG TERM PUMP RATE - 111.4 L/s

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P21D

Fillis, Peter

From: Mirihagalla, Prem
Sent: Friday, 6 September 2013 9:33 AM
To: Fillis, Peter
Subject: FW: Waggrakine Estate - Sewer Infrastructure Plan - Draft Layout of Options
Attachments: 201307171440.pdf; 201307171455.pdf

Premalal Mirihagalla

Principal Civil Engineer -Water
D +61 8 6208 0226 M +61 400 233 811
Premalal.Mirihagalla@aecom.com

AECOM

Level 7, 3 Forrest Place, Perth, WA 6000
GPO Box B59 Perth WA 6849
T +61 8 6208 0000 F +61 8 6208 0999
www.aecom.com

Please consider the environment before printing this email.

From: Mark Willson [mailto:Mark.Willson@watercorporation.com.au]
Sent: Wednesday, 17 July 2013 4:18 PM
To: Mirihagalla, Prem
Cc: murrayc@cgg.wa.gov.au
Subject: RE: Waggrakine Estate - Sewer Infrastructure Plan - Draft Layout of Options

Prem,

The wastewater plans you have provided in both options confirms the Corporations concept planning.

The options you may consider below for location of the wastewater reticulation are proposed below. Please find attached marked up plan with comments which includes a proposed option to consider locating the wastewater reticulation in regards to option 2.

Option 1 - Location of reticulation - 1. Within FUTURE road reserves and 2. Within EXISTING road reserves, along existing boundaries identified as locations for future road reserves / pos in SP.

This option may rely on;

- Orderly development from existing connection point where the main extension crosses the NWCH
- Developing road reserve at the same time as building the wastewater retic.
- Locating reticulation in individual owners property not along boundaries. Please find attached letter sent to Barry Humfrey in 2011 on this matter. This process in some cases may also be applicable to option 2, but generally location of reticulation along existing boundaries does not meet the same issues/opposition.
- For the above reasons this option may be considered as the least likely.

Option 2 - Location of reticulation within EXISTING road reserves, along existing boundaries identified as locations for future road reserves / pos in SP.

- This may also includes small sections where either the structure plan may need amending to make this work or the reticulation may need relocating when the road reserves are developed.
- In the first instance designers should avoid locating wastewater reticulation in residential lots unless there is no alternative.
- Each existing lot may have an identified point of connection as proposed on the attached plan by a black dot to ensure it can be serviced by the wastewater reticulation location identified in orange. Reticulation from this main in orange may be further investigated and provided in a separate colour in order to ensure / identify constraints of each existing lot (parent) can servicing each future individual lot (child).
- This may be considered a more likely option due to the fragmented ownership it is more likely that unorderly development will occur, existing lots will develop independently in no particular order, hence this limits where the mains extensions to.

Glenfield Structure Plan (Map Only)

The plan may also show the Glenfield Structure Plan to ensure the main extension is considered within this plan and the fact that it will bring benefit to the area which is not currently sewerred.

Have also marked up the plan above a possible alternative option for the main extension in this area as the structure plan shows to roads in this area linking chapman road and alexander drive.

<http://www.cgg.wa.gov.au/sites/default/files/Glenfield%20Structure%20Plan%20Map%20Feb%202011.pdf>

Crossing of North West Coast Highway

The report may include options / other service proposed projects which are required to cross the NWCH in a similar location. The Corporations has plans to upgrade the water reticulation main size in the area and providing and there may be cost benefits to provide sleeves to for other services at the same time during construction depending on construction technique adopted.

Please call should you wish to discuss further.

Regards

Mark

Mark Willson
Development Planner
Development Services
Water Corporation

T: (08) 9923 4910 | F: (08) 9923 4966
www.watercorporation.com.au



Please consider the environment before printing this email.

From: Mirihagalla, Prem [<mailto:Premalal.Mirihagalla@aecom.com>]
Sent: Tuesday, 16 July 2013 5:22 PM
To: Mark Willson
Subject: Waggrakine Estate - Sewer Infrastructure Plan - Draft Layout of Options

Hi Mark,

Thanks for calling back.

We wish to send you the two options we have prepared for the sewer infrastructure for Waggrakine Residential Estate for discussion.

- The proposed sewers primarily align with POS or road reserves based on the current structure plan of June 2012.
- Option 1 excludes Seafields Stage 2A and 34 of the lots in Stage 2B which may be connected to the existing sewer system south of Chapman Valley Road.
- Option 2 has slightly different catchment boundaries and main sewer alignments and includes 34 lots in Seafields Stage 2B. (but not 16 lots in Stage 2A).
- Both these options are suitable for staged development and extension to meet individual developer's needs for staged sub division.
- Flow rates were estimated based on net land area and a design flow rate of 0.168 L/s per ha of net developable land. The total flow resulting from 100% single residence development is 20.1L/s. This is the same rate that the Water Corporation used in the Waggrakine Conceptual Planning Long Term Scheme of Nov 2011.
- We have designed the size of the sewer based on Water Corporation's design criteria and using DN150 and DN225 for main sewers.

We have worked out a cost per lot which for sewer infrastructure including branch sewers up to Chapman Road and it is around \$3200 per lot. This rate is slightly less for Option 2.

As discussed, the total flows out of the estate based on these plans is about 20.5L/s, compared to about 23L/s based on Water Corporation's concept plan. With the future development of Glenfield South the flows will increase to require a DN300 pipe along Chapman Road. This is considered to be a trunk sewer which will be funded by the Water Corporation.

We are yet to work out the scope and cost of upgrading of the southern sewer system to enable connecting the Seafields Stage 2B and other lots to this system.

We will call to discuss.

Regards
Prem

Premalal Mirihagalla

Principal Civil Engineer -Water
D +61 8 6208 0226 M +61 400 233 811
Premalal.Mirihagalla@aecom.com

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Please consider the environment before printing this email.

From: Mark Willson [<mailto:Mark.Willson@watercorporation.com.au>]
Sent: Tuesday, 16 July 2013 3:24 PM
To: Mirihagalla, Prem
Subject: at my desk now, your phone message box is full

Mark Willson
Development Planner
Development Services
Water Corporation

T: (08) 9923 4910 | F: (08) 9923 4966
www.watercorporation.com.au



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Water Corporation E-mail - To report spam Click [here](#)



WHAT IS THIS AREA PROPOSED AS?

POTENTIAL TO SERVE INCREASED AREA BY PROVIDING RETIC TO AREA SUBJECT TO FURTHER PLANNING AND UPGRADING PUMP STATIONS AND PRESSURE MAIN?

GLENFIELD STRUCTURE PLAN INSERT OPPORTUNITIES

LEGEND

- CATCHMENT BOUNDARY
- PROJECT BOUNDARY
- MAIN SEWER
- EXISTING SEWER
- EXISTING RURAL LOT BOUNDARY
- PROPOSED SUPER LOT BOUNDARY
- SCHOOL SITES
- COMMUNITY FACILITIES
- LOCAL / NEIGHBOURHOOD CENTRE
- PUBLIC OPEN SPACE

CATCHMENT	AREA (Ha)	FLOW (L/S)
1	12.0	2.02
2	11.4	1.92
3	13.3	2.23
4	6.4	1.08
5	16.6	2.79
6	22.6	3.80
7	4.9	0.82
8	15.6	2.62
9	16.8	2.82
10	10.5	1.76
11	8.4	1.41

SERVICE POINT AT LOWEST POINT FOR EACH EXISTING LOT OR SUB CATCHMENT

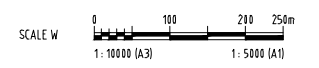
AREAS MARKED 1, 2 & 3
CAN FUTURE ROAD BE LOCATED ALONG BOUNDARY?
OR THIS SECTION MAY REQUIRE RELOCATION.

ALTERNATIVE OPTION IF PROPOSED ROAD FOLLOWED EXISTING BOUNDARY

SUB CATCHMENT BOUNDARY

PLAN
1:5000

FOR INFORMATION ONLY



REVISIONS

No.	BY	DATE	DESCRIPTION	APPD.
C				
B	GV	16/07/13	RE-ISSUED FOR DISCUSSION	PM
A	GV	16/07/13	ISSUED FOR DISCUSSION	PM

REFERENCE DRGS.

DRG. No.	TITLE

This drawing is confidential and shall only be used for the purposes of this project. The signing of this title block confirms the design and drafting of this project have been prepared and checked in accordance with the AECOM Quality Assurance system to ISO 9001:2000.

DESIGNED	CHECKED
G VIVEKANANDA	M MACLEAN
P MIRIHAGALLA	

DATE: 16/07/13

AECOM

AECOM Australia Pty Ltd A.B.N. 20 093 846 925

CITY OF
GREATER
GERALDTON

SEWAGE INFRASTRUCTURE PLANNING
WAGGRAKINE RESIDENTIAL ESTATE
SEWER LAYOUT OPTION 1

Scale A1-1:5000	A3-1:10000	Drw No. 60297775-SKT-001	Rev. C
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138



Your Ref:
Our Ref: GN12007 00325 V01
Enquiries: Phil Gale
Direct Tel: 08 9923 4942 Fax: 08 9923 4966

January 24, 2011

Humfrey Land Developments
272 Foreshore Drive
GERALDTON WA 6530

Attention: Barry Humfrey

WASTEWATER PLANNING SEAFIELDS ESTATE WAGGRAKINE

Midwest Region
45 Cathedral Avenue
Geraldton WA 6530
PO Box 43
Geraldton WA 6531
Fault Enq **13 13 75**
Account Enq **13 13 85**
Technical Enq **13 13 95**
Fax (08) 9923 4966
www.watercorporation.com.au
ABN 28 003 434 917

Further to our meeting with you and your consultant engineer Aecom in December 2010 regarding option to provide wastewater infrastructure to your Waggrakine subdivision Seafields.

The Water Corporation agreed to amend our wastewater planning proposed by Aecom in April 2008, however since then there has been no detailed design submission received. This planning had two connecting links between the existing mains in Sunset Beach and Waggrakine, one north in Okahoma Road and one south in Stella Road.

The Corporation has been in discussion with the City of Geraldton-Greenough with it's application to acquire funding to contribute to mains extensions to serve subdivisions in the non-frontal Waggrakine area.

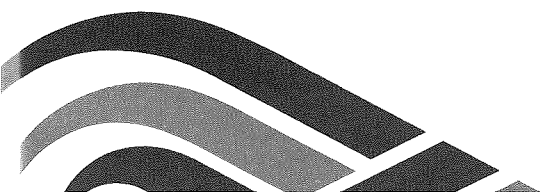
To assist the City the Corporation again reviewed the planning to serve this Waggrakine area and discovered that the original planning in 1985 showed one connecting link for the area mid way between Okahoma Road and Stella Road in a future road reserve as shown on the structure plan.

This option for the location for the wastewater reticulation is the Corporations and City of G&G's preferred option which best fits the community planning and the local structure plans and there is no duplication of mains. It also provides the sound reasons for acquiring funding to design and construct a wastewater mains extension that would provide one point of connection to serve the area detailed in the 'Waggrakine Guided Development Scheme Map'. As per the attached plan the wastewater reticulation route has the following benefits;

- 1. Existing road reserves.
- 2. Future road reserves as per the Glenfield Structure Plan. (along existing lot boundaries)
- 2. Future POS & Department of Education Land as per the 'Waggrakine Guided Development Scheme Map' (along existing lot boundaries)

The Corporation understand that Humphrey Land Developments (HLD) business objectives in releasing lots in the next stage of Seafields and its concerns of the time it may take to complete agreements with current land owners where the main may be located in the preferred route planning.

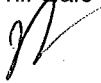
The interim solution for a temporary connection to the existing wastewater reticulation is being proposed by HLD may be agreeable. However this can only be completed if the process and controls are in place to make sure the permanent wastewater mains extension is constructed and accepted.



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Under the current process HLD has to prove that the negotiations with land owners will significantly hold up the project. I have enclosed the "*Process for locating the wastewater reticulation/easement in existing land*" that you will need to address and refer any outcomes back to the Corporation.

Should you have any questions relating to this correspondence please do not hesitate to contact Phil Gale 9923 4942.



Phil Gale
Land Development Officer
Midwest Region

Process for locating the wastewater reticulation/easement in existing land

1. Negotiations

As you are aware, it is the responsibility of the engineer to prepare the design in accordance with scheme planning and all relevant manuals, and where required for the developer engineer to negotiate and provide in writing agreement from affected landowners prior to our acceptance of design.

Where all negotiations reach a point of there being no way that agreement with affected landowners will be reached, then there is a process available whereby we can authorise you to commence formal preliminaries to works - but only when there is well documented evidence of full and thorough negotiations having occurred without success.

Successful negotiations with the landowners will be the best outcome for all as if we do have to proceed to formal Preliminaries to Works, the Minister decision is final and can not be pre-empted. Also the timeframes to get to that point can be lengthy with delay to your clients program. Just as importantly though is the need to document fully all negotiations and correspondence.

2. Negotiations Fail, Preliminaries to Works and Recommendation to Minister

The Corporation formally agrees for Preliminaries to Works to commence in accordance with the Corporations External Approvals Manual and Guidelines.

Refer to 1.2 Preliminaries To Works Guidelines.

For this to commence, please submit a draft Notice of Proposal and a copy of the proposed letter that is proposed to be sent to the owner of affected lots. The Notice of Proposal and letter must be in accordance with the examples in the External Approvals Manual and Guidelines for General Works.

Once submitted we will provide comment on the Notice and letter and return comments to you. Amended plan is then to be submitted for our signature.

Following our signing of the Notice, the Notice will be returned to you together with Authorisation to carry out Preliminaries to Works on the Water Corporations behalf, for your action.

Following the Notice being sent to all affected land owners, if any objections are received that can not be resolved the Corporation will submit a report and recommendation to the Minister provided a report has been submitted to this office that must include:-

- Detail of all alternative routes considered and full reasoning as to why they have been rejected.
- Detail of land use along the proposed route and information on the construction techniques proposed to overcome any land uses.
- A complete chronological history of negotiations which relate to the proposed sewer.
- Details of the Local Authority's structure planning for the area.
- Any other facts and information that you believe would be relevant to the Minister in making a decision.

It should be noted that:-

The time involved in going through the authorisation process has been known to be lengthy. Although the Corporation undertakes to address the matter with priority following the provision of the above information, it can not commit a Government Minister to any timeframe.

3. Performance Agreement (Bonding) Review

Any proposal to enter into a Performance Agreement for these works will only be considered following acceptance of the sewer design and submission of an application to bond works. ✓

It should not be assumed that bonding of works will be an acceptable arrangement. Therefore the program for when clearance of conditions of subdivision will occur should be based on when the works will be completed, rather than when the design will be accepted

Fillis, Peter

From: Mark Willson <Mark.Willson@watercorporation.com.au>
Sent: Thursday, 23 May 2013 12:14 PM
To: murrayc@cgg.wa.gov.au
Cc: Mirihagalla, Prem
Subject: Waggrakine Sewer Infrastructure Planning Project AECOM - Reimbursement for constructing 300DN wastewater reticulation
Attachments: 201305221652.pdf; 201305221652.pdf

Murray,

Following recent discussion/email with Aecom engineer in Perth, I have just been made aware that on 1 July 2012 last year the Corporation change it's policy and will now contribute to 300DN wastewater reticulation. Please see attached link for the information on our website.

Please consider this information as initial discussions have considered that this may change the scope of work with Aecom.

Have marked on the wastewater planning and Glenfield Structure Plan the approx. location for the DN300 wastewater reticulation required.

Approx. length = 900m and hence approx. contribution = \$540,000 (\$600 per sq m)

<http://www.watercorporation.com.au/home/faqs/builders-and-developers/do-developers-receive-any-reimbursement-for-the-construction-of-sewers>

Please call should you wish to discuss further.

Regards

Mark

Mark Willson
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Development Services
Water Corporation

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Ref: 60024442

Department of Planning and Infrastructure
Chapman Rd
Geraldton WA 6530

Att: Mr Jerom Hurley

Fax No:

9 May 2007

Dear Jerom

Waggrakine Development Scheme Preliminary Sewer Costings

Further to your instructions, a review of the existing and future planning for sewer reticulation in the above referenced area and an estimate of probable cost to extend trunk sewer mains into the area, has been conducted and is summarised on the attached estimate sheet.

In assessing these costs, the following parameters apply:-

1. The Waggrakine Development Scheme area (WDSA) is bounded by Northwest Coastal Highway (NWCH) to the west, Adelaide St & Chapman Valley Rd to the south, Sutcliffe Rd to the East (but excluding the existing Batavia Gardens Estate) and Mary St & Collins Rd to the north.
2. The WDSA is within the Water Corporation catchment for the existing No 2 Waggrakine pump station (WPS) located to the immediate north of Whitworth St in Sunset Beach. Water Corporation's planning for connectivity from the WDSA to this pump station is via:-
 - a. 225mm & 300mm diameter gravity sewers along Okahoma Rd and through private land (proposed Sunset Beach Estate and other private land holdings adjoining Chapman Rd) for the northern section, and
 - b. 225mm diameter Gravity sewers along Stella St for the southern section.Both these links involve crossing of NWCH and Chapman Rd.
3. Estimates have been based broadly allowing for working in public road reserves. They are not based on any detailed design, formal geotechnical investigation, or detailed route planning as would normally be done for preliminary planning for Infill Sewage design. Rates used are comparative to those used for other similar recent works in Geraldton. Various contingencies have hence been included to allow for variables and unidentified risks.
4. It has been assumed that most ground conditions east of Chapman Rd are favourable to easy digging by conventional machinery (a reasonable assumption considering no rock was encountered in known adjoining areas i.e. Forrester Park).

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5. Indicative contours suggest most of the gravity sewers would not need to be any deeper than 3m with the exception of the northern link from Chapman Rd into the proposed Sunset Beach Estate. 300mm diameter Gravity sewers installed recently in Sunset Beach Estate immediately north of the No 2 WPS were 4-5m deep, below water table and in 2-3m of rock. It is anticipated that this situation will prevail for the rest of the future 300mm gravity sewer through the remainder of the proposed Sunset Beach estate, through the private land to the north and across Chapman Rd. The sewer should then be able to rise at shallower depth with the rising grade along Okahoma Rd and the remainder of the WDSA.
6. Our current advice is that the proposed Sunset Beach estate is expected to be completed within 5 years. This will include the deep 300mm diameter sewer north of the sewage pump station (shown green on the attached sketch). On this basis this portion has been excluded from the above referenced estimates as it will be funded totally by the Sunset Beach Estate developer.

Water Corporation requirements for temporary sewage pump stations stipulate pressure main discharge generally only into existing 225mm diameter gravity sewers, although in some special instances discharge of limited (minor) flows is permitted into existing 150mm diameter sewers.

An estimate for an alternative temporary sewage pump station located near the corner of Mary St and Beattie Rd with a rising main south along Beattie Rd connecting into the proposed 225mm diameter gravity sewer at Stella St, far exceeded the cost for the 225mm & 300mm gravity sewer link from Mary St into the north end of Sunset Beach estate and has hence been excluded from further consideration. Additionally it would require the purchase of land for a site for the pump station, which would normally be acquired during a subdivisional process. The only benefit this would really have provided is the preclusion of benefit to other adjoining land holders outside the WDSA to subdivide with gravity sewage available, without the penalty of contribution to this scheme.

A small temporary pump station could be located in the eastern or central regions of the WDSA and potentially discharge into existing sewers in Forrester Park to the south. This would require detailed design and Water Corporation approvals for discharge into 150mm diameter sewers. Temporary pump stations could be expected to cost in the order of \$0.5M to construct with additional costs for pressure mains and consultancy fees etc. Planning, design and approvals is normally a 1-2 year process.

Potential Staging for these works could occur in the following phases:-

- **The southern link along Stella St** to join the existing sewer in Chapman Rd is relatively short and could potentially extend eastwards to service a strip of land parallel to Chapman Valley Rd possibly right up to Batavia Gardens Estate. Concurrence from Water Corporation on changes to their planned trunk main catchments would need to be ratified. The mains routes within the scheme area are dependant on future subdivisional layouts to maximise gravity sewers in future public road reserves. It will also need to skirt around the primary school on the corner of Hall Rd & Chapman Valley Rd
- **The Okahoma Rd link** is dependant on the completion of the Sunset Beach Estate sewer. Agreement from the landowner between Chapman Rd & Sunset Estate would be required for the sewer to run through his property. The remainder could run in public road reserves.
- **Trunk main along Mary St & Collins Rd** is dependant on the Okahoma Rd link
- **Trunk mains within the scheme area** is largely dependant on the Okahoma Rd link but also reliant on future subdivisional layouts to maximise gravity sewers in future public road reserves.

Discussions have been had with Water Corp regarding the scheme. They have indicated that past schemes have been trialled in other isolated locations with limited success. They would opt not to be involved in this scheme.

A contribution scheme would appear to be best calculated on a pro-rata basis based on each landowners plot size or ultimate lot yield. The scheme could be split into the northern area linking onto Okahoma Rd and a southern area linking onto Stella St.

Some of the key factors affecting such a scheme are:-

- Numerous landowners with potentially differing agendas.
- Not all land owners would develop at the same time.
- Not all land owners agreeing to a contributions scheme – no law saying that they have to.
- No control of change of ownership after contributions.
- No control of change of ownership after initial agreement to a scheme, but before contributions are made.
- How long will the agreement/scheme last.
- Existing small lot owners e.g. on Hall Rd refusing to contribute to the scheme.
- Who will be the custodian of the contributions and how will this be managed.
- How would construction be managed and by whom.
- Adjoining landowners outside the scheme area benefiting from construction of gravity mains outside of the scheme area. This may indeed conversely be a positive for the scheme by opening up other land for suitable development.
- Cost recovery of additional escalated construction costs once contributions have been resolved and or acquired, if and when construction occurs.
- Standard Rise and Fall calculations can be applied to current cost estimates to allow for changing economic effects.

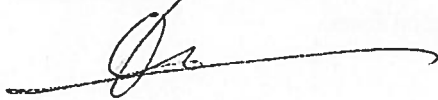
There may be other factors not readily identified here also.

Enclosed with this report is an estimate of probable cost, a sketch plan/aerial photograph overlay showing the route layout and Water Corporation's planning scheme for sewers for the area in question for your ready reference.

We trust that this may provide you with some initial core information to enable you to progress with this project.

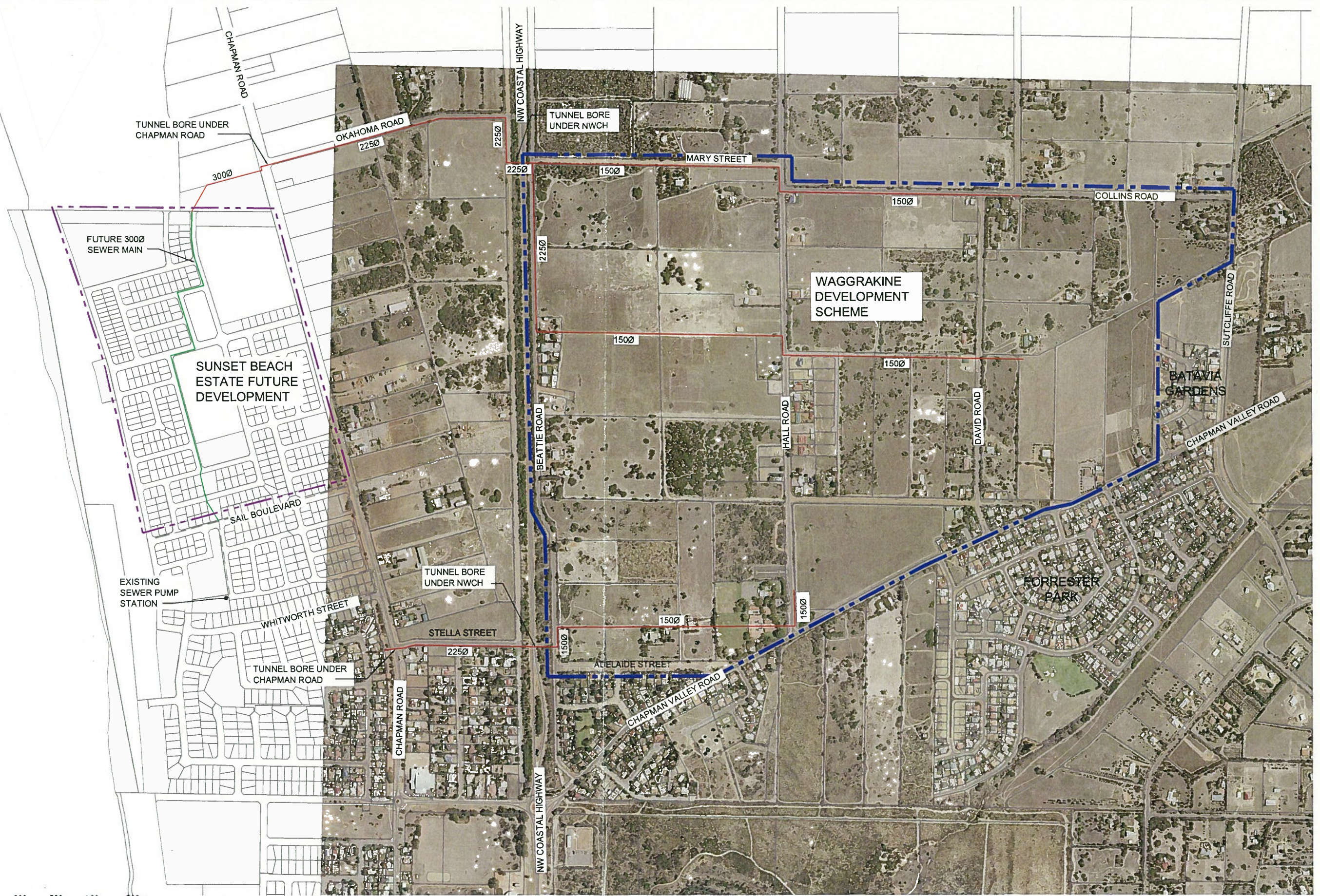
Please contact me if you have any further queries.

Yours faithfully



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encl: Sketch drawing no SK001
Estimate of probable cost
Water Corporation's Sewer planning



100 0 100 200 300 400 500 m
SCALE 1:5000

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DEPARTMENT OF PLANNING
AND INFRASTRUCTURE

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DRAWN	CHECKED
APPROVED	DATE
Drawn	Survey

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