ORDINARY COUNCIL MEETING

27 July 2021

Attachment Booklet – July 2021

ATTACHMENT: CC01

Accounts for Payment – June 2021

Attachment 1
Accounts for Payment – June 2021

Shire of Irwin

List of Accounts paid June 2021 for presentation to the Council Meeting 27 July 2021

MUNICIPAL/(TRUST) PAYMENTS

EFT/CHQ #	DATE		DESCRIPTION	PAYMENTS
EFT27449	02/06/2021	AUSTRALIAN TAXATION OFFICE - FBT	FRINGE BENEFIT TAX RETURN 2020/21	-10,608.61
EFT27450	10/06/2021	AWARE SUPER PTY LTD	SUPERANNUATION	-961.98
EFT27451	11/06/2021	CORE BUSINESS AUSTRALIA	PROJECT SUPERVISOR	-25,458.73
EFT27452	14/06/2021	SHIRE OF IRWIN - LOTTO FUND	PAYROLL DEDUCTIONS	-70.00
EFT27453	15/06/2021	IRWIN SHIRE - RATES	PAYROLL DEDUCTIONS	-930.00
EFT27454	16/06/2021	RICHARD ANDREW IRVING	ACCOMMODATION - ACTING MANAGER FINANCE	-2,750.00
EFT27455	16/06/2021	ATC WORK SMART	SCHOOL BASED TRAINEESHIP	-526.78
EFT27456	16/06/2021	AUSTRALIA POST	POSTAGE & FREIGHT CHARGES	-509.53
EFT27457	16/06/2021	AUSTRALASIAN PERFORMING RIGHT ASSOCIATION -	LICENCE FEES - DRIVE IN THEATRE	-83.89
EFT27458	16/06/2021	BABA MARDA ROAD SERVICES	TRAFFIC CONTROL FOR TREE PRUNING ON OCEAN DRIVE	-2,483.36
EFT27459	16/06/2021	BATAVIA COAST TRIMMERS	REPAIR AND REINSTALL SHADE SAILS	-1,325.00
EFT27460	16/06/2021	FLOW CONSULTING ENGINEERS	LIGHT POLE FOOTING DESIGN FOR MORETON TCE	-825.00
EFT27461	16/06/2021	CONSTRUCTION TRAINING FUND	CONSTRUCTION TRAINING FUND RECONCILIATION	-5,329.11
EFT27462	16/06/2021	BEAUREPAIRES GERALDTON	SUPPLY AND FIT NEW STEERS FOR HINO PRIME MOVER	-1,662.76
EFT27463	16/06/2021	BLACKTOP MATERIALS ENGINEERING	MATERIAL TESTING ON MORETON TERRACE	-3,344.00
EFT27464	16/06/2021	BLACKWOODS	PPE FOR TRANSFER STATION STAFF AND MARKER PAINT	-1,418.85
EFT27465	16/06/2021	BRAND MECHANICAL SERVICES	SERVICE AND REPAIRS TO TELEHANDLER AND ZERO TURN MOWER	-2,221.67
EFT27466	16/06/2021	DEPARTMENT OF MINES INDUSTRY REGULATION AND SAFETY	BUILDING SERVICES LEVY RECONCILIATION	-3,978.33
EFT27467	16/06/2021	BUNNINGS BUILDING SUPPLIES	ESKIES AND SHOVELS FOR IRWIN BUSHFIRE BRIGADE	-437.90
EFT27468	16/06/2021	CANINE CONTROL	CONTRACT RANGER SERVICES	-3,000.00
EFT27469	16/06/2021	CENTRAL REGIONAL TAFE	ROCS 1 & 2 TRAINING COURSE	-834.90
EFT27470	16/06/2021	COLAS	EMULSION SEALING TO WATERPROOF ALL EXPOSED GRAVEL AREAS ON MORETON TERRACE	-10,758.00
EFT27471	16/06/2021	TOLL	FREIGHT CHARGES	-387.78
EFT27472	16/06/2021	CENTRAL WHEATBELT IMPORTS	WIRELESS CAMERA KIT INCLUDING BASES AND HARNESS	-1,032.90
EFT27473	16/06/2021	CENTRAL WEST PEST CONTROL	ANNUAL TERMITE INSPECTION & TREATMENT OF SHIRE INFRASTRUCTURE	-14,095.00
EFT27474	16/06/2021	DALLYWATER CONSULTING	CONTRACT EHO CONSULTANT	-15,862.56
EFT27475	16/06/2021	DAVID ELBOURNE	REFUND	-1,225.50
EFT27476	16/06/2021	DAZFAB ENGINEERING	CUSTOM MADE LID FOR CAGE AT CDS	-264.00
EFT27477	16/06/2021	DC TWO PTY LTD	VOIP CHARGES	-1,709.55
EFT27478	16/06/2021	DELTA CLEANING SERVICES	CLEANING CONTRACT - MAY 2021, ADDITIONAL CLEANING OVER LONG W/E AND ADDITIONAL CLEANING OF 2 KENNEDY HEIGHTS	-15,324.29
EFT27479	16/06/2021	LANDGATE - WESTERN AUSTRALIAN LAND INFORMATION AUTHORITY	CONSOLIDATED MINING TENEMENT ROLL, MINING TENEMENT CHARGEABLE AND GROSS RENTAL VALUATIONS CHARGEABLE	-775.30
EFT27480	16/06/2021	DONGARA HANDYMAN SERVICE	BUILDING MAINTENANCE WORKS AT THE VILLAGE, ABLUTIONS AND ADMIN	-1,775.40
EFT27481	16/06/2021	DONGARA BOBCAT & CONTRACTING SERVICES	TRANSFER STATION CLEAN UP	-2,728.00
EFT27482	16/06/2021	DONGARA BODY BUILDERS	SERVICE AND REPAIRS TO HEAVY PLANT AND TRAILERS	-2,316.60
EFT27483	16/06/2021	DONGARA BUILDING & TRADE SUPPLIES	PARKS, GARDEN, BUILDING & ROAD MAINTENANCE SUPPLIES	-1,315.14
EFT27484	16/06/2021	DONGARA CONCRETE SERVICES	INSTALLATION OF PAY STATIONS AT COASTAL NODES AND REINSTALMENT OF FOOTPATH AT GRANNIES BEACH INCLUDING EARTHWORKS	-7,865.00
EFT27485	16/06/2021	DONGARA DRILLING & ELECTRICAL	RETICULATION SUPPLIES FOR FORESHORE, REPLACE STANDPIPE AT DEPOT, ELECTRICAL REPAIRS AT SHIRE FACILITIES AND THE VILLAGE	-7,499.23
EFT27486	16/06/2021	TYREPOWER DONGARA	BATTERY REPLACEMENT FOR IRWIN BFB 4.4	-400.00
EFT27487	16/06/2021	DONGARA LOCAL RAG	ADVERTISING	-160.00
EFT27488	16/06/2021	RIVERBEND FOODWORKS DONGARA	MONTHLY CONSUMABLES	-121.07
EFT27489	16/06/2021	DONGARA MIDWEST WASTE	SERVICING OF SEPTIC TANK AT TRANSFER STATION	-400.00
EFT27490	21/06/2021	AUSTRALIAN TAXATION OFFICE - BAS	BAS RECONCILIATION MAY 2021	-12,599.00
EFT27491	21/06/2021	COLAS	TABLETOP ROAD & ALLANOOKA SPRINGS ROAD BITUMEN SEALING	-407,236.48
EFT27492	21/06/2021	EASY AUTO CARE	SERVICE ON FORD RANGER	-501.95
EFT27493	21/06/2021	FENCE IT WA	TEMPORARY FENCING FOR REHAB FISHERMEN'S HALL AREA	-4,683.80
EFT27494	21/06/2021	DEPARTMENT OF FIRE AND EMERGENCY SERVICES	EMERGENCY SERVICES LEVY - QUARTER 4	-23,941.10
EFT27495	21/06/2021	FIRST HEALTH SERVICES	CONTRACTED PRACTICE MANAGEMENT - MEDICAL CENTRE	-7,975.00
EFT27496	21/06/2021	FIVESTAR BUSINESS SOLUTIONS & INNOVATION	PRINTER CHARGES - VISITOR CENTRE, ADMIN & DPI	-916.49
EFT27497	21/06/2021	CITY OF GREATER GERALDTON	MERU WASTE DISPOSAL	-10,957.68
EFT27498	21/06/2021	REFUEL AUSTRALIA	BULK DIESEL FUEL PURCHASE AND FUEL CARD PURCHASES	-8,664.27
EFT27499	21/06/2021	GLASS CO WA	REGLAZE WINDOW AT DEPOT	-191.29
EFT27500	21/06/2021	GNC	CONCRETE PIPES, RUBBER RINGS AND HEADWALLS FOR MORETON TCE	-17,272.20
EFT27501	21/06/2021	GOANNA GARDENING	CONTRACT LANDSCAPING - 2 KENNEDY HEIGHTS	-66.00
EFT27502	21/06/2021	GLOBAL SPILL & SAFETY	GUIDE POSTS FOR CASUARINA, TABLETOP AND BURMA ROAD AND CUSTOM SIGNAGE AND FLAGGING	-18,001.39
EFT27503	21/06/2021	HOCKEY'S PEST SERVICE	PEST SPRAY AT UNIT 1 THE VILLAGE	-110.00
EFT27504	21/06/2021	INCITE SECURITY	SERVICE TO CCTV SYSTEM	-567.05
EFT27505	21/06/2021	RENTOKIL INITIAL PTY LTD	SANITARY DISPOSAL UNIT - TRANSFER STATION	-122.40
EFT27506	21/06/2021	IT VISION AUSTRALIA PTY LTD	UPDATING OF SETTLEMENT STATEMENT REPORT	-550.00
EFT27507	21/06/2021	IVEY CONTRACTING	EARTHWORKS AT CEMETERY PRIOR TO ASPHALT WORKS	-3,410.00
EFT27508	21/06/2021	JAW'S PAVING LANDSCAPE & FENCING	REPAIR PAVING AT REC CENTRE	-330.00
EFT27509	21/06/2021	JOSH BYRNE & ASSOCIATES	PROGRESS PAYMENT - IRWIN WALK TRAILS & EXTENDED ENTRY STATEMENT - LANDSCAPING DESIGN	-23,476.20
EFT27510	21/06/2021	JB HI-FI GROUP PTY LTD	REPLACEMENT TABLET	-434.00
EFT27511	21/06/2021	JODEY EDWARDS	CONTRACT LANDSCAPING - THE VILLAGE	-7,128.00
EFT27512	21/06/2021	KIRKLAND ELECTRICAL SERVICES	REPAIRS TO LED SIGN - INCLUDING HIRE OF SCAFFOLD	-330.00

Shire of Irwin

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MUNICIPAL/(TRUST) PAYMENTS

EFT/CHQ #	DATE		DESCRIPTION	PAYMENTS
EFT27513	21/06/2021	BRYAN HENDRICK KLEINSMAN	CLEAN UP ON MORETON TCE, EARTHWORKS AT RAG/PLAYGROUP CARPARK AND CLEAN-UP CEMETERY FOR ASPHALT WORKS	-4,499.00
EFT27514	21/06/2021	LOCALISE PTY LTD	PROGRESS PAYMENT -STRATEGIC COMMUNITY PLAN REVIEW AND UPDATE	-10,697.04
EFT27515	21/06/2021	LO-GO APPOINTMENTS	CONTRACTOR SERVICES - MANAGER FINANCE	-11,304.22
EFT27516	21/06/2021	NODE 1 PTY LTD	NBN FIBRE CONNECTION FEE	-179.90
EFT27517	21/06/2021	MARKET CREATIONS	SUPPORT AGREEMENT, HOSTING SERVICES, VOIP SERVICES FOR SHIRE FACILITIES AND MEDICAL CENTRE	-6,769.40
EFT27518	21/06/2021	MARKETFORCE PTY LTD	ADVERTISING	-1,798.39
EFT27519	21/06/2021	MIDWEST MOWERS & SMALL ENGINES	PURCHASE OF BLOWER AND PARTS FOR SUNDRY PLANT	-434.25
EFT27520	21/06/2021	MID COAST CIVIL	MOVE/RAISE SEWER LIDS ON MORETON TCE	-12,100.00
EFT27521	21/06/2021	MIDWEST SAFETY AND TRAINING PTY LTD	CHAINSAW COURSE FOR OPERATIONS STAFF	-1,793.00
EFT27522	21/06/2021	MIDWEST SOLAR AND WATER	PLUMBING REPAIRS AT THE VILLAGE, TOWN PARK AND TOURIST INFO BAY	-487.97
EFT27523	21/06/2021	MIDWEST TURF SUPPLIES	SUPPLY, DELIVER AND LAY TURF AT RICHARDSON RD PROPERTY AND SERVICE IRRIGATION SYSTEM AT TOWN PARK	-4,562.50
EFT27524	21/06/2021	NESTLE AUSTRALIA LIMITED TRADING AS	COFFEE PODS FOR ADMIN & DEPOT	-301.50
EFT27525	21/06/2021	CLEANPAK TOTAL SOLUTIONS	RAPID CLEAN DISINFECTANT FOR OPERATIONS	-79.42
EFT27526	21/06/2021	OAKS CIVIL CONSTRUCTION PTY LTD	TRAFFIC MANAGEMENT - MORETON TCE	-4,136.00
EFT27527	21/06/2021	ONSHORE CABINETS AND FURNITURE	REPAIRS TO WATER DAMAGED KITCHEN AND VANITY DOORS	-608.00
EFT27528	21/06/2021	OFFICE NATIONAL	STATIONERY CONSUMABLES	-895.50
EFT27529	21/06/2021	PERTH IRRIGATION CENTRE	RETICULATION SUPPLIES	-610.35
EFT27530	21/06/2021	POPPIES AT THE PARK	REFUND	-147.00
EFT27531	21/06/2021	POSITION PARTNERS PTY LTD	MAGNET FIELD SUBSCRIPTION RENEWAL	-1,226.50
EFT27532	21/06/2021	PREFERRED TRAINING NETWORKS	COMMUNICATION AND TIME MANAGEMENT TRAINING	-4,620.00
EFT27533	21/06/2021	SEASIDE SIGNS	SELF PAY STATION SIGN AND RURAL BLOCK SIGN	-184.80
EFT27534	21/06/2021	SUBTERRANEAN SERVICE LOCATIONS WA	SERVICE LOCATION AT BOWLING CLUB	-841.50
EFT27535	21/06/2021	DONGARA IGA	MONTHLY CONSUMABLES	-1,612.21
EFT27536	21/06/2021	DONGARA COMMUNITY RESOURCE CENTRE	SUNDRY DONATION FOR COMMUNITY EASTER EGG HUNT 2021	-500.00
EFT27537	21/06/2021	TOTALLY WORKWEAR GERALDTON	SHIRE SHIRTS FOR STAFF	-2,198.31
EFT27538	21/06/2021	CLEANAWAY CO PTY LTD	RESIDENTIAL, COMMERCIAL AND STREET BINS COLLECTION, FRONT LIFT COLLECTION, TRANSFER STATION MTCE AND LANDFILL MTCE	-25,764.56
EFT27539	21/06/2021	T-QUIP	PARTS FOR TORO MOWER	-567.65
EFT27540	21/06/2021	TYREPOWER LIMITED	FIT TYRES TO HOLDEN COLORADO, BATTERY FOR FORD RANGER AND HOLDEN COLORADO AND PUNCTURE REPAIR ON JOHN DEERE TRACTOR	-1,575.55
EFT27541	21/06/2021	VICTOR ALLEN GATFIELD	CROSSOVER REIMBURSEMENT	-354.22
EFT27542	21/06/2021	VANGUARD PRESS	BROCHURE DISPLAY, WAREHOUSING AND TRANSPORT FEE	-809.77
EFT27543	21/06/2021	PUBLIC TRANSPORT AUTHORITY OF WA	BUS TICKET SALES	-330.19
EFT27544	21/06/2021	WELL DONE INTERNATIONAL	CALL CENTRE CHARGES	-1,509.86
EFT27545	21/06/2021	SYNERGY	ELECTRICITY CHARGES	-11,696.78
EFT27546	21/06/2021	WESTRAC EQUIPMENT	SERVICE AND PARTS FOR CAT GRADER	-3,699.88
EFT27547	21/06/2021	ON HOLD ON LINE	MONTHLY ON HOLD MESSAGE	-207.00
EFT27548	21/06/2021	WESTLINE CONTRACTING	CORE SAMPLES OF ROAD DEPTHS ON MORETON TCE	-2,695.00
EFT27549	21/06/2021	YOUNG MOTORS PTY LTD	SERVICE OF HOLDEN COLORADO	-358.97
EFT27550	21/06/2021	WINC AUSTRALIA PTY LTD	PRINTER CHARGES - DEPOT	-623.58
EFT27551	25/06/2021	IRWIN SHIRE - RATES	PAYROLL DEDUCTIONS	-930.00
EFT27552	25/06/2021	SHIRE OF IRWIN - LOTTO FUND	PAYROLL DEDUCTIONS	-70.00
EFT27553	28/06/2021	ANDREW JOHN GILLAM	MEMBERS ATTENDANCE FEES APRIL TO JUNE 2021	-1,903.00
EFT27554	28/06/2021	BARRY WYSE	MEMBERS ATTENDANCE FEES APRIL TO JUNE 2021	-1,903.00
EFT27555	28/06/2021	GRANT STEVEN EVA	MEMBERS ATTENDANCE FEES APRIL TO JUNE 2021	-1,903.00
EFT27556	28/06/2021	HAYLEY PALMER	MEMBERS ATTENDANCE FEES APRIL TO JUNE 2021	-1,903.00
EFT27557	28/06/2021	ISABELLA MARY SCOTT	MEMBERS ATTENDANCE FEES APRIL TO JUNE 2021	-1,903.00
EFT27558	28/06/2021	MARK LEONARD	MEMBERS ATTENDANCE FEES APRIL TO JUNE 2021	-1,903.00
EFT27559	28/06/2021	MICHAEL SMITH	PRESIDENT ATTENDANCE FEES APRIL TO JUNE 2021	-2,500.00
EFT27560	28/06/2021	IAN FRANCIS WEST	MEMBERS ATTENDANCE FEES APRIL TO JUNE 2021	-1,903.00
EFT27561	29/06/2021	AGLIME OF AUSTRALIA	SAND FOR ESTABLISHMENT OF DUNE SYSTEM (SURF BEACH)	-22,832.48
EFT27562	29/06/2021	AHA! CONSULTING	CAMPING REVIEW SURVEY ANALYSIS REPORT FOR JUNE 2021	-2,728.00
EFT27563	29/06/2021	AMPAC DEBT RECOVERY (WA) PTY LTD	RATES DEBT RECOVERY	-3,189.00
EFT27564	29/06/2021	AUSSIE TREE SERVICES	REMOVE LARGE LIMB OF TREE THAT HAS FALLEN ON REEVES TERRACE	-3,754.30
EFT27565	29/06/2021	BABA MARDA ROAD SERVICES	TRAFFIC CONTROL FOR WORKS ON ALLANOOKA SPRINGS ROAD	-1,557.17
EFT27566	29/06/2021	BADGELINK	VOLUNTEER, STAFF AND COUNCIL NAME BADGES	-275.93
EFT27567	29/06/2021	DONGARA BAKERY	CATERING	-58.50
EFT27568	29/06/2021	BLACKWOODS	CONSUMABLES FOR BUSHFIRE BRIGADES AND MARKER PAINT	-2,577.32
EFT27569	29/06/2021	BOS CIVIL PTY LTD	PROGRESS CLAIM - MORETON TCE CIVIL WORKS	-287,748.33
EFT27570	29/06/2021	DONGARA GUARDIAN PHARMACY	FLU VACCINATIONS - SHIRE STAFF	-325.00
EFT27571	29/06/2021	CANINE CONTROL	CONTRACT RANGER SERVICES	-1,500.00
EFT27572	29/06/2021	IRWIN RURAL SUPPLIES & STOCKFEEDS	LAYER CRUMBLES - CHICKENS	-57.00
EFT27573	29/06/2021	TOLL	FREIGHT CHARGES	-32.73
EFT27574	29/06/2021	CRAMER AND NEILL REFRIGERATION	REPLACEMENT OF COOL ROOM CEILING AT DENISON BOWLING CLUB	-4,666.53
EFT27575	29/06/2021	CIVIC WORKFORCE MANAGEMENT	PROFESSIONAL HR ADVICE AND SUPPORT	-2,193.75
EFT27576	29/06/2021	LANDGATE - WESTERN AUSTRALIAN LAND INFORMATION AUTHORITY	GROSS RENTAL VALUATIONS CHARGEABLE	-816.79
EFT27577	29/06/2021	DONGARA HANDYMAN SERVICE	BUILDING MAINTENANCE WORKS AT SHIRE FACILITIES AND ABLUTIONS	-1,493.70
EFT27578	29/06/2021	DONGARA BOBCAT & CONTRACTING SERVICES	EARTHWORKS ON MORETON TERRACE INCLUDING KERBING REMOVAL AND GRAVEL	-11,154.00

Shire of Irwin

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EFT/CHQ #	DATE		DESCRIPTION	PAYMENTS
EFT27579	29/06/2021	DONGARA DRILLING & ELECTRICAL	ELECTRICLA REPAIRS AT THE VILLAGE, REC JETTY AND RETICULATION CONSUMABLES	-456.32
EFT27580	29/06/2021	DONGARA HARDWARE	WATER FOR ADMIN AND DEPOT AND TRAILER ADAPTER FOR HOLDEN COLORADO	-329.99
EFT27581	29/06/2021	DONGARA NEWSAGENCY	PUBLICATIONS	-346.78
EFT27582	29/06/2021	DONGARA TREE SERVICES	LATERAL PRUNE AND CLEAN UP OF VERGE ON GOLF COURSE ROAD, TRIM OVERHANGING BRANCHES ON ARMSTRONG STREET AND MAKE SAFE TUART TREES ON GEORGE ST	-7,370.00
EFT27583	29/06/2021	DOOPA'S DIVERSE SERVICES	TRENCHER FOR RETIC INSTALL AT FORESHORE	-400.00
EFT27584	29/06/2021	ELEMENT ADVISORY PTY LTD	PROGRESS PAYMENT - LOCAL PLANNING STRATEGY	-8,786.80
EFT27585	29/06/2021	CITY OF GREATER GERALDTON	BUILDING CERTIFICATION SERVICES	-6,954.08
EFT27586	29/06/2021	GLASS CO WA	REPAIRS TO DOOR LOCK AT UNIT 12 THE VILLAGE	-147.20
EFT27587	29/06/2021	GERALDTON LIMESTONE RETAINING WALLS	INSTALL OF PIPE CULVERTS ON CASUARINA, BURMA AND TABLETOP ROADS	-63,322.00
EFT27588	29/06/2021	GNC	CONCRETE PIPES WITH RUBBERS FOR TABLETOP ROAD	-1,059.30
EFT27589	29/06/2021	MOORE AUSTRALIA (WA) PTY LTD	WORKSHOP REGISTRATION - FINANCIAL REPORTING, FINANCE GOVERNANCE AND MANAGEMENT REPORTING	-3,124.00
EFT27590	29/06/2021	KELYN TRAINING SERVICES	RENEWAL - ADVANCED WORKSITE TRAFFIC MANAGEMENT RENEWAL	-510.00
EFT27591	29/06/2021	BRYAN HENDRICK KLEINSMAN	BOBCAT AND OPERATOR FOR FORESHORE TURF PROJECT	-2,772.00
EFT27592	29/06/2021	KOMATSU AUSTRALIA PTY LTD	PARTS FOR KOMATSU LOADER	-980.05
EFT27593	29/06/2021	DONGARA DENISON LAUNDRY SERVICE	DRY CLEANING OF TABLE CLOTHS AT REC CENTRE	-134.40
EFT27594	29/06/2021	LO-GO APPOINTMENTS	CONTRACTOR SERVICES - MANAGER FINANCE	-14,491.59
EFT27595	29/06/2021	MARKET CREATIONS	SUPPORT AGREEMENT, HOSTING SERVICES, VOIP SERVICES FOR SHIRE FACILITIES AND MEDICAL CENTRE	-22,425.26
EFT27596	29/06/2021	MCLEODS BARRISTERS & SOLICITORS	PROFESSIONAL LEGAL FEES	-10,942.36
EFT27597	29/06/2021	MITCHELL & BROWN	REPLACEMENT OVEN FOR UNIT 35 THE VILLAGE	-2,000.00
EFT27598	29/06/2021	MIDWEST SOLAR AND WATER	PLUMBING REPAIRS AT THE VILLAGE AND SHELTER SHEDS	-1,144.21
EFT27599	29/06/2021	OAKS CIVIL CONSTRUCTION PTY LTD	TRAFFIC MANAGEMENT - MORETON TCE	-16,786.01
EFT27600	29/06/2021	OFFICE NATIONAL	STATIONERY CONSUMABLES	-695.57
EFT27601	29/06/2021	PERTH IRRIGATION CENTRE	RETICULATION SUPPLIES FOR FISHERMEN'S HALL REHAB AREA	-987.45
EFT27602	29/06/2021	RAC BUSINESSWISE	ABSOLUTE COVER FOR SHIRE VEHICLES	-2,156.00
EFT27603	29/06/2021	SHOP FOR SHOPS	NEW WALL MOUNTED BROCHURE WALL FOR THE NEW VISITOR CENTRE AREA	-626.75
EFT27604	29/06/2021	SHORELINE OUTDOOR WORLD	YEARLY SERVICE OF PANEL LIFT DOOR	-101.75
EFT27605	29/06/2021	STEWART & HEATON CLOTHING CO	CAPS WITH BUSHFIRE LOGO	-104.83
EFT27606	29/06/2021	STEVEN TWEEDIE	GOVERNANCE AND RELATED ADVICE	-66.00
EFT27607	29/06/2021	THE LIFTING COMPANY PTY LTD	REPAIR AND RECERTIFICATION TO SHIRE CHAINS	-973.50
EFT27608	30/06/2021	SHIRE OF IRWIN	BONDS	-1,547.39
32060	10/06/2021	DEPARTMENT OF TRANSPORT	SHIRE OF IRWIN NUMBER PLATES	-200.00
32061	10/06/2021	SHIRE OF IRWIN	CONTAINER DEPOSIT SCHEME	-3,874.80
32062	10/06/2021	WATER CORPORATION	VARIOUS WATER CHARGES	-74,643.61
32063	14/06/2021	SANDRA & STEFAN KUBAJ	REFUND	-121.00
32064	14/06/2021	PATRICIA MARGARET RUTT	REFUND	-681.54
32065	17/06/2021	COMMISSIONER OF STATE REVENUE - REVENUEWA	REFUND	-615.04
32066	18/06/2021	ROBYN DAWN & STEPHEN WILLIAM BUTLER	REFUND	-600.15
32067	24/06/2021	COMMISSIONER OF STATE REVENUE - REVENUEWA	REFUND	-100.00
32068	28/06/2021	DEPARTMENT OF TRANSPORT	SHIRE OF IRWIN NUMBER PLATES	-200.00
32069	29/06/2021	SHIRE OF IRWIN	PETTY CASH RECONCILIATION JUNE 2021 INCLUDING - MEDICAL, POLICE CLEARANCES, WORKING WITH CHILDREN CHECKS AND MEAL REIMBURSEMENTS	-577.85
32070	30/06/2021	WATER CORPORATION	SERVICE CHARGES - BOOKARA STANDPIPE	-291.28
DD21093.1	24/06/2021	TELSTRA AUSTRALIA	FREE WIFI DATA CHARGES	-80.00
DD21109.1	30/06/2021	TELSTRA AUSTRALIA	VARIOUS MOBILE & DATA CHARGES	-2,360.74
DD21053.1	08/06/2021	WA TREASURY CORPORATION	LOAN 93 - RECREATION CENTRE	-20,727.35
DD21083.1	21/06/2021	WA TREASURY CORPORATION	LOAN 96 - TENNIS COURT RESURFACING	-20,569.44
SOL 06/21	16/06/2021	SHINE TECH SOLAR	SOLAR REPAYMENT JUNE 2021	-1,947.66
CR 020621	02/06/2021	NAB BUSINESS VISA	NAB BUSINESS VISA TRANSACTIONS INCLUDING WATER CORP WATER METER RELOCATION FEE, IAUDITOR APP RENEWAL, COMMON SEAL STICKERS, REC JETTY RENEWAL FEE, ACCOMMODATION FOR TRAINING - PROCUREMENT, TRAFFIC MANAGEMENT AND ROCS, MEMBER EXPENSES, COMPUTER EXPENSES AND REC CENTRE EXPENSES	-3,958.23
CR 300621	30/06/2021	NAB BUSINESS VISA	NAB BUSINESS VISA TRANSACTIONS INCLUDING SORTLY RENEWAL, CATERING, CIVIC FUNCTIONS, FREIGHT CHARGES, STATIONERY, ACCOMMODATION FOR TRAINING - PROCUREMENT, ADVERTISING, COMPUTER EXPENSES AND REC CENTRE EXPENSES	-4,855.30
61872/20PB	21/06/2021	DEPARTMENT OF MINES, INDUSTRY REGULATION & SAFETY	BONDS ADMINISTRATION - PET BOND	-260.00
DD21061.1	08/06/2021	ANZ SMART CHOICE SUPER	SUPERANNUATION	-215.84
DD21061.2	08/06/2021	THE KDP SUPERANNUATION FUND	SUPERANNUATION	-51.38
DD21061.3	08/06/2021	ASGARD SUPERANNUATION	SUPERANNUATION	-388.78
DD21061.4	08/06/2021	AUSTRALIAN SUPER	SUPERANNUATION	-876.87
DD21061.5	08/06/2021	AWARE SUPER PTY LTD	SUPERANNUATION	-10,911.78
DD21061.6	08/06/2021	EQUIPSUPER SUPERANNUATION FUND	SUPERANNUATION	-134.70
DD21061.7	08/06/2021	HOSTPLUS	SUPERANNUATION	-430.02
DD21061.8	08/06/2021	MLC SUPER FUND	SUPERANNUATION	-1,287.31
DD21061.9	08/06/2021	THE M & L OLSEN SUPERANNUATION FUND	SUPERANNUATION	-105.57
DD21087.1	22/06/2021	ANZ SMART CHOICE SUPER	SUPERANNUATION	-231.04

Shire of Irwin

List of Accounts paid June 2021 for presentation to the Council Meeting 27 July 2021

MUNICIPAL /(TRUST) PAYMENTS

EFT/CHQ #	DATE	DESCRIPTION	PAYMENTS
DD21087.2	22/06/2021 ASGARD SUPERANNUATION	SUPERANNUATION	-388.78
DD21087.3	22/06/2021 AUSTRALIAN SUPER	SUPERANNUATION	-873.00
DD21087.4	22/06/2021 AWARE SUPER PTY LTD	SUPERANNUATION	-10,916.28
DD21087.5	22/06/2021 EQUIPSUPER SUPERANNUATION FUND	SUPERANNUATION	-134.70
DD21087.6	22/06/2021 HOSTPLUS	SUPERANNUATION	-454.81
DD21087.7	22/06/2021 MLC SUPER FUND	SUPERANNUATION	-1,287.31
DD21087.8	22/06/2021 THE M & L OLSEN SUPERANNUATION FUND	SUPERANNUATION	-120.15
DD21087.9	22/06/2021 AMP CORPORATE SUPER - SUPERLEADER	SUPERANNUATION	-134.70
DD21061.10	08/06/2021 AMP CORPORATE SUPER - SUPERLEADER	SUPERANNUATION	-115.56
			-1,528,265.48

Sundry Creditors as at 30/06/2021 **1,077,041.80**

The Payments included in the above list of Accounts Paid, have been authorised by the Chief Executive Officer under delegation from Council.

19/7/21
DATE

Shane Ivers
Chief Executive Officer

Shire of Irwin

Corporate Credit Card Expenditure - Payment Reference CR 020621

S.Ivers Credit Card Expenses		
MYOB Australia	Upgrade of MYOB at Visitor Centre Monthly Charge	$ 70.50
Water Corporation	Moreton Tce - Meter Relocation Fee	$ 1,122.17
Spotify	Rec Centre Gym Music	$ 11.99
Safety Culture	iAuditor App Renewal	$ 250.80
Sage Perth	Accommodation for Procurement Training - WALGA	$ 644.38
Wattle Grove Motel	Accommodation for Traffic Management Training	$ 359.00
Booking.Com	Accommodation for ROCS Training Week 1	$ 557.60
Booking.Com	Accommodation for ROCS Training Week 2	$ 532.00
NAB	Card Fee	$ 9.00
		$ 3,557.44
D.Chandler Credit Card Expenses		
First Law Promotions	Common Seal Stickers	$ 168.30
St John of God Subiaco	Flowers for Cr Palmer	$ 95.00
Department of Transport	Annual Recreational Jetty Renewal Fee	$ 42.20
Tarts & Co	Wreath for ANZAC Day 2021	$ 86.29
NAB	Card Fee	$ 9.00
		$ 400.79
TOTAL PAYMENT TO CORPORATE CREDIT CARD ACCOUNT		$ 3,958.23

Corporate Credit Card Expenditure - Payment Reference CR 300621

S.Ivers Credit Card Expenses		
Spotify	Rec Centre Gym Music	$ 11.99
Dongara Hotel Motel	WALGA Dinner	$ 446.30
Dongara Hotel Motel	WALGA Dinner	$ 61.00
Dongara Hotel Motel	Lunch	$ 134.50
Sortly	Inventory Management System Renewal	$ 2,074.24
NAB	Card Fee	$ 9.00
		$ 2,737.03
D.Chandler Credit Card Expenses		
Sage Perth	Accommodation for Procurement Training - WALGA	$ 353.50
Rural Health West	Annual Membership Renewal	$ 100.00
KaleExpress	Freight Charges - Surf Beach	$ 655.77
Dongara Bakery	Catering - Citizenship Ceremony	$ 60.00
Seek	Advertising - HR Coodinator	$ 825.00
Dongara Bakery	Catering - Library Volunteer Meeting	$ 30.00
Mitchell and Brown	HDMI Cord - Council Chambers	$ 85.00
NAB	Card Fee	$ 9.00
		$ 2,118.27
TOTAL PAYMENT TO CORPORATE CREDIT CARD ACCOUNT		$ 4,855.30

ATTACHMENT: CC02

Monthly Financial Statements for the Period Ended 30 June 2021

Attachment 1
Financial Statements for the Period Ended 30 June 2021

SHIRE OF IRWIN

MONTHLY FINANCIAL REPORT
(Containing the Statement of Financial Activity)
For the Period Ended 30 June 2021

LOCAL GOVERNMENT ACT 1995

LOCAL GOVERNMENT (FINANCIAL MANAGEMENT) REGULATIONS 1996

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KEY INFORMATION

Items of Significance
The material variance adopted by the Shire of Irwin for the 2020/21 year is $10,000 and 10%. The following selected items have been highlighted due to the amount of the variance to the budget or due to the nature of the revenue/expenditure. A full listing and explanation of all items considered of significant/material variance is disclosed in Note 15.

	% Collected / Completed	Amended Annual Budget	Amended YTD Budget	YTD Actual	Variance (Under)/Over
Significant Projects					
AGED APPROPRIATE HOUSING - STAGE 2	24%	2,042,453	2,042,453	496,594	1,545,859
R2R - PIGGERY LANE	82%	1,000	1,000	818	182
CASUARINAS ROAD - RRG	79%	357,000	357,000	282,561	74,439
MORETON TERRACE	66%	722,000	722,000	475,461	246,539
TABLETOP ROAD - RRG	80%	422,500	422,500	338,271	84,229
BURMA ROAD - RRG	45%	251,500	251,500	113,402	138,098
BLENHEIM ROAD	100%	4,950	4,950	4,950	0
GENERAL FOOTPATHS	48%	5,000	5,000	2,378	2,622
CEMETERY REVITILISATION	20%	130,000	130,000	26,203	103,797
CLIFF HEAD - PAID CAMPING IMPLEMENTATION	114%	15,000	15,000	17,139	(2,139)
SKATE PARK - PUMP TRACK	107%	263,500	263,500	281,366	(17,866)
RURAL SIGNS	56%	69,000	69,000	38,578	30,422
Grants, Subsidies and Contributions					
Operating Grants, Subsidies and Contributions	156%	525,225	525,225	818,568	293,343
Non-operating Grants, Subsidies and Contributions	53%	5,860,315	5,860,315	3,124,333	(2,735,982)
	62%	6,385,540	6,385,540	3,942,901	(2,442,639)
Rates Levied	100%	5,394,500	5,394,500	5,384,429	(10,071)

% Compares current ytd actuals to annual budget

Financial Position		Prior Year 30 June 2020	Current Year 30 June 2021
Adjusted Net Current Assets	-219%	-$ 412,904	$ 903,466
Cash and Equivalent - Unrestricted	179%	$ 1,651,177	$ 2,959,921
Cash and Equivalent - Restricted	115%	$ 1,292,763	$ 1,480,544
Receivables - Rates	92%	$ 403,418	$ 373,006
Receivables - Other	163%	$ 189,988	$ 309,328
Payables	149%	$ 816,575	$ 1,216,211

% Compares current ytd actuals to prior year actuals at the same time

Note: The Statements and accompanying notes are prepared based on all transactions recorded at the time of preparation and may vary due to transactions being processed for the reporting period after the date of preparation.

SUMMARY INFORMATION

PREPARATION TIMING AND REVIEW

Date prepared: All known transactions up to 30 June 2021
Prepared by:Jenny Goodbourn (Senior Finance Officer)
Reviewed by: Shane Ivers (CEO)

BASIS OF PREPARATION

REPORT PURPOSE

This report is prepared to meet the requirements of Local Government (Financial Management) Regulations 1996, Regulation 34 . Note: The Statements and accompanying notes are prepared based on all transactions recorded at the time of preparation and may vary due to transactions being processed for the reporting period after the date of preparation.

BASIS OF ACCOUNTING

This statement comprises a special purpose financial report which has been prepared in accordance with Australian Accounting Standards (as they apply to local governments and not-for-profit entities), Australian Accounting Interpretations, other authoritative pronouncements of the Australian Accounting Standards Board, the Local Government Act 1995 and accompanying regulations. Material accounting policies which have been adopted in the preparation of this statement are presented below and have been consistently applied unless stated otherwise. Except for cash flow and rate setting information, the report has also been prepared on the accrual basis and is based on historical costs, modified, where applicable, by the measurement at fair value of selected non-current assets, financial assets and liabilities.

THE LOCAL GOVERNMENT REPORTING ENTITY

All Funds through which the Council controls resources to carry on its functions have been included in this statement. In the process of reporting on the local government as a single unit, all transactions and balances between those funds (for example, loans and transfers between Funds) have been eliminated. All monies held in the Trust Fund are excluded from the statement, but a separate statement of those monies appears at Note 14.

SIGNIFICANT ACCOUNTING POLICES

GOODS AND SERVICES TAX

Revenues, expenses and assets are recognised net of the amount of GST, except where the amount of GST incurred is not recoverable from the Australian Taxation Office (ATO). Receivables and payables are stated inclusive of GST receivable or payable. The net amount of GST recoverable from, or payable to, the ATO is included with receivables or payables in the statement of financial position. Cash flows are presented on a gross basis. The GST components of cash flows arising from investing or financing activities which are recoverable from, or payable to, the ATO are presented as operating cash flows.

CRITICAL ACCOUNTING ESTIMATES

The preparation of a financial report in conformity with Australian Accounting Standards requires management to make judgements, estimates and assumptions that effect the application of policies and reported amounts of assets and liabilities, income and expenses. The estimates and associated assumptions are based on historical experience and various other factors that are believed to be reasonable under the circumstances; the results of which form the basis of making the judgements about carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates.

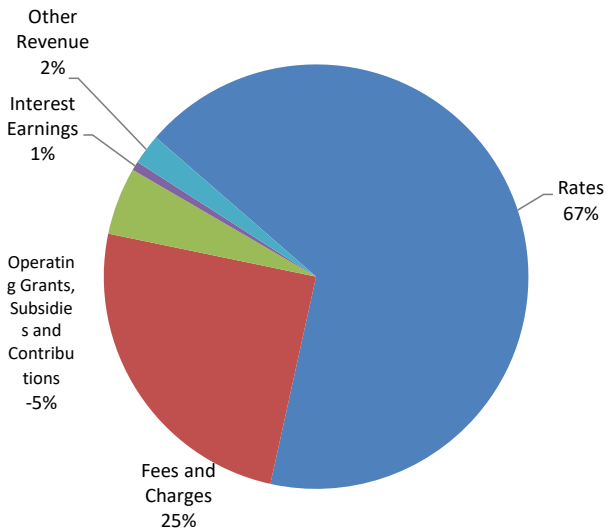
ROUNDING OFF FIGURES

All figures shown in this statement are rounded to the nearest dollar.

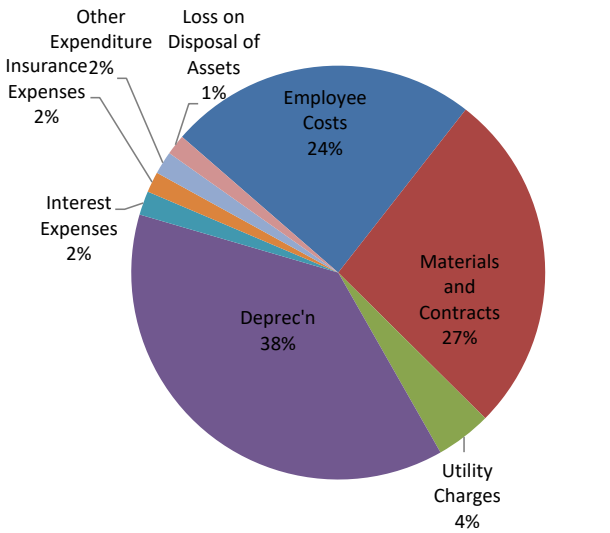
SHIRE OF IRWIN
MONTHLY FINANCIAL REPORT
FOR THE PERIOD ENDED 30 JUNE 2021

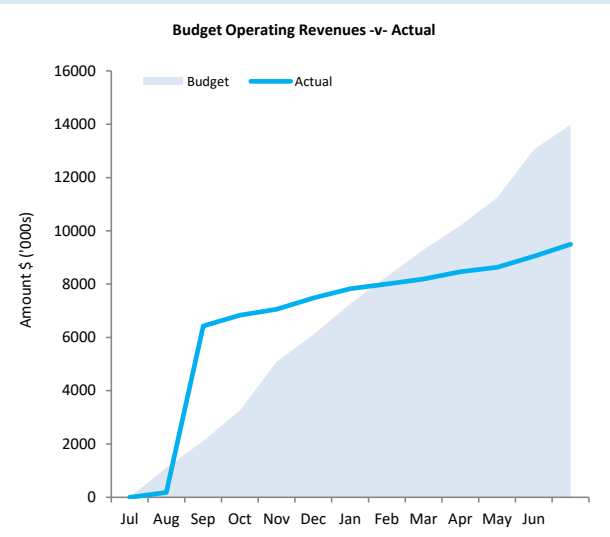
SUMMARY GRAPHS

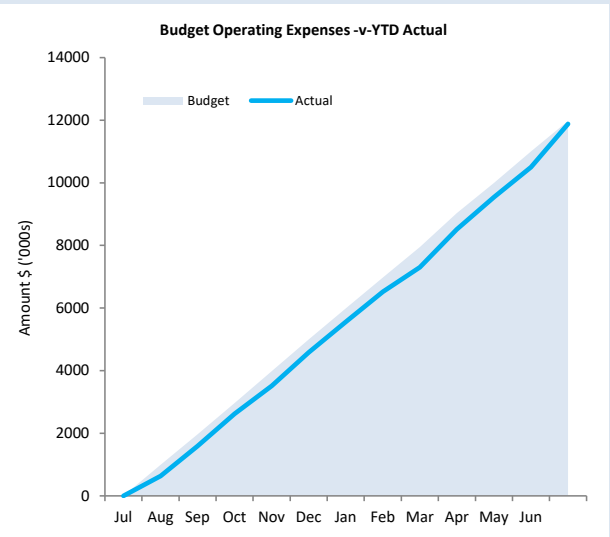
OPERATING REVENUE



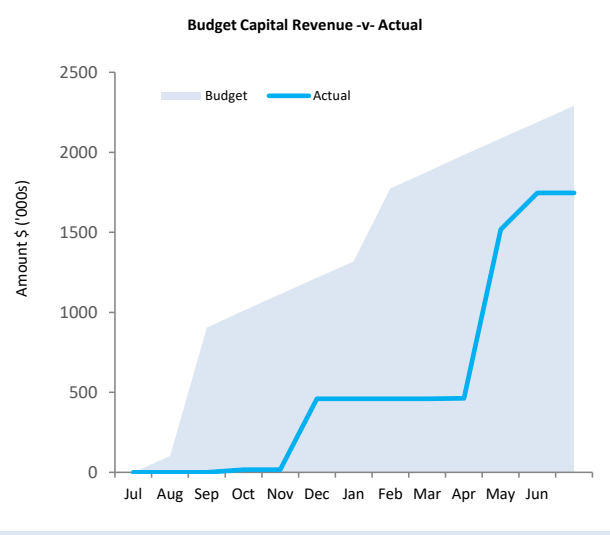
OPERATING EXPENSES



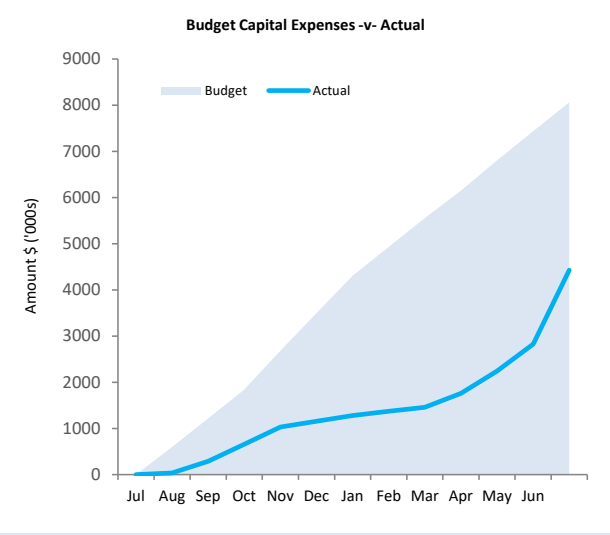




CAPITAL REVENUE



CAPITAL EXPENSES



This information is to be read in conjunction with the accompanying Financial Statements and Notes.

STATUTORY REPORTING PROGRAMS

Shire operations as disclosed in these financial statements encompass the following service orientated activities/programs.

	ACTIVITIES
GOVERNANCE	
To provide a decision making process for the efficient allocation of scarce resources.	Includes the activities of members of council and the administrative support available to the council for the provision of governance of the district. Other costs relate to the task of assisting elected members and ratepayers on matters which do not concern a specific council services.
GENERAL PURPOSEFUNDING	
To collect revenue to allow for the provision of services.	Rates, general purpose government grants and interest revenue.
LAW, ORDER, PUBLIC SAFETY	
To provide services to help ensure a safer and environmentally conscious community.	Supervision and enforcement of various local laws relating to fire prevention, animal control and other aspects of public safety including emergency services.
HEALTH	
To provide an operational framework for environmental and community health.	Inspection of food outlets and their control, provision of meat inspection services, noise control and waste disposal compliance.
EDUCATION AND WELFARE	
To provide services to the elderly, children and youth.	Maintenance of playgroup centre and senior citizen centre. Provision of youth support services.
HOUSING	
To provide and maintain elderly residents housing.	Provision and maintenance of elderly residents housing.
COMMUNITY AMENITIES	
To provide services required by the community.	Rubbish collection services, operation of rubbish transfer site, litter control, protection of the environment and administration of town planning schemes, cemetery and public conveniences.
RECREATION AND CULTURE	
To establish and effectively manage infrastructure and resource which will help the social wellbeing of the community.	Maintenance of public halls, heritage buildings, civic centres, beaches, recreation centres and various sporting facilities. Provision and maintenance of parks, gardens and playgrounds. Operation of library, television and radio rebroadcasting and other cultural facilities.
TRANSPORT	
To provide safe, effective and efficient transport services to the community.	Construction and maintenance of roads, streets, footpaths, depots, cycle ways, parking facilities and traffic control. Cleaning of streets and maintenance of street trees, street lighting etc.
ECONOMIC SERVICES	
To help promote the Shire and its economic wellbeing.	Tourism and area promotion. Provision of rural services including weed control, vermin control and standpipes. Building control.
OTHER PROPERTY AND SERVICES	
To monitor and control Shire's overheads operating accounts.	Private works operation, plant repair and operation costs and engineering operation costs.

SHIRE OF IRWIN
STATEMENT OF FINANCIAL ACTIVITY
FOR THE PERIOD ENDED 30 JUNE 2021

STATUTORY REPORTING PROGRAMS

	Note	Adopted Annual Budget	Amended Annual Budget (d)	Amended YTD Budget (a)	YTD Actual (b)	Var. $ (b)-(a)	Var. % (b)-(a)/(a)	Var. ▲▼	Significant Var. S
		$	$	$	$	$	%		
Opening Funding Surplus(Deficit)	1	(168,015)	(412,904)	(412,904)	**(412,904)**	0	0%		
Governance		0	0	0	**0**	0			
General Purpose Funding - Rates	6	5,394,500	5,388,077	5,388,077	**5,384,429**	(3,648)	(0%)	▼	
General Purpose Funding - Other		316,641	326,517	326,517	**625,920**	299,403	92%	▲	S
Law, Order and Public Safety		172,994	177,494	177,494	**152,228**	(25,266)	(14%)	▼	S
Health		60,700	86,200	86,200	**91,744**	5,544	6%	▲	
Education and Welfare		8,550	3,550	3,550	**5,131**	1,581	45%	▲	
Housing		353,000	371,160	371,160	**380,238**	9,078	2%	▲	
Community Amenities		853,855	1,034,100	1,034,100	**1,102,830**	68,730	7%	▲	
Recreation and Culture		153,817	268,950	268,950	**282,559**	13,609	5%	▲	
Transport		85,766	95,114	95,114	**50,294**	(44,819)	(47%)	▼	S
Economic Services		131,657	249,575	249,575	**259,643**	10,068	4%	▲	
Other Property and Services		69,500	122,000	122,000	**111,172**	(10,828)	(9%)	▼	
		7,600,980	**8,122,737**	**8,122,737**	**8,446,188**				
Expenditure from operating activities									
Governance		(558,300)	(609,552)	(609,552)	**(544,482)**	65,070	11%	▲	S
General Purpose Funding		(1,460,715)	(691,260)	(691,260)	**(621,664)**	69,596	10%	▲	S
Law, Order and Public Safety		(471,125)	(468,280)	(468,280)	**(498,900)**	(30,620)	(7%)	▼	
Health		(339,547)	(497,070)	(497,070)	**(490,795)**	6,275	1%	▲	
Education and Welfare		(62,370)	(67,650)	(67,650)	**(67,832)**	(182)	(0%)	▼	
Housing		(590,171)	(817,942)	(817,942)	**(828,411)**	(10,469)	(1%)	▼	
Community Amenities		(1,199,904)	(1,391,744)	(1,391,744)	**(1,428,972)**	(37,228)	(3%)	▼	
Recreation and Culture		(2,555,055)	(2,736,644)	(2,736,644)	**(2,742,753)**	(6,109)	(0%)	▼	
Transport		(3,440,854)	(4,186,635)	(4,186,635)	**(3,798,836)**	387,800	9%	▲	
Economic Services		(383,644)	(445,444)	(445,444)	**(436,303)**	9,141	2%	▲	
Other Property and Services		(48,500)	(65,000)	(65,000)	**(421,706)**	(356,706)	(549%)	▼	S
		(11,110,185)	**(11,977,220)**	**(11,977,220)**	**(11,880,652)**				
Operating activities excluded from budget									
Add back Depreciation		4,358,601	4,348,543	4,348,543	**4,485,327**	136,784	3%	▲	
Adjust (Profit)/Loss on Asset Disposal	7	9,620	186,871	186,871	**176,479**	(10,392)	(6%)	▼	
Movement in Leave Reserve (Added Back)		1,334	352	352	**564**	212	60%	▲	
Movement in Deferred Pensioner Rates/ESL		0	0	0	**0**	0			
Movement in Employee Benefit Provisions		0	0	0	**0**	0			
Rounding Adjustments		0	0	0	**0**	0			
Movement Due to Changes in Accounting Standards		0	0	0	**0**	0			
Loss on Asset Revaluation		0	0	0	**0**	0			
Adjustment in Fixed Assets		0	0	0	**0**	0			
Amount attributable to operating activities		**860,350**	**681,283**	**681,283**	**1,227,906**				
Investing Activities									
Non-operating Grants, Subsidies and Contributions	13	3,628,255	5,860,315	5,860,315	**3,124,333**	(2,735,982)	(47%)	▼	S
Proceeds from Disposal of Assets	7	40,000	469,961	469,961	**454,961**	(15,000)	(3%)	▼	
Land Held for Resale	8	0	0	0	**0**	0			
Land and Buildings	8	(2,329,327)	(2,172,816)	(2,172,816)	**(626,917)**	1,545,900	71%	▲	S
Plant and Equipment	8	(66,000)	(688,500)	(688,500)	**(31,380)**	657,120	95%	▲	S
Furniture and Equipment	8	(26,100)	(44,200)	(44,200)	**(46,107)**	(1,907)	(4%)	▼	
Infrastructure Assets - Roads	8	(1,791,127)	(3,506,930)	(3,506,930)	**(2,171,390)**	1,335,540	38%	▲	S
Infrastructure Assets - Drainage	8	0	0	0	**0**	0			
Infrastructure Assets - Footpaths	8	0	0	0	**0**	0			
Infrastructure Assets - Public Facilities	8	0	0	0	**0**	0			
Infrastructure Assets - Other	8	(495,000)	(872,300)	(872,300)	**(773,742)**	98,558	11%	▲	S
Amount attributable to investing activities		**(1,039,299)**	**(954,470)**	**(954,470)**	**(70,241)**				
Financing Actvities									
Proceeds from New Debentures	9	1,095,010	1,585,010	1,585,010	**1,055,010**	(530,000)	(33%)	▼	S
Repayment of Debentures	9	(391,148)	(341,683)	(341,683)	**(341,683)**	(0)	(0%)	▼	
Repayment of Lease Financing	9	(19,929)	(19,929)	(19,929)	**(19,930)**	(1)	(0%)	▼	
Advances to Community Groups		(395,010)	(355,010)	(355,010)	**(355,010)**	0	0%		
Proceeds from Advances		0	0	0	**0**	0			
Self-Supporting Loan Principal		25,941	8,098	8,098	**8,098**	0	0%		
Transfer to Restricted Cash - Other		0	0	0	**0**	0			
Transfer from Restricted Cash - Other		0	0	0	**0**	0			
Transfer from Reserves	10	20,000	228,135	228,135	**228,135**	0	0%		
Transfer to Reserves	10	(14,000)	(416,300)	(416,300)	**(415,916)**	384	0%	▲	
Amount attributable to financing activities		**320,864**	**688,320**	**688,320**	**158,704**				
Closing Funding Surplus(Deficit)	1	**(26,099)**	**2,229**	**2,229**	**903,466**				

KEY INFORMATION
▲▼ Indicates a variance between Year to Date (YTD) Budget and YTD Actual data as per the adopted materiality threshold.
Refer to Note 15 for an explanation of the reasons for the variance.
The material variance adopted by Council for the 2020/21 year is $10,000 and 10%.

This statement is to be read in conjunction with the accompanying Financial Statements and notes.

NATURE OR TYPE DESCRIPTIONS

REVENUE

RATES
All rates levied under the Local Government Act 1995. Includes general, differential, specific area rates, minimum rates, interim rates, back rates, ex-gratia rates, less discounts offered. Exclude administration fees, interest on instalments, interest on arrears and service charges.

OPERATING GRANTS, SUBSIDIES AND CONTRIBUTIONS
Refer to all amounts received as grants, subsidies and contributions that are not non-operating grants.

NON-OPERATING GRANTS, SUBSIDIES AND CONTRIBUTIONS
Amounts received specifically for the acquisition, construction of new or the upgrading of non-current assets paid to a local government, irrespective of whether these amounts are received as capital grants, subsidies, contributions or donations.

PROFIT ON ASSET DISPOSAL
Profit on the disposal of assets including gains on the disposal of long term investments. Losses are disclosed under the expenditure classifications.

FEES AND CHARGEES
Revenues (other than service charges) from the use of facilities and charges made for local government services, sewerage rates, rentals, hire charges, fee for service, photocopying charges, licences, sale of goods or information, fines, penalties and administration fees. Local governments may wish to disclose more detail such as rubbish collection fees, rental of property, fines and penalties, other fees and charges.

SERVICE CHARGES
Service charges imposed under Division 6 of Part 6 of the Local Government Act 1995. Regulation 54 of the Local Government (Financial Management) Regulations 1996 identifies these as television and radio broadcasting, underground electricity and neighbourhood surveillance services. Exclude rubbish removal charges. Interest and other items of a similar nature received from bank and investment accounts, interest on rate instalments, interest on rate arrears and interest on debtors.

INTEREST EARNINGS
Interest and other items of a similar nature received from bank and investment accounts, interest on rate instalments, interest on rate arrears and interest on debtors.

OTHER REVENUE / INCOME
Other revenue, which can not be classified under the above headings, includes dividends, discounts, rebates etc.

EXPENSES

EMPLOYEE COSTS
All costs associate with the employment of person such as salaries, wages, allowances, benefits such as vehicle and housing, superannuation, employment expenses, removal expenses, relocation expenses, worker's compensation insurance, training costs, conferences, safety expenses, medical examinations, fringe benefit tax, etc.

MATERIALS AND CONTRACTS
All expenditures on materials, supplies and contracts not classified under other headings. These include supply of goods and materials, legal expenses, consultancy, maintenance agreements, communication expenses, advertising expenses, membership, periodicals, publications, hire expenses, rental, leases, postage and freight etc. Local governments may wish to disclose more detail such as contract services, consultancy, information technology, rental or lease expenditures.

UTILITIES (GAS, ELECTRICITY, WATER, ETC.)
Expenditures made to the respective agencies for the provision of power, gas or water. Exclude expenditures incurred for the reinstatement of roadwork on behalf of these agencies.

INSURANCE
All insurance other than worker's compensation and health benefit insurance included as a cost of employment.

LOSS ON ASSET DISPOSAL
Loss on the disposal of fixed assets.

DEPRECIATION ON NON-CURRENT ASSETS
Depreciation expense raised on all classes of assets.

INTEREST EXPENSES
Interest and other costs of finance paid, including costs of finance for loan debentures, overdraft accommodation and refinancing expenses.

OTHER EXPENDITURE
Statutory fees, taxes, provision for bad debts, member's fees or State taxes. Donations and subsidies made to community groups.

SHIRE OF IRWIN
STATEMENT OF FINANCIAL ACTIVITY
FOR THE PERIOD ENDED 30 JUNE 2021

BY NATURE OR TYPE

	Note	Adopted Annual Budget	Amended Annual Budget	Amended YTD Budget (a)	YTD Actual (b)	Var. $ (b)-(a)	Var. % (b)-(a)/(a)	Var. ▲▼	Significant Var. S
		$	$	$	$	$	%		
Opening Funding Surplus (Deficit)	1	(168,015)	(412,904)	(412,904)	**(412,904)**	0	0%		
Rates	6	5,394,500	5,394,500	5,394,500	**5,384,429**	(10,071)	(0%)	▼	
Operating Grants, Subsidies and Contributions	12	491,725	525,225	525,225	**818,568**	293,343	56%	▲	S
Fees and Charges		1,391,062	1,896,785	1,896,785	**1,990,251**	93,466	5%	▲	
Service Charges		0	0	0	**0**	0			
Interest Earnings		53,167	52,300	52,300	**55,017**	2,717	5%	▲	
Other Revenue		269,350	241,403	241,403	**185,400**	(56,003)	(23%)	▼	S
Profit on Disposal of Assets	7	1,176	12,524	12,524	**12,524**	0	0%		
Gain FV Valuation of Assets		0	0	0	**0**	0			
		7,600,980	**8,122,737**	**8,122,737**	**8,446,188**				
Expenditure from operating activities									
Employee Costs		(2,403,645)	(2,683,323)	(2,683,323)	**(2,871,907)**	(188,584)	(7%)	▼	
Materials and Contracts		(2,541,343)	(3,845,832)	(3,845,832)	**(3,191,716)**	654,116	17%	▲	S
Utility Charges		(346,700)	(291,705)	(291,705)	**(516,330)**	(224,625)	(77%)	▼	S
Depreciation on Non-Current Assets		(4,358,601)	(4,348,543)	(4,348,543)	**(4,485,327)**	(136,784)	(3%)	▼	
Interest Expenses		(222,963)	(211,410)	(211,410)	**(222,308)**	(10,898)	(5%)	▼	
Insurance Expenses		(188,849)	(187,112)	(187,112)	**(191,782)**	(4,670)	(2%)	▼	
Other Expenditure		(1,037,288)	(209,900)	(209,900)	**(212,277)**	(2,377)	(1%)	▼	
Loss on Disposal of Assets	7	(10,796)	(199,395)	(199,395)	**(189,003)**	10,392	5%	▲	
Loss FV Valuation of Assets		0	0	0	**0**	0			
		(11,110,185)	**(11,977,220)**	**(11,977,220)**	**(11,880,651)**				
Operating activities excluded from budget									
Add back Depreciation		4,358,601	4,348,543	4,348,543	**4,485,327**	136,784	3%	▲	
Adjust (Profit)/Loss on Asset Disposal	7	9,620	186,871	186,871	**176,479**	(10,392)	(6%)	▼	
Movement in Leave Reserve (Added Back)		1,334	352	352	**564**	212	60%	▲	
Movement in Employee Benefit Provisions		0	0	0	**0**	0			
Rounding Adjustments		0	0	0	**0**	0			
Movement Due to Changes in Accounting Standards		0	0	0	**0**	0			
Loss on Asset Revaluation		0	0	0	**0**	0			
Adjustment in Fixed Assets		0	0	0	**0**	0			
Amount attributable to operating activities		**860,350**	**681,283**	**681,283**	**1,227,907**				
Investing activities									
Non-Operating Grants, Subsidies and Contributions	13	3,628,255	5,860,315	5,860,315	**3,124,333**	(2,735,982)	(47%)	▼	S
Proceeds from Disposal of Assets	7	40,000	469,961	469,961	**454,961**	(15,000)	(3%)	▼	
Land Held for Resale	8	0	0	0	**0**	0			
Land and Buildings	8	(2,329,327)	(2,172,816)	(2,172,816)	**(626,917)**	1,545,900	71%	▲	S
Plant and Equipment	8	(66,000)	(688,500)	(688,500)	**(31,380)**	657,120	95%	▲	S
Furniture and Equipment	8	(26,100)	(44,200)	(44,200)	**(46,107)**	(1,907)	(4%)	▼	
Infrastructure Assets - Roads	8	(1,791,127)	(3,506,930)	(3,506,930)	**(2,171,390)**	1,335,540	38%	▲	S
Infrastructure Assets - Drainage	8	0	0	0	**0**	0			
Infrastructure Assets - Footpaths	8	0	0	0	**0**	0			
Infrastructure Assets - Public Facilities	8	0	0	0	**0**	0			
Infrastructure Assets - Other	8	(495,000)	(872,300)	(872,300)	**(773,742)**	98,558	11%	▲	S
Amount attributable to investing activities		**(1,039,299)**	**(954,470)**	**(954,470)**	**(70,241)**				
Financing Activities									
Proceeds from New Debentures		1,095,010	1,585,010	1,585,010	**1,055,010**	(530,000)	(33%)	▼	S
Repayment of Debentures	9	(391,148)	(341,683)	(341,683)	**(341,683)**	(0)	(0%)	▼	
Repayment of Lease Financing	9	(19,929)	(19,929)	(19,929)	**(19,930)**	(1)	(0%)	▼	
Advances to Community Groups		(395,010)	(355,010)	(355,010)	**(355,010)**	0	0%		
Proceeds from Advances		0	0	0	**0**	0			
Self-Supporting Loan Principal	9	25,941	8,098	8,098	**8,098**	0	0%		
Transfer to Restricted Cash - Other		0	0	0	**0**	0			
Transfer from Restricted Cash - Other		0	0	0	**0**	0			
Transfer from Reserves	10	20,000	228,135	228,135	**228,135**	0	0%		
Transfer to Reserves	10	(14,000)	(416,300)	(416,300)	**(415,916)**	384	0%	▲	
Amount attributable to financing activities		**320,864**	**688,320**	**688,320**	**158,704**				
Closing Funding Surplus (Deficit)	1	**(26,099)**	**2,229**	**2,229**	**903,466**				

▲▼ Indicates a variance between Year to Date (YTD) Budget and YTD Actual data as per the adopted materiality threshold.
Refer to Note 15 for an explanation of the reasons for the variance.
The material variance adopted by Council for the 2020/21 year is $10,000 and 10%.

This statement is to be read in conjunction with the accompanying Financial Statements and notes.

OPERATING ACTIVITIES
NOTE 1
ADJUSTED NET CURRENT ASSETS

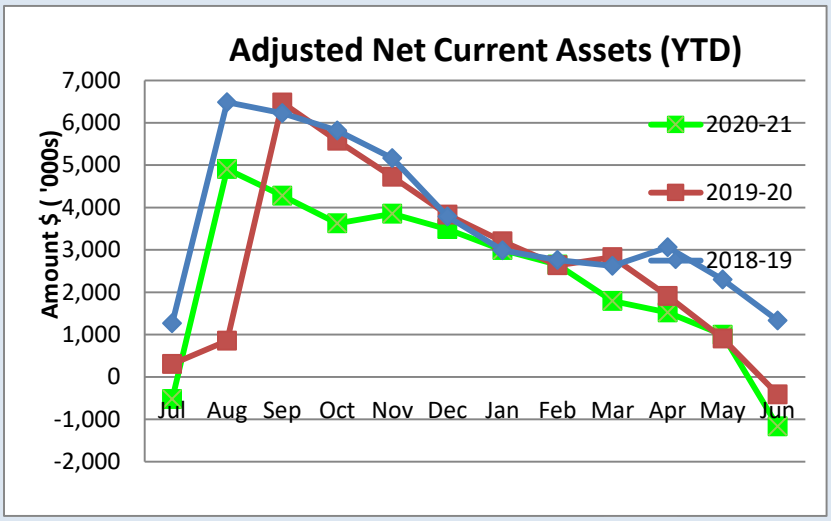
Adjusted Net Current Assets	Note	Last Years Closing 30/06/2020	This Time Last Year 30/06/2020	Year to Date Actual 30/06/2021
		$	$	$
Current Assets				
Cash Unrestricted	2	1,651,177	1,651,177	2,959,921
Cash Restricted - Reserves	2	1,292,763	1,292,763	1,480,544
Cash Restricted - General	2	362,875	362,875	362,875
Cash Restricted - Bonds & Deposits	2	198,687	198,687	210,591
Receivables - Rates	3	403,418	403,418	373,006
Receivables - Other	3	189,988	189,988	309,328
Inventories	4	18,521	18,521	18,521
		4,117,429	4,117,429	5,714,786
Less: Current Liabilities				
Payables	5	(816,575)	(816,575)	(1,216,211)
Contract Liabilities	11	(1,277,058)	(1,277,058)	(967,386)
Financial Liabilities	5	(140,508)	(140,508)	(140,508)
Bonds & Deposits	14	(198,687)	(198,687)	(210,591)
Loan and Lease Liability	9	(361,613)	(361,613)	(427,905)
Provisions	11	(416,446)	(416,446)	(416,446)
		(3,210,887)	(3,210,887)	(3,379,047)
Less: Cash Reserves	10	(1,292,763)	(1,292,763)	(1,480,544)
Add Back: Component of Leave Liability not Required to be funded		123,184	123,184	123,748
Add Back: Loan and Lease Liability		361,613	361,613	427,905
Less : Loan Receivable - clubs/institutions		(8,098)	(8,098)	0
Less : Restricted Cash General	15	(503,383)	(503,383)	(503,383)
Net Current Funding Position		**(412,904)**	**(412,904)**	**903,466**

SIGNIFICANT ACCOUNTING POLICIES

Please see Note 1(a) for information on significant accounting polices relating to Net Current Assets.

KEY INFORMATION

The amount of the adjusted net current assets at the end of the period represents the actual surplus (or deficit if the figure is a negative) as presented on the Rate Setting Statement.



This Year YTD Surplus(Deficit)
$.9 M

Last Year YTD Surplus(Deficit)

OPERATING ACTIVITIES
NOTE 2
CASH AND FINANCIAL ASSETS

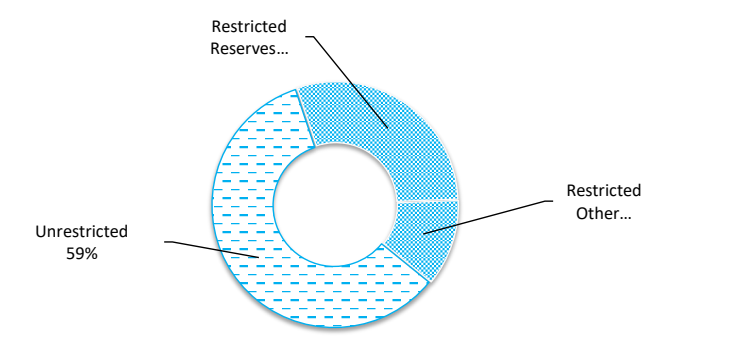
	Unrestricted	Restricted Reserves	Restricted Muni	Total Amount	Institution	Interest Rate	Maturity Date
	$	$	$	$			
Cash on Hand							
CASH ADVANCES	2,050			2,050	Cash on Hand	Nil	On Hand
At Call Deposits							
CASH AT BANK MUNI A/C	2,957,871			2,957,871	NAB	0.25%	At Call
RESERVE FUND BANK A/C		1,480,544		1,480,544	NAB	0.25%	At Call
RESTRICTED ASSETS BANK			362,875	362,875	NAB	0.25%	At Call
BONDS AND DEPOSITS HELD BANK (OLD TRUST FUND BANK)			210,591	210,591	NAB	0.25%	At Call
Term Deposits							
Nil							
Total	**2,959,921**	**1,480,544**	**573,466**	**5,013,931**			

SIGNIFICANT ACCOUNTING POLICIES

Cash and cash equivalents include cash on hand, cash at bank, deposits available on demand with banks and other short term highly liquid investments that are readily convertible to known amounts of cash and which are subject to an insignificant risk of changes in value and bank overdrafts. Bank overdrafts are reported as short term borrowings in current liabilities in the statement of financial position.

KEY INFORMATION

Cash and cash equivalents include cash on hand, cash at bank, deposits available on demand with banks and other short term highly liquid investments that are readily convertible to known amounts of cash and which are subject to an insignificant risk of changes in value and bank overdrafts. Bank overdrafts are reported as short term borrowings in current liabilities in the statement of financial position.



Total Cash	Unrestricted
$5.01 M	$1.48 M

OPERATING ACTIVITIES
NOTE 3
RECEIVABLES

Receivables - Rates & Rubbish	30 June 2020	30 Jun 21
	$	$
Opening Arrears Previous Years	350,992	472,740
Levied this year	6,085,751	6,130,640
Less Collections to date	(5,964,004)	(6,161,052)
Equals Current Outstanding	472,740	442,328
Net Rates Collectable	**472,740**	**442,328**
% Collected	92.66%	93.30%

Receivables - General	Current	30 Days	60 Days	90+ Days	Total
	$	$	$	$	$
Receivables - General	84,689	17,145	2,217	33,285	137,336
Percentage	62%	12%	2%	24%	
Balance per Trial Balance					
Sundry Debtors					137,336
Receivables - Other					171,992
Total Receivables General Outstanding					**309,328**

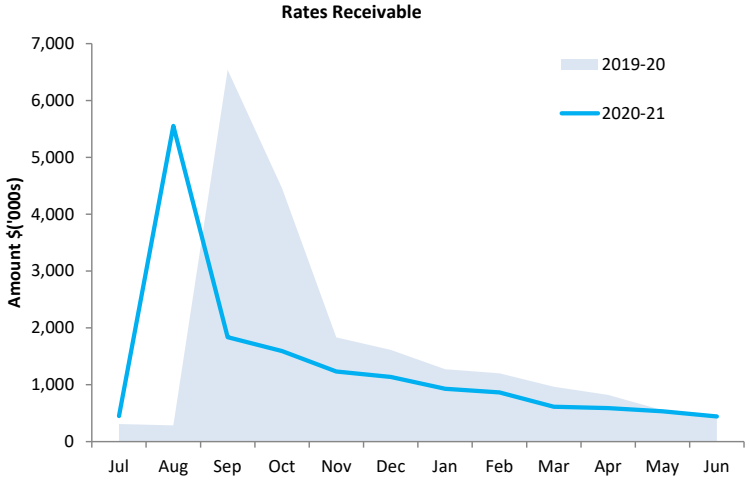
Amounts shown above include GST (where applicable)

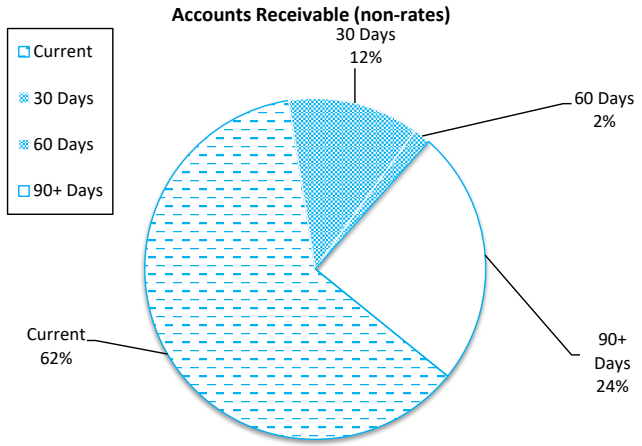
KEY INFORMATION

Trade and other receivables include amounts due from ratepayers for unpaid rates and service charges and other amounts due from third parties for goods sold and services performed in the ordinary course of business.

SIGNIFICANT ACCOUNTING POLICIES

Trade and other receivables include amounts due from ratepayers for unpaid rates and service charges and other amounts due from third parties for goods sold and services performed in the ordinary course of business. Receivables expected to be collected within 12 months of the end of the reporting period are classified as current assets. All other receivables are classified as non-current assets. Collectability of trade and other receivables is reviewed on an ongoing basis. Debts that are known to be uncollectible are written off when identified. An allowance for doubtful debts is raised when there is objective evidence that they will not be collectible.





Collected	Rates Due
93%	$442,328

Debtors Due
$309,328

Over 30 Days
38%

Over 90 Days
24%

OPERATING ACTIVITIES
NOTE 4
OTHER CURRENT ASSETS

Other Current Assets	Opening Balance 1 Jul 2020	Asset Increase	Asset Reduction	Closing Balance 30 Jun 2021
	$	$	$	$
Other Financial Assets at Amortised Cost				
Financial assets at amortised cost - self supporting loans	20,638	346,912	0	367,551
Inventory				
Fuel, Visitor and Rec Centres stock on hand	18,521	0	0	18,521
Accrued income and prepayments				
Accrued income and prepayments	15,302	0	(15,302)	0
Contract assets				
Contract assets	0	0	0	0
Total Other Current assets				**386,072**

Amounts shown above include GST (where applicable)

KEY INFORMATION

Other financial assets at amortised cost

The Shire classifies financial assets at amortised cost if both of the following criteria are met:
- the asset is held within a business model whose objective is to collect the contractual cashflows, and
- the contractual terms give rise to cash flows that are solely payments of principal and interest.

Inventory

Inventories are measured at the lower of cost and net realisable value.
Net realisable value is the estimated selling price in the ordinary course of business less the estimated costs of completion and the estimated costs necessary to make the sale.

Land held for resale

Land held for development and resale is valued at the lower of cost and net realisable value. Cost includes the cost of acquisition, development, borrowing costs and holding costs until completion of development. Borrowing costs and holding charges incurred after development is completed are expensed.

Gains and losses are recognised in profit or loss at the time of signing an unconditional contract of sale if significant risks and rewards, and effective control over the land, are passed onto the buyer at this point.

Land held for resale is classified as current except where it is held as non-current based on the Council's intentions to release for sale.

CONTRACT ASSETS

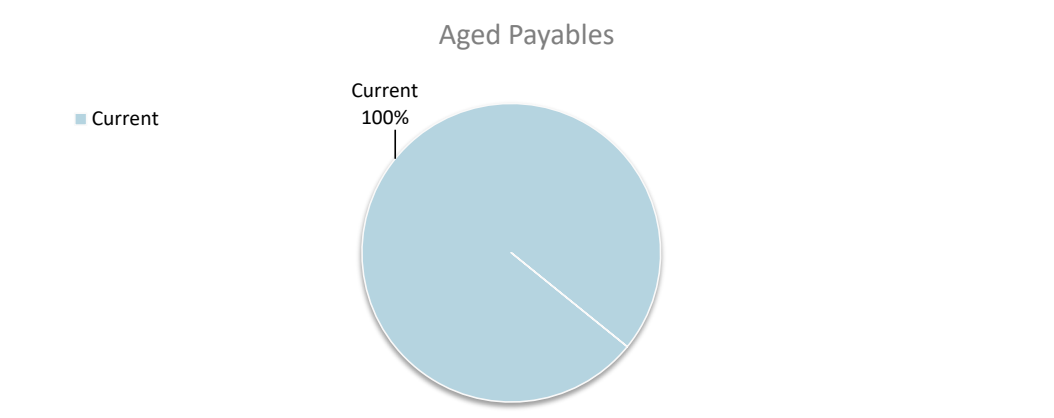
A contract asset is the right to consideration in exchange for goods or services the entity has transferred to a customer when that right is conditioned on something other than the passage of time.

OPERATING ACTIVITIES
NOTE 5
Payables

Payables - General	Current	30 Days	60 Days	90+ Days	Total
	$	$	$	$	$
Payables (Sundry Creditors) - General	949,307	73,234	30,321	24,179	1,077,042
Percentage	88.1%	6.8%	2.8%	2.2%	
Balance per Trial Balance					
Sundry creditors - General					1,077,042
Other creditors					77,087
Accrued salaries and wages					0
ATO liabilities					40,828
Financial liabilities (Developer Contributions)					140,508
Other accruals/payables					21,254
Total Payables General Outstanding					**1,356,719**
Amounts shown above include GST (where applicable)					

KEY INFORMATION

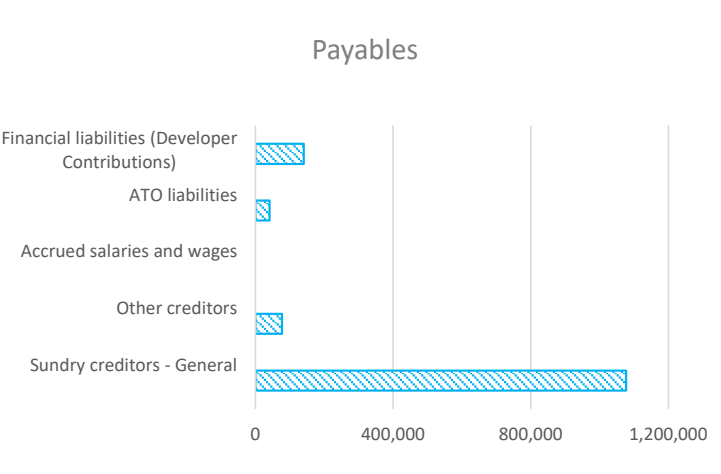
Trade and other payables represent liabilities for goods and services provided to the Shire that are unpaid and arise when the Shire becomes obliged to make future payments in respect of the purchase of these goods and services. The amounts are unsecured, are recognised as a current liability and are normally paid within 30 days of recognition.

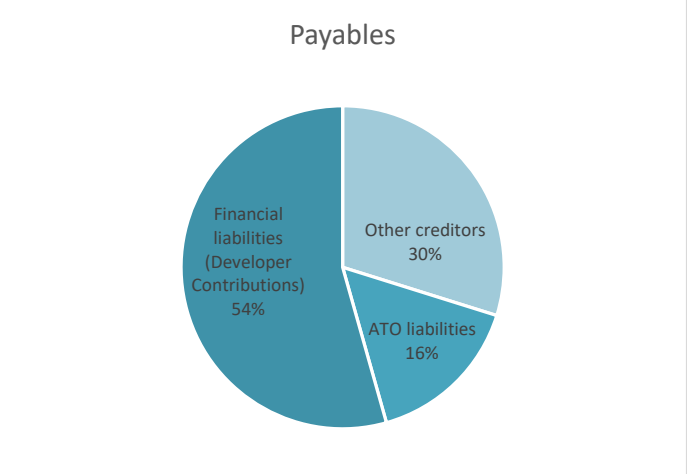


Creditors Due
$1,356,719

Over 30 Days
12%

Over 90 Days
2.2%



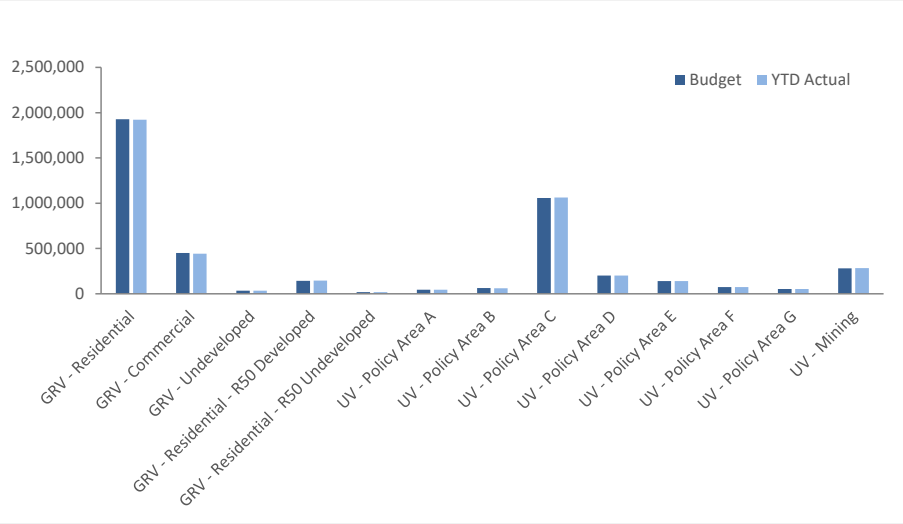


OPERATING ACTIVITIES
NOTE 6
RATE REVENUE

		Budget					YTD Acutal			
RATE TYPE	Rate in	Number of Properties	Rateable Value	Rate Revenue	Interim Rate	Back Rate	Total Revenue	Rate Revenue	Interim Rates	Back Rates	Total Revenue
	$			$	$	$	$	$	$	$	$
Differential General Rate											
GRV - Residential	0.111808	1,334	17,151,409	1,917,663	5,000	5,000	1,927,663	1,917,662.88	3,529	0	1,921,191
GRV - Commercial	0.111808	121	4,037,910	451,470	0	0	451,470	443,329.86	1,009	(2,327)	442,012
GRV - Undeveloped	0.111808	20	311,776	34,859	0	0	34,859	34,859.02	0	0	34,859
GRV - Residential - R50 Develope	0.111808	75	1,286,620	143,854	0	0	143,854	143,854.51	651	0	144,505
GRV - Residential - R50 Undevelc	0.111808	12	166,050	18,566	0	0	18,566	18,565.74	0	0	18,566
UV - Policy Area A	0.014193	5	3,160,000	44,850	0	0	44,850	44,849.88	0	0	44,850
UV - Policy Area B	0.014193	13	4,451,902	63,186	0	0	63,186	63,185.84	(348)	(719)	62,119
UV - Policy Area C	0.014193	132	74,477,529	1,057,060	0	0	1,057,060	1,057,002.80	6,894	456	1,064,352
UV - Policy Area D	0.014193	109	14,172,852	201,155	0	0	201,155	201,155.30	29	368	201,552
UV - Policy Area E	0.014193	40	9,917,800	140,763	0	0	140,763	140,763.34	0	0	140,763
UV - Policy Area F	0.014193	24	5,209,350	73,936	0	0	73,936	73,936.31	0	0	73,936
UV - Policy Area G	0.014193	27	3,704,751	52,582	0	0	52,582	52,581.53	0	0	52,582
UV - Mining	0.189882	28	1,480,782	281,174	0	0	281,174	282,811.59	(645)	379	282,546
UV - Mining Developed	0.189882	9	887,524	168,525	0	0	168,525	168,524.83	0	0	168,525
Sub-Totals		**1,949**	**140,416,255**	**4,649,643**	**5,000**	**5,000**	**4,659,643**	**4,643,083**	**11,118**	**(1,843)**	**4,652,359**
	Minimum										
Minimum Payment	**$**										
GRV - Residential	1,021	98	760,027	100,058	0	0	100,058	100,058	0	0	100,058
GRV - Commercial	1,021	65	295,666	66,365	0	0	66,365	66,365	0	0	66,365
GRV - Undeveloped	1,021	457	1,310,417	466,597	0	0	466,597	466,597	0	0	466,597
GRV - Residential - R50 Develope	1,021	7	58,658	7,147	0	0	7,147	7,147	0	0	7,147
GRV - Residential - R50 Undevelc	1,021	14	73,830	14,294	0	0	14,294	14,294	0	0	14,294
UV - Policy Area A	1,021	4	185,500	4,084	0	0	4,084	4,084	0	0	4,084
UV - Policy Area B	1,021	2	146,998	4,084	0	0	4,084	2,042	0	0	2,042
UV - Policy Area C	1,021	27	1,274,271	27,567	0	0	27,567	27,567	0	0	27,567
UV - Policy Area D	1,021	11	595,198	11,231	0	0	11,231	11,231	0	0	11,231
UV - Policy Area E	1,021	0	0	0	0	0	0	0	0	0	0
UV - Policy Area F	1,021	11	598,500	11,231	0	0	11,231	11,231	0	0	11,231
UV - Policy Area G	1,021	1	66,499	1,021	0	0	1,021	0	0	0	0
UV - Mining	1,021	18	46,545	18,378	0	0	18,378	18,378	0	0	18,378
UV - Mining Developed	1,021	0	0	0	0	0	0	0	0	0	0
Sub-Totals		**715**	**5,412,109**	**732,057**	**0**	**0**	**732,057**	**728,994**	**0**	**0**	**728,994**
		2,664	**145,828,364**	**5,381,700**	**5,000**		**5,391,700**	**5,372,077**	**11,118**	**(1,843)**	**5,381,353**
Discounts							0				0
Concession							0				0
Amount from General Rates							**5,391,700**				**5,381,353**
Ex-Gratia Rates							2,800				3,076
Movement in Excess Rates							0				0
Specified Area Rates							0				0
Total Rates							**5,394,500**				**5,384,429**

OPERATING ACTIVITIES
NOTE 6
RATE REVENUE

KEY INFORMATION
Rates, grants, donations and other contributions are recognised as revenues when the local government obtains control over the assets comprising the contributions. Control over assets acquired from rates is obtained at the commencement of the rating period or, where earlier, upon receipt of the rates.

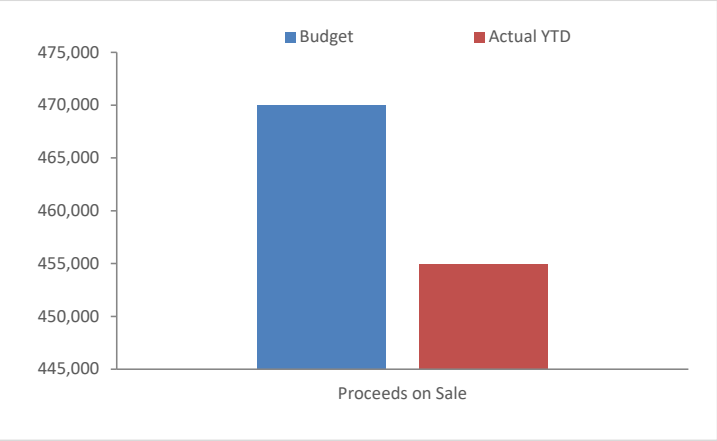


General Rates		
Budget	**YTD Actual**	**%**
$5.39 M	**$5.38 M**	**100%**

OPERATING ACTIVITIES
NOTE 7
DISPOSAL OF ASSETS

Asset Number	Asset Description	Amended Budget Net Book Value	Amended Budget Proceeds	Amended Budget Profit	Amended Budget (Loss)	YTD Actual Net Book Value	YTD Actual Proceeds	YTD Actual Profit	YTD Actual (Loss)
		$	$	$	$	$	$	$	$
	Land and Buildings								
2646	Land - 4 Kennedy Heights	160,000	160,000			160,000	160,000		
2598	Duplex 4A Kennedy Heights	215,310	125,000		(90,310)	215,310	125,000		(90,310)
2599	Duplex 4B Kennedy Heights	220,657	125,000		(95,657)	220,657	125,000		(95,657)
	Plant and Equipment								
634	John Deere Tractor Mower Ir420	0	0			0	0		
970	2010 Fuso Canter 2 Way Tip Body Ir197	25,392	15,000		(10,392)	0	0		
2758	Skid Steer Loader 226D	34,774	31,737		(3,037)	34,774	31,737		(3,036)
810	10 Cubic Metre Tipping Body	700	13,224	12,524.00		700	13,224	12,524	
		0	0						
		0	0						
		656,833	**469,961**	**12,524**	**(199,396)**	**631,440**	**454,961**	**12,524**	**(189,003)**

KEY INFORMATION



Proceeds on Sale		
Budget	**YTD Actual**	**%**
$469,961	**$454,961**	**97%**

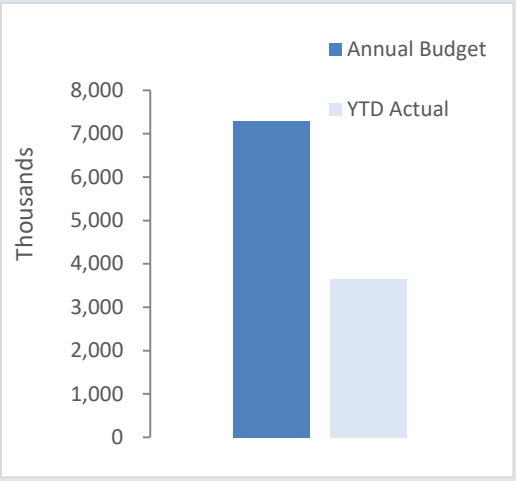
INVESTING ACTIVITIES
NOTE 8
CAPITAL ACQUISITIONS

Capital Acquisitions	Adopted Annual Budget	Amended YTD Budget	Amended Annual Budget	YTD Actual Total	YTD Budget Variance
	$	$	$	$	$
Land Held for Resale	0	0	0	**0**	0
Land and Buildings	2,329,327	2,172,816	2,172,816	**626,917**	(1,545,900)
Plant and Equipment	66,000	688,500	688,500	**31,380**	(657,120)
Furniture and Equipment	26,100	44,200	44,200	**46,107**	1,907
Infrastructure Assets - Roads	1,791,127	3,506,930	3,506,930	**2,171,390**	(1,335,540)
Infrastructure Assets - Drainage	0	0	0	**0**	0
Infrastructure Assets - Footpaths	0	0	0	**0**	0
Infrastructure Assets - Public Facilities	0	0	0	**0**	0
Infrastructure Assets - Other	495,000	872,300	872,300	**773,742**	(98,558)
Capital Expenditure Totals	4,707,554	7,284,746	7,284,746	**3,649,535**	(3,635,211)
Capital acquisitions funded by:					
	$	$	$	$	$
Capital Grants and Contributions	3,628,255	5,860,315	5,860,315	**3,124,333**	(2,735,982)
Borrowings	1,095,010	1,585,010	1,585,010	**1,055,010**	(530,000)
Other (Disposals & C/Fwd)	40,000	469,961	469,961	**454,961**	(15,000)
Council contribution - Cash Backed Reserves					
Various Reserves		228,135	228,135	**228,135**	0
Council contribution - operations		**-858,675**	**-858,675**	**-1,212,904**	(354,229)
Capital Funding Total		**7,284,746**	**7,284,746**	**3,649,535**	**(3,635,211)**

SIGNIFICANT ACCOUNTING POLICIES

All assets are initially recognised at cost. Cost is determined as the fair value of the assets given as consideration plus costs incidental to the acquisition. For assets acquired at no cost or for nominal consideration, cost is determined as fair value at the date of acquisition. The cost of non-current assets constructed by the local government includes the cost of all materials used in the construction, direct labour on the project and an appropriate proportion of variable and fixed overhead. Certain asset classes may be revalued on a regular basis such that the carrying values are not materially different from fair value. Assets carried at fair value are to be revalued with sufficient regularity to ensure the carrying amount does not differ materially from that determined using fair value at reporting date.

KEY INFORMATION



Acquisitions	Annual Budget	YTD Actual	% Spent
	$7.28 M	**$3.65 M**	**50%**

Capital Grant	Annual Budget	YTD Actual	% Received
	$5.86 M	**$3.12 M**	**53%**

INVESTING ACTIVITIES
NOTE 8
CAPITAL ACQUISITIONS

Capital Expenditure Total
Level of Completion Indicators
0%
20%
40%
60%
80%
100%
Over 100%

Percentage YTD Actual to Annual Budget
Expenditure over budget highlighted in red.

Level of completion indicator, please see table at the top of this note for further detail.

% of Completion	Assets	Account Number	Balance Sheet Category	Job Number	Adopted Annual Budget	Amended Annual Budget	YTD Budget	Total YTD	Variance (Under)/Over
					$	$	$	$	$
	Buildings								
	Other Health								
	Total - Other Health				**0**	**0**	**0**	**0**	**0**
	Housing								
0.99	AGED APPROPRIATE HOUSING - STAGE 1	2574	1311	1626	0	(26,000)	(26,000)	(25,854)	146
0.24	AGED APPROPRIATE HOUSING - STAGE 2	2574	1311	CJ18	(2,259,327)	(2,042,453)	(2,042,453)	(496,594)	1,545,859
1.00	AGED APPROPRIATE HOUSING - LIVABLE HOUSING AUSTRALIA PLAT	2574	1311	CJ31	0	(44,363)	(44,363)	(44,363)	(0)
	Total - Housing				**(2,259,327)**	**(2,112,816)**	**(2,112,816)**	**(566,812)**	**1,546,004**
	Community Amenities								
1.01	CONTAINER DEPOSIT SCHEME	1944	1311	CJ70	(20,000)	(40,500)	(40,500)	(40,961)	(461)
	Total - Community Amenities				**(20,000)**	**(40,500)**	**(40,500)**	**(40,961)**	**(461)**
	Recreation And Culture								
0.98	IRWIN REC CENTRE BUILDING - RENEWAL	2834	1311	CJ05	(25,000)	(12,500)	(12,500)	(12,232)	268
1.00	REC JETTY	2834	1311	CJ908	(25,000)	0	0	0	0
	Total - Recreation And Culture				**(50,000)**	**(12,500)**	**(12,500)**	**(12,232)**	**268**
0.29	**Total - Buildings**				**(2,329,327)**	**(2,172,816)**	**(2,172,816)**	**(626,917)**	**1,545,900**
	Plant & Equipment								
	Recreation & Culture								
0.00	PARKS & GARDENS - TRACTOR MOWER - REG IR420	2844	1312	V420	(35,000)	(50,000)	(50,000)	0	50,000
0.00	NEW TRUCK - PARKS & GARDENS	2844	1312	V852	0	(77,000)	(77,000)	0	77,000
	Total - Recreation & Culture				**(35,000)**	**(127,000)**	**(127,000)**	**0**	**127,000**
	Transport								
0.99	SIDE TIPPER	3534	1312	CJ52	(5,000)	(5,000)	(5,000)	(4,930)	70
0.00	PRIME-MOVER	3534	1312	V850	0	(309,000)	(309,000)	0	309,000
0.00	SIDE TIPPING SEMI TRAILER	3534	1312	V851	0	(260,000)	(221,000)	0	
1.00	NISSAN UD PRME MOVER 540IR	3534	1312	V526	(14,000)	(13,500)	(13,500)	(13,438)	62
1.00	BULK FUEL STORAGE TANK & SYSTEM	3584	1312	CJ44	(12,000)	(13,000)	(13,000)	(13,012)	(12)
	Total - Transport				**(31,000)**	**(600,500)**	**(561,500)**	**(31,380)**	**309,120**
0.04	**Total - Plant & Equipment**				**(66,000)**	**(727,500)**	**(688,500)**	**(31,380)**	**436,120**
	Furniture & Equipment								
	Recreation & Culture								
1.32	BASKETBALL SCOREBOARD	2824	1314	CJ81	(15,000)	(9,100)	(9,100)	(12,018)	(2,918)
0.99	GYMNASTICS EQUIPMENT - MATS, BOARDS, BEAM ETC	2824	1314	CJ35	0	(5,500)	(5,500)	(5,448)	52
	Total - Recreation & Culture				**(15,000)**	**(14,600)**	**(14,600)**	**(17,466)**	**(2,866)**
	Other Property & Services								
0.93	IT - HARDWARE	0264	1314	CJ33	(11,100)	(11,100)	(11,100)	(10,281)	819
1.00	IT - WEBSITE & INTRANET	0264	1314	CJ34	0	(12,500)	(12,500)	(12,500)	0
	Total - Other Property & Services				**(11,100)**	**(23,600)**	**(23,600)**	**(22,781)**	**819**
1.04	**Total - Furniture & Equipment**				**(26,100)**	**(44,200)**	**(44,200)**	**(46,107)**	**(1,907)**
	Roads								
	Housing								
1.00	THE VILLAGE - FOOTPATHS, HANDRAILS, KERBS	2586	1317	CJ45	(44,700)	0	0	0	0
	Total - Housing				**(44,700)**	**0**	**0**	**0**	**0**
	Transport								
4.87	R2R - FANE ROAD	6644	1317	CJ75	(64,000)	(1,000)	(1,000)	(4,866)	(3,866)
0.82	R2R - PIGGERY LANE	6644	1317	CJ76	(129,540)	(1,000)	(1,000)	(818)	182
1.00	R2R - BELAURA PLACE	6644	1317	CJ77	(21,259)	0	0	0	0
0.52	TABLETOP ROAD - SEAL - RRG	6644	1317	CJ78	0	(262,000)	(262,000)	(135,612)	126,388
0.74	ALLANOOKA SPRINGS ROAD - SEAL - RRG	6644	1317	CJ79	0	(450,000)	(450,000)	(334,285)	115,715
0.66	MORETON TERRACE	6664	1317	CJ22	(450,000)	(722,000)	(722,000)	(475,461)	246,539
0.79	CASUARINAS ROAD - RRG	6674	1317	CJ72	(357,000)	(357,000)	(357,000)	(282,561)	74,439
0.80	TABLETOP ROAD - RRG	6674	1317	CJ73	(422,500)	(422,500)	(422,500)	(338,271)	84,229
0.45	BURMA ROAD - RRG	6674	1317	CJ74	(251,500)	(251,500)	(251,500)	(113,402)	138,098
1.00	MILO ROAD DESIGN	6674	1317	CJ23	(38,528)	0	0	0	0
1.00	BLENHEIM ROAD	6694	1317	CJ24	(7,100)	(4,950)	(4,950)	(4,950)	0
0.94	ALLANOOKA RD SHOULDERS - SAFETY CRITICAL WORKS	6754	1317	SC01	0	(23,500)	(23,500)	(22,103)	1,397
1.44	DRAINAGE RENEWAL - GENERAL	6754	1317	DR01	0	(6,480)	(6,480)	(9,340)	(2,860)
0.48	GENERAL FOOTPATHS	6784	1317	CJ26	(5,000)	(5,000)	(5,000)	(2,378)	2,622
	Total - Transport				**(1,746,427)**	**(3,506,930)**	**(3,506,930)**	**(2,171,390)**	**1,335,540**
0.62	**Total - Roads**				**(1,791,127)**	**(3,506,930)**	**(3,506,930)**	**(2,171,390)**	**1,335,540**

INVESTING ACTIVITIES
NOTE 8
CAPITAL ACQUISITIONS

Capital Expenditure Total
Level of Completion Indicators
0%
20%
40%
60%
80%
100%
Over 100%

Percentage YTD Actual to Annual Budget
Expenditure over budget highlighted in red.

% of Completion	Assets	Account Number	Balance Sheet Category	Job Number	Adopted Annual Budget	Amended Annual Budget	YTD Budget	Total YTD	Variance (Under)/Over
	Level of completion indicator, please see table at the top of this note for further detail.				$	$	$	$	$
	Infrastructure - Other								
	Community Amenities								
0.20	CEMETERY REVITILISATION	2644	1318	CJ03	(130,000)	(130,000)	(130,000)	(26,203)	103,797
	Total - Community Amenities				**(130,000)**	**(130,000)**	**(130,000)**	**(26,203)**	**103,797**
	Recreation And Culture								
1.14	CLIFF HEAD - PAID CAMPING IMPLEMENTATION	8054	1318	CJ71	0	(15,000)	(15,000)	(17,139)	(2,139)
1.05	GRANNY'S BEACH - WALL	8054	1318	CJ86	0	(55,000)	(55,000)	(57,757)	(2,757)
0.85	SHADE SAILS - PARKS	2864	1318	1429	0	(9,000)	(9,000)	(7,615)	1,385
1.02	REHABILITAION FORMER FISHERMANS HALL AREA	2864	1318	CJ80	(55,000)	(55,000)	(55,000)	(55,936)	(936)
1.08	REPLACEMENT BBQ - FORESHORE	2864	1318	CJ84	0	(7,500)	(7,500)	(8,106)	(606)
1.07	SKATE PARK - PUMP TRACK	2864	1318	CJ37	(220,000)	(263,500)	(263,500)	(281,366)	(17,866)
0.09	TREE PLANTING	2864	1318	CJ49	(21,000)	(21,000)	(21,000)	(1,800)	19,200
	Total - Recreation And Culture				**(296,000)**	**(673,300)**	**(673,300)**	**(708,961)**	**(35,661)**
	Transport								
0.56	RURAL SIGNS	6794	1318	CJ10	(69,000)	(69,000)	(69,000)	(38,578)	30,422
	Total - Transport				**(69,000)**	**(69,000)**	**(69,000)**	**(38,578)**	**30,422**
0.89	**Total - Infrastructure - Other**				**(495,000)**	**(872,300)**	**(872,300)**	**(773,742)**	**98,558**
0.50	**Grand Total**				**(4,707,554)**	**(7,323,746)**	**(7,284,746)**	**(3,649,536)**	**3,414,210**

FINANCING ACTIVITIES
NOTE 9
LOAN DEBENTURE BORROWINGS AND FINANCING

(a) Information on Loan Debenture Borrowings

		New Loans			Principal Repayments			Principal Outstanding			Interest & Guarantee Fee Repayments		
Particulars/Purpose	01 Jul 2020	Actual	Amended Budget	Adopted Budget	Actual	Amended Budget	Adopted Budget	Actual	Amended Budget	Adopted Budget	Actual	Amended Budget	Adopted Budget
		$	$	$	$	$	$	$	$	$	$	$	$
Other Health													
Loan 99 - Medical Centre	1,450,000	0	0	0	58,961	58,961	58,961	1,391,039	1,391,039	1,391,039	40,072	32,786	32,786
Other Housing													
Loan 100- SIHI Completion	0	700,000	700,000	700,000	0	0	31,621	700,000	700,000	668,379	2,994	0	7,385
Recreation and Culture													
Loan 93 - Recreation Centre	2,105,156	0	0	0	109,992	109,992	109,992	1,995,164	1,995,164	1,995,164	153,471	152,737	152,737
Loan 96 - Tennis Courts Resurfacing	79,897	0	0	0	39,478	39,478	39,478	40,419	40,419	40,419	2,119	2,311	2,311
Transport													
Loan 98 - Plant	791,096	0	0	0	125,155	125,155	125,155	665,940	665,940	665,940	20,189	21,631	21,631
Loan 101 - Plant	0	0	530,000	0	0	0	0	0	530,000	0	0	0	0
	4,426,148	700,000	1,230,000	700,000	333,586	333,586	365,207	4,792,563	5,322,563	4,760,942	218,844	209,464	216,849
Self supporting loans													
Recreation and Culture													
Loan 97 - Golf Club	20,638	0	0	0	8,098	8,098	8,098	12,541	12,541	12,541	523	629	629
Loan 101 - Golf Club - Not proceeding	0	0	0	40,000	0	0	1,807	0	0	38,193	0	0	422
Loan 102 - Denison Bowling Club	0	355,010	355,010	355,010	0	0	16,037	355,010	355,010	338,973	1,623	0	3,745
	20,638	355,010	355,010	395,010	8,098	8,098	25,941	367,551	367,551	389,707	2,146	629	4,796
Total	4,446,787	1,055,010	1,585,010	1,095,010	341,683	341,683	391,148	5,160,113	5,690,113	5,150,649	220,990	210,093	221,646
Current loan borrowings	341,683							427,905					
Non-current loan borrowings	4,105,103							4,732,208					
	4,446,787							5,160,113					

All debenture repayments were financed by general purpose revenue except the Self Supporting Loan.

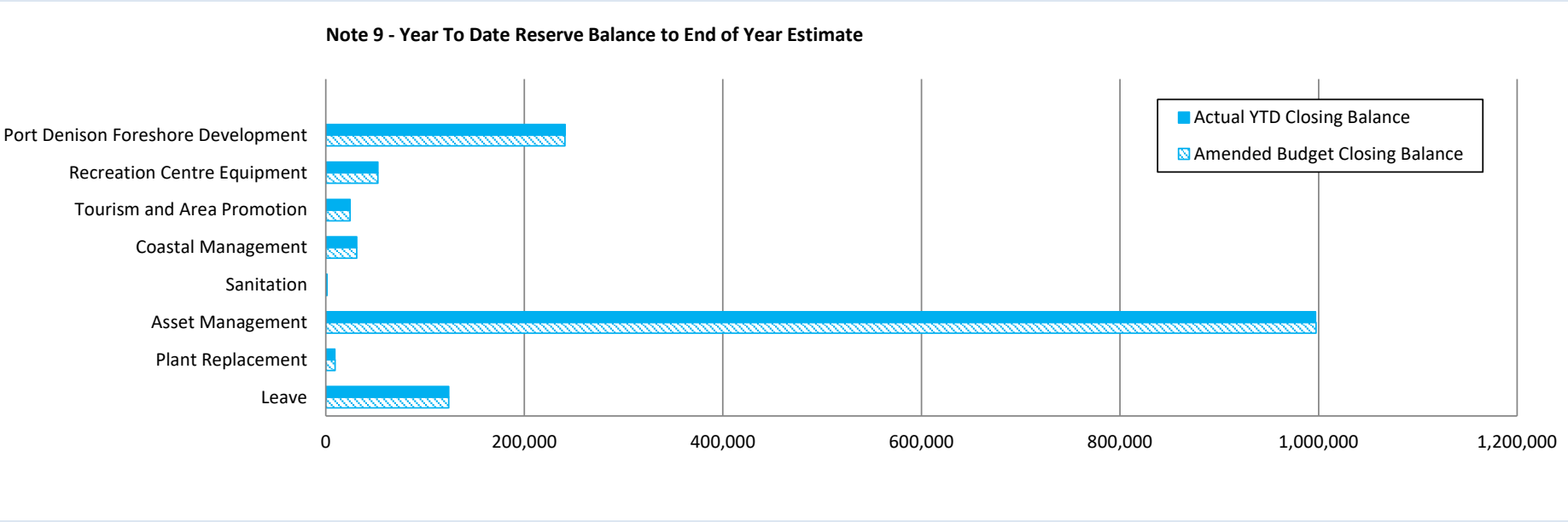
(b) Information on Financing

		New Financing			Lease Financing Principal Repayments			Lease Financing Principal Outstanding			Lease Financing Interest Repayments		
Particulars/Purpose	01 Jul 2020	Actual	Amended Budget	Adopted Budget	Actual	Amended Budget	Adopted Budget	Actual	Amended Budget	Adopted Budget	Actual	Amended Budget	Adopted Budget
		$	$	$	$	$	$	$	$	$	$	$	$
Recreation and Culture													
Solar Panels (67.941%)	39,333	0	0	0	13,540	13,540	13,540	25,793	25,793	25,793	895	895	895
Other Property and Services													
Solar Panels (32.059%)	18,560	0	0	0	6,389	6,389	6,389	12,171	12,171	12,171	422	422	422
	57,893	0	0	0	19,930	19,929	19,929	37,963	37,964	37,964	1,318	1,317	1,317
Total	57,893	0	0	0	19,930	19,929	19,929	37,963	37,964	37,964	1,318	1,317	1,317
Current financing borrowings	19,930							0					
Non-current financing borrowings	37,963							37,963					
	57,893							37,963					

Cash Backed Reserve

Reserve Name	Opening Balance	Amended Budget Interest Earned	Actual Interest Earned	Amended Budget Transfers In (+)	Actual Transfers In (+)	Amended Budget Transfers Out (-)	Actual Transfers Out (-)	Amended Budget Closing Balance	Actual YTD Closing Balance
	$	$	$	$	$	$	$	$	$
Leave	123,184	600	564	0	0	0	0	123,784	123,748
Plant Replacement	108,736	600	498	0	0	(100,000)	(100,000)	9,336	9,234
Asset Management	584,401	3,000	2,674	410,000	410,000	0	0	997,401	997,076
Sanitation	21,161	100	97	0	0	(20,000)	(20,000)	1,261	1,257
Coastal Management	138,669	600	635	0	0	(108,135)	(108,135)	31,134	31,169
Tourism and Area Promotion	24,469	100	112	0	0	0	0	24,569	24,581
Recreation Centre Equipment	52,183	300	239	0	0	0	0	52,483	52,422
Port Denison Foreshore Development	239,960	1,000	1,098	0	0	0	0	240,960	241,058
	1,292,763	**6,300**	**5,916**	**410,000**	**410,000**	**(228,135)**	**(228,135)**	**1,480,928**	**1,480,544**

KEY INFORMATION



OPERATING ACTIVITIES
NOTE 11
OTHER CURRENT LIABILITIES

Other Current Liabilities	Note	Opening Balance 1 Jul 2020	Liability Increase	Liability Reduction	Closing Balance 30 Jun 2021
		$	$	$	$
Contract Liabilities					
Unspent grants, contributions and reimbursements					
- operating	**12**	85,372	59,898	(33,548)	111,722
- non-operating	**13**	1,191,686	2,503,185	(2,813,104)	887,452
Total unspent grants, contributions and reimbursements		1,277,058	2,563,083	(2,846,651)	**999,174**
Provisions					
Annual leave		211,873	0	0	211,873
Long service leave		204,573	0	0	204,573
Total Provisions		416,446	0	0	**416,446**
Total Other Current Liabilities					**1,415,620**

Amounts shown above include GST (where applicable)

KEY INFORMATION

PROVISIONS

Provisions are recognised when the Shire has a present legal or constructive obligation, as a result of past events, for which it is probable that an outflow of economic benefits will result and that outflow can be reliably measured.

Provisions are measured using the best estimate of the amounts required to settle the obligation at the end of the reporting period.

EMPLOYEE BENEFITS

Short-term employee benefits

Provision is made for the Shire's obligations for short-term employee benefits. Short-term employee benefits are benefits (other than termination benefits) that are expected to be settled wholly before 12 months after the end of the annual reporting period in which the employees render the related service, including wages, salaries and sick leave. Short-term employee benefits are measured at the (undiscounted) amounts expected to be paid when the obligation is settled.

The Shire's obligations for short-term employee benefits such as wages, salaries and sick leave are recognised as a part of current trade and other payables in the calculation of net current assets.

Other long-term employee benefits

The Shire's obligations for employees' annual leave and long service leave entitlements are recognised as provisions in the statement of financial position.

Long-term employee benefits are measured at the present value of the expected future payments to be made to employees. Expected future payments incorporate anticipated future wage and salary levels, durations of service and employee departures and are discounted at rates determined by reference to market yields at the end of the reporting period on government bonds that have maturity dates that approximate the terms of the obligations. Any remeasurements for changes in assumptions of obligations for other long-term employee benefits are recognised in profit or loss in the periods in which the changes occur. The Shire's obligations for long-term employee benefits are presented as non-current provisions in its statement of financial position, except where the Shire does not have an unconditional right to defer settlement for at least 12 months after the end of the reporting period, in which case the obligations are presented as current provisions.

NOTE 12
OPERATING GRANTS AND CONTRIBUTIONS

Provider	Unspent Operating Grant, Subsidies and Contributions Liability					Operating Grants, Subsidies and Contributions Revenue			
	Liability 1 Jul 2020	Increase in Liability	Liability Reduction (As revenue)	Liability 30 Jun 2021	Current Liability 30 Jun 2021	Adopted Budget Revenue	Amended Annual Budget	Amended YTD Budget	YTD Actual Revenue
	$	$	$	$	$	$	$	$	$
Operating Grants and Subsidies									
General purpose funding									
Grants Commission - Roads (WALGGC)	0	0	0	0	0	155,310	155,310	155,310	344,621
Grants Commission - General (WALGGC)	0	0	0	0	0	103,831	103,831	103,831	201,938
Law, order, public safety								0	
DFES Grant - Operating Bush Fire Brigade	15,583	47,898	(22,991)	40,489	40,489	47,994	47,994	47,994	22,991
DFES Bushfire Risk Management Project	23,923	0	0	23,923	23,923	0	5,500	5,500	0
Seniors Week Grant (Council on the Ageing)	0	0	0	0	0	2,000	0	0	0
Community amenities						0	0	0	0
Local Planning Scheme Review	22,283	0	0	22,283	22,283	0	0	0	0
Springfield Structure Plan Grant	9,392	0	0	9,392	9,392	0	0	0	0
Recreation and culture						0	0	0	0
Dept Land & Development Coastal Nodes	1,500	0	0	1,500	1,500	0	0	0	0
Coastal Management	6,600	12,000	(10,556)	8,044	8,044	0	0	0	10,556
State Library - General Excellence Award Grant	5,000	0	0	5,000	5,000	0	0	0	0
Transport						0	0	0	0
DRFAWA - Grant - storm damage	0	0	0	0	0	0	550,000	550,000	0
Direct Grant (MRWA)	0	0	0	0	0	82,590	82,590	82,590	82,590
	84,281	**59,898**	**(33,548)**	**110,631**	**110,631**	**391,725**	**950,725**	**950,725**	**662,697**
Operating Contributions									
Law, order, public safety									
DFES - Community Emergency Services Manager	0	0	0	0	0	100,000	100,000	100,000	106,593
Community amenities									
Dongara Pop-up Shop - Sustainable Environment Commit	1,091	0	0	1,091	1,091	0	0	0	0
Other property and services									
Employer Incentive Funding	0	0	0	0	0	0	30,000	30,000	30,000
	1,091	**0**	**0**	**1,091**	**1,091**	**100,000**	**130,000**	**130,000**	**136,593**
TOTALS	**85,372**	**59,898**	**(33,548)**	**111,722**	**111,722**	**491,725**	**1,080,725**	**1,080,725**	**799,290**

SHIRE OF IRWIN
NOTES TO THE STATEMENT OF FINANCIAL ACTIVITY
FOR THE PERIOD ENDED 30 JUNE 2021

NOTE 13
NON-OPERATING GRANTS AND CONTRIBUTIONS

	Unspent Non Operating Grants, Subsidies and Contributions Liability					Non Operating Grants, Subsidies and Contributions Revenue			
Provider	Liability 1 Jul 2020	Increase in Liability	Liability Reduction (As revenue)	Liability 30 Jun 2021	Current Liability 30 Jun 2021	Adopted Budget Revenue	Amended Annual Budget	Amended YTD Budget	YTD Actual Revenue
	$	$	$	$	$	$	$	$	$
Non-Operating Grants and Subsidies									
Housing									
SIHI Ageing in Place (WA Country Health Service)	1,078,741	0	(522,448)	556,293	556,293	1,559,327	1,559,327	1,559,327	522,448
Recreation and culture									0
Skate Park - Pump Track (Lotterywest)	0	250,000	(250,000)	0	0	250,000	250,000	250,000	250,000
Coastal Reserve Works	15,463	0	0	15,463	15,463	0	0	0	0
Transport									0
RTR Grant - Casuarinas Rd (CJ72)	0	119,000	(94,187)	24,813	24,813	119,000	119,000	119,000	94,187
RTR Grant - Tabletop Rd (CJ73)	0	140,833	(112,757)	28,076	28,076	140,833	140,833	140,833	112,757
RTR Grant - Burma Rd (CJ74)	0	73,284	(46,033)	27,251	27,251	83,833	83,833	83,833	46,033
RTR Grant - Fane Rd (CJ75)	0	0	(4,866)	0	0	64,000	1,000	1,000	4,866
RTR Grant - Piggery Lane (CJ76)	0	0	(818)	0	0	129,540	1,000	1,000	818
RTR Grant - Bileaura Rd (CJ77)	0	0	0	0	0	21,259	0	0	0
RRG Grant - Moreton Terrace (CJ22)	73,204	147,533	(463,481)	(242,744)	(242,744)	300,000	481,333	481,333	463,481
RRG Grant - Milo Road Design (CJ23)	2,595	0	(2,595)	0	0	22,195	0	0	2,595
RRG Grant - Casuarinas RD (CJ72)	0	190,400	(188,374)	2,026	2,026	238,000	238,000	238,000	188,374
RRG Grant - Tabletop Rd (CJ73)	0	112,667	(225,514)	(112,847)	(112,847)	281,667	281,667	281,667	225,514
RRG Grant - Burma RD (CJ74)	0	134,134	(92,065)	42,069	42,069	167,667	167,667	167,667	92,065
RRG Grant - Tabletop Rd Seal (CJ78)	0	69,867	(89,167)	(19,300)	(19,300)	0	174,667	174,667	89,167
RRG Grant -Allanooka Spring Rd Seal (CJ79)	0	240,000	(222,857)	17,143	17,143	0	300,000	300,000	222,857
Roadwise Funds	6,776	0	0	6,776	6,776	0	0	0	0
Bridge Grant	14,907	0	0	14,907	14,907	0	0	0	0
LRCIP Grant - Cemetery Revaitalisation CJ03	0	65,000	(26,203)	38,797	38,797	130,000	130,000	130,000	26,203
LRCIP Grant - Rehabilitate Former Fisherman's Hall CJ80	0	25,967	(51,934)	(25,967)	(25,967)	51,934	51,934	51,934	51,934
LRCIP Grant - Rural Signage CJ10	0	34,500	(32,049)	2,451	2,451	69,000	69,000	69,000	32,049
LRCIP Grant - Surf Beach Stabilisation CJ87	0	0	0	0	0	0	261,054	261,054	234,949
DCPE Grant - Moreton Terrace CJ88	0	900,000	(387,755)	512,245	512,245	0	0	0	387,755
	1,191,686	**2,503,185**	**(2,813,104)**	**887,452**	**887,452**	**3,628,255**	**4,310,315**	**4,310,315**	**3,048,053**
Total Non-operating grants, subsidies and contributions	**1,191,686**	**2,503,185**	**(2,813,104)**	**887,452**	**887,452**	**3,628,255**	**4,310,315**	**4,310,315**	**3,048,053**

SHIRE OF IRWIN
NOTES TO THE STATEMENT OF FINANCIAL ACTIVITY **NOTE 14**
FOR THE PERIOD ENDED 30 JUNE 2021 **BONDS & DEPOSITS AND TRUST FUNDS**

In previous years, bonds and deposits were held as trust monies. They are still reported in this Note but also included in Restricted Cash - Bonds and Deposits and as a current liability in the books of Council.

Trust funds held at balance date over which the Shire has no control and which are not included in this statement are as follows:

Description	Opening Balance 01 Jul 2020	Amount Received	Amount Paid	Closing Balance 30 Jun 2021
	$	$	$	$
Restricted Cash - Bonds and Deposits				
Nomination Deposits	0.00	0.00	0.00	**0.00**
DDHS Rock Esteidford Funds	0.00	0.00	0.00	**0.00**
Aged Persons Units - Bonds	18,689.76	761.50	(1,547.39)	**17,903.87**
Youth Advisory Council	17,014.33	0.00	0.00	**17,014.33**
Kerbing Deposits	23,900.00	19,000.00	(6,000.00)	**36,900.00**
Dongara Childrens Centre	0.00	0.00	0.00	**0.00**
Old Mill Restoration	0.00	0.00	0.00	**0.00**
Water Main Contributions	0.00	0.00	0.00	**0.00**
Performance Bonds	75,832.52	0.00	0.00	**75,832.52**
Key Bonds & Various	2,070.00	0.00	(50.00)	**2,020.00**
Safer WA Committee	340.52	0.00	0.00	**340.52**
Other Grant Funds	6,643.50	0.00	0.00	**6,643.50**
Various Bonds	2,654.05	1,100.00	(1,360.00)	**2,394.05**
Basketball Club Funds	0.00	0.00	0.00	**0.00**
Shire Of Irwin - LEMC	4,887.30	0.00	0.00	**4,887.30**
BROC Funds	0.00	0.00	0.00	**0.00**
Dongara Community Festival	0.00	0.00	0.00	**0.00**
Toddler Time - Rec Centre	702.97	0.00	0.00	**702.97**
Contributions To Roads_P.O.S.	45,912.11	0.00	0.00	**45,912.11**
Transport	0.00	0.00	0.00	**0.00**
Dongara Public Cemetery	0.00	0.00	0.00	**0.00**
Non Shire - Internal Activity	40.00	0.00	0.00	**40.00**
Interest Earned On Trust Items	0.00	0.00	0.00	**0.00**
Sub-Total	198,687.06	20,861.50	(8,957.39)	**210,591.17**
Trust Funds				
Nil				
Sub-Total	0.00	0.00	0.00	**0.00**
	198,687.06	**20,861.50**	**(8,957.39)**	**210,591.17**

KEY INFORMATION

NOTE 15
EXPLANATION OF SIGNIFICANT VARIANCES

The material variance thresholds are adopted annually by Council as an indicator of whether the actual expenditure or revenue varies from the year to date budget materially.
The material variance adopted by Council for the 2020/21 year is $10,000 and 10%.

	Var. $	Var. %	Var. ▲▼	Significant Var. S	Timing/ Permanent	Explanation of Variance
	$	%				
General Purpose Funding - Other	299,403	92%	▲	S	Permanent	Interest earnt lower than budgeted
Law, Order and Public Safety	(25,266)	(14%)	▼	S	Timing	Op Grant received but shown as contract liability until expended
Transport	(44,819)	(47%)	▼	S	Permanent	Disposal of tip body - not budgted for
Expenditure from operating activities						
Governance	65,070	11%	▲	S	Timing	Audit fees budgeted for Sept
General Purpose Funding	69,596	10%	▲	S	Timing	Unpaid rate provision - COVID precaution
Other Property and Services	(356,706)	(549%)	▼	S	Timing	PWO and plant recovery rates to be checked
Investing Activities						
Non-operating Grants, Subsidies and Contributions	(2,735,982)	(47%)	▼	S	Timing	Road grants received but cannot be recognised until road construction jobs completed
Land and Buildings	1,545,900	71%	▲	S	Timing	Timing of SIHI construction works
Plant and Equipment	657,120	95%	▲	S	Timing	Timing of purchases
Infrastructure Assets - Roads	1,335,540	38%	▲	S	Timing	Timing of construction works
Infrastructure Assets - Other	98,558	11%	▲	S	Timing	Timing of constructions works
Financing Actvities						
Proceeds from New Debentures	(530,000)	(33%)	▼	S	Timing	Plant Loan not progressing in 2020/21

Reporting Nature or Type	Var. $	Var. %	Var. ▲▼	Significant Var. S	Timing/ Permanent	Explanation of Variance
0						
Operating Grants, Subsidies and Contributions	293,343	56%	▲	S	Timing	Timing of CESM recoup and DFES Op-Grant
Other Revenue	(56,003)	(23%)	▼	S	Timing	Workers Comp Reimbursement sooner than budgeted.
Expenditure from operating activities						
Materials and Contracts	654,116	17%	▲	S	Timing	Running below budget - timing of projects
Utility Charges	(224,625)	(77%)	▼	S	Timing	Timing of budget ahead of actual invoices.

NOTE 16
BUDGET AMENDMENTS

GL Code	Job #	Description	Council Resolution	Classification	Non Cash Adjustment	Increase in Available Cash	Decrease in Available Cash	Amended Budget Running Balance
					$	$	$	$
		Budget Adoption		Opening Surplus(Deficit)			(26,099)	(26,099)
		Permanent Changes					(104,381)	(130,480)
		October Review of Capital Works	041020	Capital Projects			(442,933)	(573,413)
		October Review of Operating Inc/Exp	041020	Opearating Expenditure			(293,350)	(866,763)
		Salaries & Wages - Restructure at review	041020	Salaries & Wages			(118,928)	(985,691)
		Increase in Rec Centre Rev. Review	041020	Operating Income		20,000		(965,691)
		Deletion of COVID proviison on rates	041020	Rate Income		962,888		(2,803)
					0	**982,888**	**(985,691)**	

KEY INFORMATION

ATTACHMENT: CC03

Fees & Charges 2021/2022

Attachment 1
Schedule of Fees & Charges 2021/22

2021/22 Schedule of Fees & Charges

Description	GST	2021/2022	Charge Basis
03 RATES			
Account Enquiry Fees	N	**$120.00**	Per enquiry
Property Register, Mailing List Information (owner/Property details) - no commercial benefit	N	**$15.00**	Per Assessment - $350 All Assessments
Plus Per Assessment		**$0.70**	
Reprint of Rates Notice	N	**$7.50**	Per notice
Instalment Fee	N	**$5.00**	Per notice
Debt Recovery Costs	N	**At Cost**	At Cost
Payment Arrangement Administration Fee (excluding pensioners)	N	**$30.00**	Per new Arrangement
04 GOVERNANCE			
Minutes and Agendas - NOT FOR SALE - Available free to download from council website		**Free**	Free
FOI Application Fee	N	**$30.00**	Per Application
FOI Charges (Other)	N	**See Charges Schedule for Specific Application, i.e. photocopies, posting**	Per Application
Administration			
Photocopying - Black and White A4	Y	**$1.50**	Per copy
Photocopying - Black and White A3	Y	**$2.50**	Per copy
Photocopying - Colour A4	Y	**$2.00**	Per copy
Photocopying - Colour A3	Y	**$3.00**	Per copy
Thermal Binding	Y	**$10.00**	Per copy
Laminating - A4	Y	**$2.50**	Per copy
Laminating - A3	Y	**$4.00**	Per copy
Emailing	Y	**$4.50**	Per Email
Irwin Shire Series Plates	Y	**$230.00**	Per set
05 FIRE PREVENTION			
Fines & Penalties			
These infringements are fixed by the Bush Fires Act 1954 & Regulations		**See Infringement**	
Block Slashing			
Any Firebreaks/Fire Prevention carried out on behalf of property owners will be charged out at private works rates	Y	**Recovery plus administration costs**	

2021/22 Schedule of Fees & Charges

Description	GST	2021/2022	Charge Basis
05 ANIMAL CONTROL			
Fines & Penalties			
Animal Related Offences Fines and Penalties		**See Infringement**	
Fines Enforcement Registry (FER)			
Issuing Final Demand	**N**	As per FER	
Preparing Enforcement Certificate	**N**	As per FER	
Registration of Infringement Notice	**N**	As per FER	
Dog Pound Charges			
For Seizure and Impounding of Dog	**N**	**$80.00**	Per day
Each additional day thereafter	**N**	**$35.00**	Per day
Cat Pound Charges			
For Seizure and Impounding of Cat	**N**	**$80.00**	Per day
Each additional day thereafter	**N**	**$35.00**	Per day
Equipment Hire			
Cat Trap Bond	N	**$50.00**	Per trap
Dog Registration Fee			
Lifetime Registration - Sterilised dog	N	**$100.00**	Lifetime
Lifetime Registration - Unsterilised dog	N	**$250.00**	Lifetime
Annual Registration - Sterilised dog	N	**$20.00**	Annual
Annual Registration - Unsterilised dog	N	**$50.00**	Annual
3 year Registration - Sterilised dog	N	**$42.50**	3 year
3 year Registration - Unsterilised dog	N	**$120.00**	3 year
Dogs used for Droving or Tending Stock	N	**25% of fee payable**	
Registration - Dogs owned by pensioners	N	**50% of fee payable**	
Application to keep more than 2 dogs	N	**$60.00**	Per application
Registration after 31 May in any year, for that registration year	N	**50% of fee otherwise payable**	
Licence to keep an Approved Kennel Establishment	N	**$200.00**	
Renewal of licence to keep an Approved Kennel Establishment	N	**$40.00**	Annual
Dog Tag Replacement & Transfer In	N	**$3.00**	Per tag
Registration - Cats owned by pensioners	N	**50% of fee payable**	
Registration after 31 May in any year, for that registration year	N	**50% of fee otherwise payable**	
Application to breed cats	N	**$100 per breeding cat**	
05 OTHER LAW, ORDER AND PUBLIC SAFETY			
Fines & Penalties			
Illegal Camping Fines and Penalties		**See Infringement**	
Littering Fines & Penalties		**See Infringement**	
Impounded Vehicles			
Impounding Vehicles		**See Infringement**	
Impounding Vehicle Recovery Costs	Y	**At cost**	
Impounding Vehicle Impound Fee	N	**$55.00**	Per vehicle
Impounding Vehicle Daily Storage Fee	N	**$10.00**	Daily

2021/22 Schedule of Fees & Charges

Description	GST	2021/2022	Charge Basis
07 HEALTH ADMINISTRATION AND INSPECTION			
Fines & Penalties			
Health Infringements (Health Local Laws, Food Act, Noise)	N	**See Infringement**	
Health (Offensive Trades (Fees) Regulations 1976			
Piggery	N	**$298.00**	Per application
Fish Processing Establishment	N	**$298.00**	Per application
Poultry Production and Farming	N	**$298.00**	Per application
Laundries, dry-cleaning establishments	N	**$147.00**	Per application
Any other offensive trade not specified in the Regulations	N	**$298.00**	Per application
Food Premises			
Food Act 2008			
(Exempted Food Premises: not for profit and community groups)			
New Food Business Registration (plus inspection fee below)	N	**$50.00**	Per application
Registered Premises Annual Fee (includes inspection)	N	**$55.00**	Annual
Inspection Fee	Y	**$60.50**	Per inspection
Food Safety Audit	N	**$150.00**	
Liquor Control Act 1988			
Section 39 Certificate and Inspection	N	**$50.00**	Per application
Trading in Public Places			
Stall Holders Application Fee (excludes Approved Events)	N	**$25.00**	Per application/annual
Traders Application Fee	N	**$50.00**	Per application
Approved Trading Periods			
Daily	N	**$10.00**	Per application
Weekly	N	**$40.00**	Per application
Monthly	N	**$100.00**	Per application
Annual	N	**$600.00**	Per application
Events			
Event Application Fee	N	**$300.00**	Per application
Note: Events that are community, not-for-profit or charity are exempt from the application fee.			
Lodging Houses			
Annual Renewal Fee and inspection (large over 20 rooms)	N	**$100.00**	Annual
Annual Renewal Fee and inspection (small under 20 rooms)	N	**$50.00**	Annual
Caravan Parks - Caravan Parks & Camping Grounds Act 1995			
Application for grant of renewal of licence (Annual)			
Sites (each)	N	**$6.00**	Per site
Camp Sites (each)	N	**$3.00**	Per site
Overflow (each)	N	**$1.50**	Per site
Minimum	N	**$200.00**	Per site
Temporary Caravan Park licence	N	**$100.00**	Per site
Transfer of Licence (Reg 55)	N	**$100.00**	To Comply with Local Government Act - Schedule 3
Letter of Approval for park home, hard annex related to Caravan Parking and Camping licence	N	**$100.00**	To Comply with Local Government Act - Schedule 3
Health (Public Buildings) Regulations 1992 - *Health Act 1911*			
Application for approval to construct, alter or extend public building	N	**$150.00**	Per application
Application for certificate of approval	N	**No Charge**	Per application
Application to vary certificate of approval	N	**$60.00**	Per application
Annual fee and Inspection Fee (Commercial Only)	N	**$80.00**	Annual
Public Pools			
Health (Aquatic Facilities) Regulations 2007, s 21			
Aquatic facility water sampling/testing - per facility, per visit	N	**$20.00**	Monthly
Aquatic facility Code Inspection Report - per facility	N	**$50.00**	Annual

2021/22 Schedule of Fees & Charges

Description	GST	2021/2022	Charge Basis
07 HEALTH ADMINISTRATION AND INSPECTION			
Septic Tank Fees			
Residential	N	**$118.00**	
Commercial - add $56.00 to DoH if required	N	**$118.00**	
Residential	N	**$118.00**	Inspection Fee
Commercial	Y	**$118.00**	Inspection Fee
09 OTHER HOUSING			
The Village - Single			
Units 1-24	Y	***As per lease agreement***	Per fortnight
Units 25-39	Y	***As per lease agreement***	Per fortnight
The Village - Double			
Units 1-24	Y	***As per lease agreement***	Per fortnight
Units 25-39	Y	***As per lease agreement***	Per fortnight
Pet Bond (non-refundable to meet costs of fumigation of the premises)	Y	***As per lease agreement***	Per household
Two Henry Road			
Units 1 - 6	Y	***As per lease agreement***	Per fortnight
72 Richardson Rd	Y	***As per lease agreement***	Per fortnight
Pet Bond (non-refundable to meet costs of fumigation of the premises)	Y		Per household
Kennedy Heights			
2 Kennedy Heights - Residence	Y	***As per lease agreement***	Per fortnight
10 SANITATION			
Refuse Removal Charges			
Council impose the following refuse collection charges where a property receives or is eligible to receive a rubbish collection service			
Per Bin Collected - Annual Charge			
Domestic Service 240L mobile garbage bin	N	**$280.00**	
Commercial/Industrial 240L mobile garbage bins	N	**$290.00**	
Commercial/Industrial bulk removals	N		as per volume assessed
Commercial Bulk Bin - Annual Charge			
1.5 cubic metre bin	N	**$2,270.00**	1 collection per week
1.5 cubic metre bin	N	**$4,300.00**	1 collection 2 x per week
1.5 cubic metre bin	N	**$6,325.00**	1 collection 3 x per week
1.5 cubic metre bin	N	**$1,255.00**	1 collection per fortnight
1.5 cubic metre bin	N	**$750.00**	1 collection per month
3.0 cubic metre bin	N	**$3,070.00**	1 collection per week
3.0 cubic metre bin	N	**$5,900.00**	1 collection 2 x per week
3.0 cubic metre bin	N	**$8,730.00**	1 collection 3 x per week
3.0 cubic metre bin	N	**$1,660.00**	1 collection per fortnight
3.0 cubic metre bin	N	**$950.00**	1 collection per month
Additional collections per service frequency will attract higher charges than stated above			
Delivery and removal of 1.5 or 3.0 cubic metre bin	Y	**$350.00**	Per Bin
Sale of 240L Green Mobile Bin			
Per complete bin	Y	**$105.00**	Per Bin
Per Lid	Y	**$35.00**	Per lid
Per Lid Pin	Y	**$10.00**	Per Lid Pin
Per Wheel	Y	**$27.00**	Per wheel
Per Axle	Y	**$27.00**	Per axle
Delivery - Standard	Y	**$30.00**	Per delivery
Delivery - Pensioner		**$0.00**	

2021/22 Schedule of Fees & Charges

Description	GST	2021/2022	Charge Basis
10 SANITATION - TRANSFER STATION			
Transfer Station - Domestic Waste			
Minimum Charge	Y	**$21.00**	per entry
General - Sorted into Recycling areas	Y	**No Charge**	per m³
Mixed Waste (non-recyclable)	Y	**$40.00**	per m³
Builders Waste - Mixed Rubble	Y	**$64.00**	per m³
Clean Greenwaste	Y	**$0.00**	per m³
Carboard/Paper Packaging	Y	**$16.00**	per m³
Transfer Station - Commercial Waste			
Minimum Charge	Y	**$35.00**	per entry
Mixed Waste (non-recyclable)	Y	**$70.00**	per m³
Mixed Rubble	Y	**$64.00**	per m³
Carboard/Paper Packaging	Y	**$24.00**	per m³
Clean Greenwaste	Y	**No Charge**	per m³
Clean Fill	Y	**No Charge**	per m³
Builders Waste Per Permit (minimum initial 4 passes)	Y	**$110.00**	Per pass for 2m2
Transfer Station - Special Waste			
Asbestos (wrapped) - per sheet	Y	**$10.00**	Per Item
Asbestos (wrapped)	Y	**$99.00**	per m³
Scrap Metal	Y	**No Charge**	per m³
Car Batteries	Y	**$10.00**	per item
Carcass - small	Y	**$9.00**	Per carcass
Carcass - large	Y	**$12.00**	Per carcass
E-Waste (computers, televisions etc)	Y	**$10.00**	per item
White goods	Y	**No Charge**	per item
Mattress - Single	Y	**$12.00**	Per unit
Mattress - Double	Y	**$24.00**	Per unit
Car Bodies	Y	**$45.00**	Per unit
Tyre - Motorcycle	Y	**$4.00**	Per tyre
Tyre - Passenger vehicles		**$7.00**	Per tyre
Tyre - 4WD	Y	**$10.00**	Per tyre
Tyre - Truck	Y	**$20.00**	Per tyre
Waste Oil	Y	**No Charge**	per litre
Septage - K210	Y	**$0.03**	Per litre
Grease Waste - K110	Y	**$0.03**	Per litre
Sales			
Household goods	Y	**POA**	
Building Materials	Y	**POA**	
Mulch	Y	**POA**	
Animal Carcass Collection			
240 Litre MG Bin	Y	**$110.00**	Per Bin/Collection
Carcass Weight Below 60Kg	Y	**$10.00**	Per Carcass
Carcass Weight Above 60Kg	Y	**$15.00**	Per Carcass
Refund - Container Deposit Scheme (Commencing 2 June 2020)			
Eligible beverage containers		**10c refund**	Per Item

2021/22 Schedule of Fees & Charges

Description	GST	2021/2022	Charge Basis
10 TOWN PLANNING AND REGIONAL DEVELOPMENT			
Statutory Planning and Development Fees may increase at the direction of Department of Planning, Lands & Heritage			
Description of Planning Services			
1 Determination of development application (other than for an extractive industry) where the estimated cost of the development (excluding GST) is:			
a) not more than $50,000	N	**$147.00**	
b) more than $50,000 but not more than $500,000	N	**0.32% of estimated cost**	
c) more than $500,000 but not more than $2.5 million	N	**$1,700 + 0.257% for every one dollar in excess of $500,000**	
d) more than $2.5 million but not more than $5 million	N	**$7,161 + 0.206% for every one dollar in excess of $2.5 million**	
e) more than $5 million but not more than 21.5 million	N	**$12,633 + 0.123% for every one dollar in excess $5 million**	
f) more than $21.5 million	N	**$34,196.00**	
Note: If development has commenced or been carried out, an additional amount by way of penalty, this is twice the amount of the fee payable for determination of the application (in addition to the planning fee)			
2 Amended plans and/or extension of current Planning Approval (this applies where a determination is already given by the Shire of where amended plans are submitted and not requested by the Shire)	N	**66% of the original fee with a minimum of $98 and a maximum of $295**	
3 Demolition where Planning Approval is required	N	**$147.00**	
4 Application for approval of home occupation, home business or cottage industry			
a) Initial Fee	N	**$222.00**	
b) Annual Renewal fee	N	**$73.00**	
Note: if the home based business or cottage industry has commenced, an additional amount by way of penalty, this is twice the amount of the fee payable for determination of the application (in addition to the initial fee)			
5 Application for change of use, or for an alteration, extension of use, or change of non-conforming use to which Item 1 does not apply, where the change, alteration, extension or change of use has not commenced.	N	**$295.00**	
Note: If the change of use or the alteration, extension or change of the non-conforming use has commenced or been carried out, an additional amount by way of penalty, this is twice the amount of the fee payable for determination of the application (in addition to the change of use fee)			
6 Relocation of Building Envelope	N	**$147.00**	
7 Determination of a development application for an extractive industry where development has not commenced or been carried out:			
a) Initial Fee	N	**$739.00**	
Note: If development has commenced or been carried out, an additional amount by way of penalty, this is twice the amount of the fee payable for determination of the application (in addition to the initial fee)			
8 Provision of a subdivision clearance			
a) Not more than 5 lots	N	**$73.00**	Per Lot
b) More than 5 lots but not more than 195 lots	N	**$73 per lot for the first 5 lots and then $35 per lot thereafter**	
c) More than 195 lots	N	**$7,393.00**	
9 Maximum fees: scheme amendments and structure plans (not inclusive of advertising costs)	Y	**$3,780.70 total as follows:**	Per lot
a) Executive	Y	**$88.00 per hour**	Per hour
b) Manager	Y	**$66.00 per hour**	Per hour
c) Planning Officer	Y	**$36.86 per hour**	Per Hour
d) Other Staff e.g. Environmental Health Officer	Y	**$36.86 per hour**	Per Hour
e) Administrative Officers	Y	**$30.20 per hour**	Per Hour

2021/22 Schedule of Fees & Charges

Description	GST	2021/2022	Charge Basis
10 TOWN PLANNING AND REGIONAL DEVELOPMENT			
10 Issue of zoning certificate	Y	**$73.00**	
11 Issue of Section 40 Certificate	Y	**$73.00**	
12 *Roads/R.O.W/P.A.W request for closure	Y	**$1,000.00**	
**Fee is inclusive of all associated advertising charges*			
13 Advertising			
a) On site signage	Y	**Cost + 10% administration**	
b) Newspaper Advertising	Y	**Cost + 10% administration**	
14 Copy of Planning Documents			
a) Paper Copy	Y	**$55.00**	
b) Electronic Copy	Y	**$22.00**	
15 Pre-strata inspection	Y	**$310.20**	
16 Development Approval - Bonds			
a) Small Development	N	**$5,000.00**	
b) Large Development	N	**$20,000.00**	
c) Special Use and Tourism Development	N	**To be determined by Council**	
17 Bushfire Contributions			
Lot Size			
a) Up to 9.99ha	N	**$2,000 max 10 lots plus $100 per each additional lot**	
b) 10ha to 39.9 ha	N	**$2,000 max 5 lots plus $250 each additional lot**	
c) 40ha and over		**Subject to Council consideration**	
Contribution to bushfire control in lieu of providing an individual strategic water supply for Bushfire Protection during the subdivision process.			
Planning and Development (Development Assessment Panels) Amendment Regulations (No. 2) 2021			
1. *A DAP application where the estimated cost of the development is -*			
(a) not less than $2 million and less than $7 million	N	**$5,701.00**	per application
(b) not less than $7 million and less than $10 million	N	**$8,801.00**	per application
(c) not less than $10 million and less than $12.5 million	N	**$9,576.00**	per application
(d) not less than $12.5 million and less than $15 million	N	**$9,849.00**	per application
(e) not less than $15 million and less than $17.5 million	N	**$10,122.00**	per application
(f) not less than $17.5 million and less than $20 million	N	**$10,397.00**	per application
(g) $20 million or more	N	**$10,670.00**	per application
18 Development Assessment Panels			
2. *An application under regulation 17*	N	**$245.00**	per application
19 Extractive Industry Licence			
a) Initial Fee	N	**$500.00**	per application
b) Annual Renewal fee	N	**$351.00**	Annual
Signs			
Illuminated sign - per metre minimum $50	N	**$4.00**	Per metre
Under Veranda - per metre minimum $50	N	**$4.00**	Per metre
Other Applications	N	**$55.00**	Per application
Development Signs - per metre, minimum $50	N	**$4.00**	Per metre
Sign - Panel	N	**$55.00**	Per sign
Hoardings	N	**$65.00**	Annual
Any other sign	N	**$55.00**	Per sign

2021/22 Schedule of Fees & Charges

Description	GST	2021/2022	Charge Basis
10 OTHER COMMUNITY AMENITIES - CEMETERY			
Burial Fees			
Adult interment, 13 years of age and over	Y	**$670.00**	
Child interment, under 13 years of age	Y	**$540.00**	
Interment for any stillborn child	Y	**$350.00**	
Lot Fees			
A "*Grant of Right of Burial (25 year tenure) being issued for each lot and* Ordinary land for grave 2.4m long x 1.2m wide x 1.8m deep	N	**$500.00**	
Reservation - Lot Fee (Grant of Right of Burial 25 year tenure)	Y	**$960.00**	
Other Charges			
For exhumation	Y	**$995.00**	
For re-burial after exhumation	Y	**$600.00**	
Additional fee for Graves sunk deeper than 1.8 metres (up to one metre)	Y	**$350.00**	
Reopening of grave to accommodate adult burial	Y	**$750.00**	
Reopening of grave to accommodate child under 13 burial	Y	**$580.00**	
Extra charge for burial outside normal hours including Monday burial	Y	**$400.00**	
Copy of Grant of Right of Burial	Y	**$100.00**	
Internment of ashes in family grave	Y	**$250.00**	
Permission to erect a headstone, monument kerbing	N	**$260.00**	
Single Funeral Permit (Funeral Directors Only)	N	**$160.00**	
Single Monumental Mason Application for Works	N	**$120.00**	
Alter or add to any stone monument	N	**$140.00**	
Repair or renovate any existing memorial work	N	**$120.00**	
Licences			
Funeral Director's Annual licence Fee	N	**$200.00**	
Monumental Mason's Annual licence Fee	N	**$120.00**	
Niche Wall			
Disposal of Ashes			
Interment in Single Niche	Y	**$620.00**	
Brick including 172 x 135 stainless steel engraved plaque			
Interment in Double Niche			
Brick including 208 x 135mm stainless steel plaque first plaque engraved	Y	**$760.00**	
Second Interment and plaque engraved	Y	**$520.00**	
Reservation Niche Wall Single/Double (*Reservation fee Only*)	Y	**$520.00**	
Additional fee for interment outside standard work hours	Y	**$200.00**	
Removal of ashes from cemetery to an authorised family member	Y	**$260.00**	

2021/22 Schedule of Fees & Charges

Description	GST	2021/2022	Charge Basis
11 SWIMMING AREAS AND BEACHES			
Foreshore Entertainment Events			
Bond	N	**$500.00**	Per Event
Daily Fee	Y	**$195.00**	Per Day
Coastal Squatter's Shacks			
Yearly Fee	N	**$1,648.00**	Annual
Each Additional Shack	N	**$618.00**	Annual
Recreational Jetty - Recreational Vessels			
Daily Fee (first night free)	Y	**$6.00**	Per metre
Three Days	Y	**$13.00**	Per metre
Weekly fee (equivalent to 6 days)	Y	**$26.00**	Per metre
One Month	Y	**$38.00**	Per metre
Six Months	Y	**$152.00**	Per metre
Annual fee	Y	**$230.00**	Per metre
Parks			
Town Park - includes Rotunda and use of power	Y	**$15.00**	Per hour
		$60.00	Per event
Ovals			
Hire of Dongara Oval - Casual Hire	Y	**$48.00**	Per Hour
		$195.00	
Hire of Port Denison Oval - Casual Hire	Y	**$48.00**	Per Hour
		$195.00	
Bond	N	**$500.00**	Per event
Cricket Club			
Standard Formula - Seniors	Y	**$1.38**	Per player
No teams x standard players/team x week x uses/week x fee			
Standard Formula - Juniors	Y	**$0.69**	Per player
No teams x standard players/team x week x uses/week x fee			
Vets Football Club			
Standard Formula - Seniors	Y	**$1.38**	Per Player
No teams x standard players/team x week x uses/week x fee			
Senior Football Club			
Annual hire fee for Port Denison Oval, which includes playing fixtures, pre-season and season training sessions, Function Centre & Kiosk home games (including oval lighting, change rooms)	Y	**Season Package**	Annually
Junior Football Club			
Annual hire fee for Port Denison Oval, which includes playing fixtures, pre-season and season training sessions, Function Centre & Kiosk home games (including oval lighting, change rooms)	Y	**Season Package**	Annually
Tennis Club			
Hire fees for tennis courts and hard courts for season, includes club days and club coaching	Y	**Season Package**	Annually
Dongara Denison Drive In			
Facility Fee Including kitchen	Y	**$150.00**	Per Event
Facility Fee Without kitchen	Y	**$100.00**	Per Event
Function & use of Projector - includes kitchen, toilets, projector & training. Movie costs are external	Y	**$250.00**	Per Event
Facility Bond	Y	**$200.00**	Per Event
Bond with serving of alcohol	Y	**$350.00**	Per Event
Key Bond	N	**$60.00**	Per Event
A charge applies for unsatisfactory cleaning after functions	Y	**$200.00**	

2021/22 Schedule of Fees & Charges

Description	GST	2021/2022	Charge Basis
11 OTHER RECREATION AND SPORT - CAMPING			
Overflow Camping			
Dongara Oval and Port Denison Oval	Y	**$30.00**	Per family per day
Dongara Oval and Port Denison Oval	Y	**$15.00**	Per person per day
Camping - Cliff Head, Fresh Water Point, Knobby Head			
Per Night	Y	**$20.00**	Per Vehicle
Per Night - Ratepayer Subsidy		**1 x voucher**	Per Vehicle
RV Overnight Stay - Dongara Town Oval			
Per Night, Per Vehicle	Y	**$10.00**	Per Night/Per Vehicle
12 AERODROMES			
Dongara Airstrip Landing Fee	N	**$15.00**	Per Landing

2021/22 Schedule of Fees & Charges

Description	GST	2021/2022	Charge Basis
13 BUILDING CONTROL			
Statutory Building Fees may increase at the direction of Department of Mines, Industry Regulation and Safety			
Application for Building Permits			
Certified application for a building permit (s.16(1))			
For building work for a Class 1 or Class 10 building or incidental structure	N	**0.19% of the estimated value of the building work as determined by the relevant permit authority, but not less than $105**	
For building work for a Class 2 to Class 9 building or incidental structure	N	**0.09% of the estimated value of the building work as determined by the relevant permit authority, but not less than $105**	
Uncertified application for a building permit (s.16(1))	N	**0.32% of the estimated value of the building work as determined by the relevant permit authority, but not less than $105**	
Application for a Demolition Permit (s.16(1))			
For demolition work in respect of a Class 1 or Class 10 building or incidental structure	N	**$110.00**	
For demolition work in respect of a Class 2 to Class 9 building	N	**$110.00**	Per each story of the building
Application for Occupancy Permits and Building Approval Certificates			
Application for an occupancy permit for a completed building (s.46)	N	**$110.00**	
Application for a temporary occupancy permit for an incomplete building (s.47)	N	**$110.00**	
Application for modification of an occupancy permit for additional use of a building on a temporary basis (s.48)	N	**$110.00**	
Application for a replacement occupancy permit for permanent change of the building's use, classification (s.49)	N	**$110.00**	
Application for occupancy permit or building approval certificate for registration of strata scheme, plan of re-subdivision (s.50(1) and (2)	N	**$11.60 for each strata unit covered by the application but not less than $115**	
Application for an occupancy permit for a building in respect of which unauthorised work has been done (s.51) (2))	N	**0.18 of the estimated value of the unauthorised work as determined by the relevant permit authority, but not less than $105**	
Application for a building approval certificate for a building in respect of which unauthorised work has been done (s.51), (3))	N	**0.38% of the estimated value of the unauthorised work as determined by the relevant permit authority but not less than $105**	
Existing Permit or Extend Permit			
Application for a building approval certificate for an existing building where unauthorised work has not been done (s.52(2))		**$110.00**	
Application to extend the time during which a building or demolition permit has effect (s.32(3)(f))	N	**$110.00**	
Application to replace an occupancy permit for an existing building (s.52(1)	N	**$110.00**	
Application to extend the time during which an occupancy permit or building approval certificate has effect (s.65(3)(a))	N	**$110.00**	
Building Services Levy (BSL) ***Charged on every building/demolition permit***			
$45,000 or less	N	**$61.65**	
Over $45,000	N	**0.137% of the value of work**	
Occupancy permit or building approval certificate for approved building work under ss47, 49, 50 or 52 of the Building Act	N	**$61.65**	
Occupancy permit or building approval certificate for unauthorised building work under s51 of the Building Act $45,000 or less	N	**$123.30**	

2021/22 Schedule of Fees & Charges

Description	GST	2021/2022	Charge Basis
13 BUILDING CONTROL			
Occupancy permit or building approval certificate for unauthorised building work under s51 of the Building Act over $45,000	N	**0.274% of the value of work**	
Occupancy permit under s46 of the Building Act		**No levy is payable**	
Modification of occupancy permit for additional use of building on temporary basis under s48 of the Building Act		**No levy is payable**	
Construction Training Fund (CTF)			
Charged on each building permit when the value exceeds $20,000	N	**0.2% of the value of work**	
Other Applications			
Local Government approval of battery powered smoke alarms (regulation 61)	N	**$179.40**	
Application as defined in regulation 31 (for each building standard in respect of which a declaration is sought)	N	**$2,160.15**	
Bonds			
Kerb/Footpath/Drainage	N	**$1,000.00**	Per Property
Relocation of transportable dwellings (refunded in 3 instalments)	N	**$1,800.00**	Per Property
Relocation of buildings other than dwelling	N	**$500.00**	Per Property
Swimming Pool Inspection Fee			
Initial pool inspection (new build)	N	**$57.45**	Per Property
Inspection fee invoiced annually through rates	N	**$30.00**	Per Property
Inspection fee - Other (requested by owner outside 4 yearly inspection)	N	**$70.00**	Per Property
Search Building Fee			
Building Plan Search Application - printing not included.	Y	**$23.50**	Per property
Copy of Building Permit approval documents	Y	**As per printing Fees and Charges**	Per page
Misc Council Application (other than planning)	Y	**$23.50**	Per application

2021/22 Schedule of Fees & Charges

Description	GST	2021/2022	Charge Basis
13 ECONOMIC SERVICES			
Visitors Centre			
Business Membership	Y	**Free**	Biennial
Out of Shire Membership	Y	**Free**	Biennial
Not-for-profit Groups Membership		**Free**	
Dongara - Port Denison Map Pad Purchase (non members only)	Y	**$5.50**	Each
Community Bus			
Seniors, Dongara District High School			
Within Midwest Region	Y	**$100.00**	Per Day
Outside Midwest Region	Y	**$180.00**	Per Day
Bus does not need to refuelled whilst sponsorship continues			
All other Community Groups			
Per Day	Y	**$100 plus 67c/km**	
Bus does not need to be refuelled whilst sponsorship continues			
BOND - Damage (includes key bond)	N	**$300.00**	
BOND - Cleaning	N	**$200.00**	
BOND - Key	N	**$25.00**	Per Hire
Water Sales			
Per 1000L (no minimum)	N	**$4.38**	Per Kilolitre
14 TRANSPORT			
Rural Street Numbers			
Application for a Rural Street Number (includes sign but not installation)	Y	**$35.00**	Per sign
Installing Rural Street Number	Y	**$60.00**	Per sign

2021/22 Schedule of Fees & Charges

Description	GST	2021/2022	Charge Basis
IRWIN RECREATION CENTRE			
GYMNASIUM			
Casual usage			
Junior	Y	**$7.00**	Per session
Senior	Y	**$14.00**	Per session
Membership			
Junior			
Per Year	Y	**$266.00**	
Per 6 Months	Y	**$176.00**	
Per 3 Months	Y	**$121.00**	
Pert Month	Y	**$62.00**	
Direct Debit/FN	Y	**$27.10**	
Senior			
Per Year	Y	**$532.00**	
Pert 6 Months	Y	**$352.00**	
Per 3 Months	Y	**$242.00**	
Pert Month	Y	**$124.00**	
Direct Debit/FN	Y	**$27.10**	
Visit Passes			
Junior			
5 Passes	Y	**$28.00**	
10 Passes	Y	**$50.00**	
20 Passes	Y	**$88.50**	
Senior			
5 Passes	Y	**$56.00**	
10 Passes	Y	**$100.00**	
20 Passes	Y	**$177.00**	
conditions apply to Junior fees - see Coordinator Recreation Services			
REC CENTRE MAIN STADIUM / LESSER STADIUM			
Full Court			
Juniors			
Before 6.00 pm	Y	**$21.00**	Per hour
After 6.00 pm	Y	**$26.00**	Per hour
Seniors			
Before 6.00 pm	Y	**$42.00**	Per hour
After 6.00 pm	Y	**$52.00**	Per hour
Commercial			
Before 6.00 pm	Y	**$53.00**	Per hour
After 6.00 pm	Y	**$64.00**	Per hour
Half Court			
Juniors			
Before 6.00 pm	Y	**$10.60**	Per hour
After 6.00 pm	Y	**$13.00**	Per hour
Casual per person	Y	**$5.00**	Per hour
Seniors			
Before 6.00 pm	Y	**$21.00**	Per hour
After 6.00 pm	Y	**$26.00**	Per hour
Casual per person	Y	**$5.00**	Per hour

2021/22 Schedule of Fees & Charges

Description	GST	2021/2022	Charge Basis
REC CENTRE MAIN STADIUM / LESSER STADIUM			
Both Courts			
Juniors			
Before 6.00 pm	Y	**$42.00**	Per hour
After 6.00 pm	Y	**$52.00**	Per hour
Seniors			
Before 6.00 pm	Y	**$84.00**	Per hour
After 6.00 pm	Y	**$104.00**	Per hour
Commercial			
Before 6.00 pm	Y	**$106.00**	Per hour
After 6.00 pm	Y	**$128.00**	Per hour
Setup (50% discount of hourly rate)			
Juniors			
9.00 to 3.00	Y	**$206.00**	Per day
3.00 to 9.00	Y	**$260.00**	Per night
Seniors			
9.00 to 3.00	Y	**$412.00**	Per day
3.00 to 9.00	Y	**$515.00**	Per night
Commercial			
9.00 to 3.00	Y	**$515.00**	Per day
3.00 to 9.00	Y	**$645.00**	Per night
Badminton			
Junior			
Before 6.00 pm	Y	**$8.00**	Per court
After 6.00 pm	Y	**$13.60**	Per court
Senior			
Before 6.00 pm	Y	**$14.60**	Per court
After 6.00 pm	Y	**$17.00**	Per court
Lesser Stadium			
Junior			
Full court before 6.00 pm	Y	**$17.00**	Per court
Full court after 6.00 pm	Y	**$20.00**	Per court
Senior			
Full court before 6.00 pm	Y	**$34.00**	Per court
Full court after 6.00 pm	Y	**$40.00**	Per court
Commercial			
Full court before 6.00 pm	Y	**$40.00**	Per court
Full court after 6.00 pm	Y	**$50.00**	Per court
SQUASH COURTS			
Juniors			
Per Hour	Y	**$8.60**	
Per Half hour	Y	**$6.00**	
Senior			
Per Hour	Y	**$17.00**	
Per Half hour	Y	**$12.00**	

2021/22 Schedule of Fees & Charges

Description	GST	2021/2022	Charge Basis
GYMNASTICS			
Pre-Kindy	Y	**$55.00**	Per term
Pre- Primary children	Y	**$70.00**	Per term
Level 1 (5 years+)	Y	**$85.00**	Per term
Level 2 (skill based)	Y	**$110.00**	Per term
Level 3 (skill based)	Y	**$130.00**	Per term
An annual fee is payable by each gymnast to Gymnastics WA			
TODDLER TIME	Y	**$5.00**	
FIT2LIVE OVER 50'S	Y	**$7.00**	Non Members
FIT TO LIVE CLASSES	Y	**$14.00**	Non Members
ROLLER SKATING			
Night Disco events with own skates per person	Y	**$10.00**	Per Session
Night Disco events inc hire of skates per person	Y	**$13.00**	Per Session
Other skate sessions per person	Y	**$5.00**	Per hour
Private function - see hire of stadium costs			
TENNIS COURTS			
Per hour	Y	**$14.00**	
Per hour with lights	Y	**$24.00**	
CRECHE / MEETING ROOM			
Per hour	Y	**$25.00**	
Per Child	Y	**$5.00**	
Meetings	Y	**$12.00**	
CLUB STORAGE FACILITY			
All Clubs			
Per square metre / per month	Y	**$6.00**	
GENERAL SIGNAGE			
1200mm x 1200mm	Y	**$275.00**	Annual Charge
2400mm x 1200mm	Y	**$330.00**	Annual Charge
3600mm x 1200mm	Y	**$440.00**	Annual Charge
3600mm x 1800mm	Y	**$550.00**	Annual Charge

2021/22 Schedule of Fees & Charges

Description	GST	2021/2022	Charge Basis
FUNCTION CENTRE			
Without Kitchen and Bar			
Room Hire			
Per Hour	Y	**$60.00**	
Per Day	Y	**$285.00**	
Per Night	Y	**$340.00**	
Room Hire - Commercial			
Per Hour	Y	**$75.00**	
Per Day	Y	**$356.00**	
Per Night	Y	**$425.00**	
Kitchen Hire			
Per Hour	Y	**$25.00**	
Per Day or Night	Y	**$105.00**	
Kitchen Hire - Commercial			
Per Hour	Y	**$32.00**	
Per Day or Night	Y	**$130.00**	
Bar Hire			
Per Hour	Y	**$18.00**	
Per Day or Night	Y	**$80.00**	
Bar Hire - Commercial			
Per Hour	Y	**$23.00**	
Per Day or Night	Y	**$100.00**	
Setup per hour (50% discount of hourly rate)			
Non-Commercial	Y	**$27.50**	
Commercial	Y	**$34.35**	
Bonds			
No Alcohol, no food	Y	**$200.00**	
With Alcohol	Y	**$400.00**	
With Catering	Y	**$400.00**	
Hire of Dance Floor	Y	**$490.00**	
Wedding Package 1	Y	**$1,160.00**	
Wedding Package 2	Y	**$1,590.00**	
OCEAN ROOM			
Community, Sport Clubs & Individuals			
Before 6pm - Per Hour	Y	**$31.00**	
After 6pm - Per Hour	Y	**$36.00**	
After 6pm - Per Day	Y	**$155.00**	
After 6pm - Per Night	Y	**$219.00**	
Ocean Special*			
Per Hour	Y	**$15.00**	
Annual Fee	Y	**$150.00**	
Community, Sport Clubs & Individuals			
Before 6pm - Per Hour	Y	**$38.60**	
After 6pm - Per Hour	Y	**$45.00**	
After 6pm - Per Day	Y	**$194.00**	
After 6pm - Per Night	Y	**$274.00**	
Ocean Special*			
Per Hour	Y	**$20.00**	
conditions apply - see Coordinator Recreation Services			

ATTACHMENT: CC04

Charitable Rates Exemption – Community Housing Ltd (CHL)

Attachment 1
CHL Application for Rate Exemption for 8 Church Street, Dongara

COMMUNITY HOUSING LIMITED

NEW SOUTH WALES
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E nswinfo@chl.org.au

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Sharon McNeil
Shire of Irwin Rates Team
11-13 Waldeck Street
Dongara WA 6525

Dear Ms. McNeil,

Community Housing Ltd is seeking rates exemption pursuant to the provisions to section 6.26 of the Local Government Act 1995 for the property at 8 Church Street, Dongara WA 6525 (property number A8510).

Community Housing Ltd is objecting to the rate record under section 6.76 of the Local Government Act 1995, specifically section 1a (ii) "on the basis that the land or part of the land is not rateable land". Per section 6.26 2(g) of the Local Government Act 1995, the property at 8 Church Street, Dongara WA 6525 is not rateable land as the "land is used exclusively for charitable purposes", namely housing used for the relief of the aged (Seniors +55) since February 2011.

The tenants must meet the income and asset eligibility criteria of the WA Housing Authority.

Community Housing Ltd is a not for profit organisation which provides affordable housing for people on low to middle incomes. Originating in Australia in 1993, Community Housing Limited is a registered charity and Public Benevolent company and company limited by guarantee. It operates like any other limited company, but all financial surpluses remain in the company to be reinvested in quality affordable housing for people in need, wherever they may be.

Community Housing Ltd services ultimately provide long-term secure rental tenancies for people who pay subsidised market rate. As an alternative to private rental, our services ensure that people who have low incomes can find a dependable housing arrangement so their children can attend the local school, the parent or parents can maintain employment or study, and the family can generally have enough money to live on.

Please find attached supporting documentation for our application for exemption.

If you require any further detail or have any questions in relation to our application, please do not hesitate to contact me on 03 9956 0035.

Yours sincerely,

Kevin Ayre
Finance Manager Victoria/Western Australia

APPLICATION FOR RATES EXEMPTION
Local Government Act 1995 – Section 6.26

Privacy

The personal information collected on this form will only be used by the Shire of Irwin for the sole purpose of providing requested and related services. Information will be stored securely by the Shire and will not be disclosed to any third parties without your express written consent.

Copyright

I authorise the Shire of Irwin to reproduce any attachments provided with this form for internal purposes only.

Shire of Irwin
11-13 Waldeck Street
DONGARA WA 6525
PMB 21
DONGARA WA 6525

ABN 96 734 531 282

Phone: (08) 9927 0000
reception@irwin.wa.gov.au
www.irwin.wa.gov.au

This application form is to be used by organisations seeking exemption from rates, pursuant to the provisions of Section 6.26 of the Local Government Act 1995. The application for exemption will be checked based on the information you have provided, and you will be advised of the outcome in due course.

Please attach any additional documents requested, as failure to do so may result in the application being refused.

Please note that where exemption from rates is approved, the property will still be subject to the Emergency Services Levy and any other charges, if applicable, such as rubbish collection charges. All properties which are granted exemption from rates are subject to periodic reviews to ensure continued approval.

Instructions: Please print clearly in the spaces provided.

1. PROPERTY ADDRESS DETAILS

Street address	8 Church Street
Suburb	Dongara
Rates Assessment Number (if known)	A8510

2. WHAT IS THE CURRENT USE OF THE PROPERTY? Please provide full details:

Please see attached supporting documentation.

"land used exclusively for charitable purposes, namely housing used for the relief of the aged (Seniors +55).

3. PROPERTY OWNER DETAILS

Organisation:	Community Housing Limited		
Property Owner: **If different to above**			
Postal Address:	19-23 Prospect Street, Box Hill, Vic 3128		
Telephone:	1300 245 468	**Postcode:**	3128
Mobile:		**Facsimile:**	
E-mail:			

4. APPLICANT DETAILS

Contact Person:	Coco Cheng		
Position Title:	Assistant Accountant		
Postal Address:	19-23 Prospect Street, Box Hill, Vic 3128		
Telephone:	03 9856 0074	**Postcode:**	3128
Mobile:		**Facsimile:**	03 9856 0051
E-mail:	coco.cheng@chl.org.au		

5. ORGANISATION INFORMATION

Is/does the organisation:

An incorporated body as per the Associations Incorporated Act 1987? Yes ☐ No ☑
If yes, provide a Certificate of Incorporation

Considered "not for profit"? Yes ☑ No ☐

Have a tax exemption from the Australian Tax Office (ATO)? Yes ☑ No ☐
If yes, provide a certificate of tax exemption from the ATO

Leasing the property? Yes ☐ No ☑
If yes, provide a copy of the lease and confirm if the lessee is responsible for payment of the rates

Have planning approval for the land use of the property? Yes n/a No n/a
A site inspection may be required before the application is processed

6. DOCUMENTATION REQUIREMENTS

Please provide a copy of (in addition to those specified in Section 4):

☑ Organisation's Constitution

☑ Written statement outlining the nature of the Organisation's operations.

It should include the following details:

- Use and occupancy of the property
- Type of service provided (e.g. food, accommodation etc)
- Frequency of service provision (e.g. full-time, daily, weekly etc)
- Whether payment is received for the service

☐ A plan of the property, showing all buildings and outbuildings

OR

☐ A Floor plan of the leased property area, if only part of the property is the subject of this application

☑ A Copy of the current years audited financial statements for the Organisation
(If this exemption applies to only a portion of land owned by this Organisation, provide the relevant statements for the land this application applies to.)

---

7. AUTHORISATION

By signing this application, I hereby certify that the information provided is true and correct to the best of my knowledge.

Name:	Kevin Ayre		
Position:	Finance Manager VIC/WA		
Organisation:	Community Housing Limited		
Signature: of ~~CEO / Trustee~~		**Date:**	21/06/2021

OFFICE USE ONLY

1. CONSIDERATIONS

Approval with the City's Town Planning Scheme?	YES	☐	NO	☐
Has the property been inspected?	YES	☐	NO	☐
Recommend for non-rateable status?	YES	☐	NO	☐

Section of the Local Government Act 1995 6.26(2)____

Classification: _____

Person/s or Classes of Persons Affected by this decision:

_____

Reason for non-rateable status:

New Application ☐ Review of Exemption ☐

If yes, amount of rates to be exempted and dates to be applicable from (application date).
The approval will be for a period of ___ years, unless circumstances change.

Amount: _____ Date (from): _____

Rubbish bin charges to be levied and dates to be applicable from:

Amount: _____ Date (from): _____

2. DECISION – UNDER DELEGATED AUTHORITY

This application has been:

☐ DENIED for non-rateable status ☐ APPROVED for partial non-rateable status ☐ APPROVED for non-rateable status

Name:			
Signature:		**Date:**	

Council Resolution Reference: _____

Date of Council Meeting: _____

WESTERN AUSTRALIA

OATHS, AFFIDAVITS AND STATUTORY DECLARATIONS ACT 2005

STATUTORY DECLARATION

APPLICATION FOR RATES EXEMPTION UNDER SECTION 6.26 OF THE LOCAL GOVERNMENT ACT 1995.

STATEMENT OF PROPERTY USE FOR THE YEAR ENDING 30 JUNE 2020

(1) Christian name or names and surname of declarant in full — **I** Coco Cheng

(2) Address — **of** 19-23 Prospect Street, Box Hill, Vic 3128

In the State of Western Australia

3) Occupation — Assistant Accountant

Sincerely declare as follows:-

The property located at 8 Church Street, Dongara, WA 6525
is used by Community Housing Limited
for the purposes of ~~Social Rental Housing for Seniors (Age 55+)~~
land used exclusively for charitable purposes
Description of the activities the property is used for ~~As above~~
housing used for the relief of the aged (Seniors +55)
for the period ~~Feb 201~~1 to ___ or from to 01/07/21 to 30/06/22

The applicant agrees to advise the Local Government's Rating Services Section as soon as there is **ANY** change to the purpose/s as stated above.

This declaration is true and I know that it is an offence to make a declaration knowing that it is false in a material particular.

This declaration is made under the *Oaths, Affidavits and Statutory Declarations Act 2005*

Declared at Box Hill, Victoria on the 21st June 2021

this day of 20

In the presence of

(Signature of authorised witness)

Kevin Ayre, Finance Manager Vic/WA (Accountant)

(Name of authorised witness and qualification as such a witness)

(4) Signature of person making the declaration

(4)

*Important This Declaration must be made before any of the following persons:-

Academic (post-secondary institution) Accountant Architect Australian Consular Officer Australian Diplomatic Officer Bailiff Bank Manager Chartered secretary Chemist Chiropractor Company auditor or liquidator Court officer (magistrate, registrar or clerk) Defence Force officer Dentist Doctor Electorate Officer (State – WA only) Engineer Industrial organisation secretary Insurance broker Justice of the Peace (any State) Lawyer Local government CEO or deputy CEO	Local government councillor Loss adjuster Marriage Celebrant Member of Parliament Minister of religion Nurse Optometrist Patent Attorney Physiotherapist Podiatrist Police officer Post Office manager Psychologist Public Notary, Public Servant (State or Commonwealth) Real Estate agent Settlement agent Sheriff or deputy Sheriff Surveyor Teacher Tribunal officer Veterinary surgeon

Or

any person before whom, under the Statutory Declarations Act 1959 of the Commonwealth, a Statutory Declaration may be made.

Full descriptions of these professions are available at;

https://courts.justice.wa.gov.au/_files/Professions_witness_statutory_declarations.pdf

Any authorised witness for the State of Western Australia may also witness a Commonwealth Statutory Declaration, as long as they are in Western Australia at the time of witnessing {Schedule 2, item 231 of the Commonwealth Statutory Declarations Regulations 1993}.

Further information on witnessing documents is available at
https://www.wa.gov.au/organisation/department-of-justice

PO Box 3373, Albury NSW 2640

RECEIVED
21 JUL 2005

Australian Government
Australian Taxation Office

COMMUNITY HOUSING LIMITED
(COMMUNITY HOUSING LTD)
GROUND FLOOR 16-18 ELLINGWORTH PD
BOX HILL VIC 3128

Client enquiries
Telephone: 1300 130 248

8 July 2005

Dear Organisation Manager

Notification of endorsement for charity tax concessions
For your information

Enclosed is your organisation's *Notice of endorsement for charity tax concessions.*

Please note the following points.

- Your organisation's endorsement to access charity tax concessions, together with the date or period of effect, is entered in the public register maintained by the Australian Business Registrar at **www.abr.business.gov.au**

- Your organisation's endorsement is based on the information it has supplied. Your organisation is required by law to notify the Tax Office in writing if its circumstances change and it ceases to be entitled to endorsement.

- The tax laws do not require any particular intervals between self-reviews, but we recommend a yearly review. Your organisation should also carry out a review if there are major changes to its structure or operations.

A charity can self assess its entitlement to fringe benefits tax and GST charity tax concessions up to 1 July 2005. After this date, your charity will only be eligible to access charity tax concessions available under these laws if it has been endorsed.

For more information
We have a range of publications and services for non-profit organisations. Copies of the *Income tax guide for non-profit organisations* (NAT 7967) and other publications are available on the non-profit area of our website at **www.ato.gov.au/nonprofit** or by phoning us on **1300 130 248** between 8.00am and 6.00pm, Monday to Friday.

To keep up to date on key tax issues affecting the non-profit sector subscribe to receive our free electronic news service by using the email update link on our homepage at **www.ato.gov.au**

If your organisation has also applied for other endorsements you will receive separate notification.

Yours faithfully

Michael Carmody
Commissioner of Taxation and
Registrar of the Australian Business Register

Australian Government
Australian Taxation Office

8 July 2005

Notice of endorsement for charity tax concessions

This endorsement notice has been issued to:

Name	**COMMUNITY HOUSING LIMITED**
Australian business number	**11 062 802 797**

COMMUNITY HOUSING LIMITED, a **public benevolent institution,** is endorsed to access the following tax concessions from the dates shown:

- **Income tax exemption** from **1 July 2000** under Subdivision 50-B of the *Income Tax Assessment Act 1997*.
- **GST concessions** from **1 July 2005** under Division 176 of *A New Tax System (Goods and Services Tax) Act 1999*.
- **FBT exemption** from **1 July 2005** under section 123C of the *Fringe Benefits Tax Assessment Act 1986*.

Your organisation's endorsement to access charity tax concessions, together with the date or period of effect, is entered in the public register maintained by the Australian Business Registrar at **www.abr.business.gov.au**

Your organisation must notify the Tax Office in writing if it ceases to be entitled to endorsement.

Michael Carmody

Michael Carmody
Commissioner of Taxation and
Registrar of the Australian Business Register

Community Housing Limited

ABN 11 062 802 797

Annual report
for the year ended 30 June 2020

Community Housing Limited ABN 11 062 802 797
Annual report - 30 June 2020

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These financial statements are the consolidated financial statements of the consolidated entity consisting of Community Housing Limited and its subsidiaries. A list of subsidiaries is included in note 22. The financial statements are presented in the Australian currency.

Community Housing Limited is a company limited by guarantee, incorporated and domiciled in Australia.

The registered office:
4/20 Charles Street
Parramatta NSW 2150, Australia

The principal place of business:
19-23 Prospect Street
Box Hill VIC 3128, Australia

The financial statements were authorised for issue by the Directors on 28 September 2020. The Directors have the power to amend and reissue the financial statements.

Your Directors present their report on the consolidated entity consisting of Community Housing Limited ("CHL") and the entities it controlled at the end of, or during, the year ended 30 June 2020. Throughout the report, the consolidated entity is referred to as the Group.

Directors

The following persons were Directors of Community Housing Limited during the whole of the financial year and up to the date of this report:

F Skiotis
S Bevington
K Shellshear
M O'Meara
D Week
J Duskovic

The following persons were appointed as Director and continue in office at the date of this report:

J De Vries (appointed 18 October 2019)
J Byrne (appointed 24 February 2020)
B Goodwill (appointed 24 February 2020)

The following persons resigned as Director and consequently are not in office at the date of this report:

T White (resigned 27 September 2019)
J Forbes (resigned 25 November 2019)
K Gaby (resigned 27 November 2019)

Principal activities

During the year the principal continuing activities of the Group consisted of:

(a) Management of long-term rental community housing in Australia;

(b) Development, design and construction of affordable housing projects in Australia and overseas; and

(c) Homelessness services in NSW and Victoria.

Dividends - Community Housing Limited

No dividends were paid as the Company is prohibited pursuant to its Constitution to distribute dividends.

Review of operations

The Group's operating surplus for the year, after providing for income tax, amounted to $25,854,329 (2019: Surplus $40,584,550). The Group's operating surplus before depreciation and amortisation expense amounted to $30,725,080 (2019: Surplus $42,135,266).

After accounting for other comprehensive income, the total surplus and other comprehensive income for the year amounted to $25,483,612 (2019: Surplus $40,525,454). The Group recorded a revaluation adjustment of $11,246,557 on its investment properties during the 2020 financial year (2019: $31,725,209).

National legislation has established the basis for the registration of not-for-profit social housing providers in all Australian jurisdictions. Accordingly, the Group has continued to comply with all the requirements for registration as a community housing provider in the National Regulatory System for community housing, maintaining its registration as a Tier One provider.

The staff complement increased from 305 to 307 full time equivalent employees ("FTE") in Australia (including Horizon Group) and overseas 26 FTE (2019: 34 FTE); service delivery is provided through 23 offices (including Horizon Group) with six in NSW, one in South Australia, one in Tasmania, six in Victoria, three in Queensland and six in Western Australia. Overseas CHL has seven offices in Chile, India, Indonesia, Peru, PNG, Rwanda and Timor Leste; Houses under management in Australia increased from 10,737 to 10,892 properties and tenancies from 11,020 to 11,051.

COVID-19 Pandemic

COVID-19 was declared a worldwide pandemic by the World Health Organisation in March 2020. COVID-19, as well as measures to slow the spread of the virus, have since had a significant impact on global financial markets. Governments across the globe have enforced restrictions to limit the spread of the virus, with most governments having implemented economic stimulus packages. Despite these measures, there is still considerable economic uncertainty, especially with the 'second wave' outbreak and lockdown in Victoria, and fears of a sustained recession.

COVID-19 has presented a fast evolving and significant challenge to global and local economies. The real estate sector specifically has been impacted by concerns surrounding security of income and uncertainty around property valuations. In addition, this uncertainty and associated market volatility has resulted in a significant slowdown of transactional activity and investment in most real estate markets.

Impact to date and processes applied

While management has assessed there is no noticeable or material impact on the Group's operations for FY20, they continue to review the situation to determine the possible changes that may affect FY21 and beyond. The long term impact on the Australian economy is still being assessed with expectations that property prices will be affected in the future.

Management has implemented the following processes to continually assess and monitor any impact on the Group:

· re-evaluated whether there were any additional areas of judgement or estimation uncertainty;

· assessed the carrying values of its assets and liabilities and determined the impact thereon as a result of market inputs and variables impacted by COVID-19;

· assessed each of the revenue streams and agreed that the property rental revenue could be most significantly impacted by a decline in economy and property prices. As such, management prepared a scenario analysis showing various levels of decline in property rental revenue over periods of time, assuming not all tenants would be affected at the same time, but rather gradually.

· assessed which expense items can be reduced or eliminated to offset any decline in revenue. This includes staffing reductions, discretionary expenditure such as travel and office expenses, planned and cyclical maintenance on properties and renegotiation of office leases or closure of some offices.

· considered the impact of COVID-19 on the Group's financial statement disclosures; and

· as part of the subsequent events procedures, the Group continued to monitor the impacts of COVID-19. Management has continued to re-evaluate the significant inputs used to drive property valuations and recoverability of tenant arrears on a regular basis as detailed in Note 1 (a) (vi). Based on these evaluations, the Group has determined there are no material subsequent events.

Impact on future periods

Given that COVID-19 is an ongoing situation, the Group has continued and will continue to analyse the data available. CHL is monitoring the market rent as it is anticipated there will be a decline in market rents across Australia. While CHL provides accommodation for low income individuals, the greater majority of tenants do not pay a percentage of market rent rather a percentage of their own income. These tenants are generally in receipt of government benefits therefore it is not expected the rent will change. Any tenant who pays a percentage of market rent is likely to receive a decrease, however this represents no more than 3.5% percent of the CHL total portfolio.

Given the unknown future impact that COVID-19 might have on the residential real estate market and global market in general, coupled with a lower interest rate environment, a higher degree of judgement and consideration is required in assessing the significant inputs that determine property valuations. The Group and external valuers acknowledge current valuations are subject to 'material valuation uncertainty' as a consequence of this. To date, there has been little evidence to suggest that the real estate market has softened since the onset of COVID-19. However as the COVID-19 pandemic progresses and the government stimulus is expected to diminish in FY21, it is not unreasonable to suggest that the real estate market may be negatively impacted. The Group will continue to re-assess the fair value of the portfolio to ensure appropriate consideration is given to inputs and methods used.

For details of the considerations of the statement of financial position in light of COVID-19, refer to Note 1 (a) (vi).

Rounding of amounts

The Group refers to ASIC Corporations Instrument 2016/191, relating to the 'rounding off' of amounts in the Directors' report and financial report. Amounts in the Directors' report and financial report have been rounded off to the nearest dollars in accordance with the instrument.

New developments over the year

· CHL finalised its integration with the Horizon Housing Group with the transfer of property management of all investor owned properties to Horizon Housing Realty and all compliance management under the National Rental Housing Scheme to Australian Affordable Housing Securities. All partnership projects and housing funded by the Queensland Government to be managed by Community Housing (Queensland) Limited (CHQL).

· CHL completed its first year of a reflective Reconciliation Action Plan approved by Reconciliation Australia and undertook a cultural awareness training for all staff and directors as part of the Plan.

· Aboriginal Community Housing Limited (ACHL) received registration as a Tier 2 provider under the National Regulatory Scheme for Community Housing and registration as a, Aboriginal Housing Provider with the NSW Aboriginal Housing Office. This resulted in the transfer of management of a number of properties on the NSW Mid North Coast to ACHL.

· CHL expanded the number of tenancies for disabled tenants under the National Disability Insurance Scheme (NDIS) to 35 through new housing development and have a further 38 houses under construction.

· CHL in Western Australia took transfer of 11 properties in Kalbarri for elderly people in need and lease of 37 units for low income workers in Coral Bay.

· CHQL signed leases with the Queensland Government to manage a Youth Foyer for 40 young vulnerable tenants in Logan and a 5-unit facility for women escaping domestic violence on the Gold Coast.

· CHVL completed construction of 15 homes for people in need in Castlemaine, Hepburn and Lynbrook and acquired two 5 bed group homes for people with disabilities in Moira. CHVL was also approved by the Victorian Government to develop 165 units in Alphington for people in need and for low income workers.

· CHL completed construction of 24 homes for people in need in Mernda, Victoria and 2 homes in South Australia under the Renewing our Streets and Suburbs (ROSAS) Development project.

· CHL Timor commenced a project to build a residential facility for the Catholic order of St John San Mae De Deus in Gleno providing training and employment to 26 local Timorese people.

· CHL Indonesia commenced a project in Bali to provide aged care for retired overseas aged people at risk of homelessness and to provide training and employment for poor unemployed Indonesian people in aged care.

Events since the end of the financial year

· CHL has agreed to transfer up to 196 tenancies occupied by people of Aboriginal and Torres Strait Islander background to ACHL to carry out housing management services.

· ACHL is forming agreements with Aboriginal Corporations in the NSW Mid North Coast to manage 67 tenancies.

· CHQL has completed construction of 6 units for young people with disabilities in Woolowin, Queensland. CHQL has secured funding from the Queensland Government to deliver 47 units for people who are aged in need on the Gold Coast.

· CHL has commenced partnerships to provide 38 units for people with disabilities under the NDIS in Geraldton and nine in Bankstown, Western Sydney.

· CHL is completing 15 units in Northern Adelaide as part of longterm housing development under its contract with the South Australian Government.

· CHVL completed three units for people in need in Morwell.

Likely developments and expected results of operations

· The Covid-19 pandemic has led to delays in most projects commencing outside of Australia but expect that projects in Indonesia, India, Peru and Timor Leste will all commence construction.

· CHL is responding to the introduction of stimulus packages to boost construction and maintenance of social housing in WA and SA. The Tasmanian, Victorian and WA Governments are developing programs to expand the level of social housing in their States that CHL will be a respondent to.

Environmental regulation

Environmentally Sustainable Design is a major consideration in all projects developed, and CHL fully embraces the discipline of sustainability as a developer and builder. In addition to its regular achievement of six-star energy-rated properties, CHL has applied its Place Management approach to develop entire eco-neighbourhoods in which the residences, the use of the land on the property itself, and the location of the site enable tenants to achieve the dream of environmentally-sustainable living.

The Group is continuing the rollout of solar panels to properties in Victoria and NSW and plans to introduce energy saving systems that will save up to half the cost of power for its customers in the next three years.

CHL continues to lease fuel efficient vehicles in order to reduce energy emissions.

Information on Directors and Secretary

Fionn Skiotis MSocSci (Policy & Human Services), Grad Cert SocSci (Housing Policy & Management), FAICD

Company Chair, Non-Executive Director, Member of Governance Committee

Experience and expertise

Experienced in corporate governance and management in the not for profit sector, social housing, disability, social policy, mental health, advocacy, human rights and media and communications. Over 30 years' experience in the not for profit sector in Australia and internationally. Currently serving as a Community Member of the Victorian Mental Health Tribunal (since 2006) and previously appointed to Commonwealth Social Security Appeal Tribunal (2007-09) and Victorian Intellectual Disability Review Panel (2004-07).

Stephen Bevington Dip Mgt (MBS Senior Executive Program), MAICD, Registered Domestic & Commercial Builder

Managing Director, Member of Committees: Project and Governance

Experience and expertise

Experienced in development and management of social housing for over 40-years including development of cooperative housing in London, Chairmanship of London Borough of Camden council housing authority in the 1980s, coordinator-housing cooperative programs - Victorian Ministry of Housing and Construction (1989-1991), establishment and development of Community Housing Ltd to the present day. Board member of Community Housing Industry Association.

Karine Shellshear Masters of Housing (Hons), BSoc. Studies (Hons1), BArts

Non-Executive Director, Member of Project Committee, Chair of Governance Committee

Experience and expertise

Experienced Social Housing Consultant, with over 30-years' experience in community housing; including 20-years as Executive Director of the NSW Association to Resource Co-operative Housing (ARCH) and a founding member of the Community Housing Federation of Australia (CHFA). Karine has worked in research, policy and community development positions in State and Local Government: Department of Housing; Planning and Environment; Premier's Office of Aboriginal Affairs; and Sydney City Council. She has been a strong advocate of community housing since 1981, has participated as a director on numerous community housing boards and advisory committees, including CHFA, Shelter NSW Executive and has produced a wide range of documentation, video, articles and papers related to the cooperative housing movement in NSW. Karine taught Social Research, the Housing System, Advocacy Systems; Cultural Diversity and Community Development at TAFE for 5 years between 2010 and 2014. She is currently engaged in a research history in Architecture and is a writer.

Kathy Gaby Associate Dip of Business (Real Estate). Real Estate Licence. (Resigned - 27 November 2019)

Non-Executive Director, Member of Project Committee

Experience and expertise

Experienced in real estate including licensee, property manager, co-owner of a real estate business, sales and customer service.

Maureen O'Meara PgCert (Aboriginal Alternative Healing) BAppSc (Indigenous Health)

Non-Executive Director, Member of Audit and Risk Committee

Experience and expertise

Experienced in Aboriginal relationships and interactions, government and not-for-profit sectors, housing, health, inter-sectoral government relations and management of government partnership funds, community and business development. Chair of Aboriginal Community Housing Ltd, Director of CHL Timor Ltd.

David Week BA (Berkeley), MArch (Berkeley), PhD (Sydney), Registered Architect (NSW, Non-Practising),

RAIA, Non-Executive Director, Chair of Project Committee

Experience and expertise

Experienced over 40 years in internationally developing assistance in social infrastructure and housing in the Pacific, PNG, Southeast Asia, East Asia and Africa-ongoing. Extensive experience on Australian Aid and World Bank- funded projects. Experience in Aboriginal and Torres Strait Islander health and housing projects for 20-years. Specialist knowledge and experience in community-based construction. Honorary Senior Fellow at the Melbourne School of Design, University of Melbourne.

Joe Duskovic LLB, Grad Dip LP, Solicitor, GAICD

Non-Executive Director, Member of Governance Committee

Experience and expertise

Joe is a qualified lawyer with over 25-years' legal, governance and risk experience. Joe has worked in various in-house and private practice legal roles primarily in corporate and real estate areas. He has held senior executive leadership positions in property development and not-for-profit sectors, including his current role as General Manager of Governance and Risk for St Vincent de Paul Society Queensland. Joe is a Director of Horizon Housing Company Limited, a Graduate member of the Australian Institute of Company Directors and member of the Queensland Law Society.

Jeff Forbes BComm, GAICD (Resigned 25 November 2019)

Non-Executive Director, Chair of Audit and Risk Committee

Experience and expertise

Jeff has over 35-years' experience as a finance manager, including over 16-years as the CFO of both listed and unlisted companies and is an experienced company director. In March 2013, Jeff retired from Cardno Limited, an ASX200 listed global infrastructure services company, where he was CFO, Company Secretary and an Executive Director. Prior to joining Cardno, Jeff worked in the mining and resources sector for over 30-years and has significant experience in the financing and development of resource projects in both Australia and the Asia Pacific region. Jeff returned to Cardno in 2016 as a Non-Executive Director and Chairman of the Audit and Risk Committee. Additionally, Jeff is a Non-Executive Director and Chairman of the Audit and Risk Committee of PWR Holdings Limited and Chairman of the Board of Herron Todd White (Australia) Pty Ltd and Herron Todd White (Consolidated) Pty Ltd and a member of the Financial Audit Risk Committee. He is also Non-Executive Director and Chair of Horizon Company's Finance, Audit, Risk Management and Compliance Committee.

Patricia (Trish) White BE, BA, CPEng, FIEAust, EngExec, NER, APEC Engineer, FAICD
(Resigned 27 September 2019)

Non-Executive Director, Member of Audit and Risk Committee

Experience and expertise

Experienced in project management, strategy and risk. Trish is a professional board director and strategic advisor, following a career as a senior executive for an ASX50 global resources and energy company, a Cabinet Minister in the South Australian government and as a business advisory consultant to boards and executives. She is a non-executive director of commercial as well as not-for-profit companies, and chairs university advisory boards in the areas of business and engineering. She is co-founder and Executive Director of Slingsby Taylor, which provides professional services to several sectors. Trish is a Fellow of both the Australian Institute of Company Directors and the Institution of Engineers Australia. She is also a Chartered Professional Engineer (CPEng) and Engineering Executive (Eng Exec), registered to practise in Australia and internationally.

John De Vries BComm, GAICD (Appointed 18 October 2019)

Non-Executive Director, Chair of Audit and Risk Committee

Experience and expertise

John has held executive leadership positions within government and non-government enterprises and implemented large scale strategic projects. John has a strong background in finance and administration, which includes providing financial stewardship and leadership to a $100 million research organisation. John has over 10 years' experience in the social housing sector working with both public and not for profit organisations in project management and finance roles. John is currently employed as a Business Development Manager with the University of Tasmania. John is an executive manager with leadership experience in project management and change management.

Jessie Byrne BA, BA(Hons), MA, PhD (Appointed 24 February 2020)

Non-Executive Director, Member of Audit and Risk Committee

Experience and expertise

Jessie's major area of experience has been with the public sector, where I served in various leadership and policy roles, including Deputy Chief Executive Community Wellbeing in the Attorney-General's Department SA, Director of the Local Government Division and Director of Local Government (a compliance and regulatory role) in the Premier's Department of SA, and Director of the Office of Trade in SA. Jessie sat on departmental executive committees for a number of these roles. Jessie has contributed in the areas of social, trade, local government, and legislative policy. Jessie has been in strategic policy and planning, requiring the ability to review, direct and formulate strategy, both at the organisational and project levels together with extensive social research experience through her various community and public sector roles.

Brynnie Goodwill JD, AB, GAICD (Appointed 24 February 2020)

Non-Executive Director, Member of Project Committee

Experience and expertise

Brynnie is passionate about building socially responsive, sustainable businesses. She has worked in the not-for-profit sector for more than twenty-five years, as non-executive director, CEO, senior executive and strategist. With a strong background in community engagement, she has worked in sustainability, health care, supporting Indigenous culture and communities, the arts and social justice, involving communities in Australia and the Pacific. She serves as a non-executive director on the boards of the Sydney North Health Network, Women for Election Australia and the Earth Trust. A former international corporate lawyer with extensive experience in Latin America and graduate of the Australian Institute of Company Directors, Brynnie has been involved with governance, ethics and compliance issues for many years with organisations of all sizes.

Vlad Steinberg BEc, Grad Dip AppCorpGov, MBusLaw, AGIA, ACIS, FIPA

Company Secretary

Experience and expertise

Trained in business law and governance. Experienced in company secretarial and governance practice, business management, including extensive experience in the legal system as it affects business, resources management, compliance and risk management systems, ethics, values and culture.

Meetings of Directors

During the financial year 2020, 9 meetings of Directors and 18 committee meetings were held. The number of meetings attended by each Director during the year is shown below.

Member attendance	Full meetings of Directors		Meetings of committees					
			Audit		Governance		Project	
	A	B	A	B	A	B	A	B
Stephen Bevington	9	9	9	9	5	5	4	4
Karine Shellshear	8	9	-	-	5	5	3	4
Fionn Skiotis	9	9	-	-	3	5	-	-
Maureen O'Meara	8	9	8	9	-	-	-	-
David Week	9	9	-	-	-	-	4	4
Joe Duskovic	9	9	-	-	5	5	-	-
John De Vries	5	5	5	5	-	-	-	-
Byrnnie Goodwill	3	3	-	-	-	-	1	1
Jessie Byrne	4	4	1	1	-	-	-	-
Kathy Gaby	2	5	-	-	-	-	-	2
Trish White	2	2	3	3	-	-	-	-
Jeff Forbes	3	4	5	5	-	-	-	-

A = Number of meetings attended

B = Number of meetings held during the time the Director held office or was a member of the committee during the year

Directors' interests and benefits

CHL is a company limited by guarantee. Hence, none of the Directors hold an interest but each as a Member of CHL is liable to the extent of their undertaking under the respective Constitutions.

During or since the end of the financial year, CHL has Directors' and Officers' Liability Insurance in place to insure current and former Directors, Secretaries and other officers against liabilities for costs and expenses incurred by them in defending any legal proceedings arising out of their conduct while in the capacity of Director, Secretary or other officer of CHL involving a willful breach of duty in relation to CHL.

No Director of CHL, during or since the end of the financial year, received or has become entitled to receive a benefit (other than a benefit included in the aggregate amount of emoluments received or due and receivable by the Directors shown in the financial report or the fixed salary of a full time employee of CHL or of a related body corporate) by reason of a contract made by CHL or a related body corporate with one of the Directors or with a firm of which they are a member or with a company in which they have a substantial financial interest.

Indemnification of Directors and Officers

The Group has executed deeds of indemnity in favour of:

(a) Directors of the Company (including past directors);

(b) Secretary, and

(c) Chief Financial Officer.

Each of these deeds provides an indemnity on substantially the same terms as the indemnity provided in the constitution in favour of Directors and Officers. The indemnity also gives officers a right of access to Board papers and requires the Group to maintain Directors' and Officers' liability insurance.

Proceedings on behalf of the Group

No person has applied to the Court under section 237 of the *Corporations Act 2001* for leave to bring proceedings on behalf of the Group, or to intervene in any proceedings to which the Company is a party, for the purpose of taking responsibility on behalf of the Group for all or part of those proceedings.

No proceedings have been brought or intervened in on behalf of the Group with leave of the Court under section 237 of the *Corporations Act 2001.*

Auditor's independence declaration

A copy of the auditor's independence declaration as required under section 60-40 of the *Australian Charities and* Not-for-profits Commission Act 2012 is set out on page 12.

ACKNOWLEDGEMENTS

CHL would like to recognise the good working relationships it has with the Australian Federal and State Governments of Queensland, New South Wales, South Australia, Tasmania, Victoria, Western Australia and Governments of Chile, Timor Leste, Rwanda, India, Indonesia, Peru and PNG who have significantly improved opportunities to develop housing for people in need.

Ability Options, Aboriginal Community Care Services, ACHA, Act for Kids, Aftercare, AIMS, Alola Foundation, Alpha Partners, AMES, ANCHOR, Anglicare, Anglicare Bendigo Mental Health, Anglicare Bendigo SAAP, Anglicare Tasmania, APOSS, ARAFEMI, ASCO, ASSERT, ATAP, Australian Community Support Organisation (ACSO), Australian Home care, Australian Red Cross, Austraining International, Baiyungu Aboriginal Corporation, BaptCare, Barwon Housing Action Group, Begents – Max Buchanan Foundation, BEND Inc., Bendigo Community Palliative Care Service, Benetas, Benevolent Society, Bethany Community Support, BGSR Supported Accommodation, BRC Recruitment Pty Limited, Brenda House, Bridge Housing, Brighter Futures, Brokerage and Housing Support Service, Brooks High School, Brophy Family & Youth Service, Brosnan Youth Services, Bungree Aboriginal Association, CAFES, Cam Can, Cape Hope Foundation, Carexcell, Castlemaine District Community Health Service, Catherine House, Catholic Care, Catholic Diocese in Newcastle, CatholicCare Tasmania, CECHA, Centacare, Centacare Kimberley, Centracare, Centrecare (Kalgoorlie), Centacare Kimberley, Central Access Ltd, Centrelink, Centro Nacional de Emprego Formacao Profissional, Ceylonese Elderly Citizens Association, CHESS, Child and Family Services (CAFS), Child Safety, Chinese Community Centre, Chinese Community Social Services Centre Inc, Christo Youth Services, Chrysalis, Circus Oz, City of Knox Home and Community Care, City Of Launceston, City Mission PNG, Clarence Valley Council, Coast Shelter, Coast Shelter – Wyong, Cobaw Community Health Service, Coffs Harbour Accommodation, Colac Ottway Disability Accommodation, Colac Residential Services, Colony 47, Common Equity Housing Ltd, Community Care Options, Community Lifestyle Agency inc., Correction Services, Create Foundation, Croatian Community Services, Darebin City Council, Crest, Department of Communities (WA), Department of Communities (Housing Tasmania), Department of Communities Disability services and Seniors (QLD), Child Safety and Disability Services, Department of Health and Human Services, Department of Housing and Public Works, Department of Premier and Cabinet Tasmania, Department of Primary Industries and Regional Development, Door of Hope, Drug Arm, Dundaloo Foundation Ltd., DV East, EACH, Eastern Access Community Health – Crest, Eastern Access Community Health – MARP, Eastern Access Community Health – Rivendale, Eastern Domestic Violence Service (EDVOS), Eastern Region Mental Health Association (ERMHA), East Kimberley Job Pathways, Engineers Without Borders, ERMHA support services, Esther Foundation, Fairmont Homes, Family Access Network, Family and Community Services, FICSS, Foundation for Spanish Speaking Older People, Flourish Australia, Forster Community Health, Freemantle Multicultural, Galambila, Gateways (Salvos), Geraldton Resource Centre, Gippsland & East Gippsland Aboriginal Cooperative (GEGAC), Gippsland Community Health Services, Gippsland Lakes Community Health Service (GLCHS), Good Shepherd Microfinance, Great Lakes and Manning Youth Homelessness Services, Greater Taree City Council, Harrison Community Services, Hastings Women & Children's Council, Haven Home Safe, Head Start Homes, Healthlink Lakes & Bairnsdale, Home Ground, Homebase Youth Service, Homecare, Homeplus Inc, House With No Steps, Housing Resource and Support Service, Hume, Hunter New England Health, Huon Disability Network, Icare, IFS, Independent Disability Services (IDS), Indigenous Land and Sea Corporation, Inner East Mental Health Services, Inner South Health Community, Inside Out, International Labour Organisation, Inverloch Aged Care Development Group, INVESTEC, Jesuit Congregation, Jesuit Social Services, Jewish House, John Bomford Centre, Jubullum Local Aboriginal Land Council (LALC), Junction Support Services, Kara House, Karingal Support Services, Karinya Young Women's Refuge, Kempsey Families Inc, Kempsey Mental health, Kemspey Neighborhood Centre, Kempsey Shire Council, Kempsey Women's Refuge, Kilmany Family Care, Kilmany Unity Care, Kimberley Development Commission, Kindred Spirits Foundation, Koori Employment Services (KEE),Knox City Council, Kurnai, Latrobe Community Health Service, Launceston City Council, Launceston Police, Launch Housing, Leaving Care, Lendlease, Liberty Domestic & Family Violence Specialist Services, Lifestyle Solutions, Life Without Barriers, Linkages Inc, Lotterywest, MaCauley Community Services for Women, Magnolia Place, Mallacoota District Health Service, Manningham City Program, Manningham Inclusive Community Housing (MICH), Manningham Youth and Family Services, Many Hands Australia, Many Rivers Regional Aboriginal Housing Management Services, Marist Youth Care, Maroondah Addictions Recovery Refuge, Maroondah City Council, Maroondah Halfway House, MARP, Mary MacKillop International Mission, Maryborough Correctional Centre, Maryborough Neighbourhood Centre, Max Employment, McCauley Womens Housing, McCosker House, McKenzie Bond, MCM, Mecu Limited, Melba Support Services, Melbourne City Mission, Melton Shire Housing Support, Men's Resource Centre, Mental Health CHHC, Mental Health Commission, Merindoo Youth Services, Mid Coast Connect, Mid North Coast Financial Counselling Services, MIFSA, MIFWA, MIND, Mission Australia Port Macquarie, Mission Australia Tasmania, Mission Australia FAS & GHMS, Mitchell Community Housing Services, Momentum, Monkami Centre, Moreland City Council, Mountain District Learning Centre, MRC, Multicultural Services of WA, My Foundations Youth Housing Ltd, Mylestones, Nambucca Valley disAbility Service, National Labor Force Institution Timor-Leste (INDIMO), National Research Institute of PNG, NEAMI, Neami National, NESH (Non English Speaking Housing), New Horizons - Port Macquarie, Taree, Ngwala,

NewIDAFE Inc, Ngambaga Bindarry Girrwaa Community Services, Nimoola House – Taree, Nine Mile Aboriginal Corporation, Nirrumbuk Aboriginal Corporation, Nortec, Northcott, Northern Suburbs Community Centre, Northern Suburbs Housing Community, North East Community House, North East Support Agency for Youth (NESAY), North Eastern Housing Services, Northern Kids Care, Northern Support Services, ODDESSY, NSW Health, Nyamba Buru Yawuru, Nyaliga Aboriginal Corporation, OATES, Omeo District Hospital, On Track, Orbost Regional Health, Oryx Property, Pacific Architecture Chile, Palmerston, PALS, Parkside Foundation, Partners in Recovery, Parramatta City Council, Pat Giles Centre, Paupiyala Tjarutja Aboriginal Corporation, Parramatta Mission, Perth Home Care Services, PNG National Research Institute, Port Adelaide and Enfield Council, Port Macquarie Community Mental Health Service, Port Macquarie Hastings Domestic and Family Violence Specialist Service, Port Stephens Family and Neighbourhood Services, Port Stevens Youth Options Program, PRA Service – Taree, Probation and Parole, Queensland Police Service, Quantum Support Services, Ramayhuck District Aboriginal Corporation, Randwick City Council, Ravenswood Heights Primary School, Ravenswood Neighbourhood House, Ravenswood Primary School, Reachout, Reconciliation Australia, Reconnect, Red Cross, Regional Alliance West, Regional Housing Ltd, Renewal SA, Ringwood Extended Family Services, Robinson, Rocherlea Action Group, Rocherlea Football Club, RUAH Community Services, Rumbalara Aboriginal Cooperative, Rural Housing Network, Sacred Heart Mission, Safe Futures Foundation, SAHT, Salvation Army, Salvation Army Eastcare, Salvation Army Ingle Farm, Salvo Connect, SalvoCare, Samaritans, Samaritans Foundation – Taree, SASHS, SENNAI, Settlement Services International (SSI), SHADES, Shelter Tasmania, SHIFT, South Australian Housing Authority, South West Housing Action Group, Speakout, Special Needs Accommodation Project, Spectrum Migrant Resource Centre, Springvale Indo-Chinese Mutual Assistance Association, SSI, 5 Star Project, Starting Point, St. George's Women's Refuge, St Michaels, Starting Out, STAY, St Vincent de Paul Society, Sun City Churches, TAC, Taree Women & Children's Refuge, Tenancy Skills Workshop,The Ability Centre, The Aboriginal Primary Health Care Service, The Esther Foundation, Therapy Tasmania, Timor Gap, Transformations Rehabilitation, Triaco, Totally and Partially Disabled Veterans of WA, Uniting Care Burnside, Uniting Care Gippsland, Uniting Harrison, Uniting SA, Urangan Neighbourhood Centre, Valley Industries, Valley To Plateau Support Service, Vic Deaf, Victorian Aboriginal Childcare Association, Victorian Deaf Society, Villa Maria Society for the Blind, WA Autism Association, Warrandyte Housing & Support Services, Warrina Domestic & Family Violence Specialist Services, Warrina Women's Refuge, Water Corporation, Werin Homecare Service, Werribee Support and Housing, Wesley 121, Wesley Homelessness Services, Wesley Mission Central Coast, Wesley Youth, Wesley Youth Accommodation Services, Western Port Youth Accommodation Support Service (WAYSS), West Gippsland Health Care Group, Westridge, Willoughby Council, Windarring, Windermere, Winteringham, WISE, WISHIN Inc, Within Australia (formerly SNAP), Women's Liberation Half Way House, Wunan Foundation, Wuchopperen Health Services Ltd, Xanana Trust, Yandina Connect 2, Yarram District Health Service, Yooralla, Young Women Collective, Youth Housing Support, YP Space for their cooperation and assistance over the past year.

PwC continues in office in accordance with section 327 of the *Corporations Act 2001.*

This report is made in accordance with a resolution of Directors.



Fionn Skiotis
Director

Melbourne
28 September 2020

Auditor's Independence Declaration

As lead auditor for the audit of Community Housing Limited for the year ended 30 June 2020, I declare that to the best of my knowledge and belief, there have been no contraventions of any applicable code of professional conduct in relation to the audit.

This declaration is in respect of Community Housing Limited and the entities it controlled during the period.



Amanda Campbell
Partner
PricewaterhouseCoopers

Melbourne
28 September 2020

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Liability limited by a scheme approved under Professional Standards Legislation.

Community Housing Limited
Statement of comprehensive income
For the year ended 30 June 2020

	Notes	Group 2020 $	Group 2019 $	Parent entity 2020 $	Parent entity 2019 $
Property rental revenue	3(a)	**87,330,968**	78,661,398	**57,631,443**	48,607,490
Revenue from contracts with customers	3(b)	**50,963,471**	32,806,130	**23,680,865**	13,011,168
Other income	3(c)	**12,110,166**	31,308,342	**(1,088,179)**	6,904,679
Gain on bargain purchase	16	**-**	5,661,827	**-**	5,661,827
Operating expenses		**(50,975,562)**	(43,706,829)	**(27,441,269)**	(21,070,371)
Project costs		**(491,896)**	(1,453,296)	**(404,777)**	(176,256)
Construction costs		**(2,171,781)**	-	**(2,171,781)**	-
Property costs		**(53,218,759)**	(47,875,019)	**(36,635,491)**	(30,697,725)
Tenancy costs		**(13,308,265)**	(9,417,294)	**(7,863,327)**	(5,259,426)
Fair value gain/(loss) on derivatives		**907,839**	443,301	**-**	-
Finance expenses		**(5,033,679)**	(5,557,288)	**(1,747,010)**	(1,677,912)
Surplus before income tax		**26,112,502**	40,871,272	**3,960,474**	15,303,474
Income tax expense	4	**(258,173)**	(286,722)	**-**	-
Surplus for the year		**25,854,329**	40,584,550	**3,960,474**	15,303,474
Other comprehensive income					
Item that may be reclassified to profit or loss					
Exchange differences on translation of foreign operations	17(a)	**(370,717)**	(59,096)	**-**	-
Other comprehensive income for the year, net of tax		**(370,717)**	(59,096)	**-**	-
Total comprehensive income for the year		**25,483,612**	40,525,454	**3,960,474**	15,303,474
Surplus / (Deficit) for the year is attributable to:					
Owners of Community Housing Limited		**25,858,502**	40,588,046	**3,960,474**	15,303,474
Non-controlling interest		**(4,173)**	(3,496)	**-**	-
		25,854,329	40,584,550	**3,960,474**	15,303,474
Total comprehensive income for the year is attributable to:					
Owners of Community Housing Limited		**25,487,785**	40,528,950	**3,960,474**	15,303,474
Non-controlling interest		**(4,173)**	(3,496)	**-**	-
		25,483,612	40,525,454	**3,960,474**	15,303,474

The above statement of comprehensive income should be read in conjunction with the accompanying notes

Community Housing Limited
Statement of financial position
As at 30 June 2020

		Group		Parent entity	
		2020	2019	**2020**	2019
	Notes	**$**	$	**$**	$
ASSETS					
Current assets					
Cash and cash equivalents	5	**16,889,331**	24,045,747	**3,934,447**	10,813,282
Trade and other receivables	6	**22,345,154**	15,466,464	**15,424,614**	10,005,400
Other current assets		**430,686**	398,657	**417,115**	386,845
Assets classified as held for sale	7	**-**	225,628	**-**	-
Current tax assets		**-**	174,188	**-**	-
Total current assets		**39,665,171**	40,310,684	**19,776,176**	21,205,527
Non-current assets					
Property, plant and equipment	8	**15,833,550**	13,410,390	**1,712,383**	3,225,798
Right-of-use assets	8	**9,329,779**	-	**6,723,486**	-
Intangible assets	9	**3,447,500**	4,778,022	**-**	-
Investment properties	10	**709,873,965**	686,806,473	**225,864,209**	221,195,929
Intercompany Loan Receivables	11	**-**	-	**3,392,963**	2,384,224
Investment in subsidiaries	22	**-**	-	**1,249,833**	1,249,833
Total non-current assets		**738,484,794**	704,994,885	**238,942,874**	228,055,784
Total assets		**778,149,965**	745,305,569	**258,719,050**	249,261,311
LIABILITIES					
Current liabilities					
Trade and other payables	12	**15,931,992**	15,685,160	**10,214,233**	10,689,815
Borrowings	13	**3,138,842**	40,591,284	**798,200**	677,000
Lease liabilities	8	**2,976,066**	-	**1,847,758**	-
Derivative financial instruments	14	**-**	907,838	**-**	-
Provisions	15	**2,995,342**	2,597,182	**1,263,662**	850,580
Total current liabilities		**25,042,242**	59,781,464	**14,123,853**	12,217,395
Non-current liabilities					
Borrowings	13	**104,468,785**	66,215,151	**43,207,175**	42,371,471
Lease liabilities	8	**7,286,461**	-	**5,323,445**	-
Non-interest bearing liabilities	13	**150,869,704**	154,805,283	**81,378,729**	83,179,091
Provisions	15	**3,258,784**	3,770,797	**896,061**	1,131,906
Deferred tax liabilities	4	**735,989**	477,816	**-**	-
Total non-current liabilities		**266,619,723**	225,269,047	**130,805,410**	126,682,468
Total liabilities		**291,661,965**	285,050,511	**144,929,263**	138,899,863
Net assets		**486,488,000**	460,255,058	**113,789,787**	110,361,448

The above statement of financial position should be read in conjunction with the accompanying notes

Community Housing Limited
Statement of financial position
As at 30 June 2020

		Group		Parent entity	
		2020	2019	**2020**	2019
	Notes	**$**	$	**$**	$
EQUITY					
Other reserves	17(a)	**(1,018,311)**	(647,594)	**-**	-
Retained earnings	17(b)	**487,018,006**	460,410,174	**113,789,787**	110,361,448
Non-controlling interests		**488,305**	492,478	**-**	-
		486,488,000	460,255,058	**113,789,787**	110,361,448
Total equity		**486,488,000**	460,255,058	**113,789,787**	110,361,448

The above statement of financial position should be read in conjunction with the accompanying notes

Community Housing Limited
Statement of changes in equity
For the year ended 30 June 2020

Group	Notes	Attributable to owners of Community Housing Limited: Other reserves	Retained earnings	Non-controlling interest	Total equity
		$	$	$	$
Balance at 1 July 2018		(588,498)	419,822,128	-	419,233,630
Surplus for the year		-	40,588,046	-	40,588,046
Contribution of Equity		-	-	-	-
Surplus / (Deficit) for the year		-	-	495,974	495,974
Other comprehensive income / (loss)		(59,096)	-	(3,496)	(62,592)
Total comprehensive income for the year		**(59,096)**	**40,588,046**	**492,478**	**41,021,428**
Balance at 30 June 2019		**(647,594)**	**460,410,174**	**492,478**	**460,255,058**
Change in accounting policy	1(z)	-	749,330	-	749,330
Restated balance at 1 July 2019		(647,594)	461,159,504	492,478	461,004,388
Surplus for the year		-	25,858,502	-	25,858,502
Contribution of Equity		-	-	-	-
Surplus / (Deficit) for the year		-	-	(4,173)	(4,173)
Other comprehensive income / (loss)		(370,717)	-	-	(370,717)
Total comprehensive income for the year		**(370,717)**	**25,858,502**	**(4,173)**	**25,483,612**
Balance at 30 June 2020		**(1,018,311)**	**487,018,006**	**488,305**	**486,488,000**

Parent entity	Notes	Retained earnings	Total equity
		$	$
Balance at 1 July 2018		95,057,974	95,057,974
Surplus for the year		15,303,474	15,303,474
Other comprehensive income / (loss)		-	-
Total comprehensive income for the year		**15,303,474**	**15,303,474**
Balance at 30 June 2019		**110,361,448**	**110,361,448**
Change in accounting policy	25	(532,135)	(532,135)
Restated balance at 1 July 2019		109,829,313	109,829,313
Surplus for the year		3,960,474	3,960,474
Other comprehensive income / (loss)		-	-
Total comprehensive income for the year		**3,960,474**	**3,960,474**
Balance at 30 June 2020		**113,789,787**	**113,789,787**

The above statement of changes in equity should be read in conjunction with the accompanying notes

Community Housing Limited
Statement of cash flows
For the year ended 30 June 2020

		Group		Parent entity	
		2020	2019	**2020**	2019
	Notes	**$**	$	**$**	$
Cash flows from operating activities					
Receipts from rent, operational grants and services (inclusive of GST)		**117,772,159**	113,338,178	**75,334,623**	61,352,802
Capital grants, fees and other income received (inclusive of GST)		**7,004,537**	6,396,204	**1,998,581**	4,292,522
Payments to suppliers and employees (inclusive of GST)		**(107,315,292)**	(95,555,020)	**(74,302,298)**	(53,977,470)
		17,461,404	24,179,362	**3,030,906**	11,667,854
Income taxes paid		**(264,603)**	-	**-**	-
Interest received		**181,029**	169,034	**115,068**	40,762
Interest paid		**(4,988,353)**	(5,608,948)	**(1,703,547)**	(1,733,243)
Net cash inflow from operating activities		**12,389,477**	18,739,448	**1,442,427**	9,975,373
Cash flows from investing activities					
Payments for property, plant and equipment		**(871,003)**	(2,141,299)	**(222,026)**	(927,620)
Payments for capital work in progress		**(15,189,126)**	(12,288,064)	**(5,250,558)**	(7,387,844)
Payment for software developments		**(783,999)**	(910,305)	**-**	-
Investment in term deposit		**(2,240,266)**	(4,114,301)	**(2,308,888)**	(4,114,301)
Proceeds/(payments) from sale of investment properties		**1,086,364**	-	**-**	-
Proceeds/(payments) from sale of property, plant and equipment		**161,822**	(118,725)	**89,095**	106,903
Investment in Subsidiaries	22	**-**	(714,000)	**-**	(714,000)
Cash acquired in business combination*	16	**-**	1,615,101	**-**	1,615,101
Net cash (outflow) from investing activities		**(17,836,208)**	(18,671,593)	**(7,692,377)**	(11,421,761)
Cash flows from financing activities					
Proceeds from borrowings		**3,504,239**	7,259,246	**1,742,641**	7,259,246
Repayment of borrowings		**(2,703,047)**	(4,822,438)	**(785,736)**	(1,201,531)
Principal elements of lease payments		**(2,510,877)**	-	**(1,585,790)**	-
Transactions with non-controlling interests		**-**	495,974	**-**	-
Net cash (outflow) / inflow from financing activities		**(1,709,685)**	2,932,782	**(628,885)**	6,057,715
Net increase / (decrease) in cash and cash equivalents		**(7,156,416)**	3,000,637	**(6,878,835)**	4,611,327
Cash and cash equivalents at the beginning of the year		**24,045,747**	21,045,110	**10,813,282**	6,201,955
Cash and cash equivalents at end of year	5	**16,889,331**	24,045,747	**3,934,447**	10,813,282

*On 1 October 2018, Community Housing Company Limited acquired 100% control in Northern Suburbs Housing Corporation for consideration of $0. The net assets acquired amounted to $3,530,207. Refer Note 16 - Business Combinations.

The above statement of cash flows should be read in conjunction with the accompanying notes

1 Summary of significant accounting policies

This note provides a list of all significant accounting policies adopted in the preparation of these consolidated financial statements. These policies have been consistently applied to all the years presented, unless otherwise stated. The financial statements are for the Group consisting of Community Housing Limited and its subsidiaries.

(a) Basis of preparation

These general purpose reduced disclosure financial statements have been prepared in accordance with Australian Accounting Standards and Interpretations issued by the Australian Accounting Standards Board, *Australian Charities and Not-for-profits Commission Act 2012*. Community Housing Limited is a not-for-profit entity for the purpose of preparing the financial statements.

(i) Compliance with Australian Accounting Standards - Reduced Disclosure Requirements

The consolidated financial statements of the Group comply with Australian Accounting Standards - Reduced Disclosure Requirements, interpretations issued by the *Australian Accounting Standards Board and the Australian Charities and Not-for-profits Commission Act 2012*.

(ii) Historical cost convention

These financial statements have been prepared under the historical cost convention, as modified by the revaluation of selected non-current assets, financial assets and financial liabilities for which the fair value basis of accounting has been applied.

(iii) New and amended standards adopted by the Group

The Group has applied the following standards for the first time for the financial year beginning 1 July 2019:

Reference and Title	Summary	Application date of standard	Impact on Group financial report	Application date for Group
AASB 16 Leases	The distinction between operating and finance leases has been removed. Under the new standard, an asset (the right to use the leased item) and a financial liability to pay rentals are recognised. The only exceptions are short-term and low-value leases.	1 January 2019	All leases have been assessed and reflected in the financial accounts in accordance with AASB 16.	1 July 2019

1 Summary of significant accounting policies (continued)

Reference and Title	Summary	Application date of standard	Impact on Group financial report	Application date for Group
AASB 15 Revenue from Contracts with Customers	This standard replaces the existing standards AASB 111 *Construction Contracts* and AASB 118 *Revenue* and incorporates the requirements of IFRS 15 *Revenue from Contracts with Customers* issued by the International Accounting Standards Board (IASB). Under AASB 15 all contracts with customers are assessed against various criteria including- - Identify the contract with the customer - Determine the performance obligations under the contract - Calculate the full transaction price - Allocate the transaction price to each of the performance obligations - Recognise revenue as each performance obligation has been met.	1 January 2019	If a transaction is captured under AASB 15, there is a requirement to recognise revenue upon completion of each specific performance obligation in a contract or over time the services are performed. A value needs to be assigned to these obligations and revenue is recorded as these obligations have been met. If the agreement with the customer does not meet the recognition criteria in AASB 15 then AASB 1058 will be applied (see below). All revenue items have been reviewed and assessed and reflected in the financial accounts in accordance with AASB 15.	1 July 2019

1 Summary of significant accounting policies (continued)

Reference and Title	Summary	Application date of standard	Impact on Group financial report	Application date for Group
AASB 1058 Income for Not-for-Profit Entities	This standard introduces major changes to the income recognition by private sector not-for-profit (NFP) entities. Rather than accounting for all contribution transactions under AASB 1004 Contributions, NFPs will now need to determine whether a transaction is a genuine donation (accounted for under AASB 1058) or a contract with customer (accounted for under AASB 15 Revenue from Contracts with Customers). Implementation guidance has been added to AASB 15 to assist with this determination. AASB 1058 also introduces new requirements for income recognition in several other types of transactions which don't fall within the scope of AASB, including: · obligations to acquire or construct a specific asset for an entity's own use, and · other transactions such as volunteer expenses, donated inventories, endowments and bequests.	1 January 2019	The impact of the standard has been assessed and reflected in the financial accounts in accordance with AASB 1058.	1 July 2019

1 Summary of significant accounting policies (continued)

(iv) New standards and interpretations not yet adopted

Reference and Title	Summary	Application date of standard	Impact on Group financial report	Application date for Group
AASB 2018-7 Amendments to Australian Accounting Standards - Definition of Material [AASB 101 and AASB 108]	The IASB has made amendments to IAS 1 Presentation of Financial Statements and IAS 8 Accounting Policies, Changes in Accounting Estimates and Errors which use a consistent definition of materiality to clarify when information is material.	1 January 2020	The Group must assess materiality in the context of the financial statements as a whole.	1 July 2020
AASB 2018-6 Amendments to Australian Accounting Standards - Definition of a Business [AASB 3]	The amended definition of a business requires an acquisition to include an input and a substantive process that together significantly contribute to the ability to create outputs.	1 January 2020	If acquisitions take place, the amendments will result in more acquisitions being accounted for as asset acquisitions.	1 July 2020
AASB 2019-5 Amendments to Australian Accounting Standards: Disclosure of the Effect of new IFRS Standards Not Yet issued in Australia [AASB 1054]	The standard amends AASB 1054 by adding a new requirement for entities to disclose the potential impact of IFRSs that have not yet been issued by the AASB.	1 January 2020	This disclosure is necessary for entities that wish to state compliance with IFRS, but not required for entities reporting under tier 2 of the reduced disclosure regime.	1 July 2020
AASB 2014 Amendments to Australian Accounting Standards - Sale or Contribution of Assets Between an Investor and its Associate or Joint Venture	The AASB has made limited scope amendments to AASB 10 Consolidated financial statements and AASB 128 Investments in associates and joint ventures. The amendments clarify the accounting treatment for sales or contribution of assets between an investor and its associates or joint ventures.	1 January 2022	Where the non-monetary assets constitute a business, the investor will recognise the full gain or loss on the sale or contribution of assets.	1 July 2022

1 Summary of significant accounting policies (continued)

(v) Going concern consideration

The financial report has been prepared on a going concern basis, which assumes continuity of normal business activities and the realisation of assets and the settlement of liabilities in the ordinary course of business.

The COVID-19 pandemic creates uncertainty on the global and local financial market and it affects the ability of impacted tenants to meet their rental obligations. The Group has completed an extensive assessment on trade receivables and investment properties and the directors remain confident that the Group will be able to continue as a going concern. Refer to Note 1(a) (vi).

(vi) COVID-19 Pandemic

The Group has considered the impact of COVID-19 and other market volatility in preparing its financial statements. While the specific areas of judgement as noted in Note 2 did not change, the impact of COVID-19 resulted in the application of further judgement within those identified areas. Given the evolving nature of COVID-19 and the limited recent experience of the economic and financial impacts of such a pandemic, changes to the estimates and outcomes that have been applied in the measurement of the Group's assets and liabilities may arise in the future. Other than adjusting events that provide evidence of conditions that existed at the end of the reporting period, the impact of events that arise after the reporting period will be accounted for in future reporting periods.

Consideration of the statement of financial position and further disclosures

Key statement of financial position items and related disclosures that have been impacted by COVID-19 were as follows:

(a) Trade and other receivables

The COVID-19 pandemic creates volatility on the global financial market and it affects the ability of impacted tenants to meet their rental obligations. The Group has completed an extensive assessment on trade receivables to determine the recoverability of rental income. Management is reviewing and monitoring tenants' rental payments for any changes on a daily, weekly and monthly basis. To date, the Group has not observed or expect to see material decline on its tenants' ability to pay as a result of the COVID-19 pandemic. Accordingly, no additional expected credit loss allowance pertaining to COVID-19 have been included.

(b) Investment properties

As a result of COVID-19, there is significant valuation uncertainty as a result of a contracted property investment market and less transactional evidence in the current uncertain market. Assessing the fair value of investment property involves uncertainties around underlying assumptions given the constantly changing nature of the situation. Refer to Note 10.

(c) Borrowings and debt covenants

Given the significant reliance on external borrowings, management has continuously been assessing the impact on loan facilities of a potential decrease in investment properties and the impact on bank covenants. To date, there is compliance with all covenants, however management will continue to monitor throughout FY21.

1 Summary of significant accounting policies (continued)

(b) Principles of consolidation

Subsidiaries

The consolidated financial statements incorporate the assets and liabilities of all subsidiaries of Community Housing Limited ('Company' or 'parent entity') as at 30 June 2020 and the results of all subsidiaries for the year then ended. Community Housing Limited and its subsidiaries together are referred to in this financial report as the Group or the consolidated entity.

Subsidiaries are all entities (including structured entities) over which the Group has control. The Group controls an entity when the Group is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power to direct the activities of the entity. Subsidiaries are fully consolidated from the date on which control is transferred to the Group. They are deconsolidated from the date that control ceases.

The acquisition method of accounting is used to account for business combinations by the Group. Intercompany transactions, balances and unrealised gains on transactions between Group companies are eliminated. Unrealised losses are also eliminated unless the transaction provides evidence of the impairment of the asset transferred. Accounting policies of subsidiaries have been changed where necessary to ensure consistency with the policies adopted by the Group.

(c) Foreign currency translation

(i) Functional and presentation currency

Items included in the financial statements of each of the Group's entities are measured using the currency of the primary economic environment in which the entity operates ('the functional currency'). The consolidated financial statements are presented in Australian dollars, which is Community Housing Limited's functional and presentation currency.

(ii) Transactions and balances

Foreign currency transactions are translated into the functional currency using the exchange rates prevailing at the dates of the transactions. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation at year end exchange rates of monetary assets and liabilities denominated in foreign currencies are recognised in profit or loss, except when they are deferred in equity as qualifying cash flow hedges and qualifying net investment hedges or are attributable to part of the net investment in a foreign operation.

Foreign exchange gains and losses that relate to borrowings are presented in the consolidated income statement, within finance costs. All other foreign exchange gains and losses are presented in the consolidated income statement on a net basis within other income or other expenses.

Non-monetary items that are measured at fair value in a foreign currency are translated using the exchange rates at the date when the fair value was determined. Translation differences on assets and liabilities carried at fair value are reported as part of the fair value gain or loss.

(iii) Group companies

The results and financial position of foreign operations (none of which has the currency of a hyperinflationary economy) that have a functional currency different from the presentation currency are translated into the presentation currency as follows:

- assets and liabilities for each balance sheet presented are translated at the closing rate at the date of that statements of financial position
- income and expenses for each consolidated income statement and consolidated statement of comprehensive income are translated at average exchange rates (unless this is not a reasonable approximation of the cumulative effect of the rates prevailing on the transaction dates, in which case income and expenses are translated at the dates of the transactions), and
- all resulting exchange differences are recognised in other comprehensive income.

1 Summary of significant accounting policies (continued)

On consolidation, exchange differences arising from the translation of any net investment in foreign entities, and of borrowings and other financial instruments designated as hedges of such investments, are recognised in other comprehensive income. When a foreign operation is sold or any borrowings forming part of the net investment are repaid, the associated exchange differences are reclassified to profit or loss, as part of the gain or loss on sale.

(d) Revenue recognition

The way in which revenue is accounted for has significantly changed for this reporting period with the implementation of AASB 15 Revenue from Contracts with Customers. AASB 15 replaces both AASB 118 Revenue and AASB 111 Construction Contracts. In addition, the AASB has released AASB 1058 Income of Not-for-Profit Entities (NFPs), which will change the way that NFPs will account for grants and other forms of income.

AASB 15 provides guidance on the following five elements of a contract with a customer:
1 Identifying a contract;
2 Identifying performance obligations under the contract;
3 Determining the transaction price;
4 Allocating the transaction price to each of the performance obligations; and
5 Recognising revenue as each performance obligation is met.

To correctly identify the sources of revenue, the Group has allocated revenue streams into groups to provide a broad overview of the types of revenue earned and to assist in correctly identifying the correct methodology of revenue recognition.

Revenue is recognised for the business activities under the following streams:

(i) Property rental revenue

The Group's major revenue stream is the rental services provided.

Rental revenue is recognised on a straight-line basis over the lease term under AASB 16 Leases (as opposed to the rest of the revenue streams that fall under the scope of AASB 15). Modifications to the leases are accounted for as a new lease from the effective date of the modification, considering any prepaid or accrued lease payments relating to the original lease as part of the lease payments for the new lease.

(ii) Operational grant income

This revenue is based on Government funded grants that are for operational purposes, such as salaries and general operational costs for various programs in which the Group is involved. Government grants are provided as per the agreement with some being received quarterly in advance or half yearly. Each agreement is reviewed individually with the revenue recognised over time. Each contract has unique criteria that requires the assessment be undertaken with reference to the specifics of the contract.

(iii) Property / Client Service grant income

Property / Client service grant income relates to program funding contracts with Governments for specific purposes, with an expectation that key performance targets are met such as assisting a certain number of clients in a specific time frame. Under these arrangements, the contract is allocated a transaction price for the service arrangement with revenue recognised over time, based on activity and or meeting KPI's. Any unspent amount at year-end is recognised as contract liability. Each agreement is assessed individually to ensure accurate recognition of revenue.

(iv) NRAS incentives

NRAS incentives is revenue earned under the National Rental Affordability Scheme (NRAS), which is received from the Federal and State Governments for a fixed annual amount per entitlement. Revenue is recognised over time on a straight line basis and adjusted at the end of the NRAS year (May-April) upon the completion of and acceptance of compliance reporting by Federal Government. The Federal Government then assesses the days where the property was utilised in accordance with NRAS guidelines and advises the Group. Due to the NRAS year ending 30 April, at balance date the Group has a contract asset for the revenue earned in the last two months of the financial year and any unpaid amount from the previous NRAS year.

1 Summary of significant accounting policies (continued)

(v) Recoveries

Recoveries is income related to amounts recovered from tenants or other businesses where it is agreed that the Group may recover the costs incurred. Under these arrangements, revenue is recognised at the time the invoice is raised to external parties which is at a point in time.

(vi) Management fees

Management fees relate to activity where the Group acts as agent and receive fees for managing properties. The revenue and expenses associated with these properties lie with the third party and Group only recognises a management fee over time on a straight line basis as and when the contracts allow.

(vii) Capital grant income

Capital grant income is related to grant received from government bodies or private companies for the purpose of construction or acquisition of properties to further the Group's objectives by providing social / affordable housing. There is ordinarily one performance obligation, being the 'macro-promise' to deliver a completed building to the customer including the design, construction and leasing (if applicable) of the building. The performance obligation is satisfied, and revenue including costs and margin is recognised, over time with progress determined in line with the construction's percentage of completion. The percentage of completion is determined by costs incurred to date as a percentage of total expected costs. As the funding of the construction is received in milestones, there might be a timing difference between the grant received and revenue earned, hence the Company recognises either a contract asset or contract liability depending on the position at each balance date. Each contract is assessed separately to ensure an accurate reflection of recognition of revenue.

Grants received from Government parties pursuant to a funding agreement for the purpose of providing funding for a Long Term Community Residential Accommodation project are recorded as non current contract liabilities . The liability to Government will be amortised progressively over the life of the Project, by transferring an amount to revenue annually in accordance with the terms of the funding agreement. Grant monies are initially recorded as non-current contract liabilities, as should the project be terminated before expiry of the funding agreement period, the unamortised amount outstanding will be repayable to the Government agency, in accordance with the terms of the funding agreement.

(viii) Construction revenue

Construction revenue relates to revenue recognised in relation to the ROSAS project. Refer to note 1(e) for the accounting policy of Service Concession Arrangements.

Contract assets and liabilities

Contract assets represent the Group's right to consideration for services provided to customers for which the Group's right remains conditional on something other than the passage of time. Contract assets comprise NRAS incentives, program funding, capital project funding, and project constructions. Contract liabilities arise where payment is received prior to the work being performed. Contract liabilities include funding received in advance, program surplus' capital grant projects. Contract assets and contract liabilities are recognised and measured in accordance with this accounting policy.

Until 30 June 2019

Revenue is measured at the fair value of the consideration received or receivable. Amounts disclosed as revenue are net of returns, trade allowances, rebates and amounts collected on behalf of third parties.

The Group recognises revenue when the amount of revenue can be reliably measured, it is probable that future economic benefits will flow to the entity and specific criteria have been met for each of the Group's activities as described below. The Group bases its estimates on historical results, taking into consideration the type of customer, the type of transaction and the specifics of each arrangement.

1 Summary of significant accounting policies (continued)

Revenue is recognised for the major business activities using the methods outlined below.

(i) Rental income and NRAS incentives

Rental income from the investment property is accounted for on a straight line basis over the lease term. NRAS incentives are recognised in line with the related rental income.

(ii) Grant revenue

Grant income is recognised in profit or loss when it is controlled or there is a right to receive and it is probable that the economic benefits comprising the contribution will flow to the entity, in accordance with Accounting Standard AASB 1004. When there are conditions attached to grant revenue relating to the use of those grants for specific purposes it is recognised in the statement of financial positions as a liability until such conditions are met or services provided. There are three types of Government grants:

(ii) (a) Operating Administration Project Grants

Project funding or contributions are received in relation to a financial year from Government parties for the purpose of meeting the administrative costs of the Group are included in revenue in that year.

(ii) (b) Capital Project Grants

Grants or contributions are received from Government parties for the purpose of community property acquisition or construction. Some of these grants have been classified as non-current non-interest bearing liabilities on the basis that should properties be sold, a percentage of the current market value is adjusted to reflect the obligations to the Government agencies and the balance is retained by the Group to be reinvested into the business. Grant income is recognised immediately as revenue in the Statements of comprehensive income at time of project milestone completion, where the entity obtains control of the contribution or the right to receive the contribution and the amount of the contribution can be reliably measured, as specified requirements in AASB 1004.

(ii) (c) Long Term Community Residential Accommodation funding

Grants received from Government parties pursuant to a funding agreement for the purpose of providing funding for a Long Term Community Residential Accommodation project are recorded as liabilities to the Office of Housing. The liability to Government will be amortised progressively over the life of the Project, by transferring an amount to revenue annually in accordance with the terms of the funding agreement. Grant monies are initially recorded as non-current non-interest bearing liabilities, as should the project be terminated before expiry of the funding agreement period, the unamortised amount outstanding will be repayable to the Government agency, in accordance with the terms of the funding agreement.

(iii) Services income

Services income represents construction revenue recognised at the stage of completion basis and measured using the proportion of costs incurred to date as compared to expected actual costs. Where losses are anticipated they are provided for in full. Construction revenue has been recognised on the basis of the terms of the contract adjusted for any variations or claims allowable under the contract.

Revenue from the rendering of a service is recognised upon the delivery of the service to the customers, these include:

Consultancy fees

Revenue from consulting services is recognised in the accounting period in which the services are rendered.

Property management fees

Revenue from property management service is recognised when the services are rendered.

Program income

The group provide services in the areas of property maintenance, NRAS establishment program and construction services. Revenue from these services is recognised when the entity has delivered the services and the customers have accepted the services in accordance with the program contracts.

1 Summary of significant accounting policies (continued)

(iv) Project management income – construction of assets for third parties

Project management fees are recognised in line with the related services income. Construction work in progress is valued at cost, plus profits recognised to date less any provision for anticipated future losses. Cost includes both directly incurred costs relating to specific contracts, and those costs that are attributable to the contract activity in general and that can be allocated on a reasonable basis. Construction profits for third party construction contracts are recognised at the state of completion basis and measured using the proportion of costs incurred to date as compared to expected actual costs. Where losses are anticipated they are provided for in full. Construction revenue has been recognised on the basis of the terms of the contract adjusted for any variations or claims allowable under the contract.

(v) Recoveries

Recoveries income are reimbursements of business expenses via third parties which may include water usage, property damage, insurance claims and property costs incurred on behalf of Government housing authorities.

(vi) Other income

Revenue from the rendering of a service is recognised upon the delivery of the service to the customers, these include:

Other fees income

Revenue from non-recurring extraordinary activities is recognised when received

Lease Income

Revenue from office spaces and properties lease is recognised on a straight-line basis over the lease term

(vii) Donations and bequests

Donations and bequests are recognised as revenue when received unless they are designated for a specific purpose, where they are carried forward as prepaid income on the statement of financial position.

(viii) Interest income

Interest income is recognised using the effective interest method and is recognised within Other Income in Note 4.

(e) Service Concession Arrangements

Service Concession Arrangements are recognised where the following criteria have been met for determining whether service arrangements are within the scope of IFRIC 12:

i. Where the grantor controls or regulates what services the operator must provide with the infrastructure, to whom it must provide and at what price

ii. Where the grantor controls, through ownership, beneficial entitlement or otherwise, any significant residual interest in the infrastructure at the end of the service arrangement

iii. Where the infrastructure is constructed or acquired by the operator from a third party or there is existing infrastructure of the grantor to which the operator is given access for the purpose of the service arrangement

The agreements under the Renewing Our Streets and Suburbs (ROSAS) in South Australia is within the scope of IFRIC 12 as the terms of the community housing provider meet all the criteria above.

Consequently, the Group does not recognise the properties and land received for development purposes in the Statement of financial position with respect to the ROSAS agreements.

1 Summary of significant accounting policies (continued)

From a revenue recognition perspective, there are three distinct performance obligations of the agreements:
a) Property rental services provided under a 20-year-long peppercorn lease that is recognised over time on a straight-line basis under AASB 16.
b) Development and construction services are provided on a number of properties where control is being transferred over time. The Group recognises construction revenue by reference to the stage of completion of the contract activity at the end of the reporting period. CHL measures progress using a method that depicts the entity's progress towards satisfying its performance obligation (e.g, cost-to-cost method).
Construction costs are recognised as incurred and simultaneously, a respective portion of the construction revenue will be recognised with the same frequency based upon the total budgeted costs. The operator recognises both construction revenue and a contract asset (or an intangible asset) as it performs the construction performance obligation. A contract asset is recognised to the extent that the Group expects it to be recovered by the cash consideration received from the sale of properties. An intangible asset is recognised in the latter years of the project only when the construction revenue is expected to be recovered through the property rental services of the properties.
c) Selling of properties controlled by the grantor is the last performance obligation. The selling costs is recognised as expense as incurred and the selling revenue is recognised on settlement of the sale of property, which is when the performance obligation has been satisfied.

(f) Income tax

No provision for income tax has been raised for Entities who are exempt from income tax under Division 50 of the Income Tax Assessment Act 1997. Income tax expense represents the sum of the tax currently payable and deferred tax.

Current tax

The tax currently payable is based on taxable profit for the year. Taxable profit differs from profit before tax as reported in the statement of profit or loss and other comprehensive income because of items of income or expense that are taxable or deductible in other years and items that are never taxable or deductible. Current tax is calculated using tax rates that have been enacted or substantively enacted by the end of the reporting period.

Deferred tax

Deferred tax is recognised on temporary differences between the carrying amounts of assets and liabilities in the financial statements and the corresponding tax based used in the computation of taxable profit. Deferred tax liabilities are generally recognised for all taxable temporary differences. Deferred tax assets are generally recognised for all deductible temporary differences to the extent that it is probable that taxable profits will be available against which those deductible temporary differences can be utilised. The carrying amount of deferred tax assets is reviewed at the end of each reporting period and reduced to the extent that it is no longer probable that sufficient taxable profits will be available to allow all or part of the asset to be recovered.

(g) Leases

The Group has changed its accounting policy for leases where the Group is the lessee. The new policy and its impact is described in note 1(z).

The Group's leasing activities and how these are accounted for

The Group leases various offices, equipment and vehicles. Rental contracts are made for various periods with the majority having extension options.

Contracts may contain both lease and non-lease components. The Group allocates the consideration in the contract to the lease and non-lease components based on their relative stand-alone prices. However, for leases of real estate for which the group is a lessee, it has elected not to separate lease and non-lease components and instead accounts for these as a single lease component.

Lease payments are allocated between principal and finance cost. The finance cost is charged to profit or loss over the lease period so as to produce a constant periodic rate of interest on the remaining balance of the liability for each period.

1 Summary of significant accounting policies (continued)

Right-of-use assets are generally depreciated over the shorter of the asset's useful life and the lease term on a straight-line basis. If the group is reasonably certain to exercise a purchase option, the right-of-use asset is depreciated over the underlying asset's useful life.

Payments associated with short-term leases of equipment and vehicles and all leases of low-value assets are recognised on a straight-line basis as an expense in profit or loss. Short-term leases are leases with a lease term of 12 months or less. Low-value assets comprise IT equipment and small items of office furniture.

Lease treatment until 30 June 2019

Until 30 June 2019, leases of property, plant and equipment where the Group, as lessee, had substantially all the risks and benefits of ownership were classified as finance leases. These leased items were capitalised at the lease's inception at the fair value of the leased property or, if lower, the present value of the minimum lease payments. Each lease payment was allocated between the liability and finance cost. The finance cost was charged to the profit or loss over the lease period so as to produce a constant periodic rate of interest on the remaining balance of the liability for each period. The property, plant and equipment acquired under finance leases was depreciated over the asset's useful life or over the shorter of the asset's useful life and the lease term if there was no reasonable certainty that the group will obtain ownership at the end of the lease term.

Leases in which a significant portion of the risks and rewards of ownership were not transferred to the group as lessee are classified as operating leases. Payments made under operating leases (net of any incentives received from the lessor) were charged to profit or loss on a straight-line basis over the period of the lease. Rental income for the Group is based on underlying calculations determined by Housing Policy and is recognised in accordance over the period of the lease.

Lease income from operating leases where the Group is a lessor is recognised in income on a straight-line basis over the lease term. The respective lease assets are included in the balance sheet based on their nature. The Group did not need to make any adjustments to the accounting for assets held as a lessor as a result of adopting the new leasing standard.

(h) Impairment of assets

Goodwill and intangible assets that have an indefinite useful life are not subject to amortisation and are tested annually for impairment, or more frequently if events or changes in circumstances indicate that they might be impaired. Other assets are tested for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment loss is recognised for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs to sell and value-in-use. For the purposes of assessing impairment, assets are grouped at the lowest levels for which there are separately identifiable cash inflows which are largely independent of the cash inflows from other assets or groups of assets (cash-generating units). Non-financial assets other than goodwill that suffered an impairment are reviewed for possible reversal of the impairment at the end of each reporting period.

(i) Business combinations

Acquisitions of businesses are accounted for using the acquisition method. The consideration transferred in a business combination is measured at fair value which is calculated as the sum of the acquisition-date fair values of assets transferred by the acquirer, liabilities incurred by the acquirer to the former owners of the acquiree and the equity instruments issued by the acquirer in exchange for control of the acquiree. Acquisition related costs are recognised in profit or loss as incurred. Gain on bargain purchase is recognised in the profit and loss account when the fair value of net identifiable assets acquired is more than the acquisition date fair value of consideration transferred. Refer Note 16.

1 Summary of significant accounting policies (continued)

(j) Cash and cash equivalents

For the purpose of presentation in the statement of cash flows, cash and cash equivalents includes cash on hand, deposits held at call with financial institutions, other short-term, highly liquid investments with original maturities of three months or less that are readily convertible to known amounts of cash and which are subject to an insignificant risk of changes in value, and bank overdrafts. Bank overdrafts are shown within borrowings in current liabilities in the statements of financial position.

(k) Trade receivables

Trade receivables are recognised initially at fair value and will subsequently be measured at amortised cost using the effective interest method, less loss allowance. Trade receivables are generally due for settlement within 14 days.

Collectability of trade receivables is reviewed on an ongoing basis. An allowance account (provision for impairment of trade receivables) will be used when there is objective evidence that the Group will not be able to collect all amounts due according to the original terms of the receivables.

The Group applies the AASB 9 simplified approach to measuring expected credit losses which uses a lifetime expected loss allowance for all trade receivables and contract assets.

(l) Non-current assets held for sale

Non-current assets are classified as held for sale if their carrying amount will be recovered principally through a sale transaction rather than through continuing use and a sale is considered highly probable. They are measured at the lower of their carrying amount and fair value less costs to sell.

An impairment loss is recognised for any initial or subsequent write-down of the asset to fair value less costs to sell. A gain is recognised for any subsequent increases in fair value less costs to sell of an asset, but not in excess of any cumulative impairment loss previously recognised. A gain or loss not previously recognised by the date of the sale of the non-current asset is recognised at the date of de-recognition.

Non-current assets are not depreciated or amortised while they are classified as held for sale. Interest and other expenses attributable to the liabilities of a disposal group classified as held for sale continue to be recognised.

Non-current assets classified as held for sale are presented separately from the other assets in the statement of financial position.

(m) Derivative Financial Instruments and Hedging

Derivatives are initially recognised at fair value on the date a derivative contract is entered into and are subsequently remeasured to their fair value at the end of each reporting period. The accounting for subsequent changes in fair value depends on whether the derivative is designated as a hedging instrument, and if so, the nature of the item being hedged. The Group designates certain derivatives as either:

- hedges of the fair value of recognised assets or liabilities or a firm commitment (fair value hedges)
- hedges of a particular risk associated with the cash flows of recognised assets and liabilities and highly probable forecast transactions (cash flow hedges), or
- hedges of a net investment in a foreign operation (net investment hedges).

At inception of the hedge relationship, the group documents the economic relationship between hedging instruments and hedged items including whether changes in the cash flows of the hedging instruments are expected to offset changes in the cash flows of hedged items. The Group documents its risk management objective and strategy for undertaking its hedge transactions. The Group utilises derivative financial instruments such as interest rate swaps to manage the risk associated with interest rate. Refer Note 14.

1 Summary of significant accounting policies (continued)

(n) Sale and leaseback

A sale and leaseback transaction involves the sale of an asset and the leasing back of the same asset. The Group has historically entered into Sale and Leaseback transactions. These transactions involve assessing whether a performance obligation is satisfied in AASB 15 such that the transfer of the asset is accounted for as a sale of that asset. The Group considers this condition to have been met. In these transactions the Group was the seller-lessee.

The right-of-use asset is measured as the proportion of the previous carrying amount of the asset that relates to the right of use asset retained by the seller-lessee. That is, the Group recognises only the amount of any gain or loss that relates to the rights transferred to the buyer-lessor. In the current financial year and previous financial year no sale and leaseback transactions were undertaken.

The Group considers the lease payments to be at market rates. Accordingly no adjustments are made to measure the sale proceeds at fair value in prepayments where the payments are below-market terms; or as additional financing provided by the buyer-lessor where the payments are above-market terms.

(o) Property, plant and equipment

Property, plant and equipment, other than land and buildings (investment property) are stated at historical cost less depreciation. Historical cost includes expenditure that is directly attributable to the acquisition of the items. Depreciation is provided on a straight line basis on all property, plant and equipment other than land and buildings which are measured at fair value.

The carrying amount of plant and equipment is reviewed annually to ensure it is not in excess of the recoverable amount from these assets. The recoverable amount is assessed on the basis of the expected net cash flows that will be received from the assets employment and subsequent disposal. The expected net cash flows have been discounted to their present values in determining recoverable amounts.

The cost of fixed assets constructed within the Group includes the cost of materials, direct labour, borrowing costs and an appropriate proportion of fixed and variable overheads.

Subsequent costs are included in the asset's carrying amount or recognised as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the item will flow to the Group and the cost of the item can be measured reliably. The carrying amount of any component accounted for as a separate asset is derecognised when replaced. All other repairs and maintenance are charged to profit or loss during the reporting period in which they are incurred.

The depreciation rates used for each class of depreciable assets are:

Class of fixed assets	*Rate*
Plant and equipment	20% - 40%
Motor vehicles	20% - 33.33%
Right-of-use assets	Straight line over the original length of lease

The assets' residual values and useful lives are reviewed, and adjusted if appropriate, at the end of each reporting period.

An asset's carrying amount is written down immediately to its recoverable amount if the asset's carrying amount is greater than its estimated recoverable amount (note 1(h)).

Gains and losses on disposals are determined by comparing proceeds with carrying amount. These are included in profit or loss. When revalued assets are sold, it is Group policy to transfer any amounts included in other reserves in respect of those assets to retained earnings.

1 Summary of significant accounting policies (continued)

(p) Investment properties

Investment properties are properties held to earn rental and/or capital appreciation. Investment properties are measured initially at cost, including transaction costs. Subsequent to initial recognition, investment properties are measured and recognised at fair value. An investment property is derecognised upon disposal or when the investment property is permanently withdrawn from use and no future economic benefits are expected from the disposal. Any gain or loss arising on derecognition of the property (calculated as the difference between the net disposal proceeds and the carrying amount of the asset) is included in profit or loss in the period in which the property is derecognised.

Investment properties are carried at fair value, which is based on a combination of Director and independent valuations annually or tri-annually. Changes in fair values are recorded as either profit or loss or capital grant liabilities depending on the beneficial owner of the property.

Refer to Note 10 (a) for further details to the uncertainties experienced as a result of COVID.

(q) Intangible assets

Intangible assets acquired separately are measured on initial recognition at cost. The cost of intangible assets acquired in a business combination is their fair value at the date of acquisition. Following initial recognition, intangible assets are carried at cost less amortisation and any impairment losses.

Amortisation

Intangible assets with finite lives are amortised on a straight-line basis over their useful lives and tested for impairment whenever there is an indication that they may be impaired. The amortisation period and method is reviewed at each financial year-end.

Management, Compliance Rights and Computer Software have a useful life of 4-8 years.

Assets with an assumed indefinite useful life are reviewed at each reporting period to determine whether this assumption continues to be appropriate. If not, it is changed to a finite life and accounted for prospectively as a change in accounting estimate.

Derecognition

When an intangible asset is disposed of, the gain or loss on disposal is determined as the difference between the proceeds and the carrying amount of the asset, and is recognised in profit or loss within other income and other expenses.

(r) Trade and other payables

These amounts represent liabilities for goods and services provided to the Group prior to the end of financial year which are unpaid. The amounts are unsecured and are usually paid within 30 days of recognition.

(s) Borrowings

Borrowings are initially recognised at fair value, net of transaction costs incurred. Borrowings are subsequently measured at amortised cost. Any difference between the proceeds (net of transaction costs) and the redemption amount is recognised in profit or loss over the period of the borrowings using the effective interest method. Fees paid on the establishment of loan facilities are recognised as transaction costs of the loan to the extent that it is probable that some or all of the facility will be drawn down. In this case, the fee is deferred until the draw down occurs. To the extent there is no evidence that it is probable that some or all of the facility will be drawn down, the fee is capitalised as a prepayment for liquidity services and amortised over the period of the facility to which it relates.

Borrowings are classified as current liabilities unless the Group has an unconditional right to defer settlement of the liability for at least 12 months after the reporting period.

1 Summary of significant accounting policies (continued)

(t) Borrowing costs

General and specific borrowing costs that are directly attributable to the acquisition, construction or production of a qualifying asset are capitalised during the period of time that is required to complete and prepare the asset for its intended use or sale. Qualifying assets are assets that necessarily take a substantial period of time to get ready for their intended use or sale.

Other borrowing costs are expensed in the period in which they are incurred.

(u) Provisions

Provisions for legal claims, service warranties and make good obligations are recognised when the Group has a present legal or constructive obligation as a result of past events, it is probable that an outflow of resources will be required to settle the obligation and the amount can be reliably estimated. Provisions are not recognised for future operating losses.

Where there are a number of similar obligations, the likelihood that an outflow will be required in settlement is determined by considering the class of obligations as a whole. A provision is recognised even if the likelihood of an outflow with respect to any one item included in the same class of obligations may be small.

Provisions are measured at the present value of management's best estimate of the expenditure required to settle the present obligation at the end of the reporting period. The discount rate used to determine the present value is a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability. The increase in the provision due to the passage of time is recognised as interest expense.

(v) Employee benefits

(i) Short-term obligations

Liabilities for wages and salaries, including non-monetary benefits and annual leave expected to be settled within 12 months after the end of the period in which the employees render the related service are recognised in respect of employees' services up to the end of the reporting period and are measured at the amounts expected to be paid when the liabilities are settled. The liability for annual leave is recognised in the provision for employee benefits. All other short term employee benefit obligations are presented as payables.

(ii) Other long-term employee benefit obligations

The liabilities for long service leave and annual leave are not expected to be settled wholly within 12 months after the end of the period in which the employees render the related service. They are therefore measured as the present value of expected future payments to be made in respect of services provided by employees up to the end of the reporting period using the projected unit credit method. Consideration is given to expected future wage and salary levels, experience of employee departures and periods of service. Expected future payments are discounted using market yields at the end of the reporting period of government bonds with terms and currencies that match, as closely as possible, the estimated future cash outflows. Remeasurements as a result of experience adjustments and changes in actuarial assumptions are recognised in profit or loss.

The obligations are presented as current liabilities in the statements of financial position if the entity does not have an unconditional right to defer settlement for at least twelve months after the reporting date, regardless of when the actual settlement is expected to occur.

(w) Contributions

The Group receives non reciprocal contributions from the government and other parties for no value or a nominal value. These contributions are recognised at the fair value on the date of acquisition upon which time an asset is taken up in the statements of financial position and revenue in the statements of comprehensive income. See further details in Note 1(d).

1 Summary of significant accounting policies (continued)

(x) Goods and Services Tax (GST)

Revenues, expenses and assets are recognised net of the amount of associated GST, unless the GST incurred is not recoverable from the Australian Taxation Office. In this case it is recognised as part of the cost of acquisition of the asset or as part of the expense.

Receivables and payables are stated inclusive of the amount of GST receivable or payable. The net amount of GST recoverable from, or payable to, the Australian Taxation Office is included with other receivables or payables in the statements of financial position.

Cash flows are presented on a gross basis. The GST components of cash flows arising from investing or financing activities which are recoverable from, or payable to the Australian Taxation Office, are presented as operating cash flows.

(y) Rounding of amounts

The Group refers to ASIC Corporations Instrument 2016/191, relating to the 'rounding off' of amounts in the Directors' report and financial report. Amounts in the Directors' report and financial report have been rounded off to the nearest dollars in accordance with the instrument.

(z) Changes in accounting policy, accounting standards and interpretations

AASB 15 Contracts with customers

The Group has adopted AASB 15 Revenue from contracts with Customers from 1 July 2019 which resulted in changes in accounting policies and adjustments to the amounts recognised in the financial statements. In summary, the following adjustment was made to the amounts recognised in the balance sheet at the date of initial application (1 July 2019) for the capital grant income revenue stream to recognise revenue over time on a percentage of completion basis:

Group	30 June 2019	AASB15	1 July 2019
Non-interest bearing liabilities	8,779,837	(749,330)	8,030,507
Retained earnings	460,410,174	749,330	461,159,504

Parent	30 June 2019	AASB15	1 July 2019
Non-interest bearing liabilities	800,930	532,135	1,333,065
Retained earnings	110,361,448	(532,135)	109,829,313

AASB 16 Leases

This note explains the impact of the adoption of AASB 16 Leases on the Group's financial statements.

Lease treatment post 30 June 2019

As indicated in note 1(a)(iii) above, the Group has adopted AASB 16 Leases retrospectively from 1 July 2019, but has not restated comparatives for the 2019 reporting period, as permitted under the specific transition provisions in the standard. The reclassifications and the adjustments arising from the new leasing rules are therefore recognised in the opening balance sheet on 1 July 2019. The new accounting policies are disclosed in note 8(b)(iii).

The Group adopted AASB 16 using the modified retrospective method of adoption, with the date of initial application of 1 July 2019. Under this method, the standard is applied retrospectively with the cumulative effect on initially applying the standard recognised at the date of initial application. The Group elected to use the transition practical expedient to not reassess whether a contract is, or contains, a lease at 1 July 2019. Instead, the Group applied the standard only to contracts that were previously identified as leases applying AASB 17 and AASB Interpretation 4 at the date of initial application.

1 Summary of significant accounting policies (continued)

On adoption of AASB 16, the Group recognised lease liabilities in relation to leases which had previously been classified as 'operating leases' under the principles of AASB 117 Leases. These liabilities were measured at the present value of the remaining lease payments, discounted using the lessee's incremental borrowing rate as of 1 July 2019. The weighted average lessee's incremental borrowing rate applied to the lease liabilities on 1 July 2019 was 5%.

For leases previously classified as finance leases the Group recognised the carrying amount of the lease asset and lease liability immediately before transition as the carrying amount of the right of use asset and the lease liability at the date of initial application. The measurement principles of AASB 16 are only applied after that date. The remeasurements to the lease liabilities were recognised as adjustments to the related right-of-use assets immediately after the date of initial application.

(i) Practical expedients applied

In applying AASB 16 for the first time, the Group has used the following practical expedients permitted by the standard:

- applying a single discount rate to a portfolio of leases with reasonably similar characteristics,
- relying on previous assessments on whether leases are onerous as an alternative to performing an impairment review - there were no onerous contracts as at 1 July 2019,
- accounting for operating leases with a remaining lease term of less than 12 months as at 1 July 2019 as short-term leases,
- excluding initial direct costs for the measurement of the right-of-use asset at the date of initial application, and
- using hindsight in determining the lease term where the contract contains options to extend or terminate the lease.

The Group has also elected not to reassess whether a contract is, or contains a lease at the date of initial application. Instead, for contracts entered into before the transition date the Group relied on its assessment made applying AASB 117 and Interpretation 4 *Determining whether an Arrangement contains a Lease* .

(ii) Measurement of lease liabilities

The following table shows the reconciliation of lease liabilities at 1 July 2019. The discount rate used for initial recognition of lease liabilities at 1 July 2019, being the Group weighted average incremental borrowing rate at that date was 5%.

	Group	Parent entity
	2020	2020
	$	$
Operating lease commitments disclosed as at 30 June 2019	**13,766,289**	**8,381,448**
(Less): Excluded Short Term Leases	**(212,724)**	**(85,813)**
(Less): Leases not commenced at 1 July 2019	**(243,169)**	**(243,169)**
Add: Reassessment of Lease Contracts	**1,356,054**	**987,523**
(Less): Discounted using the lessee's incremental borrowing rate at the date of initial application	**(2,850,174)**	**(1,448,668)**
Lease liability recognised as at 1 July 2019	**11,816,276**	**7,591,321**
Of which are:		
Current lease liabilities	**2,670,353**	**1,419,439**
Non-current lease liabilities	**9,145,923**	**6,171,882**
	11,816,276	**7,591,321**

1 Summary of significant accounting policies (continued)

(iii) Recognition of Right-of-use assets

The following table shows the Right-of-use assets at 1 July 2019:

	Group	Parent entity
	$	$
Right-of-use assets		
Buildings	9,858,978	6,753,535
Equipment	536,788	310,708
Vehicles	728,684	362,776
	11,124,450	7,427,019

1 Summary of significant accounting policies (continued)

Peppercorn Leases

Various State Governments provide properties to the Group to ensure affordable and social housing solutions are available to people on low incomes. These properties are provided to the Group on a peppercorn lease basis over the term of the individual agreements.

The Group has elected to measure right-of-use assets at cost rather than fair value and considers the impact on the accounts to be immaterial in nature.

The details of the Group's peppercorn leases are as follows:

Program	Number of Properties	Lease Term	Lease Payment
NSW Social Housing Management Transfer	1283	20 years	$1
NSW Community Housing Leasing Program	512	Original was 3 years to Nov-18 and extended monthly thereafter	$1
SA Renewing Our Streets and Suburbs Program	797	20 years	$0
SA Employment Related Accommodation Program	9	10 years	$0
SA Neami Program	22	From 20/02/2011	$0
SA Neami Head Lease Program	5	From 20/02/2011	$0
SA National Building Economic Stimulus Program	5	From 06/11/2010	$0
WA Community Disability Housing Program	31	10 years	$1
WA Geraldton Program	56	9 years	$1
WA Public Housing Leasing Program - Kununurra	5	2 years	$1
WA Disabled Program	7	25 years	$1
WA CCB - (mental health & disability)	81	10 years	$1
WA Exmouth Laurence Retirement Village Program	35	25 years	$1
WA Perth Program	80	10 years	$1
WA Perth Multicultural Program	4	10 years	$1
WA Property Maintenance with Neami & Mental Health Commission Program	22	10 years	$1
TAS Better Housing Futures - Residential Management Agreement	1130	10 years	$0
VIC Moreland City Council	13	40 years	$1
VIC City of Darebin	4	3 Years	$1
VIC Ferntree Gully - Long Term Leased Properties	79	5 Years	$1
VIC GEGAC Long Term Program	34	2 Years	$1
VIC Group Housing Program	37	5 Years	$2
VIC Innovative Accommodation and Support Initiative	7	50 Years	$1
VIC Housing Provider Framework	46	5 Years	$2
VIC Leased from Officer of Housing	2	5 Years	$2
VIC Manningham City Council	4	6 Years	$10
VIC West Gippsland Healthcare Group	3	6 Years	$10
VIC East Gippsland Shire Council Program	6	3 Years	$1

There are no other standards that are not yet effective and that are expected to have a material impact on the Group in the current or future reporting periods and on foreseeable future transactions.

2 Critical estimates and judgements

The directors evaluate estimates and judgments incorporated into the financial report based on historical knowledge and best available current information. Estimates assume a reasonable expectation of future events and are based on current trends and economic data, obtained both externally and within the Group.

Estimated fair values of investment properties

The Group carries its investment properties at fair value with changes in the fair values recognised in profit or loss or capital grant liabilities, depending on the beneficial owner of the property. Independent valuations are obtained every three years. Independent valuations are also obtained for all residential properties where construction has been completed by the company in the current financial year and the property has been transferred from Capital Works in Progress to Investment Properties. At the end of each reporting period, the directors update their assessment of the fair value of each property, taking into account the most recent independent valuations and analyse individual residential property by suburb. Independent valuations are performed by independent valuers who hold recognised and relevant professional qualifications and experience in the location of the investment property being valued. Refer Note 8 and 10.

Expected credit losses for trade receivables

Trade receivables are written off where there is no reasonable expectation of recovery. Indicators that there is no reasonable expectation of recovery included, amongst others, the failure of a debtor to engage in a repayment plan with the Group, and a failure to make contractual payments for a period of greater than 120 days past due.

Impairment losses on trade receivables are presented as net impairment losses within operating profit. Subsequent recoveries of amounts previously written off are credited against the same line item.

3 Revenue

(a) Property rental revenue

	Group		Parent entity	
	2020	2019	**2020**	2019
	$	$	**$**	$
Rental income	**87,330,968**	78,661,398	**57,631,443**	48,607,490
	87,330,968	78,661,398	**57,631,443**	48,607,490

(b) Revenue from contracts with customers

(i) Disaggregation of revenue from contracts with customers

The Group derives revenue from the transfer of services over time and at a point in time in the following revenue streams and geographical regions:

2020	**VIC** **$**	**NSW** **$**	**Other States *** **$**	**Total** **$**
Operational grant income	3,843,808	2,954,847	5,380,196	12,178,851
Property/Client service grant income	2,933,403	1,693,406	9,735	4,636,544
NRAS incentives	1,633,979	1,282,648	2,286,821	5,203,449
Recoveries	660,776	2,653,880	3,472,217	6,786,872
Management fees	185,849	429,542	6,662,778	7,278,168
Capital grant income	10,180,576	134,578	260,830	10,575,984
Construction revenue	-	-	2,171,781	2,171,781
Other income	365,640	173,729	1,592,451	2,131,821
	19,804,031	9,322,630	21,836,809	50,963,471
Timing of revenue recognition				
At a point in time	1,026,416	2,827,609	5,064,668	8,918,693
Over time	18,777,615	6,495,021	16,772,141	42,044,778
	19,804,031	9,322,630	21,836,809	50,963,471

* Total Revenue for Other States includes Queensland ($10,124,050), Tasmania ($2,515,286), South Australia ($3,481,905), Western Australia ($5,494,792) and International ($220,776).

2019	**VIC** **$**	**NSW** **$**	**Other States *** **$**	**Total** **$**
Operational grant income	3,839,609	2,479,551	3,737,509	10,056,670
Property/Client service grant income	2,967,145	666,338	-	3,633,483
NRAS incentives	3,092,575	1,789,446	2,112,817	6,994,839
Recoveries	576,256	1,087,205	2,534,486	4,197,946
Management fees	212,442	345,857	5,066,589	5,624,888
Other income	111,405	41,183	2,145,717	2,298,305
	10,799,432	6,409,580	15,597,118	32,806,130
Timing of revenue recognition				
At a point in time	687,660	1,128,388	4,680,202	6,496,250
Over time	10,111,772	5,281,192	10,916,916	26,309,880
	10,799,432	6,409,580	15,597,118	32,806,130

* Total Revenue for Other States includes Queensland ($6,635,345), Tasmania ($2,308,474), South Australia ($1,271,827) and Western Australia ($5,381,472).

3 Revenue (continued)

(b) Revenue from contracts with customers

(ii) Assets and liabilities related to contracts with customers

The Group has recognised the following assets and liabilities related to contracts with customers:

	Group	Parent entity
	2020	**2020**
	$	**$**
Current contract assets relating to contracts	**11,463,600**	**6,612,405**
Total contract assets	**11,463,600**	**6,612,405**
Current contract liabilities relating to contracts	**3,296,298**	**1,027,910**
Non current contract liabilities relating to contracts	**9,502,154**	**5,171,660**
Total contract liabilities	**12,798,452**	**6,199,570**

(c) Other income

	Group		Parent entity	
	2020	2019	**2020**	2019
	$	$	**$**	$
Fair value gain/(loss) on to investment properties	**10,407,113**	31,168,020	**(2,138,923)**	7,081,641
Fair value gain/(loss) on housing assets	**158,909**	(6,232)	**-**	(6,232)
Fair value gain/(loss) on completed capital work in progress assets	**1,578,045**	(1,885,526)	**909,772**	(1,885,526)
Net gain / (loss) on disposal of property, plant and equipment	**46,646**	(91,193)	**25,859**	(17,026)
Gain on reduction of capital grant liabilities	**(546,992)**	1,897,078	**-**	1,633,900
Donations	**46**	20,523	**45**	20,523
Interest income	**196,041**	205,672	**115,068**	77,399
Government incentives	**270,358**	-	**-**	-
	12,110,166	31,308,342	**(1,088,179)**	6,904,679

4 Income tax expense

Group	2020 $	2019 $
Statement of comprehensive income*		
Tax reconciliation		
Profit before tax	747,964	844,586
Income tax at the statutory tax rate of 30%	224,389	253,376
Non-deductible items	33,784	33,346
	258,173	286,722
Statement of financial position *		
Under provision in prior period	-	2,533
	-	2,533
Deferred income tax liability:		
Accelerated depreciation for tax purposes	214,355	169,968
Accrued income	671,084	620,163
Assessed Loss	(113,014)	(292,565)
Accrued expenses	(36,436)	(19,750)
	735,989	477,816

* Income tax liability is wholly related to the financial results from business operations in the Australian Affordable Housing Securities Limited which is a subsidiary of Community Housing Queensland Limited (formerly Horizon Housing Company Limited).

Recognition and measurement

Current income tax

The income tax expenses for the period comprises current income tax expense and deferred tax expense. Current income tax expense charged to the profit or loss is the tax payable on taxable income calculated using application income tax rates enacted, or substantially enacted, as at reporting date. Current tax liabilities are therefore measured at the amounts expected to be paid to the relevant taxation authority. Additional income tax arise from the distribution of dividends are recognised at the same time as the liability to pay the related dividend. The estimated average annual tax rate used for the year to 30 June 2020 is 30%.

Deferred income tax

Deferred income tax expense reflects movements in deferred tax asset and deferred tax liability balances during the period as well as unused tax losses. Deferred tax assets and liabilities are ascertained based on temporary differences arising between the tax bases of assets and liabilities and their carrying amounts in the financial statements. Deferred tax assets also result where amounts have been fully expensed but future tax deduction are available. Deferred tax assets and liabilities are calculated at the tax rates that are expected to apply to the period when the asset is realised, or the liability is settled, based on tax rates enacted or substantively enacted at the reporting date. Their measurement also reflects the manner in which management expects to recover or settle the carrying amount of the related asset or liability. A deferred tax asset is recognised only to the extent that it is probable that future taxable profits will be available against which the asset can be utilised. Deferred tax assets are reduced to the extent that it is no longer probable that the related tax benefit will be realized.

Current tax assets and liabilities

The current tax asset of $nil (2019: current tax asset of $174,188) represents the amount of income tax receivable/payable in respect of current and prior periods to the relevant taxation authority.

5 Current assets - Cash and cash equivalents

	Group		Parent entity	
	2020	2019	**2020**	2019
	$	$	**$**	$
Cash at bank and in hand*	**16,889,331**	24,045,747	**3,934,447**	10,813,282
	16,889,331	24,045,747	**3,934,447**	10,813,282

*Cash at bank includes partly committed funds for programs and projects in New South Wales, Queensland, South Australia, Tasmania, Victoria and Western Australia. The Group's committed fund is $5,280,554 (2019: $3,020,233). The Parent entity's committed fund is $1,316,478 (2019: $1,414,941).

6 Current assets - Trade and other receivables

	Group		Parent entity	
	2020	2019	**2020**	2019
	$	$	**$**	$
Trade receivables from contracts with customers	**4,797,080**	7,331,525	**3,018,411**	4,113,455
Loss allowance	**(3,434,721)**	(2,335,824)	**(2,457,066)**	(1,799,893)
	1,362,359	4,995,701	**561,345**	2,313,562
Contract assets *	**11,463,600**	-	**6,612,405**	-
Other receivables	**1,170,218**	3,977,064	**664,620**	2,250,601
Term Deposits	**6,862,173**	4,621,907	**6,584,399**	4,275,511
Amounts receivable from related parties	**-**	-	**231,407**	63,449
Prepayments	**1,486,804**	1,871,792	**770,438**	1,102,277
	22,345,154	15,466,464	**15,424,614**	10,005,400

* The Group's contract assets includes NRAS incentives receivable of $4,865,686, program funding receivable of $1,164,771, project funding receivable of $1,599,052, SA ROSAS project contract asset of $1,878,789 and management fees receivable $1,955,302.

* The Parent entity's contract assets includes NRAS incentives receivable of $4,130,300, program funding receivable of $603,316 and SA ROSAS project contract asset of $1,878,789.

7 Current assets - Assets classified as held for sale

		Group		Parent entity	
		2020	2019	**2020**	2019
	Notes	**$**	$	**$**	$
Assets classified as held for sale		**-**	225,628	**-**	-
		-	225,628	**-**	-

Assets classified as held for sale are measured at the lower of their carrying amount and fair value less costs to sell.

8 Non-current assets

(a) Property, plant and equipment

Group	Notes	**Plant and equipment** **$**	**Assets under construction** **$**	**Total** **$**
At 30 June 2019				
Cost or fair value		11,840,524	10,690,138	22,530,662
Accumulated depreciation		(9,120,272)	-	(9,120,272)
Net book amount		2,720,252	10,690,138	13,410,390
Year ended 30 June 2020				
Opening net book amount		2,720,252	10,690,138	13,410,390
Additions		871,003	15,189,126	16,060,129
Transfers to investment properties	10	-	(11,820,936)	(11,820,936)
Depreciation charge		(1,024,015)	-	(1,024,015)
Transfer to asset held for sale and disposed		-	(769,496)	(769,496)
Impairments / write-downs		(22,522)	-	(22,522)
Closing net book amount		2,544,718	13,288,832	15,833,550
At 30 June 2020				
Cost or fair value		12,689,005	13,288,832	25,977,837
Accumulated depreciation		(10,144,287)	-	(10,144,287)
Net book amount		2,544,718	13,288,832	15,833,550

8 Non-current assets (continued)

Parent entity	Notes	Plant and equipment $	Assets under construction $	Total $
At 30 June 2019				
Cost or fair value		4,508,070	2,189,413	6,697,483
Accumulated depreciation		(3,471,685)	-	(3,471,685)
Net book amount		1,036,385	2,189,413	3,225,798
Year ended 30 June 2020				
Opening net book amount		1,036,385	2,189,413	3,225,798
Additions		222,026	5,250,557	5,472,583
Transfers to investment properties	10	-	(6,636,034)	(6,636,034)
Depreciation charge		(291,543)	-	(291,543)
Transfers to asset held for sale and disposed		-	(58,421)	(58,421)
Closing net book amount		966,868	745,515	1,712,383
At 30 June 2020				
Cost or fair value		4,730,096	745,515	5,475,611
Accumulated depreciation		(3,763,228)	-	(3,763,228)
Net book amount		966,868	745,515	1,712,383

The Group and Parent entity assessed at 30 June 2020 whether there are any indicators of impairment. Other than the amounts impaired above there are no indications that an additional impairment is required, that is, where the carrying amount of an asset exceeds its recoverable amount.

8 Non-current assets (continued)

(b) Leases

This note provides information for leases when the Group is a lessee.

	Group	Parent entity
	2020	**2020**
	$	$
(i) *Amounts recognised in the balance sheet*		
The balance sheet shows the following amounts relating to leases:		
Right-of-use assets		
Buildings	**8,105,274**	**5,931,093**
Equipment	**340,423**	**199,123**
Vehicles	**884,082**	**593,270**
	9,329,779	**6,723,486**
Lease liabilities		
Current	**2,976,066**	**1,847,758**
Non-current	**7,286,461**	**5,323,445**
	10,262,527	**7,171,203**

* In the previous year, the entity only recognised lease assets and lease liabilities in relation to leases that were classified as 'finance leases' under AASB 117 *Leases*. The assets were presented in property, plant and equipment and the liabilities as part of the Group's borrowings.

Additions to the Group's right-of-use assets during the 2020 financial year was $1,347,721 (Parent Entity $1,165,672).

(ii) *Amounts recognised in the statement of profit or loss*

	Group	Parent entity
	2020	**2020**
	$	$
Depreciation charge of right-of-use assets		
Buildings	**2,430,429**	**1,465,436**
Equipment	**203,268**	**118,488**
Vehicles	**534,334**	**285,281**
	3,168,031	**1,869,205**
Interest expense (included in finance cost)	**553,189**	**377,505**
Expense relating to short-term leases (included in cost of goods sold and administrative expenses)	**108,901**	**44,639**
Expense relating to leases of low-value assets that are not shown above as short-term leases (included in administrative expenses)	**104,768**	**-**

The total cash outflow for the Group's leases in 2020 was $3,012,469 (Parent Entity $1,963,295)

9 Non-current assets - Intangible assets

Group	Management and Compliance Rights $	Computer Software $	Total $
At 30 June 2019			
Cost or fair value	3,538,899	2,391,273	5,930,172
Accumulated depreciation	(831,958)	(320,192)	(1,152,150)
Net book amount	2,706,941	2,071,081	4,778,022
Year ended 30 June 2020			
Opening net book amount	2,706,941	2,071,081	**4,778,022**
Additions	198,860	548,619	**747,479**
Assets Under Construction	-	36,520	**36,520**
Impairment	-	(1,147,940)	**(1,147,940)**
Depreciation charge	(678,706)	(287,875)	**(966,581)**
Closing net book amount	2,227,095	1,220,405	**3,447,500**
At 30 June 2020			
Cost or fair value	3,737,759	1,828,472	**5,566,231**
Accumulated depreciation	(1,510,664)	(608,067)	**(2,118,731)**
Net book amount	2,227,095	1,220,405	**3,447,500**

10 Non-current assets - Investment properties

	Group		Parent entity	
	2020 $	2019 $	**2020 $**	2019 $
At fair value				
Opening balance	**686,806,473**	606,058,964	**221,195,929**	170,681,918
Additions	**11,820,936**	12,300,680	**6,636,034**	8,755,526
Acquired through business combination*	**-**	36,721,620	**-**	36,721,620
Net gain / (loss) from fair value adjustments through Capital Grant Liabilities	**(738,602)**	2,442,715	**(738,602)**	(118,695)
Net gain / (loss) from fair value adjustments through income statement**	**11,985,158**	29,282,494	**(1,229,152)**	5,196,115
Net (loss) from fair value - transferred to Horizon Group	**-**	-	**-**	(40,555)
Closing balance	**709,873,965**	686,806,473	**225,864,209**	221,195,929

* Note 16 for Business combination

** Note 3 (c)

10 Non-current assets - Investment properties (continued)

(a) Valuation basis and restrictions upon realisation of assets

The Group obtains independent valuations for its investment properties at least every three years. Independent valuations are also obtained for all residential properties where construction has been completed by the Group in the current financial year and the property has been transferred from Assets Under Construction to Investment Properties. At the end of each reporting period, the directors update their assessment of the fair value of each property, taking into account the most recent independent valuations and an analysis of individual residential property by suburb. The Directors determine a property's value within a range of reasonable fair value estimates using relevant RP data reports. The best evidence of fair value is current prices in an active market for similar residential properties.

The ongoing COVID-19 pandemic has increased the estimation uncertainty in the preparation of these financial statements and there is significant valuation uncertainty given there is less transactional evidence in the current uncertain market. Assessing the fair value of investment property involves uncertainties around underlying assumptions given the constantly changing nature of the situation.

Given the unknown future impact that COVID-19 might have on the real estate market, coupled with a lower interest rate environment, a higher degree of judgement and consideration is required in assessing the significant inputs that determine property valuations. The Group and external valuers acknowledge current valuations are subject to 'material valuation uncertainty' as a consequence of this.

In the current year property valuations have been undertaken on one third of the Group's property portfolio during the year in accordance with the 3-year valuation cycle mentioned above. As a specific response to the material valuation uncertainty risk due to the pandemic, additional analysis was also undertaken at 30 June 2020 to assess the possible impact of COVID-19 on the whole of the Group's property portfolio. This included obtaining Real Property (RP) data and an indexation report from the external valuers. The results of this were used to risk assess whether there had been any significant decline in property valuations at 30 June 2020 which would then warrant further desktop or full valuations being performed. Following this analysis, the Group selected a sample of properties in higher risk suburbs for further desktop assessments carried out by independent external valuers. These have indicated that the values as of 30 June 2020 have not changed significantly hence no adjustment was needed for those higher risk areas.

The Directors have reviewed the results of the above and concluded that whilst the current valuations still remain subject to 'material valuation uncertainty', there was no evidence available which would suggest that property valuations had materially decreased at 30 June 2020.

Even though there is little evidence to suggest that the real estate market has softened since the onset of COVID-19, as the pandemic progresses and the government stimulus is expected to diminish in FY21, according to the independent external valuers, it is not unreasonable to suggest that the real estimate market may experience a significant decline in the next 12-18 months.

The following table provides information about the sensitivity of the carrying amounts of the investment properties should the fair value increase/decrease by 5%.

	Group	Parent entity
	$	$
+5%	745,367,663	237,157,419
-5%	674,380,267	214,570,999

10 Non-current assets - Investment properties (continued)

There are restrictions on the remittance of income and proceeds upon disposal of certain investment properties. These restrictions are as follows:

(i) certain assets are subject to first mortgage security arrangements with third party financial institutions. Investment properties with such restrictions are disclosed in Note 13(b)(i).

(ii) where the beneficial owner of an investment property is a party other than the Group there are restrictions on the remittance of income and proceeds. A liability is recognised at an amount equivalent to the carrying value of the asset subject to the restriction when the beneficial owner of the investment property is not the Group. Investment properties with such restrictions are disclosed in Note 13(b)(ii).

(iii) the Group is a recipient of capital grants and contributions of assets by various statutory bodies and the relevant statutory bodies generally retain a legal interest in the investment properties and place certain restrictions on the use of those assets. While there are a number of different arrangements in place, the restrictions generally has the effect of preventing legal dealings of these properties without the consent of the relevant statutory bodies under the respective agreements. The entity is able to borrow against these property assets and secure borrowings by mortgage.

Group

Investment properties are carried at fair value. Changes in fair values of $11,246,556 (2019: $31,725,209) are presented in the statements of comprehensive income of $11,985,158 gain (2019: $29,282,494 gain) as part of other income and in the statements of financial position of $738,602 loss (2019: $2,442,715 gain) as part of capital grant liabilities.

Parent entity

Investment properties are carried at fair value. Changes in fair values of $1,967,754 loss (2019: $5,036,865 gain) are presented in the statements of comprehensive income of $738,601 loss (2019: $5,196,115 gain) as part of other income, in the statements of financial position of $1,229,151 loss (2019: $118,695 loss) as part of capital grant liabilities and $nil (2019: $40,555 loss) as a transfer to Horizon Group.

(b) Assets pledged as security

Refer to Note 13 for information on non-current assets pledged as security by the parent entity or its controlled entities.

Investment properties are measured initially at its cost, including transaction costs. Subsequent to initial recognition, investment properties are measured at fair value.

(c) Contractual obligations

Refer to Note 20 for disclosure of any contractual obligations to purchase, construct or develop investment property or for repairs, maintenance or enhancements.

10 Non-current assets - Investment properties (continued)

(d) Additions of investment properties

Parent Entity
The investment properties additions of $6,636,034 (2019: $8,755,526) consisting of completed property transfer of $6,358,412 (2019: $8,755,526) from assets under construction, and property capital movement of $277,622 (2019: $nil) relating to solar panel installations. See Note 7.

Group
The investment property additions of $11,820,937 (2019: $12,300,680) consisting of completed property transfer of $10,220,141 (2019: $8,755,526), contribution of properties transfers of $nil (2019: $3,170,000), property capital improvement of $625,517 (2019: $375,154) relating to solar panel installations and investment property acquisitions of $975,279 (2019: $nil). See Note 7.

(e) Leasing arrangements

The investment properties are leased to tenants with rentals payable monthly. Lease payments for some contracts include CPI increases, but there are no other variable lease payments that depend on an index or rate. Where considered necessary to reduce credit risk, the group may obtain bank guarantees for the term of the lease.

Parent Entity
Rental income for the year was $57,631,443 (2019: $48,607,490). The rental agreements with the Company's tenants are no more than 12 months, at which time the tenancy agreement reverts to a month to month basis.

Group
Rental income for the year was $87,330,968 (2019: $78,661,398). The rental agreements with the Group's tenants are no more than 12 months, at which time the tenancy agreement reverts to a month to month basis.

11 Intercompany Receivables

	Group		Parent entity	
	2020	2019	**2020**	2019
	$	$	**$**	$
Foreign intercompany receivables	**-**	-	**5,931,064**	4,806,213
Loss Allowance	**-**	-	**(2,538,101)**	(2,421,989)
	-	-	**3,392,963**	2,384,224

12 Current liabilities - Trade and other payables

	Notes	Group 2020 $	Group 2019 $	Parent entity 2020 $	Parent entity 2019 $
Amounts payable to related parties		**-**	-	**799,499**	613,993
Revenue in advance - Grants and Allowances		**-**	2,324,435	**-**	715,518
Contract liabilities **		**3,296,298**	-	**1,027,910**	-
Revenue in advance - Rent and Other		**2,145,876**	1,817,732	**1,585,668**	1,600,989
Trade payables and accrued expenses *		**10,489,818**	11,542,993	**6,801,156**	7,759,315
		15,931,992	15,685,160	**10,214,233**	10,689,815

* Trade and other payables are carried at fair value.

** The Group's contract liabilities includes funding received in advance of $1,809,578 and program surplus of $1,486,720.

** The Parent entitiy's contract liabilities includes funding received in advance of $4,423 and program surplus of $1,023,487.

13 Liabilities - Borrowings and other liabilities

	Group 2020 $	Group 2019 $	Parent entity 2020 $	Parent entity 2019 $
Current borrowings				
Secured				
Bank loans*	**3,007,959**	40,581,340	**798,200**	677,000
Preference shares	**120,000**	-	**-**	-
Unsecured				
Other loans	**10,883**	9,944	**-**	-
	3,138,842	40,591,284	**798,200**	677,000
Non-current borrowings				
Secured				
Bank loans*	**104,468,785**	66,095,151	**43,207,175**	42,371,471
Preference Shares	**-**	120,000	**-**	-
	104,468,785	66,215,151	**43,207,175**	42,371,471
Unsecured – non-interest bearing				
Contract liabilities	**9,502,154**	-	**5,171,660**	-
Project liabilities	**1,190,000**	8,779,837	**-**	800,930
Capital grant liabilities	**140,177,550**	146,025,446	**76,207,069**	82,378,161
	150,869,704	154,805,283	**81,378,729**	83,179,091

13 Liabilities - Borrowings and other liabilities (continued)

All interest bearing securities are secured against investment properties. The entity does not have an overdraft facility.

(a) Security and fair value disclosures

The carrying amounts are consistent with the fair value of borrowings for both the Group and parent entity at the end of the reporting period.

*The Group does not have an overdraft facility. The bank loans are classified into five type of facilities:

Facility	***Carrying Amount***	***Product Type***	***Term/Expiry***	***Interest Type***
Facility A	$3,007,959	Mortgage	Within next 12 months	Variable Rate
Facility B	$37,576,002	Mortgage	2022	Variable Rate
Facility C	$31,169,249	Mortgage	Varied from 2023 to 2041	Variable Rate
Facility D	$35,000,000	Mortgage	Mar 2029	Variable Rate
Facility E	$723,534	Mortgage	2047	Variable Rate
	$107,476,744			

(b) Secured liabilities and assets pledged as security

(i) The bank loans are secured by first mortgages over the Group's investment properties.

		Group		Parent entity	
	Notes	**2020**	2019	**2020**	2019
		$	$	**$**	$
First mortgage — Investment properties*		**348,155,581**	345,493,581	**125,802,503**	125,930,003

*The amount of loans relates to fair value of the investment properties as provided in Note 10.

(ii) The carrying amounts of assets pledged as security for project liabilities and capital grant liabilities are:

		Group		Parent entity	
	Notes	**2020**	2019	**2020**	2019
		$	$	**$**	$
Non-current					
Investment properties		**108,287,500**	111,039,120	**106,547,500**	109,299,120

14 Derivative financial instruments

		Group		Parent entity	
	Notes	**2020**	2019	**2020**	2019
		$	$	**$**	$
Current liabilities					
Interest rate swap contracts – cash flow hedges		**-**	907,838	**-**	-

Some bank loans of a group subsidiary currently bear an average variable interest rate based on BBSY plus a margin. It is policy to protect part of the loans from exposure to increasing interest rates. Accordingly, the subsidiary had entered into an interest rate swap contract under which it was obliged to receive interest at variable rates and to pay interest at fixed rates. The hedged item was a $37.56M loan with a party that was external to the Group. The hedge contract ended in April 2020. Refer Note 13(a).

There are currently no swaps in place. The gain or loss from remeasuring the hedging instruments in the previous year at fair value was recognised in the profit and loss and payments as interest expense.

15 Liabilities - Provisions

	Group		Parent entity	
	2020	2019	**2020**	2019
	$	$	**$**	$
Current				
Provision for employee benefits	**2,995,342**	2,597,182	**1,263,662**	850,580
	2,995,342	2,597,182	**1,263,662**	850,580
Non-Current				
Provision for employee benefits	**358,477**	285,604	**207,555**	106,382
Provision for long term maintenance*	**2,900,307**	3,082,408	**688,506**	1,025,524
Provision for lease straight-lining	**-**	402,785	**-**	-
	3,258,784	3,770,797	**896,061**	1,131,906

*Provision for long term maintenance represents amounts set aside to meet contractual obligations for maintenance.

16 Business Combinations

(a) Summary of acquisition

On 1 October 2018, the Parent entity company acquired 100% control of Northern Suburbs Housing Community (NSHC) for a consideration of $0. The Group had accounted for the acquisition of the 100% ownership in NSHC on a provisional basis where the fair value of net identifiable assets acquired was provisionally determined.

The finalised fair values of the identifiable assets and liabilities acquired from NSHC at the date of acquisition are as follows:

	Note	Revised Final 2019 $	Provisional Fair Value 2019 $
Cash and Cash Equivalent		1,615,101	1,615,101
Trade and Other Receivables		7,490	7,490
Investment Property	10	34,590,000	36,721,620
Property, Plant and Equipment		15,000	15,000
Trade and Other Payables		(230,672)	(230,672)
Provisions		(1,080,712)	(1,080,712)
Non-interest bearing capital grant liabilities		(31,386,000)	(31,386,000)
Other Liabilities		-	-
Net assets transferred		**3,530,207**	**5,661,827**
Non-controlling interest acquired/(arising) on consolidation			-
Gain on bargain purchase *		(3,530,207)	(5,661,827)
Acquisition-date fair value of consideration transferred by cash paid		-	-

* The gain on bargain purchase has been reduced due to the investment property revaluation and the resulting fair value loss has been recognised in Other Income.

(b) Bargain purchase

The Group applies the acquisition method in accounting for business combinations. The consideration transferred by the Group to obtain control of a subsidiary is calculated as the sum of the acquisition date fair values of assets transferred, liabilities incurred and the equity interests. Acquisition costs are expensed as incurred. Assets acquired and liabilities assumed are generally measured at their acquisition date fair values. As the fair values of the net identifiable assets acquired exceeds the fair value of consideration paid, the excess amount is recognised in the statement of comprehensive income as gain on a bargain purchase immediately.

(c) Non interest bearing liabilities – capital grant liabilities

A liability exists to the South Australian Housing Trust (SAHT) for a portion of the lesser of the sale price or market value of a number of properties subject to a Statutory Charge. The above liabilities have been calculated in accordance with the terms of the agreement.

17 Other reserves and retained earnings

(a) Other reserves

	Group		Parent entity	
	2020	2019	**2020**	2019
	$	$	**$**	$
Foreign currency translation	(1,018,311)	(647,594)	**-**	-
Movements:				
Foreign currency translation				
Opening balance	**(647,594)**	(588,498)	**-**	-
Currency translation difference arising during the year	**(370,717)**	(59,096)	**-**	-
Balance 30 June	**(1,018,311)**	(647,594)	**-**	-

Foreign currency translation

Exchange differences arising on translation of the foreign controlled entity are recognised in other comprehensive income as described in note 1(c) and accumulated in a separate reserve within equity. The cumulative amount is reclassified to profit or loss when the net investment is disposed of.

(b) Retained earnings

Movements in retained earnings were as follows:

	Notes	Group		Parent entity	
		2020	2019	**2020**	2019
		$	$	**$**	$
Balance 1 July		**460,410,174**	419,822,128	**110,361,448**	95,057,974
Opening equity adjustment	1(z)	**749,330**	-	**(532,135)**	-
Net profit /(loss) for the year		**25,858,502**	40,588,046	**3,960,474**	15,303,474
Balance 30 June		**487,018,006**	460,410,174	**113,789,787**	110,361,448

18 Remuneration of auditors

During the year the following fees were paid or payable for services provided by the auditor of the parent entity, its related practices and non-related audit firms:

PwC Australia

	Group		Parent entity	
	2020	2019	**2020**	2019
	$	$	**$**	$
Audit and other assurance services				
Audit and review of financial statements	**277,660**	251,928	**120,600**	109,629
Other assurance services				
Debt refinancing advisory	**-**	150,000	**-**	150,000
Legal fees associated with debt refinancin	**-**	100,000	**-**	100,000
Legal and tax advices relating to Alphingtc	**-**	53,000	**-**	-
Other services	**-**	3,000	**-**	3,000
Total remuneration for audit and other assurance services	**277,660**	557,928	**120,600**	362,629

19 Contingent liabilities and contingent assets

The Group had no contingent liabilities at 30 June 2020 (2019: nil).

20 Commitments

(a) Capital commitments

Significant capital expenditure contracted for at the end of the reporting period but not recognised as liabilities is as follows:

	Group		Parent entity	
	2020	2019	**2020**	2019
	$	$	**$**	$
Plant and equipment and capital expenditure projects payable:				
Within one year	**8,440,810**	16,560,291	**3,095,199**	4,842,339
Later than one year but not later than five years *	**77,047,176**	75,535,947	**1,037,583**	-
	85,487,986	92,096,238	**4,132,782**	4,842,339

* The increase in capital commitments later than one year but not later than five years is due to the Group signing a contract with Alpha Partners to purchase 165 units at a total estimated project cost of $74.5M. On 9 April 2020, CHVL received a letter of offer from the Department of Treasury and Finance regarding financing for the acquisition of the units. Transaction documents for the loan with Treasury Corporation of Victoria are currently being finalised.

Commitments not included under AASB 16 for the Group in 2020 is $1,146,634 ($518,683 within one year, $627,951 later than one year but not later than five years); Parent in 2020 $nil.

(b) Lease commitments: Group as lessee

Non-cancellable operating leases

Non-cancellable operating leases contracted for but not capitalised in the financial statements:

	Group	Parent entity
	2019	2019
	$	$
Commitments for minimum lease payments in relation to non-cancellable operating leases are payable as follows:		
Within one year	3,805,125	1,857,327
Later than one year but not later than five years	7,765,997	4,328,954
Later than five years	2,195,167	2,195,167
	13,766,289	8,381,448

Adoption of AASB 16 for the reporting period 2019-20 means operating leases are now classified as right-of-use

21 Related party transactions

(a) Parent entities

The ultimate parent entity within the Group is Community Housing Limited.

Transactions between related parties are on normal commercial terms and conditions no more favourable than those available to other parties unless otherwise stated.

(b) Subsidiaries

Interests in subsidiaries are set out in note 22.

(c) Key management personnel compensation

	Group		Parent entity	
	2020	2019	**2020**	2019
	$	$	**$**	$
Employment benefits	**3,287,955**	3,452,769	**1,243,765**	913,995

Key management personnel benefits represent wages and salaries, including non-monetary benefits, allowances, superannuation, annual leave and long service leave payments.

(d) Loans to/from related parties

	Parent entity	
	2020	2019
	$	$
Amounts (due to)/payable from subsidiaries:		
Beginning of the year	**(550,544)**	(324,248)
Funds advances/repaid	**3,858,273**	4,672,761
Intercompany charges*	**(3,875,821)**	(4,899,057)
Closing payable	**(568,092)**	(550,544)

*This includes the transactions with CHVL, ACHL and Horizon Group.

(e) Terms and conditions

Outstanding balances are unsecured and are repayable on demand.

(f) Amounts (due to)/payable from related entities

	Parent entity	
	2020	2019
	$	$
Intercompany charges outstanding with subsidiaries	**(568,092)**	(550,544)
Intercompany loans/funds invested*	**5,931,063**	4,806,213
Provision against intercompany loans	**(2,538,101)**	(2,421,989)
	2,824,870	1,833,680

*This is intercompany fund transfers to related foreign entities.

During the year a provision of $116,112 (2019: $nil) was made by the parent entity against amounts receivable from overseas subsidiaries.

22 Interests in other entities

Significant investments in subsidiaries

The consolidated financial statements incorporate the assets, liabilities and results of the following principal subsidiaries in accordance with the accounting policy described in Note 1(b):

Name of entity	Country of incorporation	Class of shares	Equity holding[1]			
			2020	2019	**2020**	2019
			%	%	**$**	$
Community Housing (Vic) Limited	Australia	Not Applicable[2]	**100**	100	-	-
Aboriginal Community Housing Limited	Australia	Not Applicable[2]	**100**	100	50,000	50,000
Community Housing (Qld) Limited (formerly Horizon Housing Company)	Australia	Ordinary	**100**	100	5	5
Horizon Housing Solution Limited	Australia	Ordinary	**100**	100	-	-
Horizon Housing Reality Limited	Australia	Ordinary	**100**	100	-	-
Australian Affordable Housing Securities Limited	Australia	Ordinary	**100**	100	-	-
Building Communities (VIC) Ltd	Australia	Ordinary	**100**	100	-	-
Building Communities Housing Ltd	Australia	Ordinary	**100**	100	-	-
CHL Timor, Unipessoal, Lda (formerly CHL Industries Timor Ltd)	Timor Leste	Ordinary	**100**	100	4,906	4,906
CHL Chile SpA (formerly Community Housing Latin America SPA)	Chile	Ordinary	**100**	100	248,206	248,206
CHL Building Design Services Private Ltd	India	Ordinary	**99.9**	99.9	1,753	1,753
Community Housing (PNG) Limited	Papua New Guinea	Ordinary	**100**	100	-	-
CHL Indonesia (formerly PT Affordable Housing Indonesia)	Indonesia	Ordinary	**95**	95	-	-
Promotora CHL Peru S.A.C	Peru	Ordinary	**90**	90	230,963	230,963
CHL Rwanda Ltd	Rwanda	Ordinary	**100**	100	-	-
Shivdhan Community Housing Pvt Ltd	India	Ordinary	**60**	60	714,000	714,000
					1,249,833	1,249,833

(1) The proportion of ownership interest is equal to the proportion of voting power held.

(2) The company is limited by guarantee and is a wholly owned subsidiary of Community Housing Limited.

(3) Horizon Housing Group consist of four companies is a wholly own subsidiary of Community Housing Limited, effective control was on 30th April 2018. Community Housing (Qld) Limited owns 100% of ordinary shares of Australian Affordable Housing Securities Limited and they have issued redeemable convertible preference shares with voting rights of $120,000 to Social Ventures Australia.

(4) CHL Chile SpA is 100% owned subsidiary of Community Housing Limited.

(5) Investment recognised in Community Housing (PNG) Limited in financial year 2014-2015, has been subsequently impaired.

(6) CHL Indonesia is a 95% owned subsidiary of Community Housing Limited. The carrying value of the investment is nil at 30th June 2020. The remaining 5% is owned by Community Housing Indonesia.

(7) Promotora CHL Peru S.A.C is limited by shares and is a 99.9% owned subsidiary of Community Housing Limited. The remaining 0.1% is owned by CHL Chile Spa.

(8) CHL Rwanda Ltd is a wholly own subsidiary of Community Housing Limited. The carrying value of the investment is nil at 30th June

(9) The Indian subsidiary of Community Housing Limited Australia, CHL Building Design Services based in Ahmedabad, India has invested in 60% equity in Shivdhan Community Housing Private Limited. The company is set up to engage in an affordable housing project called Pooja Heaven in Ahmedabad.

23 Financial Risk Management

Activities and management policies

The Group's activities expose it to a variety of financial risks, including the effects of changes in market prices, credit and liquidity risks. The Group actively manages market risk. Credit and liquidity risk management focuses on minimising the potential adverse effects on the financial performance of the Group.

(a) Market risk

(i) Foreign exchange risk

The Group undertakes transactions denominated in foreign currencies from time to time and resulting from these activities, exposures in foreign currencies arise. The Group's approach to foreign currency risks has resulted to date in the acceptance of exposures as they arise.

(ii) Interest rate risk

The Group is exposed to interest rate risk on borrowings for various projects. One of the facilities is a ($35M) loan with NHFIC and is fixed for 10 years at 2.93%. The majority of the loans are based off the 90 day BBSW, re-priced in June, September, December and March each year, which makes the Group's earnings sensitive to changes in this benchmark. Based on the loan balance as at 30 June 2020, a 100 basis point increase/decrease in the 90 Day BBSW will decrease/(increase) the Group's surplus/(loss) by $632,449.

For details of the intercompany loans and external borrowings outstanding as at 30 June 2020, refer to notes 6, 13 and 21. Other intercompany balances are non-interest bearing and are repayable on demand.

(b) Credit risk

In the normal course of business the Group incurs credit risk from trade receivables and financial institutions. The Group performs credit evaluations of its housing customers when they apply for housing. The Group acknowledges that given the industry it operates in there are concentrations of credit risk to low income households. The Group maintains its cash and bank balances with a financial institution with a high credit rating. The carrying amount of trade receivables best represents the Group's maximum credit risk exposure.

The Group is exposed to credit risk on intercompany loan receivables. The Group applies a simplified model of recognising lifetime credit losses as these items do not have a significant financing component.

(c) Liquidity risk

The Group aims to prudently manage liquidity risk by maintaining sufficient cash and other liquid assets or the availability of funding in the form of intercompany debt. Intercompany balances are repayable on demand.

The table below analyses the Group's financial liabilities into relevant maturity groupings based on the remaining period at the reporting date to the contractual maturity date. The amounts disclosed in the table are the contractual undiscounted cash flows at the reporting date.

		No later than 1 year		**Later than 1 year**	
	Note	**2020**	2019	**2020**	2019
		$	$	**$**	$
Contractual maturities of financial liabilities					
Lease liabilities	8	**2,976,066**	-	**7,286,461**	-
Trade and other payables	12	**15,931,992**	15,685,160	**-**	-
Loans and borrowings	13	**3,138,842**	40,591,284	**104,468,785**	66,215,151
Leases	20	**-**	3,917,378	**-**	9,961,164
		22,046,900	60,193,822	**111,755,246**	76,176,315

23 Financial Risk Management (continued)

The Group is not aware of any material exposure to financial risk from financial instruments at the date of this report other than interest rate risk. For further information on borrowings refer to note 13.

(d) Fair value measurements

The carrying value of all financial assets and liabilities approximate their fair values.

24 Events occurring after the reporting period

No matters or circumstances have occurred subsequent to year end that has significantly affected, or may significantly affect, the operations of the company or Group, the results of those operations or the state of affairs of the Group or parent entity in subsequent financial years.

Directors' declaration
30 June 2020

In the Directors' opinion:

(a) the financial statements and notes set out on pages 13 to 60 are in accordance with Australian Charities and Not-for-Profit Commission (ACNC) Act 2012 or equivalent, including:

(i) complying with Accounting Standards - Reduced Disclosure Requirements and other mandatory professional reporting requirements, and

(ii) giving a true and fair view of the consolidated entity's financial position as at 30 June 2020 and of its performance for the year ended on that date, and

(b) there are reasonable grounds to believe that the Group will be able to pay its debts as and when they become due and payable.

The Directors have been given the declarations of the Managing Director and Chief Financial Officer as required by section 295A of the Corporations Act 2001.

This declaration is made in accordance with a resolution of directors.



Fionn Skiotis
Director

Melbourne
28 September 2020

Independent auditor's report

To the members of Community Housing Limited

Our opinion

In our opinion:

The accompanying financial report of Community Housing Limited (the Company or Parent Entity) and its controlled entities (together the Group) is in accordance with Division 60 of the *Australian Charities and Not-for-profits Commission (ACNC) Act 2012*, including:

(a) giving a true and fair view of the Group's and Parent Entity's financial positions as at 30 June 2020 and of their financial performances for the year then ended

(b) complying with Australian Accounting Standards - Reduced Disclosure Requirements and Division 60 of the *Australian Charities and Not-for-profits Commission Regulation 2013*.

What we have audited

The financial report comprises:

- the Group's and Parent Entity's statements of financial position as at 30 June 2020
- the Group's and Parent Entity's statements of comprehensive income for the year then ended
- the Group's and Parent Entity's statements of changes in equity for the year then ended
- the Group's and Parent Entity's statements of cash flows for the year then ended
- the notes to the Group's and Parent Entity's financial statements, which include a summary of significant accounting policies
- the directors' declarations.

Basis for opinion

We conducted our audit in accordance with Australian Auditing Standards. Our responsibilities under those standards are further described in the *Auditor's responsibilities for the audit of the financial report* section of our report.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Independence

We are independent of the Group in accordance with the ethical requirements of the Accounting Professional and Ethical Standards Board's APES 110 *Code of Ethics for Professional Accountants (including Independence Standards)* (the Code) that are relevant to our audit of the financial report in Australia. We have also fulfilled our other ethical responsibilities in accordance with the Code.

Other information

The directors are responsible for the other information. The other information comprises the information included in the annual report for the year ended 30 June 2020, but does not include the financial report and our auditor's report thereon. Prior to the date of this auditor's report, the other information we obtained included the directors' report.

Our opinion on the financial report does not cover the other information and accordingly we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial report, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial report or our knowledge obtained in the audit, or otherwise appears to be materially misstated.

If, based on the work we have performed on the other information that we obtained prior to the date of this auditor's report, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Responsibilities of the directors for the financial report

The directors of the Company are responsible for the preparation of the financial report that gives a true and fair view in accordance with Australian Accounting Standards - Reduced Disclosure Requirements and the *Australian Charities and Not-for-profits Commission (ACNC) Act 2012* and for such internal control as the directors determine is necessary to enable the preparation of the financial report that gives a true and fair view and is free from material misstatement, whether due to fraud or error.

In preparing the financial report, the directors are responsible for assessing the ability of the Group to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the directors either intend to liquidate the Group or to cease operations, or have no realistic alternative but to do so.

Auditor's responsibilities for the audit of the financial report

Our objectives are to obtain reasonable assurance about whether the financial report as a whole is free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with the Australian Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial report.

A further description of our responsibilities for the audit of the financial report is located at the Auditing and Assurance Standards Board website at: http://www.auasb.gov.au/auditors_responsibilities/ar3.pdf. This description forms part of our auditor's report.

PricewaterhouseCoopers

PricewaterhouseCoopers

Amanda Campbell
Partner

Melbourne
28 September 2020

Australian Government

Australian Charities and Not-for-profits Commission

THIS CERTIFIES THAT

Community Housing Limited

ABN:11 062 802 797

IS A REGISTERED CHARITY
AND HAS BEEN TRANSFERRED FROM THE

Australian Taxation Office

TO THE

Australian Charities and Not-for-profits Commission

ON THE DATE OF

3 December 2012

CERTIFIED BY

Susan Pascoe

Susan Pascoe AM

Commissioner

Australian Charities and Not-for-profits Commission

Copy only. Original available on request

CORPORATIONS LAW

A Company Limited by Guarantee

CONSTITUTION

OF

COMMUNITY HOUSING LIMITED
ABN 11 062 802 797

CORPORATIONS LAW

A COMPANY LIMITED BY GUARANTEE NOT HAVING A SHARE CAPITAL

CONSTITUTION

OF

COMMUNITY HOUSING LIMITED

DEFINITIONS

1. **(a)** The following words and expressions in this Constitution have the several meanings hereby assigned to them unless meanings are excluded by or are repugnant to the context or subject (that is to say):
"Alternate Director" means any person who for the time being holds office as an Alternate Director

"this Constitution" shall mean this Constitution as originally adopted or as from time to time duly added to or amended.

"the Law" shall mean the "Corporations Law" or any statutory modification amendment or re-enactment thereof from time to time.

"the Company" means the abovenamed Company.

"Directors" and "Board" means all or any number of the Directors for the time being of the Company acting in accordance with this Constitution**.**

"Dividend" means any dividend arising from the division of the profits of Company and shall include "bonus".

"member" means any person for the time being registered in the register as a member.

"office" or "registered office" means the registered office for the time being of the Company within Australia.

"paid" means paid or credited as paid.

"the Register" means the register of members of the Company to be kept pursuant to the law.

"the seal" means the common seal from time to time of the Company.

"the Secretary" means and includes the Secretary and any assistant

or acting Secretary and any person for the time being appointed to perform whether alone or in addition to any other person or persons the duties of a Secretary of the Company.

"special resolutions" shall have the meaning to that expression as stated in the Law.

"in writing" and "written" includes printing and lithography and other modes of reproducing or representing words in a visible form.

Words or expressions contained in these regulations shall be interpreted in accordance with the provisions of the Law as in force at the date at which such interpretation is required.

(b) Words importing the singular shall mean and include the plural and vice versa and each gender shall mean and include each other gender.

(c) The headings of clauses do not form part of this Constitution and shall not affect the interpretation thereof.

2. The name of the Company is Community Housing Limited.

3. The object for which the Company is established is to be a non profit corporation that:-

(a) acquires on its own behalf, or manages or holds as trustee on behalf of any public, government, semi or local government or charitable person, association, bodies, funds, institutions or organizations, land and buildings so that:

(i) shelter is provided to persons in crisis and/or who have inadequate access to safe and secure housing;

(ii) housing may be provided to low income persons including members from ethnic groups, young people (single, dependent or otherwise), people with disabilities, people who are aged, childless couples, single parent families, families and/or other households in need;

(b) provides housing advice and referral services which may assist homeless persons into stable and long term housing;

(c) advances education.

4. In furtherance of the said object of the Company, the Company may:-

(a) liaise with any Government or Authority whether Federal, State or Local for furtherance of its object;

(b) accept grants of money from any Government or Authority whether

Federal, State or Local and enter into any arrangement or agreement with the same or with any public or government body that may seem conducive to carrying out of the Company's objects and to obtain from any such Government, Authority or Body any rights, privileges or concessions which may be deemed advisable or of benefit;

(c) manage any of the said land and buildings for the furtherance of its object;

(d) in the furtherance of its object the Company shall have the following power to:-

(i) take and acquire by way of purchase, transfer, conveyance, option, mortgage, license, assignment, exchange, lease, partition or otherwise any real property of any tenure and any interest therein including all improvements thereon, fixtures, fittings, plant, machinery, equipment, materials, goods, chattels and effects and any rights, easements, appurtenances, advantages, conveniences and concessions in connection therewith and to sell, grant options, mortgage, charge or otherwise encumber, license, exchange, lease out or otherwise deal in the same.

(ii) to pay all the associated costs of acquiring, owning, leasing, transferring, mortgaging or otherwise dealing with real property;

(iii) to borrow or raise and secure the payment of money in such a manner as the Company may think fit and in particular the issue of debentures or debenture stock (perpetual or otherwise), bonds, mortgages, bills of sale or other securities charged upon all or any of the Company's property or without such security and to purchase or pay off any such securities;

(iv) to accept, demand and enforce payment of moneys owed to the Company;

(v) to take any gift of property or any other gift for the furtherance of the objects of the Company and establish a Gift Fund for this purpose;

(vi) to take such steps by appeals in writing or orally as may from time to time be deemed expedient for the purposes of procuring contributions to the funds of the Company by way of grants, donations, gifts or otherwise howsoever and upon such terms and conditions and generally as the Company or its directors think fit;

(vii) to do all such other things as are conducive to the attainment of the aforementioned object.

5. The income and property of the Company whencesoever derived shall be applied solely towards the promotion of the objects of the Company as set forth in this Constitution, and no portion thereof shall be paid or transferred, directly or indirectly, by way of dividend, bonus or otherwise howsoever by way of profit to the members of the Company PROVIDED THAT nothing herein shall

prevent the payment, in good faith, of reasonable and proper remuneration to any officer or servant of the Company or to any member of the Company in return for any services actually rendered to the Company nor prevent the payment of interest or reasonable and proper rent for premises demised or let by any member to the Company.

6. The liability of members is limited.

7. Every member of the Company undertakes to contribute to the property of the Company in the event of the same being wound up while he is a member, or within one year after he ceases to be a member, for payment of the debts and liabilities of the Company contracted before he ceased-to be a member and of the costs, charges and expenses of winding up and for the adjustment of the rights of the contributors among themselves, such amount as may be required, nor exceeding the sum of Twenty Dollars ($20.00)

8. If upon the winding up or dissolution of the Company there remains, after satisfaction of all debts and liabilities, remaining assets in a participating jurisdiction, the same shall not be paid to or distributed among the members of the Company but shall be given or transferred to another registered community housing provider or Housing Agency in the jurisdiction in which the asset is located.

9 If the Gift Fund is wound up or if the endorsement of the Company as a deductible gift recipient is revoked, any surplus assets of the Gift Fund remaining after the payment of liabilities attributable to it shall be transferred to a fund, authority or institution to which income tax deductible gifts can be made.

MEMBERS

10. Up to 50 natural or artificial persons may be members of the Company. However the Directors may from time to time register members in excess of this number.

10A. For admission as a member of the Company, every applicant, i.e. natural person or artificial person will have a partnership agreement for the provision of housing or delivery of support services to the Company's tenants, shall comply with requirements prescribed by the Board of Directors, comply with the requisites of this Constitution and also comply with such other requirements as the Board of Directors may prescribe either generally or in any particular case.

10B. The Board of Directors may in its discretion and without being required to assign any reason therefore refuse to accept any application for admission to membership of the Company and may in like manner refuse to admit any applicant to membership.

10C. Membership of the Company is personal to the member and is not transferable.

ANNUAL SUBSCRIPTION

11. **(a)** The annual subscription payable by members of the Company shall be as such as the Company in general meeting shall from time to time prescribe, provided that until the Company shall otherwise resolve the annual subscription shall be ONE DOLLAR ($1.00) provided that the Company shall not at any time prescribe an annual subscription more than FIVE DOLLARS ($5.00).

(b) All annual subscriptions shall become due and payable in advance on the 1st day of July in every year.

CESSATION OF MEMBERSHIP

12. If the subscription of a member shall remain unpaid for a period if six calendar months after it becomes due, then the member may after notice of the default shall have been sent to him by the Secretary be debarred by resolution of the Directors from all privileges of membership.

13. A member may at any time by giving notice in writing to the Secretary resign his membership of the Company but shall continue to be liable for any annual subscription and all arrears due and unpaid at the date of his resignation and all other moneys due by him to the Company, and in addition for any sum not exceeding Twenty Dollars ($20.00) for which he is liable as a member of the Company under Clause 7 of the Constitution of the Company.

14. If any member shall willfully refuse or neglect to comply with the provisions of the Constitution of the Company or shall be guilty of any conduct which in the opinion of the Board of Directors is unbecoming of a member or prejudicial to the interest of the Company or becomes of unsound mind or a person whose person or estate is liable to be dealt with in any way under the Law relating to mental health the Board of Directors shall have power to expel the member from the Company provided that at least one week before the meeting of the Board of Directors at which a resolution for his expulsion is passed the member shall have had notice of such meeting and of what is alleged against him and before the passing of such resolution have has an opportunity of giving orally or in writing any explanation of defense he may think fit and provide further that any such member may by notice in writing lodge with the Secretary at least twenty-four hours before the time for holding the meeting at which resolution for his expulsion is to be considered by the Board of Directors elect to have the question of his expulsion dealt with by the Company in general meeting and in that event an extraordinary general meeting of the Company shall be called for the purpose and if at the meeting a resolution for the expulsion of the member be passed by a majority of more than seventy-five percent (75%) of those present and voting (such vote to be taken by ballot) the member shall be expelled.

GENERAL MEETINGS

15. An annual general meeting of the Company shall be held in accordance with the provisions of the Law. All general meetings other than the annual general meetings shall be called extraordinary general meetings.

16. Any director may whenever he thinks fit convene an extraordinary general meeting, and extraordinary meetings shall be convened on such requisition or in default may be convened by such requisitions as provided by the Law.

17. Subject to the provisions of the Law relating to special resolutions and agreements for shorter notice, fourteen days' notice at the least (exclusive of the day on which notice is served or deemed to be served, but inclusive of the day for which notice is given) specifying the place the day and the hour of meeting and in case of special business the general nature of that business shall be given to such persons as are entitled to receive such notices from the Company.

18. All business shall be special that is transacted at an extraordinary general meeting, and also all that is transacted at an annual general meeting with the exception of the consideration of the accounts, balance sheets, and the report of the Directors and auditors, the election of Directors in the place of those retiring, and the appointment and fixing of the remuneration of the auditors.

18a This Constitution may only be amended by special resolution in accordance with the Corporations Act 2001 or equivalent.

PROCEEDINGS AT GENERAL MEETING

19. No business shall be transacted at any general meeting unless a quorum of members is present at the time when the meeting proceeds to business. Save as herein otherwise provide**d** three members present in person attending as a proxy or as representing a corporation, which is a member, shall be a quorum**.**

20. If within half an hour from the time appointed for the meeting a quorum is not present, the meeting, if convened upon the requisition of members, shall be dissolved, in any case it shall stand adjourned to the same day in the next week at the same time and place, or to such other day and at such other time and place as the Directors may determine, and if at the adjourned meeting a quorum is not present within half an hour from the time appointed for the meeting, the members present (being not less that two) shall be a quorum.

21. The Chairman may, with the consent of any meeting at which a quorum is present (and shall if so directed by the meeting), adjourn the meeting from time to time and from place to place, but no business shall be transacted at any adjourned meeting other than the business left unfinished at the meeting from which the adjournment took place. When a meeting is adjourned for thirty days or more, notice of the adjourned meeting shall be given as in the case of an original meeting. Save as aforesaid it shall not be necessary to give any notice of an adjournment or of the business to be transacted at an adjournment meeting.

22. ***(a)*** At any general meeting a resolution put to the vote of the meeting shall be decided on a show of hands unless a poll is (before or on the declaration of the result of the show of hands) demanded:-

(i) by the Chairman; or

(ii) by at least three members present in person or by proxy; or

(iii) by any member or members present in person or by proxy and representing not less than one-tenth of the total rights of all members having the right to vote at the meeting.

(b) Unless a poll is so demanded a declaration by the Chairman that a resolution has on a show of hands been carried, or carried unanimously, or by a particular majority, or lost, and an entry to that effect in the minute book containing the minutes of the proceedings of the company shall be conclusive evidence of the fact without proof of the number or proportion of the votes recorded in favour of or against the resolution.

(c) The demand for a poll may be withdrawn.

23. If a poll is duly demanded it shall be taken in such manner and either at once or after an interval or adjournment or otherwise as the Chairman directs, and the result shall be the resolution of the meeting at which the poll was demanded, but a poll demanded on the election of a Chairman or on a question of adjournment shall be taken forthwith.

24. In the case of an equality of votes, whether on a show of hands or on a poll, the Chairman of the meeting at which the show of hands takes place or at which the poll is demanded shall be entitled to a second or casting vote.

25. At any general meeting on a show of hands every person who is a member or representative of a member shall have one vote and on a poll every member present in person or by proxy or by attorney or other duly authorised representative shall have one vote.

26. A member who is of unsound mind or whose person or estate is liable to be dealt with in any way under the law relating to mental health may vote, whether on a show of hands or on a poll, by his committee or by the public trustee or by such other person as properly has the management of his estate, and any such committee trustee or other person may vote by proxy or attorney.

27. No member shall be entitled to vote at any general meetings unless all moneys presently payable by him to the Company have been paid.

28. No objection shall be raised to the qualification of any voter except at the meeting or adjourned meeting at which the vote objected to is given or tendered, and every vote not disallowed at such meeting shall be valid for all purposes. Any such objection made in due time shall be referred to the Chairman of the meeting, whose decision shall be final and conclusive.

29. The instrument appointing a proxy shall be in writing (in common or usual form) under the hand of the appointee or of his attorney duly authorised in writing or, if the appointee is a corporation, either under seal or under the hand of an officer or attorney duly authorised. A proxy may but need not be a member of the Company. The instrument appointing a proxy shall be deemed to confer authority to demand or join in demanding a poll.

30. The instrument appointing a proxy and the power of attorney or other authority, if any, under which it is signed or a notarially certified copy of that power or authority shall be deposited at the registered office of the Company, or such other places within the State as is specified for that purpose in the notice convening the meeting, not less than forty-eight hours before the time for holding the meeting or adjourned meeting at which the person named in the instrument proposes to vote, or, in the case of a poll not less than twenty four hours before the time appointed for the taking of the poll, and in default the instrument of proxy shall not be treated as valid.

31. A vote given in accordance with the terms of an instrument of proxy or attorney shall be valid notwithstanding the previous death or unsoundness of mind of the principal or revocation of the instrument or of the authority under which the instrument was executed, or the transfer of the share in respect of which the instrument is given, if no intimation in writing of such death, unsoundness of mind, revocation or transfers as aforesaid has been received by the Company at the registered office before the commencement of the meeting or adjourned meeting at which the instrument is used.

DIRECTORS/APPOINTMENT/ETC.

32. Directors shall be members of the Company.

33. Directors must not hold office (without re-election) for a term longer than three years from the date of their election. A full three-year term shall be considered to have been served upon the passage of three Annual General Meetings (AGM):

(a) Directors shall take office immediately following the close of the AGM at which they are elected. A retiring Director holds office until the close of the AGM at which that Director retires, but is eligible for re-election at the AGM.

b) At each AGM one third of the remaining directors, or if the number of remaining directors is not a multiple of three, rounded down to the nearest whole number, must retire. The directors to retire shall be those directors who have served longest in office, taken in order from the date of their initial appointment. This rule does not apply to directors appointed to fill a casual vacancy on the Board since the previous AGM and the Managing Director.

34. The Company at the meeting at which a director so retires may fill the vacated office b**y** electing a person thereto, and in default the retiring director shall if offering himself for re-election and not being disqualified under the Law from holding office as a director be deemed to have been re-elected unless at that meeting it is expressly resolved not to fill the vacated office or unless a resolution for the re-election of that director is put to the meeting and lost.

35. The Company may from time to time by ordinary resolution passed at a general meeting increase or reduce the number of Directors, and may also determine in what rotation the increased or reduced number is to go out of office.

36. The Board shall comprise no more than NINE (9) directors.

37. Deleted

38. Persons who are members of the Company shall be entitled, in accordance with Clause 33 to elect eligible directors having relevant skills, amongst others financial, legal, project management, strategic management or community housing management skills.

39. The directors shall have power at any time, and from time to time, to appoint any person to be a director, either to fill a casual vacancy or as an addition to the existing directors, but so that the total number of Directors shall not at any time exceed the number fixed in accordance with clause 36. Any director so appointed shall hold office only until the next following annual general meeting and shall then be eligible for re-election.

40. The Company may by ordinary resolution remove any director before the expiration of his period of office, and may by an ordinary resolution appoint another person in his stead; the person so appointed shall be subject to retirement at the same time as if he had become a director on the day on which the director whose place he is appointed was last elected a director.

41. The office of director shall become vacant if the director:-

(a) ceases to be a director by virtue of the Law;

(b) becomes bankrupt or makes an arrangement or composition with his creditors generally;

(c) becomes prohibited from being a director by reason of any order made under the Law;

(d) becomes of unsound mind or a person who or whose estate is liable to be dealt with in any way under the law relating to mental health;

(e) resigns his office by notice in writing to the Company;

(f) for more than six months is absent without permission of the Directors from meetings of the Directors held during that period;

(g) without the consent of the Company in general meeting holds any office of profit under the Company;

(h) is directly or indirectly interested in any contract or proposed contract with the Company and fails to declare the nature of his interest in manner required by the Law;

(i) Deleted

(j) subscription is overdue for six (6) months; or

(k) ceases to be a member of the company.

POWERS AND DUTIES OF DIRECTORS

42. The management and control of the Company and its funds shall be vested in the Board of Directors which, in addition to the powers and authorities by this Constitution expressly conferred on it, may exercise all such powers and do all such acts and things as may be exercised and done by the Company which are not hereby or by the Law expressly directed or required to be exercised or done by the Company in General Meeting and subject nevertheless to the provisions of the Law and this Constitution and to any resolution from time to time passed by the Company in General Meeting PROVIDED THAT no resolution shall invalidate any prior act of the Board of Directors which would have been valid if such resolution had not been passed.

43. The Directors may exercise all the powers of the Company to borrow money and to mortgage or change its undertaking, property and uncalled capital, or any part thereof, and to issue debentures and other securities whether outright or as a security for any debt, liability or obligation of the Company or of any third party.

44. The Directors may from time to time by power of attorney appoint any corporation, firm or person or body of persons, whether nominated directly or indirectly by the Directors, to be the attorney or attorneys of the Company for such purposes and with such powers, authorities and discretions (not exceeding those vested in or exercisable by the Directors under these regulations) and for such period and subject to such conditions as they may think fit, and any such powers of attorney may contain such provisions for the protection and convenience of persons dealing with any such attorney as the Directors may think fit and may also authorise any such attorney to delegate all or any of the powers, authorities and discretions vested in him.

45. All cheques, promissory notes, drafts, bills of exchange and other negotiable instruments, and all receipts for money paid to the Company, shall be signed, drawn, accepted, endorsed or otherwise executed as the case may be, by any two directors or one director and the secretary or in such manner as the Directors from time to time determine.

46. The Directors shall cause minutes to be made:-

(a) of all appointments of officers;

(b) of names of Directors present at all meetings of the Company and of the Directors; and

(c) of all proceedings at all meetings of the Company and of the Directors.

Such minutes shall be signed by the Chairman of the meeting at which the proceedings were held or by the Chairman of the next succeeding meeting.

PROCEEDINGS OF DIRECTORS

47. The Directors may meet together for the dispatch of business adjourn and otherwise regulate their meetings, as they think fit. A director may at any time

and the secretary shall on the requirement of a director summon a meeting of the Directors.

48. Subject to this Constitution questions arising at any meeting of Directors shall be decided by a majority of votes and a determination of the Directors. In the case of an equality of votes the Chairman of the meeting shall have a second or casting vote.

49. A director shall not vote in respect of any contract or proposed contract with the Company in which he is interested, or any matter arising thereout, and if he does so vote his vote shall not be counted.

50. Any director with the approval of the Directors may appoint any person (whether a member of the Company or not) to be alternate or substitute director in his place during such period as he thinks fit. Any person while he so holds office as an alternate or substitute director shall be entitled to notice of meetings of the Directors and to attend and vote thereat accordingly, and to exercise all the powers of the appointee in his place. An alternate or substitute director shall not be a member of the Company, and shall ipso facto vacate office if appointment or removal under this regulation shall be effected by notice in writing under the hand of the director making the same.

51. The quorum necessary for the transaction of the business of the Directors may be fixed by the Directors, and unless so fixed shall be three.

52. The continuing directors may act notwithstanding any vacancy in their body, but if and so long as their number is reduced below the number fixed by or pursuant to the regulations of the Company as the necessary quorum of Directors, the continuing directors or director may act for the purpose of increasing the numbers of Directors to that number or of summoning a general meeting of the Company, but for no other purpose.

53. The Directors may elect a Chairman of their meetings and determine the period for which he is to hold office, but if no such Chairman is elected, or if at any meeting the chairman is not present within fifteen minutes after the time appointed for holding the meeting, the Directors present may choose one of their number to be chairman of the meeting.

54. The Directors may delegate any of their powers to committees consisting of such member or members of their body as they think fit; any committee so formed shall in the exercise of the powers so delegated conform to any regulations that may be imposed on it by the Directors.

55. A committee may elect a chairman of its meetings; if no such chairman is elected, or if at any meeting the chairman is not present within ten minutes after the time appointed for holding the meeting, the members present may choose one of their number to be chairman of the meeting.

56. A committee may meet and adjourn, as it thinks proper. Questions arising at any meeting shall be determined by a majority of votes of the members present, and in the case of an equality of votes the chairman shall have a second or casting vote.

57. All acts done by any meeting of the Directors or of a committee of Directors or by any person acting as a director shall, notwithstanding that it is afterwards discovered that there was some defect in the appointment of any such director or person acting as aforesaid or that they or any of them were disqualified, be as valid as if every such person had been duly appointed and was qualified to be a director.

CIRCULATING MINUTES

58. ***(a)*** If all the directors have signed a document containing a statement that they are in favour of a resolution of the directors in terms set out in the document, a resolution in those terms shall be deemed to have passed at a meeting of the directors held on the day which the document was signed and at the time at which the document was last signed by a director or, if the directors signed the document on different days, on the day on which, and at the time at which, the document was last signed by a director.

(b) For the purposes of subregulation (a), 2 or more separate documents containing statements in identical terms each of which is signed by one or more directors shall together be deemed to constitute one document containing a statement in those terms signed by those directors on the respective days on which they signed the separate documents.
(c) A reference in subregulation (a) to all the directors does not include a reference to a director who, at a meeting of directors, would not be entitled to vote on the resolution.

DIRECTORS MEETINGS (TELEPHONE AND VIDEO-UPS)

59. For the purposes of this Constitution, the contemporaneous linking together by instantaneous communication device of a number of consenting directors not less that the quorum together with the secretary, whether or not any one or more of the directors is out of Australia, shall be deemed to constitute a meeting of the directors and all the provisions of this Constitution as to the meetings of the directors shall apply to such meetings held by instantaneous communication device so long as the following conditions are met:

(a) all directors for the time being entitled to receive notice of the meeting of directors (including any alternate for any director) shall be entitled to notice determined by directors from time to time of a meeting by instantaneous communication device and to be linked by instantaneous communication device for the purpose of such meeting. Notice of any such meeting shall be given on the instantaneous communication device or in any other manner permitted by the Constitution;

(b) each of the directors taking part in the meeting by instantaneous communication device and the secretary must be able to hear each of the other directors taking part at the commencement of the meeting;

(c) at the commencement of the meeting each director must acknowledge his presence for the purpose of a meeting of the directors to all the other directors taking part.

60. A director may not leave the meeting by disconnecting his instantaneous communication device unless he has previously obtained the express consent of the chairman of the meeting and a director shall be conclusively presumed to have been present and to have formed part of the quorum at all times during the meeting by instantaneous communication device unless he has previously obtained the express consent of the chairperson of the meeting to leave the meeting.

61. A minute of the proceedings at such meeting by instantaneous communication device shall be sufficient evidence of such proceedings and of the observance of all necessary formalities if certified as a correct minute by the chairperson of the meeting and by the secretary.

62. For the purposes of this clause 'instantaneous communication device' shall include telephone, television or any other audio and/or visual device which permits instantaneous (or near as practicable thereto) communication.

MANAGING DIRECTORS

63. The Directors may from time to time appoint one or more of their body to the office of managing director for such period and on such terms as they think fit and, subject to the terms of any agreement entered into in any particular case, may revoke any such appointment. A director so appointed shall not while holding that office, be subject to retirement, but his appointment shall be automatically determined if he ceases from any cause to be a director.

64. The Directors may entrust to and confer upon a managing director any of the powers exercisable by them upon such restrictions as they may think fit, and either collaterally with or to the exclusion of their own powers, and may from time to time revoke, withdraw, alter or vary all or any of those powers.

ALTERNATE DIRECTORS

65. The Directors may from time to time appoint any person to be an alternate Director and may from time to time cancel any such appointment. The Directors may fix determine and vary the powers duties and remuneration of any person so appointed, but a person so appointed shall not be required to be a member to qualify him for appointment nor have any right to attend or vote at any meeting of Directors except by the invitation and with the consent of the Directors.

REMUNERATION OF DIRECTORS

66. The directors shall be paid such remuneration as is from time to time determined by the company in general meeting.

67. The Directors may also be paid all travelling and other expenses properly incurred by them in attending and returning from meetings of the directors or any committee of the directors or general meetings of the company or otherwise in connection with the business of the company.

SECRETARY

68. The Secretary shall in accordance with the Law be appointed by the Directors for such term, at such remuneration, and upon such conditions as they may think fit, and any secretary so appointed may be removed by them.

INDEMNITY

Indemnity for Liability (other then for legal costs)

69. To the extent permitted by the Law, the Company indemnifies every person who is or has been a Director, Secretary, Chief Executive Officer, Committee member and any other Officer of the Company or of a wholly-owned subsidiary of the Company against any liability incurred by the person as a Director, Secretary, Chief Executive Officer, Committee member and any other Officer of the Company or of a wholly-owned subsidiary of the Company, to another person except in circumstances where:

(a) the liability is owed to the Company or a wholly -owned subsidiary of the Company; or

(b) the liability is owed to a person other than the Company or a wholly-owned subsidiary of the Company and the liability arises out of conduct involving a lack of good faith; or

(c) the liability arises from a pecuniary penalty order or a compensation order of the Law.

Indemnity for Legal Costs

70. To the extent permitted by the Law, the Company indemnifies every person who is or has been a Director, Secretary, Chief Executive Officer, Committee member and any other officer of the Company or a wholly-owned subsidiary of the Company against any liabilities for costs and expenses incurred:

(a) in defending or resisting proceedings in which the person is found to have a liability for which they could not be indemnified under Clause 69; or

(b) in defending or resisting criminal proceedings in which the person is found to be guilty; or

(c) in defending or resisting proceedings brought by the Australian Securities and Investment Commission (ASIC) or a liquidator for a Court order if the grounds for making the order are found by the Court to have been established; or

(d) in connection with proceedings for relief to the person under the Law and the Court denies the relief,

save that sub-clause (c) shall not be construed as excluding any

indemnity being provided to a person for costs and expenses incurred in responding to action by ASIC or a liquidator as part of an investigation before commencing proceedings for the Court order.

Insurance premiums for Certain Liabilities

71. The Company may pay, or agree to pay, a premium in respect of a contract insuring a person who is or has been a Director, Secretary, Chief Executive Officer, Committee member and any other officer of the Company or a wholly-owned subsidiary of the Company against a liability:

(a) Incurred by the person in their capacity as a Director, Secretary, Chief Executive Officer, Committee member and any other officer of the Company or a wholly-owned subsidiary of the Company or in the course of acting in connection with the affairs of the Company or a subsidiary of the Company or otherwise arising out of the Officer's holding such office PROVIDED THAT the liability does not arise out of conduct involving a wilful breach of duty in relation to the Company or subsidiary of the Company or a contravention of section 182 or 183 of the Law; or

(b) for costs and expenses incurred by that person in defending proceedings, whatever their outcome.

Payments of Legal Costs

72. To the extent permitted by the Law and notwithstanding clauses 66 and 67, the Company may make (or agree to make) payment, whether by way of advance, loan or otherwise, to a Director, Secretary, Chief Executive Officer, Committee member and any other officer of the Company or a wholly-owned subsidiary of the Company in respect of costs and expenses incurred by that person in defending any proceedings provided that:

(a) the person is or may be entitled to be indemnified by the Company against liability for the cost and expenses pursuant to clause 70; and

(b) it would be reasonable in the circumstances of the Company, disregarding any other financial benefits given or payable to the person by the Company, to:

(i) make the payment at the time the payment was or is given; or

(ii) agree to make the payment at the time when the agreement is or was made; and

(c) the person must repay the amount paid if the costs and expenses become costs and expenses for which the person is not entitled to be indemnified by the Company pursuant to clause 70.

Exemptions

72A Nothing in clauses 69 to 70 shall be construed as providing an exemption to a person from a liability to the Company incurred as a Director, Secretary, Chief Executive Officer, Committee member and any other officer of the Company.

Definition of "Proceedings"

72B For clauses 70 to 72, the term "proceedings" means any proceedings, whether civil or criminal, being proceedings in which it is alleged that the person has done or omitted to do some act, matter or thing in that person's capacity as an Officer or in the course of acting in connection with the affairs of the Company or a wholly-owned subsidiary of the Company (for the purpose of clauses 70 to 72) or a subsidiary (for the purpose of clause 71) or otherwise arising out of the Officer's holding such as office (including proceedings alleging that the person was guilty of negligence, default, breach of trust or breach of duty in relation to the Company or a wholly-owned subsidiary of the Company (for the purpose of clause 70 to 72) or a subsidiary (for the purpose of clause 71)

SEAL

73. The Directors shall provide for safe custody of the seal, which shall only be used by the authority of the Directors or of a committee of the Directors authorised by the Directors to act on their behalf, and every instrument to which the seal is affixed shall be signed by a director and shall be countersigned by the Secretary or by a second director or by some person appointed by the Directors.

ACCOUNTS

74. The Directors shall cause proper accounting and other records to be kept and shall distribute copies of Statement of Financial Position, Statement of Financial Performance and Cash Flow Statement as required by the Law and shall from time to time determine whether and to what extent and at what times and places and under what conditions or regulations the accounting and other records of the Company or any of them shall be open to the inspection of members not being Directors, and no member not being a director shall have any right of inspecting any account or book or paper of the Company except as conferred by statute or authorised by the Directors or by the Company in general meeting.

75. True accounts shall be kept of the sum or sums of money received and extended by the Company and the matter in respect of which such receipt and expenditure takes place, and of the property, credits and liabilities of the Company, and subject to any reasonable restrictions as to the time and manner of inspecting the same that may be imposed in accordance with the regulations of the Company for the time being in force, shall be open to the inspection of the members. Once at least in every year, the accounts of the Company shall be examined by one or more properly qualified Auditor or Auditors.

INSPECTION OF RECORDS

76. The company shall guarantee directors, auditors and other officers access - from

when they are appointed until seven years after their retirement or resignation - to all relevant company records which came into existence during their term of office.

NOTICES

77. (1) Not less than twenty-one days notice of every General Meeting specifying the place day and hour of the meeting and the general nature of the business to be dealt with shall be given to the members in the manner hereinafter provided.
(2) Not less than twenty-one days notice of every General Meeting at which it is proposed by the Company to pass a special resolution as defined by the Law specifying the place day and hour of the meeting and the intention to propose the resolution as a special resolution shall be given to the members in the manner hereinafter provided or in such manner (if any) as may be prescribed by the Company in General Meeting.

78. All notices may be served upon any member either personally or by sending the same through the post addressed to such member at the member's address as entered in the Register, or may be given electronically if a member nominates an electronic address or in exceptional circumstance may be served by advertisement in at least one daily national newspaper if such notice be intended for all members of the Company. Notices of meeting served by advertisement in newspapers shall contain details of the nature and purpose of the meeting.
The accidental omission to give notice of a meeting to, or the non-receipt of such notice by any member shall not invalidate the proceedings of a meeting held in pursuance of such notice

79. Notwithstanding anything contained in Clause 78 notice of a General Meeting of the Company specifying an intention to propose a resolution as a special resolution shall be served by sending the same through the post. Notice in the Annual Report of the Company forwarded to each member shall constitute sufficient notice within the meaning of this Clause.

80. Any notice sent by post shall be deemed to have been served on the third working day following posting.

81. **(1)** Notice of every general meeting shall be given in any manner hereinbefore authorised to:-

(a) every member except those members who (having no registered address within the State) have not supplied to the Company an address within the State for giving of notices to them;

(b) the auditor for the time being of the Company.

(2) No other person shall be entitled to receive notices of general meetings.

INTERPRETATION OF THIS CONSTITUTION

82. If a clause or part thereof is, or may become, unenforceable at law for any reason whatsoever, this Constitution is severable in respect of such clause or part thereof and the remainder of this Constitution is to be read and construed for all intents and purposes as if the same did not form part of this Constitution.

83. Subject to the overriding powers of members in General Meeting, contained in Clause 42 hereof, and to the jurisdiction of the Courts, if any doubt shall arise as to the proper construction or meaning of any of this Constitution made hereunder or any of them or of any expression therein the decision of the Board of Directors thereon shall be final and conclusive provided such decision be reduced to writing and recorded in the Minute Book of the proceedings of the Board of Directors.

ATTACHMENT: ID01

Delegated and Authorised Actions for June 2021 - Development

Attachment 1
Table of Delegated Actions for June 2021

Records of exercise of delegated powers or duties

Reference	Function	Category	Officer	Date of decision	Decision	Description	Person or classes of persons
EMP200	Grant a Building Permit	CEO to Employees	Manager Development	1 Jun 2021	Granted	Building Permit - Dwelling	Port Denison Builders
EMP200	Grant a Building Permit	CEO to Employees	Manager Development	4 Jun 2021	Granted	Building Permit - Dwelling	Meliador (WA) Pty Ltd
EMP200	Grant a Building Permit	CEO to Employees	Manager Development	10 Jun 2021	Granted	Building Permit - Dwelling	WA Country Builders Pty Ltd
EMP200	Grant a Building Permit	CEO to Employees	Manager Development	10 Jun 2021	Granted	Building Permit - Ancillary Dwelling	J Rogers
EMP200	Grant a Building Permit	CEO to Employees	Manager Development	9 Jun 2021	Granted	Building Permit - Dwelling	Plunkett Homes Pty Ltd
EMP200	Grant a Building Permit	CEO to Employees	Manager Development	17 Jun 2021	Granted	Building Permit - Outbuilding	Aussie Sheds Group
EMP200	Grant a Building Permit	CEO to Employees	Manager Development	17 Jun 2021	Granted	Building Permit - Dwelling	Warren Taylor Homes Pty Ltd
EMP200	Grant a Building Permit	CEO to Employees	Manager Development	18 Jun 2021	Granted	Development Approval - Dwelling	WA Country Builders Pty Ltd
EMP200	Grant a Building Permit	CEO to Employees	Manager Development	24 Jun 2021	Granted	Building Permit - Dwelling	Tunbridge Construction and Maintenance Pty Ltd

Records of exercise of delegated powers or duties

Reference	Function	Category	Officer	Date of decision	Decision	Description	Person or classes of persons
EMP200	Grant a Building Permit	CEO to Employees	Manager Development	21 Jun 2021	Granted	Building Permit - Outbuilding	Norwest Building Group Pty Ltd
EMP200	Grant a Building Permit	CEO to Employees	Manager Development	23 Jun 2021	Granted	Building Permit - Outbuilding	Aussie Sheds Group
EMP200	Grant a Building Permit	CEO to Employees	Manager Development	24 Jun 2021	Granted	Building Permit - Outbuilding	Ryan Patterson
EMP200	Grant a Building Permit	CEO to Employees	Manager Development	28 Jun 2021	Granted	Building Permit - Outbuilding	MGI Construction Pty Ltd
EMP200	Grant a Building Permit	CEO to Employees	Manager Development	30 Jun 2021	Granted	Variation to Dwelling & Retaining Walls	McAullay Builders Pty Ltd
EMP904	Local Planning Scheme No.5	CEO to Employees	Manager Development	3 Jun 2021	Granted	Development Approval - Dwelling	Warren Taylor Homes
EMP904	Local Planning Scheme No.5	CEO to Employees	Manager Development	4 Jun 2021	Granted	Development Approval - Ancillary Dwelling	PJ Ruffles
EMP904	Local Planning Scheme No.5	CEO to Employees	Manager Development	9 Jun 2021	Granted	Development Approval - Outbuilding	Norwest Building Group

Records of exercise of delegated powers or duties

Reference	Function	Category	Officer	Date of decision	Decision	Description	Person or classes of persons
EMP904	Local Planning Scheme No.5	CEO to Employees	Manager Development	21 Jun 2021	Granted	Development Approval - Outbuilding	Aussie Sheds Group
EMP904	Local Planning Scheme No.5	CEO to Employees	Manager Development	24 Jun 2021	Granted	Development Approval - Dwelling	Cedar Homes

ATTACHMENT: ID02

Shire of Irwin Coastal Management Plan

Attachment 2
Literature Review and Stakeholder & Community Engagement Plan

Attachment 3
Schedule of Submissions

landinsights
PLANNING DESIGN ENVIRONMENT

COASTAL MANAGEMENT PLAN

LITERATURE REVIEW

PREPARED FOR

SHIRE OF IRWIN

MARCH 2020

Prepared by:

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Document details:

Document History:

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Important Note:

"The information contained in this report has been prepared with care by the author(s), or it has been supplied to the author(s) by apparently reliable sources. In either case, the author(s) have no reason to doubt its completeness or accuracy. However, neither the author(s) company nor its employees guarantee the information, nor does it or is it intended to form part of any contract. Accordingly, all interested parties should make their own inquiries to verify the information, as well as any additional or supporting information supplied, and it is the responsibility of interested parties to satisfy themselves in all respects.

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1 Introduction

1.1 Background

This report presents the review of the background documents relating to the Coastal Management Plan for the Shire of Irwin, including federal, state and local government policies as well as other planning documents and background information. The purpose of the literature review is to establish the planning context (to communicate to the reader the guiding principles behind coastal management and the obligations of local and state government and land holders) and to provide information on the variety of reports which have been prepared for the study area which provide justification for some of the recommendations provided.

Planning documents such as the *Shire of Irwin Local Planning Scheme No. 5* (WAPC, 2008) and *Shire of Irwin Local Planning Strategy 2017* (Shire of Irwin and TPG, 2017) provide context for the future planning of the area. Local reports such as the *Coastal Hazard Risk Management and Adaptation Plan* (Shire of Irwin, 2016) and *NACC Off-Road Feasibility Study* (NACC, 2015) provide context and help to guide the formulation of strategies and actions. Detailed information is extracted from these documents where relevant in the CMP to provide environmental, social and cultural context of the study area.

The documents included in this review include the following:

- Australian Coastal Public Safety Guidelines
- Multiple Land Use Framework
- The Burra Charter
- Risky business – a resource to help local governments manage environmental health risks
- Mid-West Regional Planning and Infrastructure Framework 2015
- Mid-West Tourism Development Strategy
- State Planning Policy 2 – Environmental and Natural Resources Policy
- State Planning Policy 2.6 (SPP 2.6) and Guidelines
- Coastal Hazard Risk Management and Adaptation Planning Guidelines

- State Planning Policy 3.5 – Historic Heritage Conservation
- Status of Coastal Planning in Western Australia 2012
- Coastal Planning and Management Manual 2003
- Coastal Management Specification Manual 2010
- Tourism Planning Guidelines 2014
- A Strategic Approach to Caravan and Camping Tourism in Western Australia 2012
- Batavia Coast Strategy
- Climate Change Adaptation Action Plan
- Shire of Northampton Local Planning Scheme No. 10
- Shire of Chapman Valley Coastal Management Strategy and Action Plan 2016
- Shire of Northampton Coastal Strategy 2006
- Off-Road Vehicle Areas in the Northern Agricultural Region of Western Australia Feasibility Study
- Control of African Boxthorn Regional Management Plan
- Lucky Bay Coastal Node Study
- Geraldton Regional Flora and Vegetation Survey
- Migration of limesand dunes in Western Australia and their impacts
- Shire of Northampton Strategic Community Plan 2016-2026

2 Federal

2.1 Australian Coastal Public Safety Guidelines

The *Australian Coastal Public Safety Guidelines* were prepared in 2007 by Surf Lifesaving Australia. The purpose of the guidelines is to provide world-best practical advice to land managers with a responsibility for public safety on the Australian coast.

Application/Implication

These guidelines can be used by the Shire when considering coastal hazards and risks, coastal signage, beach cleaning, emergency management and coastal tourism safety.

2.2 Multiple Land Use Framework

Multiple landowners can exist over an area and can cause issues when it comes to access and land use across an area, especially where historic cadastre patterns have resulted in odd-shaped lots and patterns. The *Multiple Land Use Framework* (MLUF) was prepared by the Standing Council on Energy and Resources in 2013 in recognition of the conflict arising over land access and land use. The aim of the MLUF is to enable government, community and industry to effectively and efficiently meet land access and use challenges, expectations and opportunities. It was developed with the minerals and energy resources sectors in mind, however the underlying concepts can be applied to all sectors. The MLUF recognises that access to land is fundamentally important to the successful management of competing interests of mining, energy, agriculture, environment, community and other significant land users.

Application/Implication

This document has a focus on outlining the guiding principles and objectives of the project, rather than specific advice as to how land use conflicts and access can be resolved. Each situation should be considered on a case-to-case basis and terms negotiated between affected parties.

2.3 The Burra Charter

The Burra Charter (Australia ICOMOS Inc., 2013) provides guidance for the conservation and management of places of cultural significance (cultural heritage places). It sets a standard of practice for those who provide advice, make decisions about, or undertake works to places of cultural significance, including owners, managers and custodians. The Charter can be applied to all types of places of cultural significance including natural, Indigenous and historic places with cultural values. It provides guidance on conservation principles, conservation process and conservation practice.

The steps in the Burra Charter process are:

- Understand the place
- Assess cultural significance
- Identify all factors and issues
- Develop policy
- Prepare a management plan
- Implement a management plan
- Monitor the results of the management plan.

Application/Implication

The principles and guidelines from The Burra Charter should be used by the Shire and coastal managers in the management and protection of cultural heritage sites.

2.4 Risky business – a resource to help local governments manage environmental health risks

Risky Business – a resource to help local governments manage environmental health risks was prepared by the Australian Government Department of Health (previously the Department of Health and Ageing) and the Environmental Standing Committee in 2012. The aim of the resource is to raise awareness of how to minimise the financial, health and reputation risks related to the environmental health responsibilities of local governments and thereby protect the best interests of both their communities and their organisation. It outlines six steps to achieve effective environmental health risk management:

- Identify responsibilities

- Identify roles – how does the local government manage environmental health
- Identify what the environmental health risks are
- Identify the likelihood and likely consequences of the risks
- Identify how the local government can reduce the risks
- Identify how local government can achieve risk management outcomes.

Application/Implication

This guideline is a useful resource not only for the CMP but for the Shire of Irwin to use in their regular operations. Some of the guidelines can be incorporated into the Shire's Strategic Plan and other environmental management plans.

3 State

3.1 Mid-West Regional Planning and Infrastructure Framework 2015

The *Mid-West Regional Planning and Infrastructure Framework* was finalised by the WAPC in 2015. It provides a regional context for land use planning in the Mid West, an overview of major regional economic, social, cultural and environmental issues, priority actions for planning and priority infrastructure projects. It categorises the region into three sub-regions: Batavia Coast, North Midlands and Murchison. The Shire of Irwin is located within the Batavia sub-region.

The Batavia coast includes the Regional City of Geraldton and the two Sub-Regional Centres of Dongara–Denison and Kalbarri. This sub-region will have the greatest pressure for development and will therefore require careful growth management. Dongara-Denison is identified as a *sub-regional centre.* They are described as centres which '*support the population and economic activities within the surrounding hinterlands'.* A *Potential Infrastructure Corridor* is also shown running through Dongara-Denison and north along the coast towards Geraldton.

The Framework also identifies a number of minerals and resources along the coast including a gypsum mine south of Dongara and a limestone-limesand mine close to the Dongara townsite.

Application/Implication

The Framework states that the Batavia Coast will have the greatest pressure for development. This increased pressure for development and population growth could have a cumulative effect on the coastal area by increasing the number of visitors to the area, especially during holiday periods. Being located in close proximity to Geraldton also appeals the coastal areas of the Shire to locals from surrounding local government areas which places even greater pressure on the Shire for coastal management.

3.2 Mid-West Tourism Development Strategy

The *Mid West Tourism Development Strategy* was prepared by the Mid West Development Commission, the Regional Development Australia and Evolve Solutions in 2014 to inform future development and investment in the Mid West. The Strategy identified that the Mid West is underperforming as a tourist destination in that its potential is not being realised and recommends the following:

1. *Increasing accommodation capacity from camping through to resorts*
2. *Opening up day use sites-places previously overlooked or under-developed to enhance the Mid-West's appeal as a destination*
3. *Improving the quality and distribution of information for pre-trip planning and way finding*
4. *Attracting more high-yield visitors and the growing self-drive and RV market*
5. *Increasing the range of Aboriginal and eco nature-based tourism activities, attractions and experiences.*

The following recommendations are made with regards to the Shire of Irwin:

- *Continue to encourage the development of a 4-5 star hotel-resort at the former Kailis plant site near the foreshore; ideally 40-50 rooms to support events / seminars using the conference facilities within the recreation centre. Encourage TWA to co-promote the site to investors*
- *Encourage the development of additional farmstays, holiday homes, B&B's and lodges-hostels; encourage growth in visitation during the peak periods*
- *Investigate the development of a fortnightly or monthly farmers market in-near town; encouraging local producers, entrepreneurs and businesses to deliver a variety of produce and products.*
- *Investigate parking for long vehicles near the main street, with appropriate signage*
- *Continue to explore the sustainability of an ocean pool as an attraction*
- *Investigate greater use of the river, the riverbanks and surrounding areas, including day time activities (e.g. trails, picnic areas, benches, pathways, canoeing, swimming) and evening activities (e.g. BBQ's, rest areas)*
- *Investigate larger, more prominent signage on the Brand Highway / Kailis Drive junction to encourage higher volume of visitors / vehicles into Port Denison.*

- *Investigate re-branding as Dongara with a strong emphasis on ocean/coast, river, heritage, country town, fishing and marine activities. Phase out Port Denison and Shire of Irwin from all branding and tourism promotion. Introduce a logo and tag line and incorporate into all promotional mediums.*
- *Investigate upgrading directional signage in-around Geraldton to the visitor centre, day use sites, attractions / places of interest, hospitality, parking (for long and short vehicles), trails and sport-rec facilities.*
- *Continue to progress the Port Denison Foreshore master plan.*
- *Continue to progress the Town centre revitalisation plan including the RV park, the relocated Visitor Centre and visitor amenities at the Park.*
- *Continue to progress the development of tourism nodes along the coast both as day use sites and overnight short stay sites.*

Application/Implication

Implementation of the above actions for the Shire of Irwin is hoped to lead to an increase in tourism and visitation in the Shire, focusing on the coastal areas and the townsite. This can lead to increased coastal use and possible degradation which will need to be appropriately managed by the Shire and other coastal managers to help manage degradation.

3.3 State Planning Policy 2 – Environmental and Natural Resources Policy

State Planning Policy 2 – Environmental and Natural Resources Policy (SPP) was prepared by the WAPC in 2003. The Policy objectives of SPP 2 are to integrate environmental management with broader land use planning, to protect, conserve and enhance the natural environment and to promote sustainable use of natural resources. Policy Measures in SPP 2 focus on water resources, air quality, soil and land quality, biodiversity, agricultural land, minerals, petroleum and basic raw materials, marine resources and aquaculture, landscape, greenhouse gas emissions and energy efficiency.

Application/Implication

The preparation of this Coastal Management Plan is a response to the objectives of SPP 2 and its main purpose it to protect, conserve and enhance environmental features along the coast, to promote sustainable use for future generations to enjoy and to provide practical and realistic actions that can be used by decision-makers.

3.4 State Planning Policy 2.4 – Basic Raw Materials

SPP 2.4 – Basic Raw Materials was prepared by the WAPC in 2000. It *sets out the matters which are to be taken into account and given effect to by the Commission and local governments in considering zoning, subdivision and development applications for extractive industries (for the extraction of basic raw materials) and zoning, subdivision and development applications in the vicinity of identified basic raw material resource areas*.

The policy objectives are to:

- *identify the location and extent of known basic raw material resources;*
- *protect Priority Resource Locations, Key Extraction Areas and Extraction Areas from being developed for incompatible land uses which could limit future exploitation;*
- *ensure that the use and development of land for the extraction of basic raw materials does not adversely affect the environment or amenity in the locality of the operation during or after extraction;*
- *provide a consistent planning approval process for extractive industry proposals including the early consideration of sequential land uses.*

Application/Implication

While the Policy mapping does not extend into the study area, the policy objectives are applicable. The Mid-West Regional Planning and Infrastructure Framework identifies a number of minerals and basic raw materials along the coast including a gypsum mine south of Dongara and a limestone-limesand mine close to the Dongara townsite. The use of the site for low-key coastal development should not have an adverse impact on the possible future use of the site for basic raw materials extraction. Any permanent development proposed along the coast should consider the impact on basic raw materials.

3.5 Draft State Planning Policy 2.4 – Basic Raw Materials and Guidelines

Draft SPP 2.4 – Basic Raw Materials and the *Basic Raw Materials Guidelines* were released for public comment in October 2018. The SPP 'enables the responsible extraction of Basic Raw Materials (BRM), while ensuring the protection of people and the environment.' The updated mapping identifies 'Extraction Sites' and areas of 'Significant Geological Supplies'. The Policy provides guidance to operators and decision makers regarding applications for BRM extraction, as well as other types of planning applications that can potentially impact on extraction sites or significant geological supplies.

The draft SPP 2.4 mapping indicates that a number of limesand significant geological supplies are located along the coast south of the Port Denison/Dongara townsite.

Application/Implication

As with the current SPP 2.4, the implications of the draft SPP 2.4 are similar in that any application for basic raw materials will need to consider the impact on the environment and any coastal development will need to consider its possible impact on BRM. The use of the site for low-key coastal development should not have an adverse impact on the possible future use of the site for basic raw materials extraction.

3.6 State Planning Policy 2.9 – Water Resources

SPP 2.9 – Water Resources was prepared by the WAPC in 2009. It provides guidance to planning decision-makers for consideration of water resources in land use planning. The objectives of the policy are:

1. *To protect, conserve and enhance water resources that are identified as having significant economic, social, cultural and/or environmental values*
2. *To protect, conserve and enhance water resources that are identified as having significant economic, social, cultural and/or environmental values*
3. *To promote and assist in the management and sustainable use of water resources.*

Water resources included within the Policy include groundwater, wetlands, waterways and estuaries.

Application/Implication

The only surface water feature in the study area is the Irwin River. The surface water catchment areas for the Shire's coastal area includes 'Moore-Hill Rivers' and 'Greenough River'. The entire coastal area is included within the 'Arrowsmith' Proclaimed Groundwater Area (under the *Rights in Water and Irrigation Act 1914*). Application of SPP 2.9 will be required should any development be proposed along the Shire's coast that may impact on water resources.

3.7 State Planning Policy 2.6 – State Coastal Planning Policy

SPP 2.6 – State Coastal Planning Policy was prepared by the WAPC in 2013. This Policy provides guidance for decision-making within the coastal zone including managing development and land use change, establishment of foreshore reserves; and to protect, conserve and enhance coastal values. The Policy is to inform and guide decision-making by the WAPC and its Committees, and in integrating and coordinating the activities of state agencies that influence the use and development of land in the coastal zone. It also provides guidance for private landowners wishing to undertake development in the coastal zone.

Application/Implication

SPP 2.6 will be used as a guiding document during preparation of the CMP and the hazard assessments undertaken by Seashore Engineering.

3.8 State Planning Policy 2.6 State Coastal Planning Policy Guidelines

The *State Coastal Planning Policy Guidelines* were prepared by the WAPC in 2013. These guidelines were prepared to support the implementation of SPP 2.6 and to assist decision-makers to:

- Consider coastal hazards and evaluate their likelihood
- Identify realistic and effective management and adaptation responses to those risks
- Prioritise the management and adaptation responses.

The Guidelines provide detailed guidance for the application of the policy measures. It includes details on the following:

- Development and settlement
- Earthworks and soil
- Water resources and management
- Visual landscape
- Coastal hazard risk management and adaption planning process
- Vulnerability assessment
- Assessing risk adaption options
- Ongoing risk management and adaption planning
- Communication and consultation
- Coastal adaption and protection grants scheme
- Infill development
- Coastal protection works
- Public interest
- Public access
- Coastal roads and car parks
- Coastal pedestrian access and dual use paths
- Coastal foreshore reserves
- Ecological values
- Landscape, seascape and visual landscape
- Heritage
- Coastal strategies and management plans.

A large focus of the guidelines is planning and adapting to setbacks and ensuring infrastructure and facilities are appropriate.

Application/Implication

The SPP 2.6 Guidelines will be used during preparation of the CMP and the hazard assessments undertaken by Seashore Engineering.

3.9 State Planning Policy 3.4 – Natural Hazards and Disasters

SPP 3.4 – Natural Hazards and Disasters was prepared by the WAPC in 2006. The purpose of the Policy is to encourage local governments to adopt a systematic approach to the consideration of natural hazards and disasters when making planning decision. Natural hazards and disasters include flood risk, bushfire, landslides, cyclonic activity, severe storms and storm surge.

The Policy objectives are to:

- Include planning for natural disasters as a fundamental element in the preparation of all statutory and non-statutory planning documents, specifically town planning schemes and amendments, and local planning strategies
- Through the use of these planning instruments, to minimise the adverse impacts of natural disasters on communities, the economy and the environment.

Application/Implication

Natural hazards and disasters applicable to the coastal zone include flood risk (in low-lying areas such as waterways), bushfire, coastal erosion, storm surge, severe storms (including cyclones) and landslides (or limestone collapse). The hazards most applicable to the study area include bush fire (this is addressed under SPP 3.7), coastal erosion and storms (this is addressed under SPP 2.6) and flood risk (applicable to the Irwin River areas). There are no limestone outcrops or slopes of 15% or greater that will warrant too much concern about landslides. Natural hazards and disasters can be addressed through the Shire's fire and emergency response plan for the coast. Any applications for development or building along the coast will need to take this policy into consideration.

3.10 State Planning Policy 3.5 – Historic Heritage Conservation

SPP 3.5 – Historic Heritage Conservation was prepared by the WAPC in 2007. This policy sets out the principles of sound and responsible planning for the conservation and protection of Western Australia's

historic heritage. It applies principally to historic cultural heritage including heritage areas, buildings and structures, historic cemeteries and gardens, man-made landscapes and historic or archaeological sites with or without built features.

The objectives of this policy are:

- *To conserve places and areas of historic heritage significance*
- *To ensure that development does not adversely affect the significance of heritage places and areas*
- *To ensure that heritage significance at both the State and local levels is given due weight in planning decision-making*
- *To provide improved certainty to landowners and the community about the planning processes for heritage identification, conservation and protection.*

The policy measures include identification and assessment of places of state significance by the Heritage Council of WA, designation of heritage areas, establishment of heritage lists, consideration of heritage when undertaking planning and establishment of development control principles.

Application/Implication

There is one heritage site on the State Register located at the Port Denison townsite ('two obelisks and commemorative plaques'. Two Registered Aboriginal Heritage Sites are located within the Port Denison/Dongara townsite. The first is the 'Irwin River' (ID 18907) which is described as 'historical, mythological, camp, natural feature, water source' and the second is 'Leander Point' (ID 5280) which is described as 'artefacts/scatter, midden/scatter'. One 'Other Heritage Site' is identified within the study area which stretches along the southern part of the Shire's coast. This site is called 'Eneabba West' (ID 15297) and is identified as 'stored data' and not a site as such. It is described as 'ceremonial, fish trap, camp, water source, other'.

There are few implications from SPP 3.5 as there are few heritage sites identified in the study area. However, should any development be proposed in the study area it will be necessary to follow the guidance in this policy as well as the relevant legislation.

3.11 State Planning Policy 3.7 – Planning in Bushfire Prone Areas

SPP 3.7 – Planning for Bushfire Prone Areas was prepared by the WAPC in 2015. It provides the foundation for land use planning to address bushfire risk management in Western Australia and to inform and guide decision-makers, referral agencies and landowners to help achieve acceptable bushfire protection outcomes. It applies to development in designated bushfire prone areas.

The entire coastal area is included in the mapped bushfire prone area, including parts of the coast through the Port Denison/Dongara townsite. This is owing to the amount of vegetation located along the Shire's coastal areas which increases fire hazard.

Application/Implication

Fire and emergency management plans are essential for coastal areas which are identified as bushfire prone. This is particularly important as the coastal areas are frequently used by the community for recreation and social purposes. The Shire should ensure that they have appropriate fire and emergency management plans in place and implemented as appropriate.

3.12 Draft Position Statement – Tourism Land Uses Within Bushfire Prone Areas

The *draft Position Statement – Tourism Land Uses Within Bushfire Prone Areas* was prepared by the WAPC in 2018. It provides the WAPC's policy position for short stay tourism land uses and tourism land uses limited to day/night use with no overnight stay located within bushfire prone areas. It should be referred to in conjunction with SSPP 3.7.

The objectives of the Policy are to:

- *minimise vulnerability of tourism land uses in bushfire prone areas*
- *provide bushfire protection relevant to the characteristics of the tourism land use*

- *identify and understand the risks in order to anticipate and provide suitable bushfire risk management measures*
- *achieve a balance between bushfire risk management measures, environmental protection and biodiversity management and landscape amenity.*

With regards to caravan parks, the Position Statement states the following:

> *Standard type caravans and motor homes used for short-term tourist accommodation generally cannot achieve any level of construction under AS 3959. Compliance with the general policy measures should be demonstrated including the provision of APZs for habitable buildings such as offices, shops and enclosed eating areas. The emphasis should also be on emergency management, early evacuation and/or non-operation on days of catastrophic fire danger rating or in high fire risk areas, a fire danger rating of very high, severe or extreme, may be more appropriate. Where suitable vehicular access to two different destinations cannot be provided, the BMP should identify the risks and propose bushfire mitigation measures to reduce this risk, including a refuge building or open space area.*

With regards to camping grounds, the Position Statement states the following:

> *No construction requirements for tents are provided in AS 3959. Due to the nature of materials used in tent construction, little can be done to enhance structural resilience. The emphasis should also be on emergency management, early evacuation and/or non-operation on days of catastrophic fire danger rating or in high fire risk areas, a fire danger rating of very high, severe or extreme, may be more appropriate. Western Australia contains many camping grounds that are remote from townsites and emergency services and require special consideration. Some of these camping grounds provide limited facilities and may or may not include an on-site caretaker. There is an inherent risk associated with these areas, bushfire being one of them. It is the responsibility of the owner/operator to provide information on the bushfire risks associated with the area and any emergency management options available. It is also the responsibility of those visiting these areas to understand and prepare for these risks. Vehicular access may be limited to 4-wheel drive; and*

potable water and water for firefighting may not be available. The use of remote camping grounds in high risk bushfire prone areas during periods of elevated bushfire danger is discouraged. The BMP should identify the risks and propose bushfire mitigation measures to reduce this risk. This could include improvements to vehicular access, signage and identification of areas of 'least risk' for the camp sites.

Application/Implication

The draft Position Statement is a useful document for coastal managers in the Shire of Irwin because a majority of the coastline is located within a bushfire prone area. The preparation of any bushfire or emergency management plans should refer to the Position Statement. Recommendations from the Position Statement can be included such as improvements to vehicular access, signage, identification of areas of 'least risk' for the camp sites, emergency management, early evacuation and/or non-operation on days of catastrophic fire danger rating or in high fire risk areas, a fire danger rating of very high, severe or extreme.

3.13 Status of Coastal Planning in Western Australia 2012

The *Status of Coastal Planning in Western Australia* was prepared by the WAPC in 2012 to assist with the implementation of the Coastal Planning Program for the state.

The Coastal Planning Program is one of the tools used to update the WAPC on land use and management of the State's coastal resources. The report identifies that the coastal considerations for the Mid West region are:

- *Protection of the coast and the cost of protection works.*
- *Control of off-road vehicles.*
- *Balancing recreational demands for coastal access and Oakajee Port requirements.*
- *Preservation of areas with high biodiversity conflicting with land use required for residential or commercial development.*
- *Planning for climate change.*

Application/Implication

The report identifies a number of existing plans relating to the Shire of Irwin's coastal areas, however some of these have been updated since the Status of Coastal Planning was prepared (such as the Irwin River Estuary Management Plan prepared in 2014). The report doesn't identify any outstanding plans in need of preparation in the Shire of Irwin. However as the existing Irwin Coastal Development Strategy is close to 20 years old it is considered in need of revision.

3.14 Coastal Planning and Management Manual 2003

The *Coastal Planning and Management Manual* was prepared by the WAPC in 2003 to provide a practical guide to coastal planning and management in WA. It provides information on a broad range of issues which should be considered when managing the coastline such as the following:

- Common coastal management problems
- Techniques for dune stabilisation
- Rehabilitation of coastal landscapes
- Revegetation methods
- Weed management.

A number of principles are described in the manual, the aim of which is to advise readers about an appropriate framework for managing the coast. These principles address the following:

- Sustainable management
- Identifying the limits of acceptable change
- Maintenance of ecosystem integrity
- Consultation
- Respect for and protection of Indigenous rights, interests, culture and heritage
- Identification of management objectives
- Staged management approaches
- Minimal intervention
- Site-specific management approaches.

Application/Implication

This manual is a useful environmental planning tool which can be used by the Shire when undertaking rehabilitation, dune stabilisation and weed control.

3.15 Coastal Management Specification Manual 2010

The *Coastal Management Specification Manual* was prepared in 2005 by Green Skills for the South Coast Management Group and revised in 2010. It provides a guide for the construction of coastal infrastructure, including specifications and drawings for the design of features such as seating and tables, BBQs, signage, cap parking areas, campsites, timber boardwalks and steps, viewing platforms, birdhides, low water use toilets and fish cleaning stations.

Application/Implication

The Specification Manual should be referred to when designing and constructing infrastructure along Shire's coastline.

3.16 Tourism Planning Guidelines 2014

The *Tourism Planning Guidelines* were prepared by Tourism WA, the then Department of Planning and the Western Australian Planning Commission in 2014. They aim to provide assistance to local governments when preparing the tourism component of a local planning strategy. The purpose of this is to encourage an increased focus on land use planning for tourism and to provide local governments with a rationale for determining future land allocation, planning controls and infrastructure needs for tourism.

The report provides guidance with regards to site assessments for future tourist accommodation development, infrastructure and services, tourist attractions, activities and amenities, tourism precincts and sites, zoning for tourism, tourist development in non-tourist zones, redevelopment areas, hotels, holiday homes and caravan parks.

The Guidelines encourage caravan parks and camping to provide for a particular niche in the short-stay accommodation market and the provision of affordable accommodation for tourists. Camping grounds are

described in the Guidelines as low-key, low impact sites that have no or limited facilities. With regards to caravan park redevelopment, the Guidelines suggest that the local planning scheme require that a Local Development Plan is prepared to support the development.

Application/Implication

The Shire's coastal areas primarily comprise of low-key camping areas and recreational areas, including some squatter shacks along the southern coastal areas. The Guidelines should be referred to when considering whether certain sites should be improved, new sites created or existing sites closed or when the Shire updates its Local Planning Strategy or Scheme.

3.17 A Strategic Approach to Caravan and Camping Tourism in Western Australia 2012

A Strategic Approach to Caravan and Camping Tourism in Western Australia was prepared by Tourism WA, Brighthouse and Starfish Business Solutions in 2012 and provides recommendations to address the provision of caravan and camping infrastructure, particularly in coastal locations. The aim is to make WA the preferred caravan and camping holiday destination.

One medium priority was identified by Tourism WA within the Shire of Irwin. The priority identified was the need for more dump points along Indian Ocean Drive.

Recommendations presented in the report include the following:

- *Recommendation 1: Streamline caravan park and campgrounds regulations to improve supply and meet market demand*
- *Recommendation 2: Increase support for landbank to release land for more caravan park developments where viable*
- *Recommendation 3: Identify opportunities to access Western Australia's conservation estate*
- *Recommendation 4: Create public-private partnerships to improve delivery and maintenance of caravan and camping facilities*
- *Recommendation 5: Partner with Indigenous Australian's to develop caravan and camping infrastructure on Indigenous land*

- *Recommendation 6: Provide better guidelines for the development of caravan parks to Local Government*
- *Recommendation 7: Develop a State-wide overflow policy that works for visitors and supports industry*
- *Recommendation 8: Raise the bar on skills for the caravan and camping sector*
- *Recommendation 9: Improve data to support decision making*
- *Recommendation 10: Develop a marketing strategy to improve perceptions and online presence of the caravan and camping sector*
- *Recommendation 11: Secure sustainable regional tourism benefits from the resource mining boom.*

Application/Implication

This document does not make many recommendations with relation to the coastal areas within Shire or Irwin. Despite this, there is some useful information contained within the above general recommendations which can be applied to the study area.

3.18 Aboriginal Heritage Due Diligence Guidelines

The *Aboriginal Heritage Due Diligence Guidelines* were prepared by the then Department of Aboriginal Affairs (now DPLH) and Department of Premier and Cabinet in 2013. The purpose of the Guidelines is to assist land users to be more aware of how their activities could adversely impact an Aboriginal site. Compliance with the Guidelines will not of itself guarantee compliance with the *Aboriginal Heritage Act 1972*, however, where the Guidelines are followed, it is less likely that Aboriginal sites will be harmed. The Aboriginal Heritage Directorate recommends that developers undertaking activities within the study area take into consideration the Guidelines when planning. The Guidelines have been developed to assist proponents to identify any risks to Aboriginal heritage and to mitigate risks where heritage sites may be present. Due diligence may involve one or more of the following actions:

(a) assessing the landscape where an activity is to take place;

(b) assessing the proposed activity and the potential impact on the landscape;

(c) searching the Register of Aboriginal Sites and the Aboriginal Heritage Inquiry System;

(d) consulting with the relevant Aboriginal people;

(e) agreeing to an Aboriginal heritage survey; or

(f) other heritage management strategies.

Application/Implication

Two Registered Aboriginal Heritage Sites are located within the Port Denison/Dongara townsite. The first is the 'Irwin River' (ID 18907) which is described as 'historical, mythological, camp, natural feature, water source' and the second is 'Leander Point' (ID 5280) which is described as 'artefacts/scatter, midden/scatter'. One 'Other Heritage Site' is identified within the study area which stretches along the southern part of the Shire's coast. This site is called 'Eneabba West' (ID 15297) and is identified as 'stored data' and not a site as such. It is described as 'ceremonial, fish trap, camp, water source, other'.

The Guidelines should be considered by coastal managers when undertaking any development along the coast. Following the Guidelines should help with compliance with the *Aboriginal Heritage Act 1972* which should also be adhered to when undertaking any development along the coast.

3.19 Indian Ocean Drive Planning Guideline

The *Indian Ocean Drive Planning Guideline* was prepared by the WAPC in 2014. The Guideline sets out broad guidelines for the location, siting and design of various land uses and development in the locality of Indian Ocean Drive with the purpose of retaining the rural and natural landscape and enhancing the provision of services and facilities available to all users of the road. It applies specifically to a 500 metre corridor on either side of the road reserve.

The Guidelines state that currently there are no tourist accommodation providers directly abutting Indian Ocean Drive outside towns but a number of proposals for tourist development in the vicinity of Indian Ocean Drive are being considered including a caravan park on freehold land in the vicinity of Knobby Head.

With regards to stopping locations, Main Roads established a stopping place along the northern section of the road near Knobby Head and the Guidelines state that there is potential for additional stopping places in the northern section of the road.

The Guidelines makes the following recommendations with regards to the study area:

1. *Establish a permanent forum for shire planning officers from the Shires of Gingin, Dandaragan, Coorow, Carnamah and Irwin with Department of Planning, Main Roads and Department of Parks and Wildlife officers support as needed.*
2. *Prepare a uniform local planning policy to be adopted by the five local governments to guide decision-making in relation to land use and development along Indian Ocean Drive.*
3. *Prepare model provisions that could be incorporated into local planning schemes when rezonings are considered that would assist in controlling the siting and screening of development, based on the outcomes of a visual landscape assessment.*
4. *Investigate mechanisms that could be incorporated into local planning schemes to ensure that permitted development such as sheds, single houses, fencing and water tanks are consistent with this Guideline.*
5. *Investigate mechanisms that could be incorporated into local planning schemes to ensure that permitted development such as sheds, single houses, fencing and water tanks are consistent with this Guideline.*
6. *Improve signage on Indian Ocean Drive to identify the location and distance to stopping places and toilets, such as at Hangover Bay and Cervantes, and to inform road users of fuel availability along the road.*
7. *Consider new look-outs in the northern section of Indian Ocean Drive, such as at Freshwater Point (Shire of Irwin) and the upgrading of existing look-outs, such as at Lions Lookout (Shire of Dandaragan).*
8. *Progress planning for additional toilet facilities approximately mid-way between Perth and Jurien Bay.*

9. *Consider enhancing opportunities for travellers to enjoy the landscape and its natural features through the construction of walk trails of various lengths, starting from roadside bays, e.g. from the Wedge lookout down to the coast, or from one roadside stopping place to the next, taking care to locate trails beyond the noise and sight of traffic.*
10. *Consider the guidelines and strategies regarding form and colour as reflected in the Guideline when maintenance, improvements or reconstruction of Main Roads' stopping places occur.*
11. *. Determine the need for additional telecommunications infrastructure to improve mobile phone coverage in areas that currently lack that access such as north of Coolimba and between Nilgen and Grey, south of Cervantes.*
12. *Prepare a fire and vehicle accident risk assessment and associated procedures for the management of emergencies, including evacuation, utilising Indian Ocean Drive and the connecting road network.*
13. *Develop a mobile phone 'application' for road users, particularly visitors, that provides information about the facilities such as stopping places, tourist destinations and service stations, on and in the vicinity of Indian Ocean Drive, as well as interpretative information about the environment.*

Application/Implication

The Guidelines mention a possible caravan park on freehold land in the vicinity of Knobby Head. It recommends additional stopping places north of Knobby Head and lookouts north of Freshwater Point.

3.20 Coastal Sediment Cells for the Mid-West Coast (between the Moore River and Glenfield Beach, Western Australia)

Coastal Sediment Cells for the Mid-West Coast (between the Moore River and Glenfield Beach, Western Australia) was prepared by Seashore Engineering for the Department of Transport in 2014. The aim of the report was to identify a hierarchy of sediment cells to assist planning, management, engineering, science and governance of the Mid-West coast. The report identified Six primary cells, 15 secondary cells and 41 tertiary cells between the Moore River and Glenfield Beach.

The primary cells within the Shire of Irwin were RO7D (south of Dongara) and RO7E (north of Dongara). The secondary cells from south to north along the Irwin coastline are 9, 10, 11 and 12.

Application/implication

The report states that *a major technical use for sediment cells is to improve erosion hazard assessments by better integrating regional and local coastal change. Regional changes may include the effects of climate or sea level fluctuations and the consequent variations in sand supply. Local changes include storm responses and coastal interactions with natural and artificial structures. Improved knowledge of how local changes may have broader impact is essential to good coastal planning.* Further technical information and recommendations from Seashore Engineering will be integrated into the CMP for priority sites.

3.21 Coastal Risk Profile – Sector 4

The *Coastal Risk Profile* Report was prepared by Surf Lifesaving Western Australia in 2005 for the Local Government Insurance Services WA. It evaluates coastal risk at coastal locations stretching from the Shire of Gingin to the Shire of Northampton. The assessment undertakes a risk profile analysis which gives a rating for hazards, population use and frequency of use. The resultant rating is the Facility Visitation Rate which is an indication of overall risk to coastal users.

The report gives the following Facility Visitation Risk ratings for the coastal sites within the Shire:

- Arurine Bay and Port Denison Harbour – 5
- Nine Mile Beach and Ten Mile Beach – 4
- Carsons Beach, Irwin River mouth, Dongara, King Bay, Five Mile Beach and Seven Mile Beach – 3
- Knobby Head, Freshwater Point and Cliff Head – 2

Application/Implication

It is not clear from the report what the scale of the Facility Visitation Risk ratings are, however it can reasonably be concluded that the lower the number the lower the risk. Beaches within the Shire of Irwin have been identified as having low risk. It should also be noted that some of the beach names listed in this report could be inaccurate or not the local names.

3.22 Climate Change Adaptation Action Plan

The *Climate Change Adaptation Action Plan* was prepared by AECOM Australia Pty Ltd for the Batavia Regional Organisation of Councils (BROC) in 2010. The BROC comprises the City of Geraldton-Greenough and the Shires of Irwin, Northampton and Chapman Valley. It identifies risks and opportunities and develops adaptation actions for the councils in response to the higher temperatures, reduced rainfall and sea level rise projected for the region in the future. The report identifies 68 individual risks (which are rated from 'Low' to 'Extreme') and highlights 12 potential climate change related opportunities.

In general, the report proposed the following actions to address the following areas:

- *Water and energy efficiency and other sustainable design issues;*
- *The climate resilience of essential infrastructure;*
- *The long term protection and enhancement of public open spaces;*
- *The protection of local properties from sea level rise and bushfire risks;*
- *Community resilience to increased heat and bushfire risks;*
- *Staff health and safety;*
- *The protection of at risk coastal and other habitats;*
- *Weed and pest control and the protection of biodiversity corridors;*
- *The financial preparedness of BROC members in the face of climate change risks; and*
- *The economic development potential of the renewable energy and the aquaculture industries in the region.*

Most proposed actions take one of the following forms:

- *Providing additional community education (for example regarding the potential impacts of climate change on local biodiversity);*

- *Providing incentives to encourage climate resilient behaviours in the community (for example to encourage residential and commercial uptake of rainwater tanks);*
- *Undertaking further studies (for example cost-benefit analyses and risk mapping projects);*
- *Incorporating or strengthening of resource efficiency and climate resilient principles in councils' existing plans and strategies (for example in the City of Geraldton Greenough's Bushfire Emergency Response Plan);*
- *Implementing ongoing monitoring programs (for example regarding infrastructure conditions or patterns in the use of community facilities);*
- *Providing additional community services (for example targeting vulnerable populations during heat waves);*
- *Closer collaboration with relevant regional bodies (for example with the Fire and Emergency Services Authority and the Department of Planning).*

Application/Implication

While the actions and recommendations in the *Climate Change Adaptation Action Plan* more closely relate to a CHRMAP rather than this CMP, there are certain suggestions which can be applicable such as community education and monitoring.

3.23 The Coast of the Shires of Coorow to Northampton, Mid West, Western Australia: Geology, Geomorphology and Vulnerability

The Technical Report for *The Coast of the Shires of Coorow to Northampton, Mid West, Western Australia: Geology, Geomorphology and Vulnerability* was prepared by Eliot, et al. (2012) for the DPLH and DoT. The aim of the project was *to determine the vulnerability of landforms on the Mid-West coast to changing weather and oceanographic conditions, including projected changes in climate*.

Sixty four cells were identified along approximately 160 km of coast (however three of these cells were not considered in the assessment). Out of these, five cells a (8%) were highly susceptible to environmental change, 39 of the 61 (64%) cells examined were moderately susceptible and 17 cells (28%) had a landform association with a low susceptibility. Areas with low susceptibility to environmental change were

most common south of Flat Rocks (City of Greater Geraldton), a number of which are within the Shire of Irwin including the area from Webb Islet to Cliff Head, Leander Point to Seven Mile Beach and Bookara South.

An analysis of landform stability revealed that a high proportion, fifty three of the 61 (87%) cells examined, were moderately to highly unstable. Eight cells (13%) had a low instability ranking, 25 cells (41%) were moderately unstable and 28 cells (46%) were of high instability. Sediment cells with low instability were most common on the coast south of Cliff Head. Cells within the Shire of Irwin with high instability include tracts of land between Cliff Head and Leander Point and at Nine Mile Beach.

The overall results for coastal vulnerability indicated that four (6.5%) of the 61 cells examined had a low level of vulnerability; 14 (23%) were of low-to-moderate vulnerability; 17 (28%) were moderately vulnerable; 22 (36%) were of moderate-to-high vulnerability and four (6.5%) had a high vulnerability.

The report gives some more detailed information on the susceptibility, instability and vulnerability at the Port Denison ad Dongara townsite. Seaspray Beach is considered to have a high vulnerability due to the influence of the Irwin River and modifications as a result of the Harbour (constructed in 1979). The report recommends that *a coastal setback is required north of Seaspray Beach where there is potential for migration of the shoreline salient*. The low-lying land adjoining the Irwin River is vulnerable to inundation of the alluvial flats, approximately 1.5-4 km upstream of the mouth. Blowouts and sandsheet activation are of concern, particularly south of the harbour and the report advises that *coastal access be designed to minimise loss of vegetation of the foredunes and frontal dunes*.

Application/implication

The Technical Report provides information on the susceptibility, landform stability and vulnerability within the Shire of Irwin, and includes recommendations and advice with a focus on the Port Denison and Dongara townsite. This information will continue to be used by Seashore Engineering in their detailed assessment of certain hotspot sites for incorporation in this CMP.

3.24 Draft Coastal Character and Values Study – Stage One Study of Four Case Studies in Western Australia

The draft *Coastal Character and Values Study – Stage One Study of Four Case Studies in Western Australia* was prepared by Middle, G. and Scherini, R. at Curtin University in 2013 for the National Sea Change Task Force. The aim of the study is to develop *a methodology and planning tool to capture and document coastal values and character in coastal communities*. This document reports on stage one of the study which involved selecting four coastal communities in WA as case studies to test and refine the methodology. The four coastal communities were:

- Shoalwater, City of Rockingham
- Australind, Shire of Harvey
- Flinders Bay, Shire of Augusta-Margaret River
- Falcon, City of Mandurah

The methodology involved a survey of beach users and a photo-elicitation to record and research visual aspects.

A review of the beach survey found that the results of all four case studies was similar. Those surveyed valued most highly the naturalness of the coast, the beach as an important social space and the primary uses were low key based recreation and aquatic-based recreation. The photo-elicitation found that the naturalness of the coast is significant in defining character and that there are two broad coastal settlements based on the built environment: those where built form is considered significant at defining character and those that do not.

The study recommended that the survey is also expanded to ask participants to identify in words or phrases to describe the overall character of the settlement.

Application/Implication

The results of the study provides useful information on what the community generally value about the coast and how to capture the important characteristics of a beach through community surveys and photos. This is applicable to the development of this CMP which involves a community survey and a site assessment by the consultant team to determine opportunities and constraints to future use and management.

4 Local

4.1 Batavia Coast Strategy

The *Batavia Coast Strategy* was prepared in 2001 by the Batavia Coast Coastal Planning Group and Landvision. The Batavia Coast Strategy provides regional and local directions for future coastal planning and management along the Batavia Coast. The study area extends from the northern boundary of the Shire of Northampton to Dongara in the south. It includes the coastal towns of Geraldton, Dongara, Cape Burney, Horrocks, Port Gregory and Kalbarri.

The Strategy states that tourism development *in the region, including permanent developments, tour operations, and events of a temporary nature (such as surfing and windsurfing competitions), may be both appropriate and desirable at certain locations along the Batavia Coast*. It recommends the encouragement of greater tourism and recreation opportunities at Kalbarri, Port Denison and Dongara.

The Batavia Coast Strategy recognises the need to maintain off-road vehicle access to recreational sites and opportunities but advocates a more controlled approach in co-operation between ORV users and land managers. It also recognises the possibility of additional camping areas being identified in the future as pressures grow.

Application/Implication

The Batavia Coast Strategy is a higher-level document which applies to a number of local government areas. The new Coastal Management Plan provides an opportunity to provide more detailed recommendations for the Shire, as well as an updated recommendations based on current use and demand.

4.2 Off-Road Vehicle Areas in the Northern Agricultural Region of Western Australia Feasibility Study

The *Off-Road Vehicle Areas in the Northern Agricultural Region of WA Feasibility Study* was undertaken by Pretzel S. and the Northern Agricultural Catchments Council (NACC) in 2015 as a response to community and environmental concerns about unmanaged off-road vehicle (ORV) use within the coastal zone of the Northern Agricultural Region (NAR). The study investigates the feasibility of establishing one or more areas of land within the NAR as an ORV 'Permitted Area' under the *Control of Vehicles (Off-Road Areas) Act 1978*.

Currently there are five gazetted areas under the *Control of Vehicles (Off-Road Areas) Act*. These areas are located in Lancelin, Ledge Point, Cervantes, Jurien and Southgates.

The Study identified a number of 'hot spot areas' within all Shires including three in the Shire of Irwin – Port Denison dunes, White Tops Reserve and South Beach.

The study investigated the possibility of creating Permitted Areas at Southgates, Buller River Mouth and Jurien Bay. No Permitted ORV Areas were identified within the Shire of Irwin.

Application/Implication

The Study does not identify any ORV areas within the Shire of Irwin. Permitted ORV Areas need to be gazetted under the *Control of Vehicles (Off-Road Areas) Act* and it is unlikely that there is enough demand or an appropriate site in the Shire to warrant this. Regardless, use of off-road vehicles will need to be addressed in the Coastal Management Plan.

4.3 Control of African Boxthorn Regional Management Plan

The *Regional Management Plan to Control African Boxthorn* (NACC, n.d.) was commissioned by NACC with the purpose of guiding and prioritising on-ground works to control African boxthorn (*Lycium ferocissimum*) within four local government areas in the Northern Agricultural Region (the Shires of Irwin, Chapman Valley and Northampton and the City of Greater Geraldton). The document aims to collate and

present as much information as possible on the effective management of African Boxthorn, and to prioritise sites for future control works based on the current known distribution data, locations of current investment in control and proximity to conservation assets.

There is occurrence along the Irwin River Estuary which is being managed as required.

4.4 Migration of limesand dunes in Western Australia and their impacts

The *Migration of Limesand Dunes in Western Australia and Their Impacts* as prepared by the then Department of Mines and Petroleum (now the Department of Mines, Industry Regulation and Safety) in 2017. It is a documentation of the rates and directions of migration of limesand dunes along the Mid West coast between Lancelin and Geraldton. The study has a focus on the Shire of Coorow, however the findings are also applicable to the Shire of Irwin.

The study used ArcGIS, georeferenced maps and aerial images from 1960 to 2010 to measure and monitor the locations of a selection of mobile dunes. Over the period of the study those measured travelled at rates that averaged between 4.1 and 15.8 metres a year for the 50 years, generally moving in a northerly direction, covering between 20,000 and 14 hectares and the longest migration distance identified is 21 kilometres. The monitoring of migration rates can provide valuable information for resource management and geohazard risk reduction as the rates and directions measured can provide predictive tools to document future impacts on built infrastructure.

Application/Implication

There are no large mobile dunes within the study area that impact along the coast. Some dunes are located within Beekeepers Nature Reserve, however this is outside of the study area.

4.5 Shire of Irwin Coastal Development Strategy 2000

The *Shire of Irwin Coastal Development Strategy* was prepared by the Shire of Irwin and Land Vision in 2000. The study area extended approximately 18 kilometres from Little Mexico to North Cliff Head (the southern part of the Shire's coastline). The purpose of the Strategy is to:

- *Ensure the orderly removal of the squatter-built structures from the coast and their replacement with more appropriate forms of land use, including establishment of node for commercial fishing and coastal recreation*
- *Provide a framework for rehabilitation of the coastal lands following removal of the squatter shacks and other buildings*
- *Incorporate ecologically, environmentally and socially sensitive features though an innovative design technology and philosophy balanced with the need for use of the coast to be economically viable and ecologically sustainable*
- *Provide for the establishment of small development nodes that support commercial fishing and coastal recreation, and that will become an asset to the Shire of Irwin*
- *To enable the Shire of Irwin and relevant State Government agencies to agree to an implementation process for creation of coastal access points for day visitors, nodes for commercial fishing and recreational use of the nearshore waters, and tourist accommodation.*

The following coastal sites are included in the Strategy:

- Little Mexico
- South Knobby Head
- Knobby Head
- North Knobby Head
- Little Freshwater
- Freshwater Point
- Bee Hollow
- South Cliff Head
- Cliff Head
- North Cliff Head.

The Strategy provides a proposed level of development for each of the above coastal sites and proposed design guidelines.

Development proposed for each site is listed in the table below. Comment is also provided regarding the current level of development for each site.

SITE	LAND USE FROM 2000 STRATEGY	PROPOSAL FROM 2000 STRATEGY	COMMENT
Little Mexico	16 shacks. Used for recreational fishing and boat launching. Used for picnics, day use activities and camping.	Short term: • Remove shacks and rubbish • Investigate potential for developing group camping and accommodation for schools • Implement rehabilitation program in conjunction with the development of day use facilities (including access, pathways, parking, boat launching from the beach, picnic areas and shelters) and maintain beach launching. Medium to long term: • Investigate group accommodation and marine research and development opportunities.	Certain recommendations are still applicable (such as removal of shacks not currently licenced to professional fishermen, removal of rubbish and rehabilitation where required). Further development (such as day use facilities and group accommodation) is not considered necessary for this site.

SITE	LAND USE FROM 2000 STRATEGY	PROPOSAL FROM 2000 STRATEGY	COMMENT
South Knobby Head	19 shacks. Used for recreational fishing and boat launching. Used for picnics, day use activities and camping.	Short term: • Remove shacks and rubbish • Investigate potential for developing group camping and accommodation for schools • Implement rehabilitation program in conjunction with the development of day use facilities (including access, pathways, parking, boat launching from the beach, picnic areas and shelters). The Strategy also recommends investigating the potential for development of an 'Eco Centre' – a specially designed centre which would contain an environmental research centre, limited accommodation, educational/interpretation centre, group facilities (indoor gathering space, amphitheatre, kitchen, showers etc.) and day visitor facilities (toilets, seating, drinking fountains etc.).	Certain recommendations are still applicable (such as removal of shacks not currently licenced to professional fishermen, removal of rubbish and rehabilitation where required). Further development (such as day use facilities, group accommodation and an 'Eco-Centre') is not considered necessary for this site.

SITE	LAND USE FROM 2000 STRATEGY	PROPOSAL FROM 2000 STRATEGY	COMMENT
Knobby Head	12 shacks. Used for recreational fishing and boat launching. Used for picnics, day use activities and camping.	Short term: • Remove shacks and rubbish • Implement rehabilitation program in conjunction with the development of day use facilities (including access, pathways, parking, boat launching from the beach, picnic areas and shelters).	Certain recommendations are still applicable (such as removal of shacks not currently licenced to professional fishermen, removal of rubbish and rehabilitation where required). Further development (such as day use facilities) is not considered necessary for this site.

SITE	LAND USE FROM 2000 STRATEGY	PROPOSAL FROM 2000 STRATEGY	COMMENT
North Knobby Head	9 shacks including 5 used by professional fishers. Used for professional and recreational fishing. Also for boat launching, beach activities, picnic, camping and say sue activities. Five boat moorings.	Short term: • Provide sites for professional fishing camps • Remove shacks and rubbish • Implement rehabilitation program integrated with the development of non-serviced caravan and camping sites (required detailed plan) • Develop multi-use car parks, pathways, boat launching areas and picnic sites Medium to long term: • Investigate opportunities for developing low-key family style accommodation such as cabins, cottage, chalets, bunkhouses, dormitories for groups and maintain caravan and camping areas (developer could be Council or joint venture) • Assess strategic implications of development of permanent residences on privately owned land adjoining the site.	The CMP has reviewed the actions and taken an approach to keep these sites for lower key camping and RV use.

SITE	LAND USE FROM 2000 STRATEGY	PROPOSAL FROM 2000 STRATEGY	COMMENT
Little Freshwater	Approximately 30 shacks used by recreational and professional fishers. Used for picnics, camping and day trip activities. Two professional fisher vessels are moored here.	Short term: • Remove shacks and rubbish • Implement rehabilitation Medium to long term: • Develop non-serviced caravan and camping sites including toilet (low-key with limited facilities). Requires detailed plan and management program and assessment of effluent disposal. • Develop parking, paths, boat launching areas, picnic sites.	Certain recommendations are still applicable (such as removal of shacks not currently licenced to professional fishermen, removal of rubbish and rehabilitation where required). Further development (such as a formal camping site) is not considered necessary for this site.

Freshwater Point	Some shacks (number not disclosed). Used for fishing industry receival depots, professional fishing camps. Beach used for boat launching, loading and unloading of fishing boats. Fishing boat refuelling. Major boat mooring area.	Short term: • Remove shacks and rubbish • Relocate fishing camps to approved sites (provide for 10 professional fisher camps) • Develop a 'Fishers Centre' including sea search and rescue station, gathering areas, amenities, car park and other facilities) • Rationalise fishing industry facilities and improve road and parking • Provide sites for receival depots • Provide sites for bulk fuel storage and associated facilities • Investigate potential for jetty/marina • Ongoing monitoring and review Medium to long term: • Provide additional activities and sites as required • Investigate potential for tourist resort • Include a site for a caretaker • Investigate opportunities for aquaculture • Investigate water supply and effluent treatment/disposal.	The CMP has reviewed the actions and taken an approach to keep these sites for lower key camping and RV use.

SITE	LAND USE FROM 2000 STRATEGY	PROPOSAL FROM 2000 STRATEGY	COMMENT
Bee Hollow	9 shacks. Used for boat launching, picnicking, beach fishing, recreation and boat mooring.	Short term: • Remove shacks and rubbish • Implement rehabilitation • Construct public access and facilities • Develop lookout • On-going management and monitor impacts. No timeframe: • Seek expressions of interest for a tourist resort providing for mixed use accommodation from camping to resort accommodation. • The area for tourist development to be identified through a detailed capability and suitability study.	Certain recommendations are still applicable (such as removal of shacks not currently licenced to professional fishermen, removal of rubbish and rehabilitation where required). Further development (such as a tourist resort) is not considered necessary for this site.

SITE	LAND USE FROM 2000 STRATEGY	PROPOSAL FROM 2000 STRATEGY	COMMENT
Palm Springs	2 shacks in this location. Used for beach fishing and some beach boat launching. Good swimming beach.	Short term: • Remove shacks and rubbish • Establish a walking track to the beach • Close unnecessary tracks • Develop access and management facilities (low priority) Medium term: • On-going management and monitor impacts.	Certain recommendations are still applicable (such as removal of shacks not currently licenced to professional fishermen, removal of rubbish and ongoing management). Installation of facilities is not considered necessary for this site.

SITE	LAND USE FROM 2000 STRATEGY	PROPOSAL FROM 2000 STRATEGY	COMMENT
South Cliff Head	17 shacks located along approximately 500 metres of coast, largely occupied by recreational users and one professional fisher.	Short term: • Remove shacks and rubbish • Construct coastal access parking and access to the beach and boat launching areas. • Develop day use picnic sites. • Rehabilitate and close unnecessary tracks. Medium term: • Install toilets Long term: • Detailed site assessment to determine suitability for tourist development • Seek expressions of interest for a low-medium level tourist resort or nature-based operation. • On-going management and monitor impacts.	Certain recommendations are still applicable (such as removal of shacks not currently licenced to professional fishermen, removal of rubbish, rehabilitation and ongoing management where required). Picnic areas and toilets have been installed. Further development (such as a low level tourist resort) is not considered necessary for this site.

North Cliff Head and Cliff Head	Approximately 64 shacks, largely occupied by recreational users, three by professional fishers. A jetty is located at the southern end of the site.	Short term: • High – site should be one of the first rehabilitated and developed • Remove shacks and rubbish • Implement rehabilitation program • Develop public facilities • Develop professional fisher sites • Designate camping and day visit areas • On-going monitoring, management of impacts and reviewing program Medium term: • Plan and develop holiday accommodation which could be through one or more of the following methods: o Council ranger or tender out ranger services to collect fees from camping and caravan sites using Cape Range National Park model (i.e. designated sites, no booking, limit of length of stay, limited facilities to support tourists, only toilet and showering facilities). o Council to develop and manage tourist accommodation using the	Certain recommendations are still applicable (such as removal of shacks not currently licenced to professional fishermen, removal of rubbish, rehabilitation and on-going monitoring where required). Further development (such as holiday accommodation) is not considered necessary for this site. There may be some provision for consideration of a caretaker for the camp site.

SITE	LAND USE FROM 2000 STRATEGY	PROPOSAL FROM 2000 STRATEGY	COMMENT
		Rottnest Island Board as a model o As above but in a joint venture with private enterprise o Long term lease of each or all development nodes.	

Application/Implication

The proposals in the 2000 Strategy range from simply removing shacks and rehabilitating each site to development into a formal professional fisher and recreational camping sites. Since that time there has been more research and policy around coastal hazards and setbacks. The coastal hazard risks are likely to be a roadblock with regards to more formal development of these sites. Since 2015 the Shire have lost the ability to lease shacks and therefore other management and use of the area will need to be considered.

4.6 Shire of Irwin 10+ Year Strategic Community Plan 2017 – 2027

The *Shire of Irwin 10+ Year Strategic Community Plan* was prepared by the Shire in 2017. The Plan states that the vision of the Shire is *a safe place to live, an exciting place to visit and a progressive place to work*. The Shire's mission is *delivering excellence in service, driving growth and building strong relationships – we are open for business*.

Through the results of a community survey, the Shire identified four main priorities areas for the Shire to focus on. One of these four priorities is management of the coast and estuary *by rehabilitating local beaches and addressing erosion, repairing and upgrading the boat ramp, and providing better amenities*.

The Strategy explains that *it is evident that the community values its 'coastal/country town' atmosphere and whilst development is embraced, good planning is essential to ensure growth and development improves, and does not detract, from the coastal lifestyle valued by the community*.

Application/Implication

The vision of the Community Plan is relevant as it relates to tourism in the Shire, much of which is concentrated along the Shire's coastline. It is also clear that the community value the Shire's coastal areas and would like to see management focus on these areas.

4.7 Shire of Irwin Corporate Business Plan 2013 – 2017

The *Shire of Irwin Corporate Business Plan* was prepared by the Shire in 2013 as a response to the 2012 Shire of Irwin Strategic Community Plan. The purpose of the Plan is to set out the prioritisation of actions and the availability of resources to achieve the actions set out in the Strategic Community Plan.

The Plan identifies protection and management of the Shire's coastal areas. Strategy 1.2.6 is to *Develop a Coastal Management and Facilities Strategy* and it lists Actions 1.2.6.1 and 1.2.6.2 as *review the Irwin Coastal Plan, with an emphasis on infrastructure and facilities, and include a stakeholder and community engagement component* and *Improve and maintain coastal infrastructure*.

One of the Environmental Objectives of the Plan is to *manage and protect the coastal environment and the Irwin river environment*. The Strategies and Actions to achieve this are as follows:

STRATEGY	ACTION
Continue to partner with State Government and other funding providers, to support coastal protection works.	Formalise a partnership with State Government and other funding providers who support coastal protection. Including a regular reporting mechanism to inform them of current works and future requirements.
Review, regulate and monitor access to our natural assets.	Review the Shire of Irwin Coastal Development Strategy (south coast settlement nodes)

STRATEGY	ACTION
	Prepare a coastal management strategy for the coastal reserves along the Shire's northern coastline.
Support environmental community organisations and initiatives that promote coastal protection, foreshore and river reserve management, such as Northern Agricultural Catchment Council.	Provide Shire representation and/or in-kind support to environmental community initiatives as appropriate.
Review and implement an Irwin River Estuary Management Plan, including noxious weed eradication.	Review the Irwin River Estuary Management Plan and provide a staging plan for implementation.
	Implement the revised Irwin River Estuary Management Plan

Source: *Shire of Irwin Corporate Business Plan,* 2013

Application/Implication

Review of the Shire of Irwin Coastal Development Strategy (2000) and preparation of a new Coastal Management Plan which incorporates the entire coastline is recognised in this Plan. The strategies and actions listed should also help guide the content of the new Coastal Management Plan.

4.8 Shire of Irwin Property Infrastructure Asset Management Plan

Th *Shire of Irwin Property Infrastructure Asset Management Plan* was prepared by the Shire in 2012 to investigate *whether Council's current level of asset operational, maintenance and renewal funding are sufficient to sustain the assets at a standard that will be acceptable to both asset owners and users*. The assets covered by the Plan include (amongst others) community uses, historic site buildings, land blocks, public toilets and sporting and park amenity buildings.

The Plan acknowledges that tourism is a significant industry for the Shire and that *predicted growth in the tourism and resource industries in the region will see increased demand for new infrastructure and greater wear on existing infrastructure as the population expands. This will likely lead to higher costs to Council as*

asset lives will be reduced. The Plan also anticipates that, based on data from the Tourism Forecasting Committee, that tourism numbers will continue to grow until the year 2020. The Plan predicts that with the *Shire a popular destination for tourists a greater demand for recreational facilities, including ablution blocks, boat launching ramps, walking trails, footpaths etc., will ensue. In summary, it is expected that there will be an increase in demand for recreational facilities due to an ageing population and increasing tourist numbers*.

Application/Implication

The Shire's Asset Management Plan will continue to be revised by the Shire to take into account current assets, required maintenance and budget. The Asset Management Plan should take into account the recommendations of the Coastal Management Plan to ensure they are properly budgeted and planned for.

4.9 Shire of Irwin Roads and Footpaths Infrastructure Asset Management Plan

The *Shire of Irwin Roads and Footpaths Infrastructure Asset Management Plan* was prepared by the Shire in 2012 to investigate *whether Council's current level of asset operational, maintenance and renewal funding are sufficient to sustain the assets at a standard that will be acceptable to both asset owners and road users*. It collates current road network asset condition, valuation, income and expenditure data, and compares it with the asset stock's long term funding needs.

Application/Implication

While there are not many local or Shire roads that occur within or provide access to the coastal sites outside of the townsite, this Asset Management Plan outlines the funding that can be allocated to upgrades and maintenance of the roads that exist primarily within the townsite. Likewise, footpaths are primarily located within the townsites and the Asset Management Plan provides for upgrades to these.

4.10 Shire of Irwin Draft Long Term Financial Plan 2013 – 2028

The *Shire of Irwin draft Long Term Financial Plan 2013 – 2028* was prepared by the Shire in 2013. The purpose of the Plan is to set out service levels into the future to assist the Shire with maintain a healthy financial position and forecasting population growth of 2.5% per annum over the life of the Plan.

The Plan does not list many capital projects along the coastline north or south of Dongara/Port Denison. A majority of the capital projects are located within the townsite. Some allocation was given for Seven Mile Beach Road in 2014/15.

Application/Implication

The Long Term Financial Plan indicates where budgeting and spending will take place until the year 2028 (approximately the next 8-9 years). While there is some investment shown for coastal areas within the townsite there is not much allocation to other areas along the coast. The Shire's financial position should be taken into account when preparing the Coastal Management Plan and what can be achieved in the short to medium term. There might be an opportunity for some investment in the long term once the Long Term Financial Plan is reviewed in the future.

4.11 Shire of Irwin Tourism Development Plan 2013 – 2018

The *Shire of Irwin Tourism Development Plan 2013 – 2018* was prepared by the Shire in 2013 to enable the Council to take an integrated and co-ordinated approach to tourism planning and to guide tourism growth in the Shire of Irwin over the next five to ten years.

The Plan reviews the impact of tourism on the Shire, the current tourism markets, opportunities and constraints, planning, marketing, events and an action plan for implementation.

Positive impacts of tourism noted in the Plan are that it creates employment opportunities and brings investment to the area through new businesses and infrastructure development. Negative impacts are noted as overloading local services during peak periods, creating traffic problems and bringing antisocial behaviour. The Plan states that in the case of the Shire *it is critical to consider a market, which could be defined as "traditional family holidays" where families and family groups can enjoy healthy, safe and affordable time together doing something different every day*.

The Plan notes that after a review of the existing tourism market that *Dongara-Port Denison currently has a dominant domestic tourism market share of approximately 95% with it comprised of 90% intrastate and 5% interstate.* Tourism is strongly affected by seasonal factors such as school holidays and Easter holidays and long weekends.

The following actions relate to the Shires coast:

- Action 5.8 – review of coastal camp sites within the Shire

The Plan makes the following comment with regards to the coastal camping sites in the Shire:
There currently exists coastal camp sites at Knobby Head, Fresh Water Point and Cliff Head approximately 50 kilometres south of Port Denison on the Indian Ocean Drive and 7 Mile Beach north of Dongara off the Brand Highway. There are a number of sites adjacent to the beach that attracts caravans, RVs and campers. Due to the distance, it is an area that is not patrolled by the Shire ranger on a regular basis. This is a lost opportunity for the Shire in that the people that stay at this site bring no economic benefit as they do not necessarily buy supplies in Dongara-Port Denison and in fact are a cost in that the sites need to be visited from time to time and rubbish needs to be collected. There are a number of alternative approaches to these sites from closing them and that signs are erected advising that caravan and camping sites are available in Dongara - Port Denison through to contracting/licencing a third party to manage these areas and charge for use. Detailed analysis of the options is beyond the scope of this study and it is recommended that a review of the sites and options should take place with the view to increasing the benefits to local business and protecting the environment.

Application/Implication

Research information from the Tourism Development Plan can strongly inform the Coastal Management Plan by indicating where tourism demands are and what the opportunities and weaknesses are.

4.12 Shire of Irwin Access and Inclusion Plan 2012 – 2017

The Shire of Irwin Access and Inclusion Plan was prepared by the Shire of Irwin in 2012. The Plan sets to ensure that areas of the greatest need and impact for people with a disability are initiated first. It sets out seven desired outcomes aimed at improving access and inclusion for people with disability. These outcomes are included below.

1. *People with disability have the same opportunities as other people to access the services of, and any events organised by the Shire of Irwin*
2. *People with disability have the same opportunities as other people to access buildings and other facilities of the Shire of Irwin*
3. *People with disability receive information from the Shire of Irwin in a format that will enable them to access the information as readily as other people are able to access it*
4. *People with disability receive the same level and quality of service as other people from the staff of the Shire of Irwin*
5. *People with disability have the same opportunities as other people to make complaints to the Shire of Irwin*
6. *People with disability have the same opportunities as other people to participate in any public consultation by the Shire of Irwin*
7. *People with disability have the same opportunities as other people to obtain and maintain employment with a public authority.*

The document includes an 'Implementation Plan' which lists the tasks to achieve the above outcomes.

Application/implication

While the natural topography and landscape of coastal areas can make it difficult to provide access for people with disabilities, it should be provided wherever possible by referring to the Access and Inclusion Plan. The Plan requires the Shire to ensure all infrastructure related to transport facilities are accessible, including upgrades to footpaths and fishing platforms. Provision should be made in the CMP to provide for disability access along the Shire's coast where possible.

4.13 Shire of Irwin Coastal Hazard Risk Management and Adaptation Plan (CHRMAP)

The *Shire of Irwin Coastal Hazard Risk Management and Adaptation Plan (CHRMAP)* was prepared in 2016. The purpose of the CHRMAP is to *provide strategic guidance on coordinated, integrated and sustainable management and adaptation for land use and development in the coastal zone*. It provides information on the effects of coastal hazards, presents a decision-making framework to assess risks, highlights coastal hazard areas (in terms of vulnerability and risk) and suggests adaptation options.

Sites identified with a *high* risk priority level for coastal inundation are:

- Port Denison, Granny's Beach and Surf Beach
- South Beach South
- Seaspray Beach

Sites identified with an *extreme* risk priority level for coastal erosion are:

- Port Denison, Granny's Beach and Surf Beach
- South Beach North
- Seaspray Beach

Sites identified with a *high* extreme risk priority level for coastal erosion are:

- South Beach South
- Freshwater Point
- Cliff Head North
- Cliff Head South.

Actions of *High Priority* are as follows:

1. *In the Port Denison, Granny's Beach and Surf Beach area:*
    a. *Investigate potential inundation impacts and ascertain the need and viability for improving the inundation resilience of public infrastructure in this area (e.g. the sea wall between Granny's Beach and Surf Beach)*

b. *Investigate retrofitting urban drainage systems to accommodate fluvial flooding*
c. *Investigate the need for coastal protection structures to protect/defend areas from erosion*

2. *Carry out flood modelling of the Irwin River, including an analysis of combined river flooding and coastal impacts.*

Actions of *Medium* priority are as follows:

1. *In all coastal areas where new buildings are proposed, ensure all buildings are relocatable.*
2. *In urban areas – continue to implement the Shire's Green Infrastructure Strategy and the Local Planning Policy for Water Sensitive Urban Design.*
3. *Modifications to the Planning Scheme.*
4. *In all areas, educate the public about the area's natural communities and sensitive habitats and encourage public appreciation and environmentally sound recreational enjoyment of the area.*
5. *In all areas monitor and allow natural processes to occur, and ensure the public are kept informed.*

As can be seen from the above, most of the CHRMAP's high priority actions relate to the foreshore areas in the townsites (Port Denison, Granny's Beach and Surf Beach) and around the Irwin River mouth. Many of the medium priorities relate to other coastal sites such as South Beach and the sites in the southern part of the Shire. With regards to South Beach (south of Port Denison) the CHRMAP recommends to educate the public, ensure that all approved buildings within the caravan park are relocatable, to monitor for natural processes and to plan for the movement of infrastructure. With regards to Freshwater Point, Cliff Head North and Cliff Head south the CHRMAP recommends to ensure that all approved buildings are relocatable, educate the public, monitor and allow natural processes to occur and to plan for the movement of infrastructure.

Application/Implication

The high priority sites identified in the CHRMAP are supported by other coastal engineering reports undertaken in the area of the years and these sites are to be given particular attention in the assessment by Seashore Engineering. The long term future use of areas at high risk of erosion as identified in the CHRMAP should also be considered in the CMP. Management actions should be practical and realistic considering the outcomes of coastal hazard assessments.

4.14 Irwin River Estuary Management Plan

The *Irwin River Estuary Management Plan* was prepared in 2014 by Land Insights and the Shire of Irwin. The purpose of the Management Plan is to facilitate improved access, signage and low-key recreational facilities along the Irwin River Estuary. The study area extends from west of Dongara (Priory Lodge) to the river mouth.

Recommendations from the Management Plan focus on improvements to the environment (such as weed removal and revegetation) and enhancing the recreational potential along the River (such as revitalisation of Dongara House, providing a footbridge across the river, revitalising the picnic area and installing signage).

The Management Plan study area extends further inland than the Coastal Management Plan, however it includes some coastal areas such as Reserve 41087 at the mouth of the river and Reserve 38046 along the coast. Management recommendations along this section include the following:

- P3 – Liaise with major landowners of freehold land within the Study Area to investigate opportunities to swap, cede or manage these lands in accordance with this Management Plan.
- E3 – Create Fauna Habitat Protection Areas.
- R9 – Provide bike facilities at the picnic area near the bridge, at either side of the proposed footbridge, at the carpark along Ocean Drive and at the Church Street lookout.
- R13 – Install interpretative signage along the walking tracks and at recreation nodes.

Application/Implication

Although the Irwin River Estuary Management Plan is largely outside of the study area for the Coastal Management Plan, the recommendations for the river mouth and any coastal areas can be taken into consideration.

4.15 Shire of Irwin Green Infrastructure Strategy 2015 – 2020

The *Shire of Irwin Green Infrastructure Strategy 2015 – 2020* was prepare by the Shire in 2015. It describes the network of green spaces and water systems that deliver multiple environmental, economic and social values and benefits. The aim of the Strategy is to improve the integrated network of multifunctional green spaces and corridors and ensure that the Shire leads by example by reducing water and energy consumption, and by implementing efficient and innovative systems, projects and initiatives.

Green infrastructure considered by the Strategy includes:

- Street trees and verge plantings
- Improvements to public open space (parks) and other green spaces
- Community gardens and horticultural areas
- Sustainable building design principles
- Recycling programs
- Wind farms, solar farms and wave power
- Water resources and desalination systems
- Sustainable drainage systems incorporating the principles of Water Sensitive Urban Design
- Connections, including roads, verges, footpaths, cycle ways, water courses and other wildlife corridors.

It promotes and encourages multifunctional greenspaces connected by footpaths and cycleways, reducing water and energy consumption, utilising sustainable energy sources, enriching biodiversity and creating cool urban areas through the use of green infrastructure.

Application/Implication

The Green Infrastructure Strategy focuses the townsite and developed areas which does not directly apply to a majority of the Shire's coastal areas except for those areas within the town. The proposals in the Strategy to utilise sustainable energy, reduce water and energy use, enhance biodiversity through use of green spaces and creating connected, multifunctional green spaces are applicable to the use and possible future development of the Shire's coastal areas. The focus, as supported by the Green Infrastructure Strategy, is to create low-key and sustainable recreational spaces that can be enjoyed by the community.

4.16 Dongara-Port Denison District Structure Plan

The *Dongara-Port Denison District Structure Plan* was prepared by the Shire of Irwin and GHD in 2014. It *sets out the broad principles for development of Dongara-Port Denison and will guide the preparation of more detailed local structure plans.*

The Structure Plan identifies the coastal areas and coastal reserves as *Public Open Space.* The Plan notes that climate change and sea level rise may become a real challenge for the coastal and rivers edge areas within the Structure Plan area and recommends that in order to protect and manage these areas, that the Shire complete a coastal adaptation study. This has been undertaken (CHRMAP, 2016). It also recommends that the Shire *develop an integrated network of multifunctional green spaces and corridors as part of a Green Infrastructure Strategy which should be underpinned by easily maintained, economically and environmentally sustainable engineering solutions*.

Inland from the *Public Open Space* areas, the Structure Plan identifies *Existing Urban* as well as a *Neighbourhood Centre* adjacent to the Port Denison Foreshore. The Structure Plan encourages the redevelopment and revitalisation of the Port Denison commercial area to *strengthen the area as a neighbourhood centre and promote the Centre's role as a tourist destination*. Areas identified for *Future Urban* in the Structure Plan are inland from the coast.

Application/Implication

Revitalisation and redevelopment of the Port Denison neighbourhood centre will improve and increase the attractiveness of the area for tourists, which could in turn place additional use and pressure on the

adjacent coastal areas. The *Future Urban* areas identified as *St Dominics Precinct* and *Race course Precinc*t are north of Dongara and run parallel to the coast. Development of these areas will increase the number of residences/population north of town and will ultimately lead to increased use of the coastal areas north of Dongara. Any development proposals for these areas will need to consider how the coast will be managed including what linkages will be provided (roads and pathways), facilities to be provided and other management.

4.17 Dongara Tourist Park Local Development Plan and Foreshore Management Plan

The *Dongara Park Local Development Plan (LDP) and Foreshore Management Plan* was prepared by Halsall & Associates on behalf of the Dongara Tourist Park in 2016. The LDP applies to Part Lot 3000/Reserve 32182 and Part Reserve 42150 Carnarvon Street and George Street, Port Denison, located at the southern side of Port Denison, adjacent to South Beach and lose to the fishing boat harbour. This site has been leased by Council over the years as a caravan park and the LDP sets out the future planning and goals for the site to allow for improvements and development.

Reserve 32182 (Lot 3000) incorporates the majority of the caravan park and associated development while Reserve 42150 is the coastal foreshore area.

The site comprised of 73 caravan and camping sites and 16 chalets before preparation of the LDP. It also includes associated amenities such as a manager's residence, reception and shop, recreation facilities, access and parking areas and landscaped areas. The LDP proposed to increase the accommodation options to 66 camping and caravan sites, 35 chalets with ensuites and 3 chalets with disability access. Other additions include two pools, barbeque areas, a café and additional parking.

A Foreshore Management Plan was also prepared as part of the LDP. The Plan notes that since the time of purchasing the property in 2003, the owners have undertaken coastal management of the foreshore adjacent to the site including:

- Dune stabilisation to stop sand drift across the park
- Stabilising blow outs immediately fronting the boundary

- Forming natural barriers to stop uncontrolled pedestrian access
- Created a designated pedestrian pathway to the beach
- Built low impact barriers to direct pedestrian movement onto designated pathways.

The owners have limited uncontrolled pedestrian movement in a number of ways already including the establishment of a limestone wall along the southern boundary supplemented by planting vegetation to stop uncontrolled pedestrian access to the south and by constructing a brick-paved walkway behind the cabins and fencing off the vegetation.

The Foreshore Management Plan proposes to continue rehabilitation and management of the coastal reserve and to ensure that the main elements of the Plan are implemented within two years of the LDP adoption. Actions include:

- *Recognising hazards and risks associated with extensive seaweed beds particularly across the frontage of the reserve and to the north and fragile cliff areas further north*
- *Noting the dunes are at the high water mark*
- *Recognising areas requiring rehabilitation either due to natural 'blow out' or through previous disturbance*
- *Direction of visitors to the park to one main point of access to the beach and strengthening this pathway system*
- *Continuing rehabilitation works which includes brushing and seeding of affected areas within the foreshore*
- *Implementing signage along the beach and adjacent to the edge of the park to advise persons to stay out of conservation areas and fragile dune systems and direct persons to the dedicated beach track*
- *Allocate signage and deposit visitors to the beach southward avoiding encouragement of beach users to the north where hazards exist and advising beach users to enter that their own risk*
- *Presenting a hard edge to the foreshore by way of low key fencing and limestone walls to define the edge of the reserve*

- *Maintaining post and wire fences about the designated path to the beach to avoid visitors exiting the designated track prior to the beach.*

Application/Implication

The proposal in the LDP for additional accommodation sites will increase the number of tourists and potential coastal users in the town. The additional management proposed for the foreshore will assist with protection of the coastal reserve from additional use pressure. The recommendations from the Foreshore Management Plan should be considered during preparation of the Coastal Management Plan.

4.18 Port Denison Foreshore Masterplan

The *Port Denison Foreshore Masterplan* was prepared by the Shire of Irwin and RPS in 2013. The Plan extends from Granny's Beach to the obelisk and is bound to the east by Port Leander Drive. It provides the future vision for the Port Denison foreshore.

The Master Plan divides the area into five precincts:

1. Granny's Beach Precinct
2. Foreshore Park Precinct
3. Foreshore Core Precinct
4. Boat Ramp Precinct
5. Obelisk Precinct.

The Master Plan provides detailed recommendations for the above five precincts including new car parking, new amenities block, creation of sandy beach areas, children's play area, new fig and pine trees and construction of footpaths. Recommendations aim to enhance and improve on the recreational potential of the area.

Application/Implication

The Master Plan provides detailed recommendations for the Port Denison foreshore area which should be referred to and considered in the preparation of the Coastal Management Plan.

4.19 Shire of Irwin Local Planning Strategy

The *Shire of Irwin Local Planning Strategy* was endorsed by the WAPC in 2017. It sets out the long term planning directions for the Shire and guides land use planning over the next 20 years. The Strategy recognises the coastline as a significant asset to the Shire and forms a part of the community. It also acknowledges that the coastline experiences significant development pressure and that there is a need for a greater understanding of coastal processes in the area.

The preparation of the Coastal Management Plan is identified as Action 1.2.3 of the Strategy which states:

> *In accordance with the CHRMAP, prepare a detailed Coastal Management Plan for the Irwin Coastline in order to provide a framework for the coordination of activities along this section of the coast.*

The Strategy also makes the following recommendation with regards to squatter shacks (Action 1.12.1):

> *Progressively address the squatter shack issue in accordance with the State Government Squatter Policy and State Planning Policy 2.6 - State Coastal Planning Policy.*

With regards to the Irwin River, the Strategy notes that it is subject to flooding and makes the following recommendation (Action 1.4.1):

> *Introduce a Special Control Area in the Local Planning Scheme to provide development controls in relation to the Irwin River flood-way and floodplain development control area.*

The Shire's coastal areas are included in Policy Areas A, B, E and H. Policy Area A stretches from the south of Port Denison to south of Cliff Head. Policy Area B includes the Dongara and Port Denison townsites and the coastal areas directly north and south of the town. Policy Area E extends from north of Dongara to the northern boundary of the Shire. Policy Area H stretches from Cliff Head to the southern boundary of the Shire.

The following recommendations are made with regards to coastal management.

ACTION NUMBER	POLICY AREA	RECOMMENDATION
PA 1.3 1.3.1	A	Coordinate the preparation of a detailed Coastal Management Plan in conjunction with Policy Area E to coordinate management and appropriate use of the coastal nodes along the Irwin coastline.
PB 1.7.1	B	Prepare a set of Design Guidelines for lots along Point Leander Drive located adjacent to the foreshore to ensure objectives relating to character, amenity and a positive aesthetic contribution to the adjacent public realm are met.
PE1.1 1.1.1	E	Implement relevant actions from the Coastal Hazard Risk Management Adaptation Plan (CHRMAP) to guide the future use, development and protection of this section of coastline.
PE1.1 1.1.2	E	Require a foreshore reserve to be defined and ceded as a condition of approval to any rezoning or subdivision of land.
PE1.1 1.1.3	E	Retain the dune system within the 'General Farming' (Rural) zone where there is a general presumption against subdivision except where land is first reclassified to 'Special Use' to facilitate a project of tourist significance.
PE1.1 1.1.4	E	Require rezoning for subdivision and/or development, to have regard to the recommendations of relevant strategic planning documents, particularly in relation to development and access to the coast and Brand Highway, and any other management plan prepared for the coastal strip.
PE1.1 1.1.5	E	Support the undertaking of a Coastal Management Strategy for the coast north of Dongara, including this policy area, and consider adoption of its recommendations once complete.
PE1.1 1.1.6	E	Support the implementation of a fire management plan for the coastal dune area in conjunction with the relevant authorities.

ACTION NUMBER	POLICY AREA	RECOMMENDATION
PH1.1 1.1.1	H	Support the removal of existing unlawful squatter shacks on coastal Crown land as per the State Government Squatter Policy (July 1989 and January 1999).
PH1.1 1.1.2	H	Investigate the formalisation of leasehold tenure for fishers' shacks only in the circumstance that the use of the shack is in conjunction with fishing licenses issued by the Department of Fisheries and subject to negotiation between local authorities and the Department of Lands.
PH1.2 1.2.1	H	Further investigations in consideration of the character and environmental values of the natural area to be undertaken by the landowner/s to justify any development of tourist traveller facilities and appropriate ancillary uses.

Application/Implication

The Strategy identifies the same coastal nodes as identified in the Shire of Irwin Coastal Development Strategy 2000 and includes the same recommendations. However, it also recognises the need to prepare a new and updated Coastal Management Strategy/Plan for the whole coastal area. A number of recommendations are made with regards to the future use and management of the Shire's coastal areas which are incorporated and supported by the Coastal Management Plan.

4.20 Shire of Irwin Local Planning Scheme No. 5

The *Shire of Irwin Local Planning Scheme No. 5* was endorsed by the WAPC on the 7th May 2008. The Scheme zones land and sets aside land for reserves for public purposes and controls the types of uses and development allowed in different zones.

The following zones and reserves apply to the Shire's coastal areas.

LOCATION	ZONE/RESERVE
Northern boundary to the Dongara townsite.	Coastal area is reserved as *Local Reserve.* Inland from the reserve the land is zoned *General Farming.*
Dongara and Port Denison townsite	Coastal area is reserved as *Local Reserve*. Directly south of Port Denison the coastal area is reserved as *Local Reserve*. Inland from the *Local Reserve* the land is reserved for *Public Purposes* (*Airport* and *Common*).
South of Port Denison to North Cliff Head	Reserved as *Conservation* for Beekeepers Nature Reserve.
North Cliff Head to the Shire's southern boundary	Coastal area is reserved as *Local Reserve.*

A person must not use a *Local Reserve* or commence or carry out development on a Local Reserve without first having obtained planning approval under Part 9 of the Scheme.

The objectives of the *General Farming* zone are to preserve and protect land for agricultural use and to ensure the preservation of the rural character and rural appearance of the zone.

In addition to the above zones and reserves, the Scheme also designates some *Special Use* zones adjacent to the coastal areas which can also impact on future use and management. These are listed in the table below. As can be seen, there are multiple areas zoned *Special Use* to allow for the use and development of these areas for holiday accommodation and tourist uses. Many are located in the Dongara and Port Denison townsite and two (SU1 and SU29) are located north and south along the coast respectively.

LOCATION	NUMBER	SPECIAL USE PERMITTED USES
Wakeford Road, Bookara. Adjoining the northern boundary of the Shire.	Special Use SU1	Tourism and Recreation Resort compromising: • Resort Centre/Hotel/Motel Accommodation (Licensed) • Clubhouse • Mediterranean (Seaside) Villas • Holiday Villas and Lake • Resort Shopping • Camping Area • Caravan Park • Horse Riding Farm • Dormitories • Function and Convention Centre • Resort Community Facilities • 18 hole Golf Course • Model Tourist Farm • Rural Pursuits • Incidental uses to the permitted uses.
Strata Lot 1, Church Street, Dongara	Special Use 6	• Caravan/Chalet Park • Camping Ground • Holiday Accommodation • Incidental uses to the permitted uses.
Lot 94 (reserve No. 25412) Church Street, Dongara	Special Use 7	• Holiday Accommodation • Incidental uses to the permitted uses.
Pt Sub Lot 48, Point Leander Drive, Port Denison	Special Use 12	• Public Restaurant • Holiday Accommodation • Tavern: provided it is incidental to the other permitted uses • Incidental uses to the permitted uses

LOCATION	NUMBER	SPECIAL USE PERMITTED USES
Pt Sub Lot 49, Point Leander Drive, Port Denison	Special Use 13	• Caravan/Chalet Park • Incidental uses to the permitted uses.
Lot 915, (reserve no. 37184), Ocean Drive and Point Leander Drive, Port Denison	Special Use 14	• Aged persons village
Lot 946 (reserve no. 25826), Ocean Drive, Port Denison	Special Use 15	• Caravan/Chalet Park • Camping Ground • Incidental uses to the permitted uses.
Lot 947, Hampton Street, Port Denison	Special Use 16	• Eating House • Incidental uses to the permitted uses.
Lot 3000 (reserve no. 32182) Corner George and Carnarvon Street, Port Denison	Special Use 17	• Caravan/Chalet Park • Camping Ground • Incidental uses to the permitted uses
Lot 742, Corner Fletcher and George Street Port Denison	Special Use 18	• Aged persons village
Lots 53 and 54, Point Leander Drive, Port Denison	Special Use 28	• Hotel • Motel • Restaurant • Eating House

LOCATION	NUMBER	SPECIAL USE PERMITTED USES
Portion of Lot 55, Indian Ocean Drive, Arrowsmith. Opposite North Knobby head, inland on Indian Ocean Drive	Special Use SU29	Tourist Site, comprising: • Caravan Park • Chalet Park • Camping Area • Single House • Workforce Accommodation • Convenience Store • Restaurant • Incidental uses to the permitted uses

Application/Implication

The entire coastal area is reserved as *Local Reserve*, except for the Beekeepers Nature Reserve which is reserved as *Conservation.* The northern coastal areas only have a small strip within the reserve, apart from certain sites such as 7 Mile Beach and Bookara Beach which have additional areas reserved. This reservation is appropriate for the Shire's coastal areas and allows for its continued use for recreation.

The Special Use sites which adjoin the Shire's reserves provide for a variety of tourist and recreational uses such as camping, caravanning and holiday accommodation. These uses are compatible with coastal areas. The Special Use areas within the townsites provide a location for camping and caravanning to reduce the incidence of this occurring within coastal reserves. North and south of the townsites there are no formal camping or caravanning locations. There are two Special Use areas (SU1 and SU29) located north and south of the townsites (SU1 is located at the northern boundary and SU 29 is opposite Nobby Head). Neither have been developed.

4.21 Irwin River Flood Study

The *Irwin River Flood Study* was commissioned by the Shire of Irwin and prepared by Hydrologia in 2017. The objective of the study was to provide updated hydraulic modelling and mapping to inform decision-making and mitigation strategies regarding use of flood prone land, with consideration of the effects of

climate change. The purpose of this is to guide future land use planning and development decision making, emergency response planning and increase community awareness of flood risk.

The Study notes that flooding of the Irwin River has occurred at multiple times since European settlement.

The Study provides outcomes of the hydraulic modelling and floodplain mapping for 1 in 10 AEP (annual exceedance probability), 1 in 100 AEP, 1 in 2000 AEP and probable maximum flood.

Application/Implication

The study area for the assessment included the Irwin River from the east of Dongara and does not specifically focus on the Irwin River mouth or coastal area. Nevertheless, the document includes historical information and photographs from previous floods at the Irwin River mouth and the hydraulic modelling and floodplain mapping shows the areas possibly at risk for the river mouth.

4.22 Dongara to Cape Burney: Visual Landscape Assessment

The *Dongara to Cape Burney Visual Landscape Assessment* was commissioned by the then Department of Planning and prepared by Ecoscape in 2011. The study was prepared as a response to increase development pressure along the coast. The aim of the study was to develop key findings for landscape management and design guidelines for future development within the study area. The study was undertaken by reviewing the Department's assessment of landscape character and by undertaking a site reconnaissance, an evaluation of landscape values, recreations sites, visual access, viewsheds and cross section analysis.

The study notes that the area lies within the *Geraldton Plain landscape character type* which is characterised by *rocky shorelines, exposed mobile dunes and shrub covered dunes across open alluvial flats and steep flat topped ranges to the east.*

The dune system along the section of the coast from Dongara to Nine Mile Beach is described as having no exposed sand areas on the dunes and a thick cover of coastal vegetation. Some tracks and firebreaks are evident along fencelines of lots throughout the area.

The coastal plain unit (inland from the dune system) from Wakeford Road to Dongara is described as generally being of rural character with some natural elements due to greater diversity in landform and natural vegetation. This section of the coast is within the Tamala South System which is *characterised by lowhills and rises with some limestone outcropping. As a result the terrain of this landscape character unit is varied with several gently contoured basins or swales. These gentle swales are interspersed with areas that are undulating or contain low dunes and/or patches of remnant vegetation*. The typical vegetation species within this area is listed as being *Acacia rostellifera, Melaleuca huegelii, Eucalyptus* oraria *and Eucalyptus obtus*iflora.

The 'most preferred' landscapes within the study area are listed as:

- areas with high degree of naturalness
- high degree of topographic variety
- vegetation diversity
- outstanding combinations of landform, vegetation
- patterns and waterbodies in one area
- presence of waterbodies
- seascapes
- significant/historic features
- distinctive remnant vegetation
- individual structures that strengthen rural character.

Areas identified as 'most preferred' were identified mostly along the coastal plain unit along Brand Highway north of Seven Mile Beach to McKenzies Beach.

Application/Implication

The Visual Landscape Assessment provides interesting information on the landscape characteristics of the coastal area north of Dongara. The 'most preferred' areas were identified west of the Brand Highway and did not extend to the dune system or beach areas. However, the assessment describes the coastal area north of Dongara as having largely intact and undisturbed dunal vegetation and topographic variety which adds to the tourist and recreational appeal of the area.

4.23 Monitoring: Coastal Erosion

The Shire of Irwin prepared *Monitoring: Coastal Erosion* in 2013 to document erosion within the Dongara and Port Denison foreshore areas and the coastal areas to the south of Port Denison. It provides information for each of the following sites:

Freshwater Point

Erosion occurred in 2011. Tamarisk trees were damaged, and fishermen shacks were undermined by erosion. Limestone Mahl fill was placed back onto the eroded areas.

Denison Foreshore

In past years, erosion continually affected the foreshore area and the Shire replenished with sand each year. Concrete blocks were used to build a wall in December 2009 but did not work. Further erosion problems existed in 2012 and the concrete blocks previously laid were washed out. The forshore was backfilled and Flex Mat placed down before being covered with sand and grass.

Granny's Beach

Damage was caused by storms in 2009. Limestone blocks were used to create a wall later in 2009. Erosion occurred again in 2010 and storms in 2011 undermined the footpath and caused extensive erosion. The stone sea wall was constructed in 2011. Further erosion occurred in 2013, exposing the limestone wall footings. The beach was subsequently covered in sand and seaweed. Cracking of the limestone wall was evident in 2013.

Surf Beach

Following erosion issues, the Shire added sand replenishment to Surf's Beach in 2009. Erosion issues continued in 2010 and 2011. In 2012 the Council removed up to half the car park and footpath and commenced battering down the dune to provide safer access to the beach. Concrete blocks were placed down as a border to define the beach from the car park.

Seaspray Beach

Erosion issues in 2013 exposed old infrastructure from the crayfishing industry.

Seven Mile Beach

Access eroded away in 2013 and sand replenishment undertaken in the same year. Signage was added in 2013 to protect the dune systems. A new car parking area was constructed in 2013.

4.24 Dongara to Cape Burney, Western Australia – Coastal Geomorphology

The *Dongara to Cape Burney, Western Australia – Coastal Geomorphology Technical Report* was prepared by Damara WA Pty Ltd in 2011. The primary objective of the project was *to describe the geomorphology of the coast between the northern limit of the Dongara Townsite and the mouth of the Greenough River at Cape Burney South*. The secondary objective was *to identify areas of relative instability including sections of the beach and barrier dune that are potentially subject to risk in response to projected environmental change*.

The report concludes the following:

- The seaward part of the barrier is highly susceptible to destabilisation by Metocean processes, particularly north of Nine Mile Beach. Hence development of infrastructure (such as roads, parking areas and amenity buildings) on frontal dunes is highly constrained.
- Compartment 1 (south of Nine Mile Beach) is the most amenable for development
- Compartment 2 (Nine Mile Beach to Headbutts) comprises active dunes that is highly susceptible to change.

Cells 1 – 6 relate to the Shire of Irwin. The susceptibility, instability and combined risk for these cells is included in the table below.

		SUSCEPTIBILITY		INSTABILITY				
CELL	**BOUNDARY**	**FOREDUNE AND FRONTAL DUNE**	**BACK BARRIER AND HIND DUNE**	**INSHORE**	**FORESHORE**	**FRONTAL DUNE**	**BARRIER**	COMBINED RISK
1	Leander Point to Dongara North	Low to moderate (2)	Low (1)	Low to moderate (2)	Moderate (3)	Low to moderate (2)	Low to moderate (2)	Low to moderate (12)
2	Dongara North to Harleys Hole	Low to moderate (2)	Low (1)	Low to moderate (2)	Moderate (3)	Low to moderate (2)	Low to moderate (2)	Low to moderate (12)
3	Harleys Hole to Seven Mile	Low to moderate (2)	Low (1)	Low (1)	Moderate (3)	Low to moderate (2)	Low to moderate (2)	Low to moderate (11)
4	Seven Mile to Nine Mile	Moderate (3)	Low to moderate (2)	Low (1)	High (1)	Moderate (3)	Moderate to high (2)	Low to moderate (12)
5	Nine Mile to Bookara South	High (5)	Low to moderate (2)	Moderate to high (4)	High (5)	High (5)	Moderate to high (4)	Moderate to high (25)
6	Bookara South to Shire boundary	Moderate to high (4)	Moderate (3)	Moderate to high (4)	High (5)	Moderate to high (4)	Moderate (3)	Moderate to high (23)

Adapted from Damara WA Pty Ltd, (2011)

Recommendations for Cells 1 – 6 are shown in the table below.

CELL	BOUNDARIES	CONSDERATIONS
1	Leander Point to Dongara North	1. The coast between Leander Point and Dongara North is outside the Study area but is a natural extension from a resource management perspective and should be considered as such. 2. Any proposal for development Near the shore Between the Mouth of The Irwin River and Dongara North should consider the changes in The sediment budget due to erosion south of the river. 3. Setbacks to Development should allow for adjustment of the coastal outline in plan within the northern section of the cell. 4. Beach access ways should be minimised and tracks along the coast kept well to the landward margin of the narrow foredune plain, if not abandoned altogether.
	Dongara North to Harleys Hole	1. Calculation of setbacks should allow for potential changes to the configuration of the coast under projected changes in climate and sea level. 2. Beach access ways, particularly through the frontal dune ridge may pose a management risk. 3. Tracks along the coast should be kept to the landward margin of the narrow foredune plain and off the seaward slopes of the frontal dune ridge.
3	Harleys Hole to Seven Mile	1. Calculation of setbacks should allow for potential changes to the coastal outline in plan form under the appropriate scenario for projected change in climate and sea level. 2. Tracks along the coast should be kept to the landward margin of the narrow foredune plain and off the seaward slopes of the frontal dune ridge. 3. Consideration should be given designing development on the backbarrier to fit the topography rather than imposing a grid layout of any subdivision.

CELL	BOUNDARIES	CONSDERATIONS
4	Seven Mile to Nine Mile	1. Calculation of setbacks should allow for potential changes to the coastal outline in plan form under the appropriate scenario for projected changes in climate and sea level. 2. Beach access ways, particularly between Seven Mile and Getaway Beach and in the northern half of the cell, may pose a management risk. 3. The reach of coast in Cell 4 is increasingly susceptible to erosion with distance north. Hence tracks along the coast should be kept to the landward margin of the narrow foredune plain in the southern part of the cell and restricted access provided in the northern sector. 4. Access tracks to the beach should be established through stable dunes demonstrably perched on coastal limestone. 5. Consideration should be given designing development on the backbarrier to fit the topography rather than imposing a grid layout of any subdivision.
5	Nine Mile to Bookara South	1. There is scope for development on deflation plains and depressions in the Northern half of the back barrier. 2. The change in orientation and the active blowouts along the coast in Cell 5 may be a consideration in future planning. 3. Access tracks to the beach should be established through stable dunes demonstrably perched on coastal limestone.
6	Bookara South to Shire boundary	1. Deflation plains and depressions in the southern third of the cell adjoin those in Cell 5 and appear amenable to development. 2. Access tracks to the beach should be established through stable dunes demonstrably perched on coastal limestone. 3. Any proposed development should be contingent for plans to minimise access tracks to the shore, and keep them within the southern third of the cell.

Adapted from Damara WA Pty Ltd, (2011)

Application/implications

The Technical Report for Dongara to Cape Burney provides some useful recommendations for the future use and development north of Dongara to the northern boundary of the Shire. This section of the coast is relatively undeveloped, apart from a formal access point at Seven Mile Beach and tracks leading to other beach sites. The low-key nature of this area of coastline is likely be continued in the future.

4.25 Coastal Hotspots

The Coastal Hotspots document was prepared by Seashore Engineering in 2019. It identifies 'hotspot' number 14 at Port Denison which extends from Granny's Beach to north of Surfs Beach. The hotspot is described as follows:

Erosion at Grannies Beach in Dongara has occurred progressively in response to construction of the Port Denison Marina modifying an embayment and truncating sediment transport from the south. Grannies Beach was originally in the central part of a half heart shaped embayment controlled by rock outcrops at Leander Point and in the vicinity of the Irwin River mouth. It was intermittently supplied by sediment from the south, bioproduction from offshore reefs, and sediment discharge from the Irwin River during flood events; the latter two components have been insufficient to compensate for the loss of sand from the south. Erosion has threatened the Dongara Denison Beach Holiday Park, which would have been sited as a relocatable asset, resulting in the construction of a rock revetment. This revetment has enhanced erosion due to regularly reflecting wave action creating a loss of a permanent beach, and transfer of the erosion hazard to the north. Most recently the revetment was extended north and the car park was modified.

Eight publicly owned assets may be at risk of erosion damage in the area, with four assets at risk of damage in the short-term, including shade umbrellas, beach access points, the path and the reconstructed car park. In the longer term, Ocean Drive, Marine Heights, the leasehold caravan park, and associated services (critical water pipeline, phone, power), as well six private properties are high-value assets at risk.

The main recreational uses of the site are swimming, surfing, windsurfing/kitesurfing, walking and cycling. The Dongara community have an active interest in the management of this foreshore.

The management options for the next 0-5 years are to 'protect' the area, for the preparation of planning frameworks for retreat in the next level of management and to review lease agreements with the caravan park for clarify responsibilities for coastal erosion mitigation. The management options for the next 5-25 years is to retreat (relocate Ocean Drive and caravan park) and to protect by extending the revetment 150m to protect the road at the southern end. The management options for 25+ years is to retreat (relocate the road and retreat the caravan park).

4.26 Modelling of Coastal Inundation and Erosion Process at Shire of Irwin Coastal Region – Technical Input for Irwin Coastal Hazard Risk Management and Adaptation Plan

Modelling of Coastal Inundation and Erosion Process at Shire of Irwin Coastal Region – Technical Input for Irwin Coastal Hazard Risk Management and Adaptation Plan was prepared by Curtin University for the Shire of Irwin, NACC and the WAPC in 2016. It sets out the results of numerical modelling of coastal inundation and coastal erosion and displays the sea level rise and water level scenarios on maps. Sites of interest in the study include Port Denison, Granny's Beach/Surf Beach, South Beach, Seaspray Beach/Irwin River, Seven Mile Beach, Freshwater Point and Cliff Head. Inundation maps and erosion maps are provided for each site for the 1 year ARI, 100 year ARI and 500 year ARI in the present year (2016) and also for the year 2070 and 2110. It is important to note that the study acknowledges that it *was conducted with very limited data and site information* and that *the results should be used as indicators and preliminary findings for further detailed studies*.

Overall, the study found that *future climate change and sea level rise has adverse impacts on Shire of Irwin coastal region. Inundation will be expanded inland creating more areas inundated by severe weather conditions. Erosion will be more active and erode the beach at most of the locations, especially where extreme wave conditions occurs.*

Application/Implication

The study recommends that the results should be used as indicators and preliminary findings for further detailed studies which are listed in the report. The more coastal hazard investigations being undertaken by Seashore Engineering for certain sites will provide this more detailed information for incorporation into the CMP.

4.27 Port Denison Beach Erosion Investigations

The *Port Denison Beach Erosion Investigations* were undertaken in 2001 by MJ Paul and Associates Pty Ltd on behalf of the Shire of Irwin and the Department of Transport. It focuses on the beach adjacent to the 'Dongara Denison Beach Caravan Park' located north of the Port Denison harbour and looks at the likely causes of beach erosion and assesses the full range of options for managing its impact.

The study reviewed historic aerial photos, beach profile surveys and near-shore hydrographic surveys. The beach profile monitoring confirmed that the beach erosion is limited to a 400m long section of beach.

The options provided in the report are:

- Do nothing – this option is to not add any coastal protection but to look at relocating the buildings associated with the caravan park.
- Seawall – this options would prevent further erosion of the beach opposite the caravan park
- Beach renourishment – adding sand of similar particle size and grading to widen and improve the beach
- Rubble mound groynes – consisting of 4 x 50m long groynes spaced 200m apart, along with sand renourishment
- Offshore rubble mound breakwaters – consisting of 7 x 60m long groynes spaced 200m apart, along with sand renourishment.

The preferred strategy recommended by the report was sand renourishment.

Application/implication

This report is almost 20 years old, however it contains some useful historical information regrading the coastline at Granny's and Surfs Beach which may be useful in the detailed coastal hazard investigation undertaken by Seashore Engineering for this CMP.

4.28 Dongara Beaches Concept Plan

The *Dongara Beaches Concept Plan* was prepared in 2012 by MP Rogers and Associates Pty Ltd.

It states that after the 2001 *Port Denison Beach Erosion Investigations* report the Shire continued to undertake sand renourishment but the dune continued to erode and threaten the caravan park. A 30m seawall was constructed in 2010 and an extension of 170m occurred in 2011 leaving Granny's Beach and Surf Beach without protection. The purpose of this report is to *investigate options to help maintain beach width at these beaches and reduce the amount of beach nourishment required to be placed*.

Four options were investigated for Granny's Beach:

- Existing Case – Beach Nourishment. Placing sediment on the beach and in the nearshore area to mitigate coastal damage and beach erosion
- Concept Option 1 – Offshore Breakwater with Beach Nourishment. Construction of an offshore rubble mound breakwater extending north from the Port Denison breakwater. The conceptual structure is 50 m long and approximately 50 m from the design beach position.
- Concept Option 2 –GSC Groyne with Beach Nourishment. A 30 m long groyne constructed to the -1 mAHD contour at the northern end of Grannies Beach to trap some of the northern longshore sediment transport.
- Concept Option 3 – Perched Beach with Beach Nourishment. Placement of a structure with a crest height around mean sea level to hold sand nourishment at Grannies Beach.

After consideration of the above options, the Shire and DoT *agreed that concept Option 2 (GSC groyne) appears to be the most appropriate to meet the objectives of the Shire*.

Three options were investigated for Surf's Beach:

- Existing Case – Beach Nourishment. Placing sediment on the beach and in the nearshore area to mitigate coastal damage and beach erosion
- Concept Option 1 – Rock Groyne with Beach Nourishment. Construction of a rock groyne to the north of the car park, beach renourishment, extension of the existing rock wall by 50m and the construction of a low crested, terraced seawall at the rear of the newly placed beach
- Concept Option 2 – Extend the Existing Seawall. Extending the existing rock seawall approximately 150 m to the northern end of the car-park.

After consideration of the above options, the Shire and DoT agreed that concept Option 2 (Extending the Seawall) was the most appropriate.

Application/Implication

This report provides useful information on the history of Granny's Beach and Surf's Beach and the recent construction of the sea wall. This may be useful in the detailed coastal hazard investigation undertaken by Seashore Engineering for this CMP.

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landinsights
PLANNING DESIGN ENVIRONMENT

SHIRE OF IRWIN COASTAL MANAGEMENT PLAN

STAKEHOLDER AND COMMUNITY ENGAGEMENT PLAN

PREPARED FOR

SHIRE OF IRWIN

JULY 2019

Rev 1c

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1 Introduction

1.1 Background

This Stakeholder and Community Engagement Program (SCEP) has been developed as a leadership document for the Shire of Irwin Project Manager, Shire Staff, Council, Stakeholders and Shire-appointed consultants to facilitate communication and consultation for the review of the Shire of Irwin Coastal Management Plan.

The SCEP is focused on involving the broader community in preparing the Coastal Management Plan (CMP) to ensure that it reflects a longer-term vision while taking into account immediate management requirements. It has been prepared in accordance with the objectives and principles outlined in Council Policy *C5 – Community Engagement and Public Consultation*. The objective of the plan is to demonstrate how community, stakeholders and council will be involved as part of the process and to:

- Improve the quality of decision making through community participation
- Commit to accountability and democracy and transparency
- Offer and /or create new perspectives on selected issues
- Provide the Council greater legitimacy for decision making.

1.2 Purpose

The purpose of the SCEP is to:

- Provide an understanding of the purpose and intent of the CMP
- Provide communication and engagement objectives
- Identify project stakeholders
- Set out the community and stakeholder engagement approach, tools and techniques and engagement schedule
- Define the key roles and responsibilities of Land Insights and the Shire of Irwin throughout the consultation process

1.3 Applicability of Council Policy C5

Council Policy C5 outlines expected levels and mechanisms of consultation based on different project types. The policy identified six different groups of issues that Council would likely wish to consult on. This project falls within *Group Five: Major Plans which have impacts across the Shire.*

Community Engagement Guidelines within the policy state that expected consultation mechanisms. For a *Group Five* project, the following is anticipated:

- Written contact to affected household or group. Information will be given on how the receiver may give feedback
- Council-organised community forum/meeting.
- Surveys or other forms of formal market research that are independently conducted and are statistically valid. Note: matters that are identified as requiring surveys will be determined by Council on a case-by-case basis when the scoping of the matter and full consultative program is presented to Council.
- Seek input via affected groups or advisory committees (if relevant one exists).
- Council's Shire Website / Brilliant Blend Bulletin / Council Facebook Page / Notice Board / Shire of Irwin Electronic Community Sign
- Advisory Public Notices / Media Release (i.e. Dongara Denison Local Rag, Geraldton Guardian etc)
- Public Notice advertising for public comment/feedback

These consultation mechanisms have been considered and are largely implemented in this project.

2 Project description

2.1 Purpose and intent of the CMP

The CMP will provide actions and recommendations to assist the Shire of Irwin with the management and protection of the coastline for the next 10 years.

The objectives of the CMP are to:

- Identify current land uses, values and issues of the Shire's coastal land which may impact upon future coastal management for the next 10 years
- Consider risks, actions and recommendations from existing Shire plans and strategies
- Facilitate sustainable management and protection of the Shire's coastal land and reserves
- Ensure adequate consideration of coastal hazards is undertaken, particularly in areas outside the scope of the Shire's CHRMAP, and ensure management is in accordance with SPP 2.6 and associated Guidelines
- Increase community awareness of and participation in coastal management
- Plan for future urban and tourist growth in the region and the effects this may have on recreational use and existing and proposed coastal facilities
- Provide an implementation plan that identifies management actions and sets priorities.

The CMP will include recommendations to address planning, environment and coastal engineering in order to address the variety of issues along the coast. It will provide on-ground management focus for the recently completed Shire of Irwin Coastal Hazard Risk Management and Adaptation Plan (CHRMAP), as well as recommendations for integration with the Shire's local planning framework.

The coastline south of Port Denison has historically been used by professional fishermen and holiday-makers and a number of coastal shacks exist throughout the area. The CMP will consider the future of the shacks and the use of the area.

Granny's Beach located within the townsite is identified as a coastal hazard 'hotspot'. The CMP will include a low-cost monitoring framework for the beach and a set of triggers to guide on-ground management.

2.2 Communication and engagement objectives

The purpose of community and stakeholder consultation is to identify:

- What the community and stakeholder value about the Shire's coast
- What the coast is used for (e.g. recreation, camping, professional fishing etc.)
- Threats to the coastline (e.g. certain land uses, coastal processes, degradation etc.)
- Issues along the coast (e.g. access, land use conflicts, lack of facilities, coastal changes etc.)
- Suggestions and ideas for improvements to the management of the coastline.

The communication and engagement objectives for the project are to:

- Encourage the participation of everyone affected by or interested in the CMP
- Create an encouraging and supportive engagement environment
- Ensure information regarding the CMP process is easily accessible and understood
- Foster an appreciation and understanding of varying views and needs with respect to the CMP
- Ensure an open, transparent and accountable community and stakeholder engagement process is undertaken
- Allow sufficient time to participate and engage in the CMP process
- Provide a consistent approach to community and stakeholder engagement
- Ensure the communication and engagement expectations of the community and stakeholders are managed and guided in accordance with the SCEP.

3 Project stakeholders

3.1 Introduction

This chapter identifies the stakeholders for the project. By understanding who these individuals and groups are it is possible to understand what degree of influence and thus involvement they should have as part of the project.

3.2 Stakeholder identification

STAKEHOLDER	KEY AREA OF INTEREST	COMMUNICATION METHODS	RESPONSIBILITY
Shire of Irwin Council	Representative of ratepayers, residents and business. Decision makers for Shire of Irwin.	Council agenda (detailing the results of any consultation to date and a project update) and Council meetings.	Shire of Irwin Project Manager
Chief Executive Officer, Executive Management Team and Project Leadership Team	Responsible to the Council on managing the administration of the Shire.	Emails and meetings.	Shire of Irwin Project Manager
Steering Committee	Project committee established by the Shire to guide the project. This group is made of key stakeholders to the project. Members of this group are identified below.	Emails and meetings.	Shire of Irwin Project Manager and Land Insights
Government Departments/ Authorities	Responsible for delivery of various public services. The DPLH will provide approval on the final project outputs.	Letters/emails and phone calls (as required).	Land Insights
Key Utility and Infrastructure Providers	Responsible for key utilities and infrastructure in the area (such as water, power and transport).	Letters/emails and phone calls (as required).	Land Insights

STAKEHOLDER	KEY AREA OF INTEREST	COMMUNICATION METHODS	RESPONSIBILITY
Property Owners in the project area.	Residential and business property owners who are living/working within the project area.	Direct mail outs and emails, updates on the Shire of Irwin website, updates on the Shire of Irwin social media, advertisements in the local paper.	Shire of Irwin Project Manager and Land Insights
Residents and Lessees in the project area.	Residents and lessees who are living/working within the project area.	Direct mail outs and emails, updates on the Shire of Irwin website, updates on the Shire of Irwin social media, advertisements in the local paper.	Shire of Irwin Project Manager and Land Insights
Community Groups/Friends of Groups/Activist Groups.	Community interest groups focused on varying issues including societies, friends of groups and associations.	Direct mail outs and emails, updates on the Shire of Irwin website, updates on the Shire of Irwin social media, advertisements in the local paper.	Shire of Irwin Project Manager and Land Insights
Other Key Stakeholders General Public.	Various interests.	Direct mail outs and emails, updates on the Shire of Irwin website, updates on the Shire of Irwin social media, advertisements in the local paper.	Shire of Irwin Project Manager and Land Insights

3.3 Steering Committee

The Steering Committee is made up of the following members:

NAME	STAKEHOLDER GROUP
Nick Boegl	DPLH
Jane Stockley	DPLH
Brendan Jeans	Shire of Irwin

NAME	STAKEHOLDER GROUP
Councillor K Wilson	Shire of Irwin Councillor
Councillor M Leonard	Shire of Irwin Councillor
Sarah Taylor	Community representative

3.4 Stakeholders

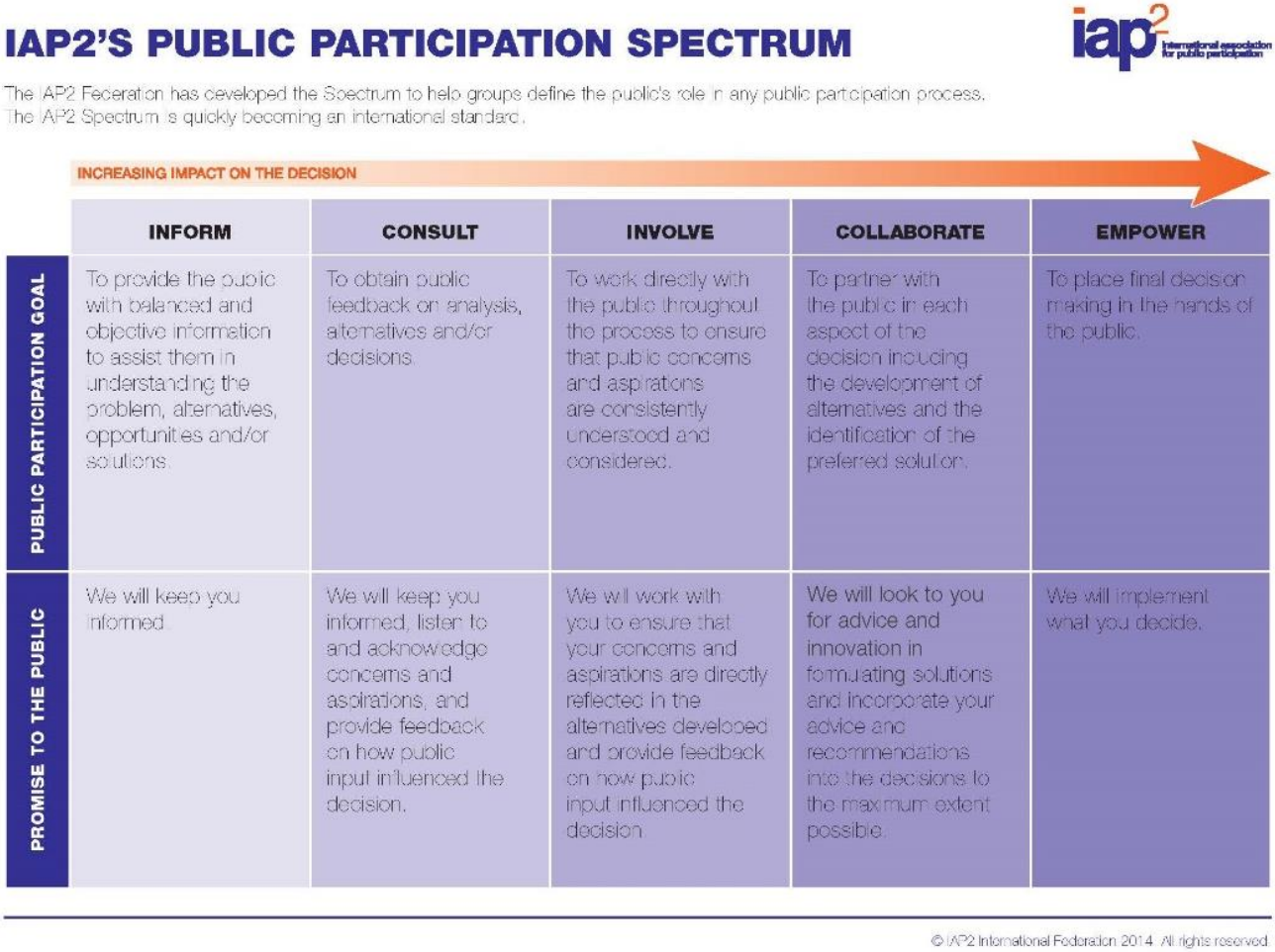
The following stakeholder lists are a starting point for the consultation program. It may become apparent during the course of the project that other parties should be consulted. As such this should not necessarily be seen as an exhaustive list.

NAME	STAKEHOLDER GROUP
Government stakeholders	Shire of Irwin and Councillors Department of Planning, Lands and Heritage Department of Biodiversity, Conservation and Attractions Department of Water and Environmental Regulation Department of Transport Main Roads WA Service and Utility providers
Community stakeholders	Shack owners Surf club Fishermen groups Yamatji Marlpa Aboriginal Corporation Community Coastcare and Friends of Groups Coastal businesses (caravan park owners and store owners etc) The wider community

4 Approach and engagement methods

4.1 Level of engagement

Five levels of engagement are recommended by the International Association for Public Participation (IAP2) platform as outlined in the IAP2 Public Participation Spectrum extract below. This is used as a guide in many projects and has been adopted as an overarching guide to consultation in this project.



IAP2'S PUBLIC PARTICIPATION SPECTRUM

The IAP2 Federation has developed the Spectrum to help groups define the public's role in any public participation process. The IAP2 Spectrum is quickly becoming an international standard.

INCREASING IMPACT ON THE DECISION

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

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Source: https://www.iap2.org.au/Tenant/C0000004/00000001/files/IAP2_Public_Participation_Spectrum.pdf

The suggested project response to the IAP2 Participation Spectrum is outlined in the table below.

ENGAGEMENT LEVEL	SUGGESTED PROJECT RESPONSE
INFORM	Social Media Distribution of letters to key stakeholders Notice on Shire Website
CONSULT	Survey (online/hard copy) Targeted Stakeholder Discussion (e.g. specific stakeholders)
INVOLVE	Community Workshop Community Information Evening Steering committee
COLLABORATE	Steering Committee Targeted feedback Workshop/Information Sessions
EMPOWER	Delegated Decisions via Steering Committee as appropriate Input to Council meetings. Recognition of Council as representing the community in adopting the CMP.

4.2 Engagement methods

The following table sets out the engagement methods to be employed at specific stages of the project. Subject to agreement, the methods and indicative dates may be subject to change as the project progresses.

KEY TASKS		DETAILED DESCRIPTION	INDICATIVE DATE	RESPONSIBILITY
STAGE 1 – PROJECT INCEPTION				
1.1	Project Inception	Meet with the Shire's Project Team to discuss and clarify project scope of works, including scope of community engagement.	Completed May 2019	Shire of Irwin and Land Insights
1.2	Stakeholder identification	Prepare a detailed stakeholder list in conjunction with the Shire.	Completed May 2019	Shire of Irwin (supply list) and Land Insights (determine level of involvement)
1.3	Draft SCEP	Following the identification of all relevant stakeholders, prepare a draft Stakeholder and Community Engagement Plan for review by the Steering Committee.	Completed June 2019	Land Insights (in consultation with the Shire)
1.4	SCEP review	Project Steering Committee to review and provide feedback on the draft Stakeholder and Community Engagement Plan.	Completed June 2019	Steering Committee
1.5	Final SCEP	Finalise Stakeholder and Community Engagement Plan, in response to feedback for Council to consider.	July Council Meeting	Land Insights (in consultation with the Shire)
STAGE 2 – DRAFT COASTAL MANAGEMENT PLAN				
2.1	Council briefing	Shire Officers to provide a briefing to Council, informing of the proposed project and engagement process.	July 2019 Council meeting	Shire of Irwin Project Manager

KEY TASKS		DETAILED DESCRIPTION	INDICATIVE DATE	RESPONSIBILITY
2.2	Community survey	Prepare a community survey which can be made available in hardcopy format and online. The survey will ask participants to identify environmental, social and economic values along the coast, to share local information, as well as identify any issues affecting the coast and any suggestions for improvement. The survey will be made available in hardcopy format at the Shire's office and at any other business or outlet who can volunteer to keep surveys (such as caravan parks and local businesses along the coast). It will also be available online and a link will be provided from the Shire's website and from their social media accounts.	July 2019	Land Insights

KEY TASKS		DETAILED DESCRIPTION	INDICATIVE DATE	RESPONSIBILITY
2.2	Communications and advertising	• Prepare letters to inform community and key stakeholders of their opportunity to contribute to the project. Provide workshop and survey details and key information about the project • Prepare newspaper advertisements and media releases for the workshop within local media, which shall include key event information, links to the Shire webpage, and requests for event RSVP • Establish Shire contact email address (and phone number/contact name) for individuals to ask questions and register interest for the workshop Launch communications and advertising material including: • Distribution of letters • Advertisements within local newspapers • Notice on Shire's website and social media accounts • Surveys made available (hardcopy and online) • Request stakeholders/steering group members promote the project via their organisation's communications tools (i.e. websites, newsletters and social media).	July 2019 Late July/early August 2019 Late July/early August 2019 Late July/early August 2019	Land Insights – to prepare letters and communication materials and the survey Shire of Irwin – to organise distribution of letters and survey, update Shire website and social media and manage RSVP's.
2.4	Preparation for workshop	Prepare information to be discussed and presented at the workshop such as plans of the coastal area and hardcopies of the community survey. The Shire Project Manager will be responsible for booking the venue (note that the date and location will have been decided in Stage 1) and organising catering.	Late July/early August 2019	Land Insights – prepare material for the workshop. Shire of Irwin – organise booking of the venue.

KEY TASKS		DETAILED DESCRIPTION	INDICATIVE DATE	RESPONSIBILITY
2.5	Workshop	Facilitate a 2-3 hour workshop. The workshop will be focused on determining a community vision for the management of the Shire's coastline by working through four key tasks: • Identification of values of the Shire's coastline • Identification and review of potential risks or threats to the coast • Consideration of any trends (management trends or physical trends) appearing on the coast (this is particularly useful when there are long-standing community members who have noted changes along the coast over time) • Using this information, determine how the future of the coast should be managed by identifying a vision for future use and management. Plans of the coastal area will be available at the meeting to allow people to see the sites and to refer to anything in particular. Comments from the meeting will be recorded by the Shire and Land Insights. Participants will be invited to also complete the survey.	Late August/early September 2019	Land Insights and Shire of Irwin. Note: Shire of Irwin to arrange external facilitator.
2.6	Analyse information	Following the Workshop and return of all surveys, Land Insights will analyse the information gathered and summarise the key 'learnings', which will be used by the project team to inform the CMP. The purpose of the review is to observe any common themes and issues, to identify any significant issues and to contemplate ideas raised.	September 2019	Land Insights
2.7	Draft CMP review process	The draft CMP will be reviewed by the Shire Project Manager and Steering Committee.	October 2019	Shire of Irwin and Land Insights

KEY TASKS		DETAILED DESCRIPTION	INDICATIVE DATE	RESPONSIBILITY
2.8	Draft CMP to Council	Following the above, the draft CMP will be presented to Councillors at a Council Meeting to consider endorsement for advertising.	December Council Meeting	Shire of Irwin
2.9	Public advertisement	The draft CMP will be advertised for public review and comment. The Shire will be responsible for preparing public advertising including: • Project update and invitations to comment on proposed CMP via Facebook, local media advertisements and posters/flyers at key community locations • Written invitations to comment on proposed CMP to be mailed to key stakeholders • Updates to the Shire website with a link to the draft CMP and a link to a comment form • Draft CMP document to be printed and displayed at Council building (and local Library), alongside printed feedback forms to enable people to provide handwritten feedback. The advertisement should also include information about the Information Session to be arranged during the public advertising period.	January 2020 – February 2020	Shire of Irwin

KEY TASKS		DETAILED DESCRIPTION	INDICATIVE DATE	RESPONSIBILITY
2.10	Public Information Session	The information session will operate essentially as a 'drop in' session, whereby members of the community can attend the session at any time, without needing to stay for the entirety. Our consultant team would be available for discussion with members of the community on a one-on-one basis or in small groups, depending on numbers. Discussions will therefore be targeted at particular issues or components of the draft CMP that are of interest to the person/s attending. We usually make a comment/feedback form available at these sessions for community members to complete at the time or to take for later submission.	February 2020	Land Insights and the Shire of Irwin
2.11	Review submissions	Following closure of the advertising period, Land Insights will review all submissions and provide a Schedule of Submissions for consideration by the Shire and the Steering Group.	March 2020	Land Insights
STAGE 3 – FINAL COASTAL MANAGEMENT PLAN				
3.1	Final CMP	The Final CMP will be presented to Council for final adoption. Following this, the CMP will be made available on the Shire's website and a hardcopy will be printed and displayed at Council building (and local Library).	April 2020	Shire of Irwin

5 Response and review

The requirement of Shire officers in providing responses back to the community will be via the methods and forums of consultation outlined in this document. However, in summary the following feedback and response mechanisms are to be observed throughout the work program:

- Minutes of all meetings
- Shire Facebook Page updates as required
- Review and collation of survey results
- Preparation of outcomes report of workshops (as part of consultation summary)
- Submissions/summary of submissions.

Community consultation/engagement processes are to be avoided over school holidays, particularly summer holidays. The summer holidays also coincide with the busier times for the farming community which should also be avoided. It is suggested that December-January be avoided for significant consultation.

It is recommended that this document be treated as a guide only, with acknowledgement of the need for flexibility in response to project progress.

Schedule of Submissions – Shire of Irwin Coastal Management Plan 2020

Number	Respondent	Comment	Officer Response
1	Department of Mines, Industry Regulation and Safety	I refer to your correspondence dated 2 September 2020 seeking Department of Mines, Industry Regulation and Safety (DMIRS) comments on the advertised draft Shire of Irwin Coastal Management Plan. Overall this proposal raises no significant access concerns regarding mineral or petroleum resources, geothermal energy or basic raw materials as the strategies and actions identified in the Management Plan do not materially affect mining or petroleum interests. DMIRS raises the following considerations with respect to each Sector identified in the Management Plan: • Sector 1: Coal resource has been identified 1km inland from Nine Mile Beach to Box Rox. • Sector 2: Mining Tenements in this sector include: M70/309, L70/207 (pending), P70/1735 (pending), E70/5041 (tenement covers the beach), M70/1271, M70/311, E70/355. Most tenure is more than 700 meters from the coastline and should not generate any land use conflicts. • Sector 3: Camp grounds (North Cliff Head, Cliff Head and South Cliff Head) should not encroach into Mining Lease M70/613 and tenement holders should be notified of any additional/upgraded access tracks through their tenement.	Noted. Noted. Noted. Noted. Noted. There are no proposals in the CMP to expand these campgrounds into the tenement areas.

Number	Respondent	Comment	Officer Response
		There is also Mining Lease M70/929 (pending) in the area north of M70/613 that may impact beach accessibility and the North Cliff Head camping ground. Please find attached some maps depicting the location of the tenements and resources identified for each sector as per the above points. Accordingly, the Department of Mines, Industry Regulation and Safety lodges no objection to the proposal provided the identified mining tenements are consulted where necessary. I trust this feedback is useful. If you require any clarification on the above please do not hesitate to contact me directly.	Noted. Any conflicts with coastal access can be worked through if a mining proposal is approved for the area. Noted. Noted.
2	Department of Primary Industries and Regional Development	Thank you for inviting the Department of Primary Industries and Regional Development (DPIRD) to comment on the Draft Coastal Management Plan. DPIRD supports the draft plan in general and offers the following comments: • In Section 7.10 (p58) of the draft plan, in relation to Objective 1: 'identify current land uses, values and issues of the Shire's coastal land' – To reduce possible land use conflict, DPIRD would like to highlight the area of high quality agricultural land (HQAL) to the south of Steele Road, Bonniefield and east of the Brand Highway – significant to the agriculture industry and previously identified by	Noted. These areas of HQAL are located outside of the CMP study area and so none of the recommendations in the CMP will interfere with HQAL. Section 7.10 amended to include a recommendation to protect HQAL (refer to EL15).

Number	Respondent	Comment	Officer Response
		DPIRD for the Shire of Irwin. DPIRD recommends that important agricultural land and investments need to be protected by planning mechanisms such as zoning, buffers or separation distances to secure ongoing activities and to prevent interference from the encroachment from sensitive land use, as guided by State Planning Policy 2.5 – Rural Planning. • Action EL9 (p60) requests assistance from DPIRD for the eradication of feral rabbits, foxes and cats from the study area. The responsibility for this activity lies with Recognised Biosecurity Groups (RBGs) and the Shire of Irwin is a member of the Midlands RBG. • DPIRD supports the protection of limesand reserves and the planning mechanism such as buffers or separation distances to allow ongoing access to the resources and to prevent encroachment from sensitive land uses. Section 3.5 of the Literature Review (p10) refers to draft State Planning Policy 2.4 – Basic Raw Materials and Guidelines. As this planning policy is still under review, the shire may also refer to State Planning Policy 2.5 – Rural Planning, Section 5.9 Basic raw materials outside of the Perth and Peel, for guidance in this matter. • In 1993 Griffin (Griffin, EA, 1993, Flora of the Quindalup dunes between Swan and Irwin Rivers, Western Australia. Unpublished report to the Coastal Planning Branch, Department of Planning and Urban Development and the Heritage Council of WA) undertook a study of the flora, formation and movement of coastal dunes in this region for the	Recommendation EL9 has been modified to mention the Midlands RBG. Noted draft format and SPP2.5 relevance. A reference has been made to this report in the CMP, although the specific vegetation information relating to the study area is difficult to ascertain from the report.

Number	Respondent	Comment	Officer Response
		Department of Planning which remains very relevant today.	
3	Department of Biodiversity, Conservation and Attractions	Thank you for the invitation to make comment on the draft Shire of Irwin Coastal Management Plan. The Department of Biodiversity, Conservation and Attractions (DBCA) recognises the objectives of the Irwin Coastal Management Plan and will continue to liaise and work in conjunction with the Shire of Irwin as required. DBCA will continue to manage Beekeepers Nature Reserve as legislated under the Conservation and Land Management Act (1984) and Regulations (2002).	Noted. Noted.
4	Main Roads Western Australia	Thank you for the recent referral of the Shire of Irwin Draft Coastal Management Plan, advertised for public consultation, submissions due 29 October 2020. Main Roads has reviewed the Draft Management Plan and provides the following comments: Sector 1 – Northern Beaches – Brand Highway 305.00 to 329.85 SLK (Tyford Road to Shire northern boundary) Main Roads agree with the 'issues' and 'opportunities' identified on page 80 and provides the following comments for the Shire's consideration: • The table refers to access from Indian Ocean Drive, which is incorrect, the correct reference is Brand Highway. • It is understood that access to the beach nodes may be formalised in the future as part of development or increased use. One of these areas incudes access to Five Mile Lagoon and Beach, which appears to be	Noted and updated. There are no recommendations or proposals in the CMP to provide access and formalisation of Fire Mile Lagoon and Beach. There are no

<table>
<tr><th>Number</th><th>Respondent</th><th>Comment</th><th>Officer Response</th></tr>
<tr><td></td><td></td><td>
via Lot 761 access to Brand Highway. The access to Lot 761 also appears to provide access t lots which have no direct access to a road reserve or access easement. Main Roads understands the Shire has identified the issue and continues to consider how it may be resolved. Formalising the access for shared use shall require consultation with Main Roads and assessment.
• Wakeford Road intersection with Brand Highway may not have adequate site distance or geometry at this location. Further review may need to be considered and discussed with the City of Greater-Geraldton.

Section 3 – Southern Nodes – Indian Ocean Drive (IOD) – 241.5 to 267.29 SLK (Murra Place to Bee Hollow).
Main Roads agree with the ‘issues’ and ‘opportunities’ identified in the table on page 117 and provide the following comments for the Shire’s consideration:

Table: type and quantity of coastal accesses;
<table>
<tr><th>Type of Access</th><th>Qty</th></tr>
<tr><td>Coastal Node – Beach Access, Rest Area, 72 Hr Paid Camping, Fishing Shacks</td><td>5</td></tr>
<tr><td>Coastal Node – Beach Access, Rest Area, 72 Hr Paid Camping</td><td>1</td></tr>
<tr><td>Coastal Node – Beach Access and Fishing Shacks</td><td>4</td></tr>
<tr><td>Informal Tracks – Beach access – Consider closing/consolidating</td><td>17</td></tr>
<tr><td>Gypsum/Lime Sand Access, Cliff Head – 260.2 SLK</td><td>1</td></tr>
</table>
</td><td>
recommendations or proposals to formalise beach nodes in the future.

There are no recommendations or proposals in this CMP to utilise Wakeford Road. Note future discussions required with CGG for any plans to develop.

Noted. No specific recommendations have been made to close tracks along this Sector. Recommendation EL4 proposes to ‘Close and rehabilitate informal tracks as they occur and in accordance with the programme of works developed by the responsible landowner’, however this relates more to the tracks around the coastal nodes themselves.

The results of the assessment are noted. Shire to continue liaison with MRWA regarding access requirements.
</td></tr>
</table>

Number	Respondent	Comment	Officer Response
		Proposed Tourist Development Area – Lot 55 on East Side opp. Knobby Head | 1 • Driveway access to a Main Road considers the safety and efficiency of the network and all road users. A road safety inspection was completed in 2019 on the IOD between 240.49 to 253 SLK that identified loose material at several of the accesses was being carried onto the IOD. A recommendation was made to seal them for a short distance. In general a sealed driveway provides vehicles with greater control during ingress/egress. Loose material has the potential to cause vehicle damage and affect vehicle traction on the road, creating an unsafe environment. The maintenance of the access and removal of any material carried onto a Main Road is the responsibility of the owner of the driveway. An unsealed driveway is likely to require increased maintenance frequency, in particular at the edge of the road pavement, which has associated costs and risks for completing maintenance work within a road reserve. An unsealed crossover may be more expensive over the life of the driveway. • To formalise public access from the IOD to the coastal sites, a traffic assessment should be completed to identify accesses that should be closed or consolidated and what upgrades are required to the permanent accesses, including the extent of seal. The assessment may also take into account closure of accesses on the east side of the Indian Ocean	Noted. The CMP doesn't recommend the formalisation of access to the coastal sites along Sector 3. However a recommendation has been included to undertake this assessment. Noted.

Number	Respondent	Comment	Officer Response
		Drive. The Shire completed the consolidation of three accesses to one access at Cliff Head in 2016. • The assessment shall be completed in accordance with: - WAPC Transport Impact Assessment Guidelines (August 2016); - Austroads Guide to Traffic Management Part 12 - Traffic Impacts of Development; - Main Roads design geometry standards and review process. • If the assessment identifies that upgrades to intersection with IOD are required, detailed design and construction shall be completed and funded fully or partially by the applicant as part of the development. • Any proposed works within the IOD road reserve will require an Application Form for Undertaking Works Within the Road Reserve to be completed and submitted to Main Roads Mid West-Gascoyne Region for assessment. Coastal Erosion needs to be monitored and may have long term future impacts on road alignment and the Shires associated beach access and infrastructure.	Noted. Noted. Coastal erosion has been considered in this CMP. The Shire monitors coastal erosion.
5	Department of Transport	As requested we have reviewed coastal management aspect of the Shire of Irwin Draft Coastal Management Plan. The Coastal sites which have been identified in the CHRMAP(2016) as high risk include Grannies Beach, Surf Beach, and South Beach. The CMP includes a framework to guide implementation of future on-ground management	Noted.

Number	Respondent	Comment	Officer Response
		options at Grannies Beach and Surf Beach, including maintenance regimes and potential modification of assets to help achieve priority actions from the CHRMAP. The followings are our comments and feedbacks: 1. At Grannies Beach and Surf Beach, DoT recommend beach photo monitoring (by NACC or shire) to be included in this plan. DoT supports the implementation plan and management actions listed below: - Truncate the north-west corner of the car park subject to erosion on Ocean Drive, in short-term - Close the northern access of this car park and create a new access point in medium term. - Continued erosion is expected along Grannies/Surf Beach and will require road and carpark relocation in the longer-term. - Interim options to defer road relocation should be evaluated, including reinforcement of existing nearshore reef control point/construction of Groyne field. 2. Page 95, six coastal management concept options are listed in Table 10.3 briefly. A concept design level documentation and cost estimate for each option is required. At least a concept drawing overlaid on a recent aerial photo for each option need to be provided. Figure 10.10 is a sketch for Option 4, 5, and 6. Further details about the structure construction cost calculation, sand nourishment source, volume, and timing need to be added.	This recommendation has been included into Sector 2. Noted as a subsequent action to progress following CMP adoption.

Number	Respondent	Comment	Officer Response
		3. Relocation of Ocean Drive is a most likely option. The cost estimate for this important option is considered a critical information to be provided in this CMP. 4. Please add a section for value of assets at risk. A summary table of estimated value of vulnerable built assets (road, carpark, properties) in each sector need to be included. The Shire of Gingin CHRMAP report provides good examples https://www.gingin.wa.gov.au/Profiles/gingin/Assets/ClientData/Documents/Final_CHRMAP_Copy.pdf 5. Page 97, Figure 10.11, is these three pictures representing the predicted future coastline for Option 4, 5, and 6? if so, please say it. 6. The resolution of Figure 8.3, 8.6, 8.9, 8.10, 9.2, 10.2, and 10.4 are poor and not readable.	Noted however will require more detailed separate assessment to ascertain. This is more relevant to the CHRMAP which the Shire has already prepared. Is referencing implementation of options noting requirements and estimate costs. Resolution improved.
6	Private submission	I wish to submit public feedback of the Coastal Management Plan. "The purpose of the Coastal Management Plan is to inform the Shire of appropriate future development and land use of coastal land under the ownership or management of the Shire. The Plan investigates and takes into account coastal hazards/risks and coastal processes so that we have a better understanding of how the areas of coastal land will form or be impacted over time". It has been great having this plan drafted, however I has not had the full input from the public- only those who had access to the internet and knew of the survey or attended the meeting at the Rec Centre. I recommend a post survey at our local supermarkets for all ages to comment on.	Hard copy surveys were distributed to several venues around town including the Shire office.

Number	Respondent	Comment	Officer Response
		I also recommend a photo timeline to be conducted of these areas to show their changes pre covid/post covid. The photo provided of 7mile Beach on page 76 by Land Insights was taken on May 2019. During pre-covid this site was full of caravans and once it was closed- it has allowed the area to regerminate coastal vegetation, minimise dune erosion and less waste. There is now also ample car space for all day users. Caravans limited the access to this beach. No camping has also minimised the risk of hazardous fires that can potentially get out of control to nearby properties as campers were cutting down vegetation and lighting fires. Covid has unfortunately changed 2020 but it has however had some positive effect. Its been nice to see coastal vegetation re-growing.	Noted – this change of use will continue to occur seasonally and from year to year during the life of the CMP. Any decisions over the 10-20yr horizon will be subject to onsite review for any changes.
		On page 79 'a continuous coastal track runs between seven mile beach and nine mile beach, with several shacks'- this is not correct as the Shire would know there are no shacks along this track only residential farm/coastal properties, and Getaway Beach- all whom are landowners that pay good rates to live in that area and are only supplied waste removal once a week. No water is supplied, nor paved footpaths, yet 7mile beach access is not maintained for local use. Rarely the beach access is graded/ gravel, the dunes are not protected and signage is rusting or minimal.	Noted and updated.
		And may I add it is not a continuous track- it stops at private property! Numerous people still drive through, cutting padlocks and trespass. 9 mile is also not accessible as it too is private property. The sooner the public understand this the	This is true. The CMP comments on the fact that the majority of the northern beaches are located on private property (freehold) and are not publicly accessible.

Number	Respondent	Comment	Officer Response
		better, before more livestock get on roads or breakin's occur. Also on pg 79, it talks about the environment- 7 mile has changed over the years there was once a lovely lawn area until the Shire ripped it all up and laid down gravel for a larger car park. Tourists now also park on the dune systems which is evident to erosion. Rocks that once were a dune barrier are now on the beach and in the sand as a safety hazard! Vegetation has been cut down, burnt and removed to create camping sites or camping fires. The clause 'the vegetation is relatively undisturbed' is a lie and based on what evidence???? On page 81. 'Low key nature of these sites and the low visitation due to difficult access' ???? Based on what evidence? If the Shire Ranger took note of visitation and recorded number plates it would be evident there was a high number of visitation by campers from self sufficient/backpackers, and local users. As for difficult access- it is a sealed public road. It may however be the only beach access north of Dongara but that's Town Planning otherwise buy land back from residents at 5mile and create another beach access. I do however agree with the plan there are 'no recommendations to provide additional facilities'- on the basis to keep it undeveloped and day use only so locals and travellers can all use the beach EQUALLY. Rate payers pay to live in that location and it is the only local north beach to	Noted. The CMP recommends that the 'no camping' sign is reinstated at Seven Mile Beach for the tracks into the dunes. This is more of a generalised comment for the site in the CMP and not a site specific vegetation survey. The comment 'difficult access' has been removed. Noted.

Number	Respondent	Comment	Officer Response
		access. It should not become a free 72hr camping site that is taken over as a caravan park. Additional signage is also agreed- noting emergency numbers, no fires, no camping, no fishing research area, parking allocation (boats/trailers, caravans or cars) Etc. well over due. Pg 82- 'maintain seven mile beach as an unserviced and self contained site to limit the likelihood of the site being used for overnight camping' The only way of doing this is not allowing camping at all! Therefore it does not require Shire rates to pay for facilities, continual Ranger watches, continual over flow waste removal, or Coast vegetation. It's time for tourists to WANT to stay IN Dongara and not by-pass our town and only want to stay at free camping. Rate payers are paying for other people's free holidays- that's not fair. Tourist who do stay at these sites are only staying over night in transit and not spending $ in our town. We should not be supporting free-loaders but providing a site in town, working with our caravan parks to provide low-fee camping so all businesses in town benefit and where already facilities are provided.	Noted. Noted, Council resolved to prohibit camping and daily patrols will continue to monitor compliance. Noted.
7	Private Submission	1. Risk of coastal erosion to Grannies Beach has been heavily mitigated through the installation of a granite rock wall immediately in front of the Big4 Park. 2. The Plan identifies that further erosion from wind and waves continue to impact the northern end of Grannies Beach where the rock wall ends (R41008 on page 107 of the draft Plan))	Noted. Noted and agreed.

Number	Respondent	Comment	Officer Response
		3. Recommend extending the rock wall past the Surf Beach to the area in front of Marina Heights (R45621 on page 107) thereby providing similar protection achieved at Grannies Beach to the northern carpark and Ocean Drive. Commends the Shire for undertaking this important coastal planning review as part of the wider WA State Coastal Planning process.	Options have been investigated in the CMP which would require more detailed investigation now having some understanding of the coastal processes. Noted.
8	Private submission	The Shire of Irwin Coastal Management Survey Report showed that Arrowsmith Lake area is UCL as in the first attachment. (The yellow windy strip North South is "Other Reserve" for the Old North Road / old stock route The pink gap in the yellow strip just north of the Brand Hwy was probably caused by the Summers family taking out an environmental lease on that area in the 60's so the area could not be mined/farmed. This I would imagine would no longer be valid – we have had no contact regarding it that I am aware in several decades. The Lake is at the end of the Arrowsmith River, and has a large range of flora and fauna. The frog population, while diminishing, has been in huge numbers over the years. A biologist now living in Dongara, has found plant species endemic to the area.	The data shown on the tenure plans is from the Landgate database. The area being referred to in this submission is outside of the CMP study area and project scope.

Number	Respondent	Comment	Officer Response
		He has identified tiny perch we saw arriving in the first few metres of water as the river first arrived into the lake this year. The Arrowsmith Lake seems to be used a reference point for the southern border of northern Midwest species of flora and fauna, and the northern border of southern Midwest species. We are now noticing people coming in to saw trees for firewood and rubbish left. Vehicle tracks also cause some disturbance. It would be ideal if this site could be protected more, even if it was to return to the yellow ”Other Reserve” status. For the DBCA to take over this land could even be better.	
9	Private submission	We wish to respond to the Draft Coastal Management Plan prepared by Land Insights earlier this year. Our interest in the issue is borne from the fact that our residence is located less than 100 meters from the Surf Beach car park. We note that there could be many causes for the increased erosion in recent years, perhaps exacerbated by La Nina. The original 100 meter length of revetment was constructed at Grannies beach in the early 2000’s and was lengthened by 300 meters in 2011.	Noted. Noted. Noted. Noted. Noted.

Number	Respondent	Comment	Officer Response
		As predicted, erosion continued in a northerly direction following completion and, in all likelihood, will only increase as El Nino approaches.	
		The tenure of the land rests with the Shire of Irwin under a Management Order from the State Government.	Noted.
		The State Government has been less than helpful in providing support to Local Governments experiencing coastal erosion issues along the entire coastline.	Noted.
		The City of Fremantle is currently spending $3m on restorative works at Port Beach while the Cities of Stirling, Joondalup and Wanneroo have similar issues.	Noted.
		The Shire of Irwin needs State Government support in addressing this problem into the future and local MP's need to be approached for their support.	Noted.
		We note that there will be a further round of grants available from February 2021 and hopefully these MP's will throw their support behind the Shire.	Noted, the CMP recommends that the Shire apply for grants where available.
		The options listed and costed by Land Insights show that a 900 meter long revetment would cost $150,000 and would have a 30 year life.	Noted.
		From a laypersons perspective, it could be argued that this option, apart from being the most economical, would protect the coastline to the river mouth at least.	Noted.

Number	Respondent	Comment	Officer Response
		Yes, northwards of the river mouth is likely to come under pressure and a further solution will need to be found for that eventuality in the longer term. However, Surf Beach, Nun's Pool and the river mouth itself would benefit, as well as Ocean Drive not needing to be re-located at enormous cost. We trust that you will consider our views during your assessment favourably, particularly as they relate to affected property owners, existing infrastructure and future tourism. We would be pleased to respond to any further information you seek from us at any time.	Noted. The Shire will need to consider the impacts of coastal works on all sections of the coast. Noted. Noted. Noted.
10	Private submission	Just letting you know that there's a little car pull off bay near the soldier statues and tourists park there and then walk down the dune to swim. I'm worried about the dune damage due to the foot traffic. I was thinking that track should be closed off from people to preserve the dune.	Noted for signage protection and likely consideration for Ocean Drive options.
11	Private submission	Obelisk – Port Denison Signage at obelisk needs updating and replacement to educate visitors and locals about history of the site, marine life and bird life (ospreys), coastal plants, safety signage re boating, water sports, local emergency numbers. Refurbish commemorative plaques on the obelisk. More comprehensive information re stories of fishermen who are commemorated on the plaque.	Noted. A recommendation included in Sector 2 (refer S2-19) regarding the obelisk and upgrades to signage and plaques.

ATTACHMENT: ID03

Subdivision of Lots 5, 10 & 15 Brand Highway, Bonniefield

Attachment 1
Cover Letter

Attachment 2
Subdivision Plan

Attachment 3
Local Structure Plan

Attachment 4
Supplementary Information

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Our Reference: 2172Ltr152B
Enquiries: Eleni Thorman / Harry Norman

14 May 2021

Department of Planning, Lands and Heritage
140 William Street
PERTH WA 6000

Attention: Gary James

Dear Gary

RE: PROPOSED SUBDIVISION APPLICATION
LOTS 5, 10 & 15 BRAND HIGHWAY, BONNIEFIELD

Please find enclosed a subdivision application for the creation of 91 single residential lots and sections of road reserve from Lots 5, 10 and 15 Brand Highway, Bonniefield.

Included with this application is the following:

- Signed Form 1A;
- Application fee $10,327.00;
- Proposed plan of subdivision (CLE Ref. 2172-151A-01);
- Endorsed Local Structure Plan (CLE Ref. 2172-88E-01);
- Subdivision approval WAPC Ref. 151026, including approved plan (CLE Ref. 2172-112B-01);
- Bushfire Management Plan, prepared by Bushfire Safety Consulting (May 2021);
- Local Water Management Strategy, prepared by Civic Technology Pty Ltd (September 2014);
- Technical Note to Transport Impact Assessment, prepared by Riley Consulting (April 2021);
- Landform Report, 2005; and
- Certificates of Title for Lots 5, 10 and 15.

BACKGROUND

The subdivision application area covers approximately 57 hectares of land zoned 'Development' in accordance with the Shire of Irwin Local Planning Scheme 5 (LPS5).

On 25 February 2015, *Lots 4, 5 and 10 Brand Highway, Bonniefield, Dongara – Local Structure Plan (LSP)* was approved by the WAPC. The proposed subdivision is covered by this LSP, which identifies the application area as 'Residential' with a density coding of R2.5.

On 20 April 2015, the WAPC approved subdivision 151026 over lots 5 and 10 Brand Highway for the creation of 82 residential lots ranging from 4,002m^2 to 1.3ha in area. The approval however is no longer valid.

A copy of the approval and the approved plan of subdivision has been provided for your reference (refer plan 2172-112B-01).

PROPOSAL

The purpose of this application is to create 91 single residential lots to accommodate the logical expansion of the Dongara town site and formalise the intent of the associated LSP.

The proposed application is consistent with the approved LSP. The rationale for the density, layout and interface are detailed within the Local Structure Plan (refer plan 2172-88E-01), which also addresses issues such as bushfire risk and traffic management. These matters will be discussed in further detail below.

The subdivision application allows the creation of:

- 91 residential lots, ranging in area from 4000m^2 to 1.3ha;
- Five (5) areas of public open space, totalling approximately 6.7ha; and
- Portions of local road reserve connecting back to Brand Highway.

It is also noted that the subdivision design facilitates the retention of three (3) existing dwellings and associated outbuildings as indicated in the proposed plan of subdivision.

A copy of the proposed plan of subdivision has been provided (refer plan 2172-151A-01).

Residential Density

The lot sizes proposed by the subdivision are consistent with the Residential R2.5 density designated under the approved LSP which has a minimum lot area requirement of 4,000m^2.

Public Open Space

The areas of POS identified on the plan of subdivision are consistent with the areas identified on the adopted LSP and are consistent with the 10% public open space policy requirement under the *Liveable Neighbourhoods.*

The 1.93ha portion of POS within the south-west corner of the site includes retained remnant vegetation. This is consistent with the approved LSP which provides scope for the POS to provide a more natural area of open space.

The 20m strip of linear POS abutting Brand Highway will serve as an appropriate interface with the Highway, provide a buffer between the Highway and the proposed lots as well as supporting at-source disposal of stormwater.

Two local parks on either side of the new Boulevard Entry Road totalling 2.8ha between them are proposed to provide more conventional local park land, as well as an attractive entry into the estate.

Francisco Road / Brand Highway intersection

This subdivision application proposes the closure of the Francisco Road / Brand Highway intersection, with a technical note prepared to support its removal. The assessment undertaken identifies that removal of access to Lots 5 and 10 Brand Highway via Francisco Road will have no

detrimental traffic impact to the operation of the proposed northern access to Brand Highway. A technical note has been prepared by Reilly Consulting and is appended to this application.

Pre-lodgement discussions have been undertaken with the Shire and the Department regarding the closure of this intersection, and is justified for the following reasons:

- The connection is highly undesirable from a safety perspective, due to speeds along Brand Highway which are not suitable for traffic entering and exiting via this road. The removal of collision points at the existing four-way intersection is a desirable outcome from a road safety perspective.
- The surrounding road network is considered to have the necessary capacity to accommodate traffic demands of the existing and proposed development without the need for this connection.
- The removal of the Francisco Road / Brand Highway intersection is predicated on the consolidation of access to Brand Highway from the Boulevard Entry Road to the north. This intersection has been identified as part of the structure plan process and the subsequent subdivision approval (WAPC 151026) which includes a condition for the construction of an intersection at the Boulevard Entry Road.
- The upgrade of the Boulevard Entry Road / Brand Highway intersection will offset any future traffic increases in providing a suitable and safe access point to Brand Highway.
- The closure of the Francisco Road intersection does not impact the sites ability to provide the necessary fire access / egress. The existing road reserve ensures emergency access is retained via Francisco Road.
- Additional emergency egress can be sought via the existing east-west informal road just inside the northern boundary of Lot 10. The informal access road has recently been surfaced to a reasonable standard and is located within a registered access easement on the title of Lot 10.
- All lots will be capable of accessing Brand Highway to the east or south to Brennand Road via the western portion of the existing Francisco Road reserve.
- The Francisco Road, Dongara – Structure Plan Traffic Report does not provide any recommendation for access to be taken from Francisco Road onto Brand Highway. This is reflected in the structure plan which outlines concerns for the intersection and touts the potential for Francisco Road to be closed.

In summary, the closure of the eastern end of Francisco Road and removal of Francisco Road / Brand Highway intersection is considered to provide a number of significant benefits for the subject site without compromising the future surrounding traffic network. In doing so, this would improve vehicle safety accessing Brand Highway by diverting traffic away from this potentially problematic four way intersection of Francisco Road / Brand Highway / Bonniefield Road East to the improved Boulevard Entry Road intersection.

Movement Network

The proposed road network is generally consistent with the LSP and the WAPC's *Liveable Neighbourhoods* policy.

The road layout proposed by the previous subdivision 151026 has been revised to provide greater legibility and permeability throughout the site.

Specifically, the closure of the Francisco Road / Brand Highway intersection has allowed for the consolidation of the Boulevard Entry Road / Brand Highway intersection as the main entrance point to the area as identified by the LSP.

To provide additional legibility and amenity the proposed subdivision plan includes a new 30m wide north-south road reserve providing access from Francisco Road to the south to Boulevard Entry Road. This reserve will sufficiently accommodate the existing and future traffic demands and ensure greater north-south connectivity within and across the subdivision area. Additionally, the reserve has been proposed at a width of 30m to ensure the retention of existing mature trees where possible to provide an immediate high level of amenity for residents and visitors.

Bushfire

It is acknowledged that the application area is presently identified by the DFES mapping as bushfire prone, for this reason a Bushfire Management Plan has been prepared by Bushfire Safety Consulting.

The BMP outlines that all lots on site can accommodate residential development with exposure levels of BAL-29 or lower. All lots and road reserves will be established and maintained by an Asset Protection Zone (APZ) along the outer boundaries of the subject site.

In addition to the above, the internal road network ensures two-way access to two different destinations.

A copy of the Bushfire Management Plan has been included for your reference.

Reticulated Sewerage

Further to pre-lodgement discussions with the City and DPLH, with reference to the Government Sewerage Policy 2019 (the Policy) and previous approvals over the site, it is considered that on-site effluent disposal (and not reticulated sewerage) is suitable for the following reasons:

- The approved LSP and previous subdivision approval did not provide any requirement for connection to any of form of sewer reticulation and acknowledged that reticulated sewerage service was not available to the proposed lots. This is reflected in condition 20 of WAPC 151026 which required the following notification on titles '*A reticulated sewerage service is not available to the lot/s'.*
- The Local Water Management Strategy (prepared by Civic Technology Pty Ltd in 2014) found that the subject site was suitable for onsite effluent disposal for lots to a minimum size of 2000m^2. A copy of the endorsed LWMS has been provided for your reference as part of this application.
- The findings of Land Capability Assessment in support of the initial rezoning of the site indicate the sites suitability for on-site disposal of waste-water.
- The proposed subdivision complies with the minimum site requirements outlined in the Government Sewerage Policy (2019). For residential subdivision in towns outside the Metropolitan and Peel Region Scheme with existing sewerage schemes, a minimum lot size of 1000m^2 is required to accommodate on-site sewerage. The minimum lot size proposed as part of this subdivision is 4000m^2 and is therefore satisfies this policy provision.
- The site is unlikely to have a detrimental impact on the water quality of Irwin River, as the site is not located within the related sewerage sensitive area. The site is located 3.0km from the Irwin River at the nearest point and 0.9km from the northern boundary of the

related sewerage sensitive area. As such, it is considered that each lot is capable of accommodating on-site sewage disposal without impacting the water quality of the Irwin River, endangering public health or impacting the surrounding environment.

- The proposed subdivision has been prepared in accordance with LPS5 which outlines that lots exceeding 4000m² in area do not require connection to deep sewer.

With the above in mind, it would indicate that prior approvals have been predicated on the basis of the provision of on-site effluent disposal. Such an approach would not jeopardise future land use, prejudice the physical or financial ability to provide sewerage in the wider locality and does not pose an unacceptable risk to public health, the environment or water resources.

Also attached is the Landform Report relevant to the site, prepared as part of the early LSP investigations, which provides further detail in this regard.

Early discussions with the Shire of Irwin on this matter were concluded via an email from the Shire Planner which indicated as follows –

With the current sewer network some distance south within the townsite, if the site is proven to be capable for on-site effluent with the proposed lot sizes, I think there would be scope to support without the provision of reticulated sewer.

The information as part of this application sufficiently demonstrates the capability for on-site effluent disposal for the proposed lots. The provision of on-site sewage disposal is considered suitable and compliant with the overarching policy requirements and for such reasons we are of the view that reticulated sewerage should not be required, consistent with the original subdivision approval.

SUMMARY

In summary, this application is consistent with *Lots 4, 5 and 10 Brand Highway, Bonniefield, Dongara – Local Structure Plan* and the previous WAPC subdivision approval 151026. Accordingly, we trust this application can be determined favourably. If you should have any queries, please contact Eleni Thorman or Harry Norman of this office on 08 9382 1233.

Yours faithfully

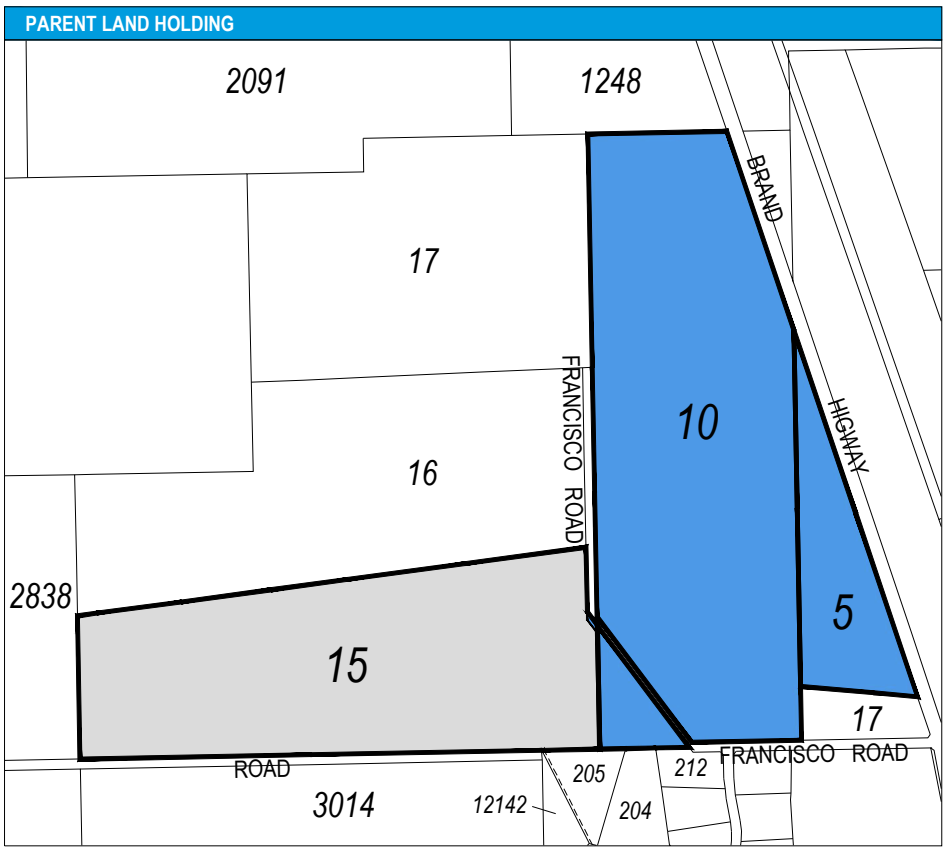


ELENI THORMAN
PRINIPAL PLANNER
CLE TOWN PLANNING + DESIGN

CC: Ben Clarke CBRE

This plan has been prepared for general information purposes only and uses potentially uncontrolled data from external sources. CLE does not guarantee the accuracy of this plan and it should not be used for any detailed site design. This plan remains the property of CLE.

PARENT LAND HOLDING



LOT SUMMARY

Size	No. Lots
4000m² - 4999m²	65
5000m² - 9999m²	24
1ha - 2ha	2
Total Lots	**91**
Minimum Lot Size	- 4000m²
Maximum Lot Size	- 12955m²
Average Lot Size	- 4813m²
Total Lot Area	- 43.7982ha

LEGEND

Lot 5 - 8.5761ha
Lot 10 - 48.2455ha
Lot 15 - 36.8958ha

Subject Area - 56.8556ha

Balance of Lot 15 - 36.8618ha

YIELD

Residential	-	91 lots
Balance	-	1 lot
Total	-	92 lots

All road carriageway detail where depicted on this subdivision plan including road pavements, road treatments, medians or parking, are for illustrative purposes only and are subject to final engineering design and separate approval processes. The detail reflects the preferred urban design intent for the road network standards.

All dimensions and areas depicted on this plan are subject to pre-cal and final survey and will vary from the figures shown. This plan remains the property of CLE.

Road Reserve (340m²)

DEPARTMENT OF PLANNING, LANDS AND HERITAGE

DATE	FILE
17-May-2021	160823

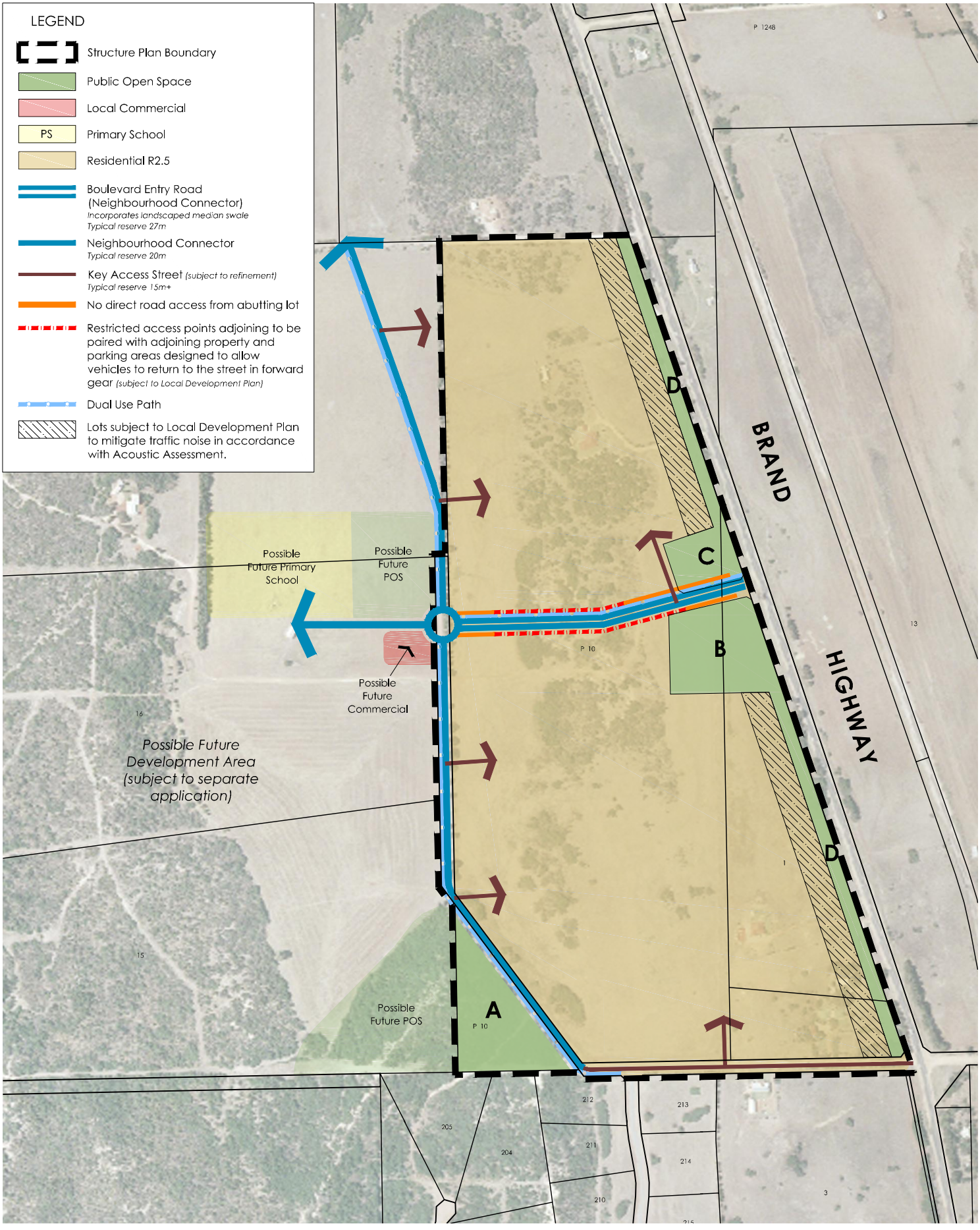
0 50 100 150 200 250 300m

CLE Town Planning + Design

PROPOSED FREEHOLD SUBDIVISION

Lot 5, 10 & 15 Brand Highway, Bonniefield

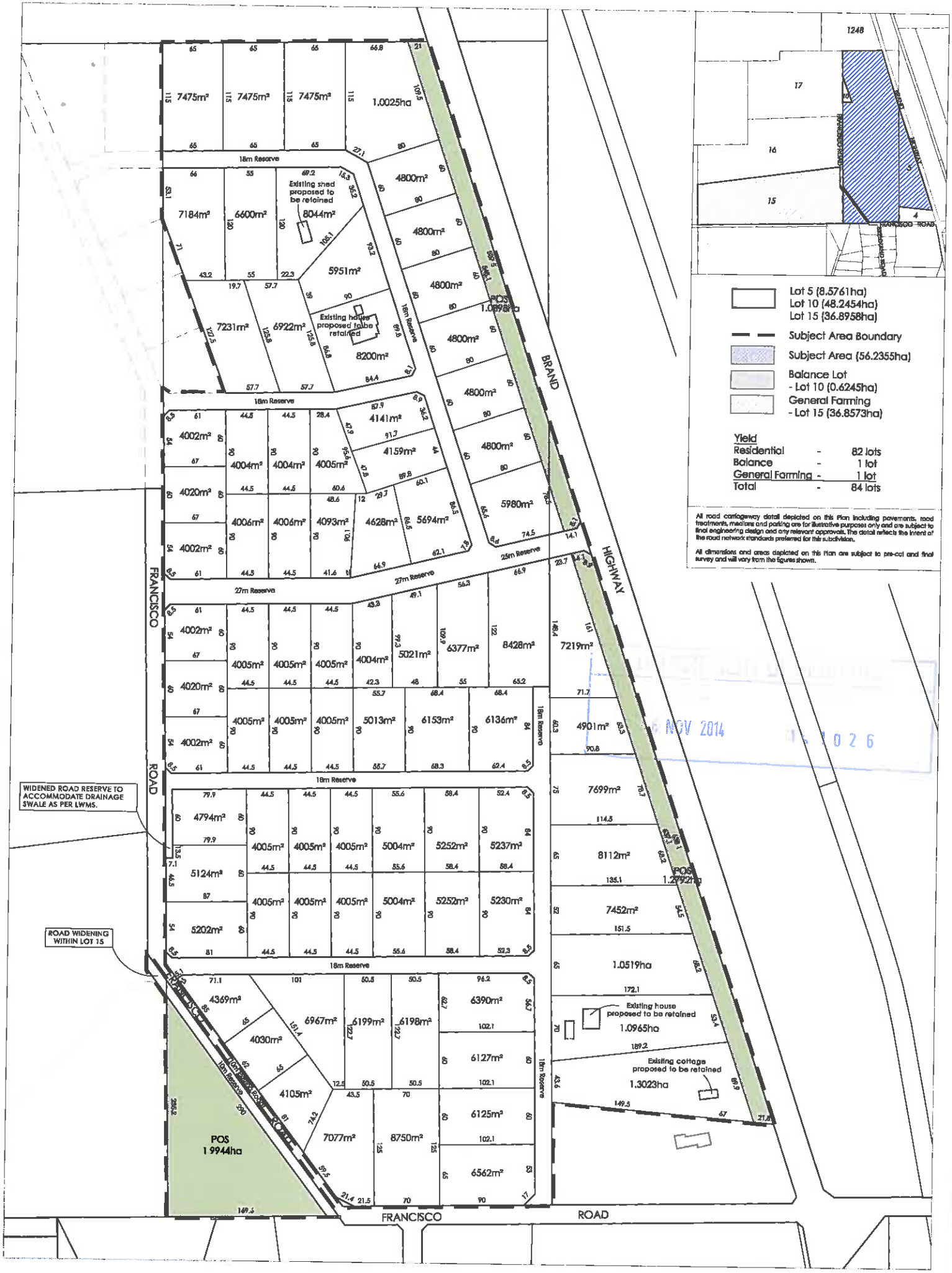
plan no: **2172-151B-01**
date: 14 May 2021
scale: 1:4,000 @A3, 1:2,000 @A1



LOCAL STRUCTURE PLAN

Francisco Road, Dongara

Previous Subdivision Plan



PROPOSED SUBDIVISION
Lots 5 & 10 Brand Hwy, Dongara
Shire of Irwin

plan no: 2172-112A-01
scale: 1:5000 @ A4
date: 21.10.2014

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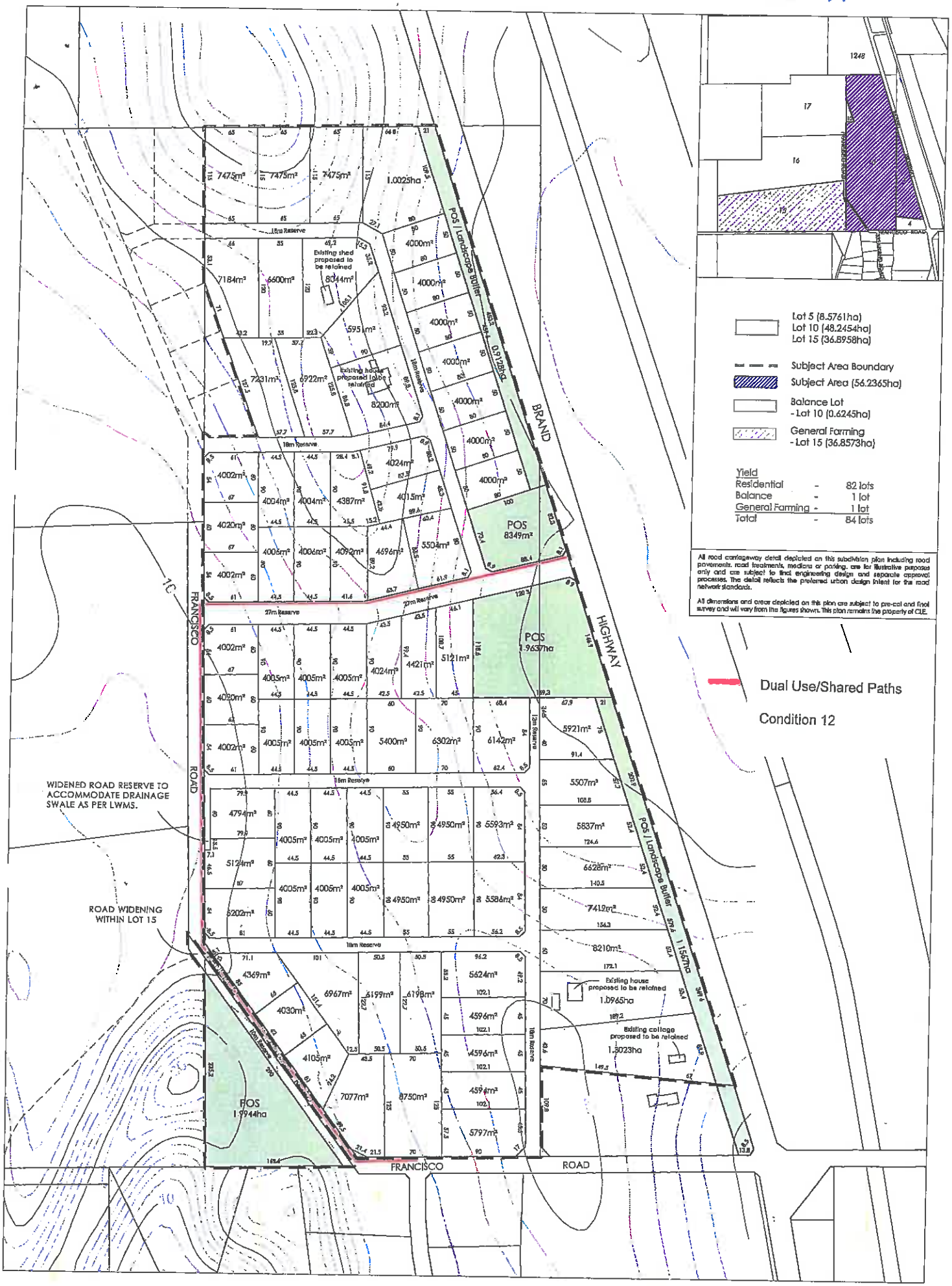
ATTACHMENT A



CLE TOWN PLANNING + DESIGN

AMENDED PLAN OF SUBDIVISION
Lots 5 & 10 Brand Hwy, Dongara
Shire of Irwin

plan no: 2172-112B-01
scale: 1:4000 @ A3
date: 15.01.2015

This plan is current at the revised date & subject to approval, survey & engineering detail. This plan remains the property of CLE ©

Francisco Road - Access Review

1. EXECUTIVE SUMMARY

1.1. This technical note has been prepared to consider the removal of access to Brand Highway via Francisco Road for Lots 5 and 10 Brand Highway, Dongara, as well as a number of lots within the immediate surrounds. This technical note is an update to the structure plan traffic report prepared by Riley Consulting dated 13 January 2014.

1.2. The removal of access via Francisco Road is considered supportable as it can have a positive impact to local road safety. Alternative access via an approved new access to the north is capable of accommodating all forecast traffic movements and will ultimately be constructed with full deceleration turning lanes.

1.3. Sidra analysis for a forecast year of 2030 assuming 3% growth per annum to Brand Highway demonstrates that excellent Levels of Service will be provided for all traffic movements at the new intersection.

2. THE SITE AND SURROUNDING ROAD NETWORK

2.1. The subject land comprises of Lot 5 and Lot 10 Brand Highway and is located west of the highway approximately 1.5km north of Dongara town. The location of the subject site is shown in Figure 1.

2.2. A structure plan traffic report was prepared for the subject land in 2014 and considered the development of 85 residential dwellings.

2.3. At that time Brand Highway had a daily traffic demand of 3,140 vehicles per day (vpd) south of Matheson Road (about 10km north of the subject site).

2.4. Traffic data on the Main Roads website recorded in 2020/21 shows 3,180vpd south of Francisco Road. It can be seen that underlying traffic demands have changed marginally since the structure plan traffic report was prepared.

2.5. The peak period of traffic demand is shown to occur between 11am and 12pm when 292 movements were recorded split 144 northbound and 154 southbound (2020/21 data). During the traditional morning peak (8am-9am) the demand is 105 northbound and 112 southbound. During the higher evening peak (4pm-5pm) the demand is 118 northbound and 90 southbound. The data is attached at Appendix A.

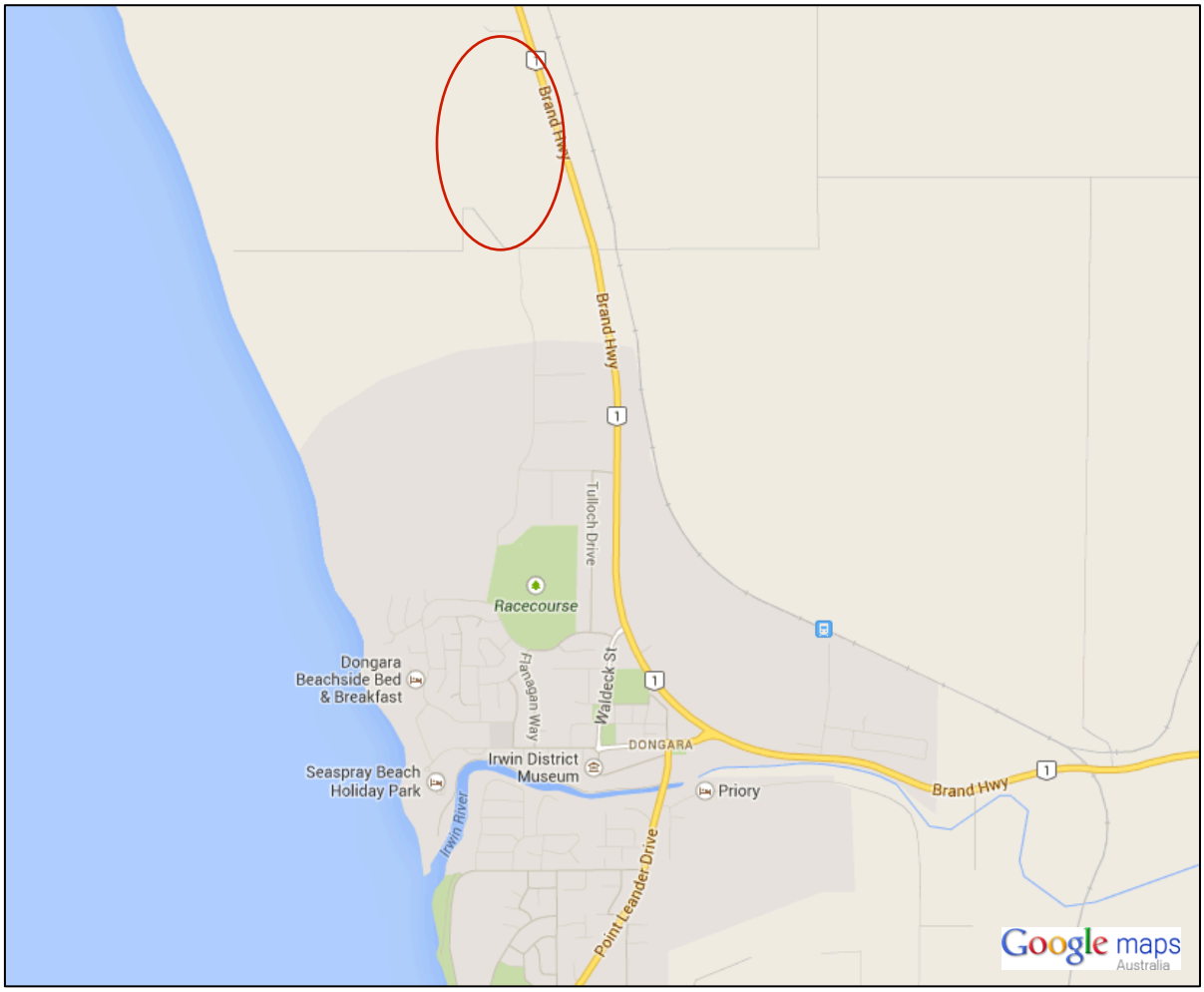


Figure 1 Site Location

3. CHANGES TO THE PROPOSED DEVELOPMENT

3.1. The only change to the development proposal is the removal of access using Francisco Road.

3.2. Francisco Road is an existing road reservation that intersects Brand Highway opposite Bonniefield Road. Whilst both roads experience very low traffic demands, the removal of intersection collision points is considered as a beneficial outcome for road safety. Given the higher traffic speeds on this section of the Brand Highway, the proposal is considered a preferable outcome.

3.3. A concept road layout for the proposed development is shown in Figure 2.

3.4. As a result of the removal of access via Francisco Road, traffic will re-distribute over the internal road network to access Brand Highway and Dongara. Reference to the forecast traffic demands in the structure plan traffic report indicates that Francisco Road had a demand of 304vpd. Whilst the removal of this link may result in some additional traffic using Brennand Road, it is

expected that the majority of re-distribution will occur to the northern access. For the purpose of this investigation all traffic is assigned to Road A, the new access link to Brand Highway.

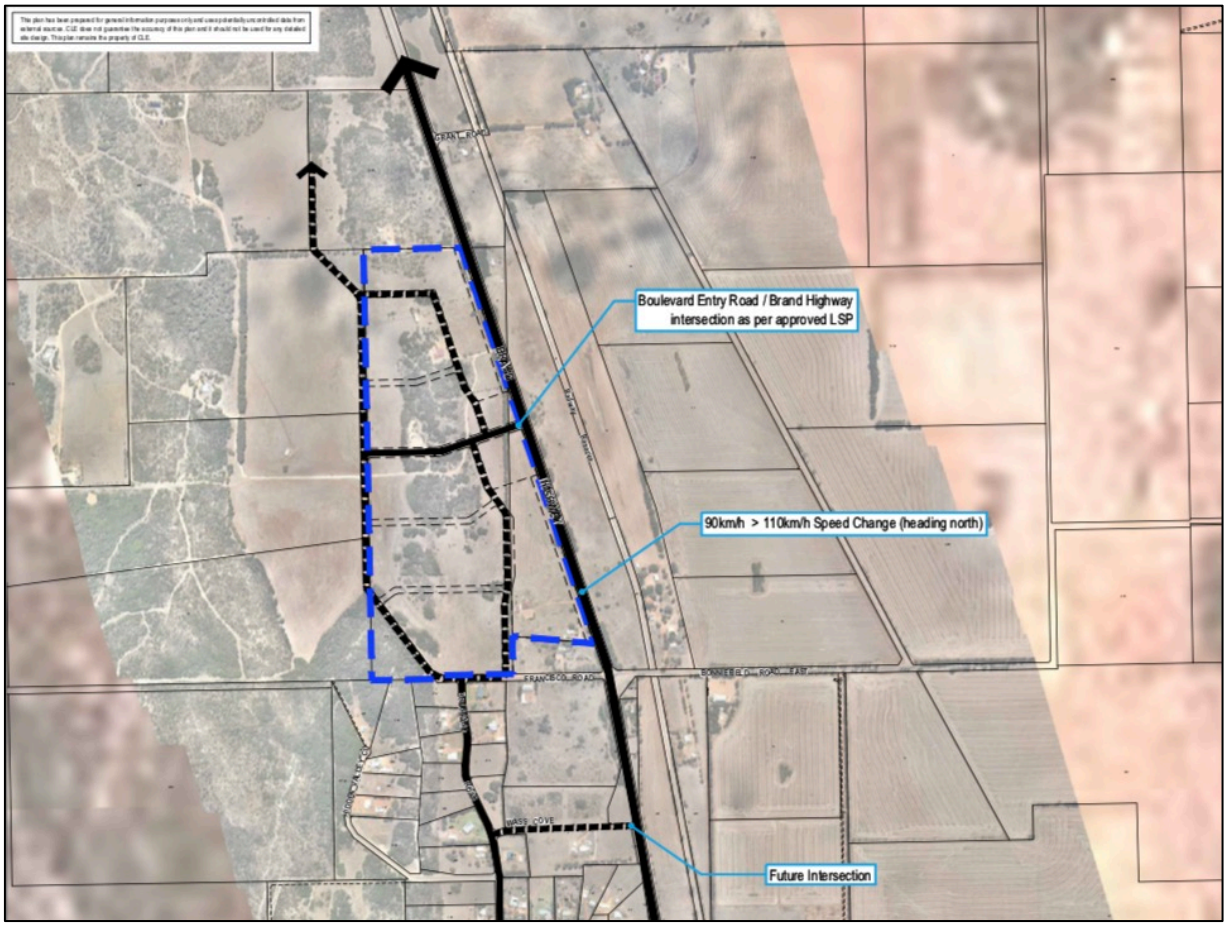


Figure 2 Indicative Road Layout Plan (Source: CLE Town Planning + Design)

4. TRAFFIC IMPACTS

4.1. Sidra analysis of the Brand Highway access intersection has been updated to reflect all development traffic using this access. The future year (2030) turning demands are shown in Appendix B. Growth at 3% per annum is applied to Brand Highway for the purpose of this study. It is also assumed that the access is constructed with turning lanes as identified in the structure plan traffic report.

4.2. The Sidra assessment attached at Appendix C indicates that excellent Levels of Service can be expected for all movements in the forecast year of 2030.

4.3. Appendix D provides further assessment based on the potential of land west of Lots 5 and 10 Brand Highway being developed in the 10 year planning horizon (1,500 lots as indicated in the structure plan traffic report). Sidra analysis of this

ultimate scenario is attached at Appendix D for information only (land to the west is not part of the approved structure plan.

4.4. It can be seen that additional development to the west will need to address access to the Brand Highway if developed to 1,500 lots.

5. CONCLUSIONS

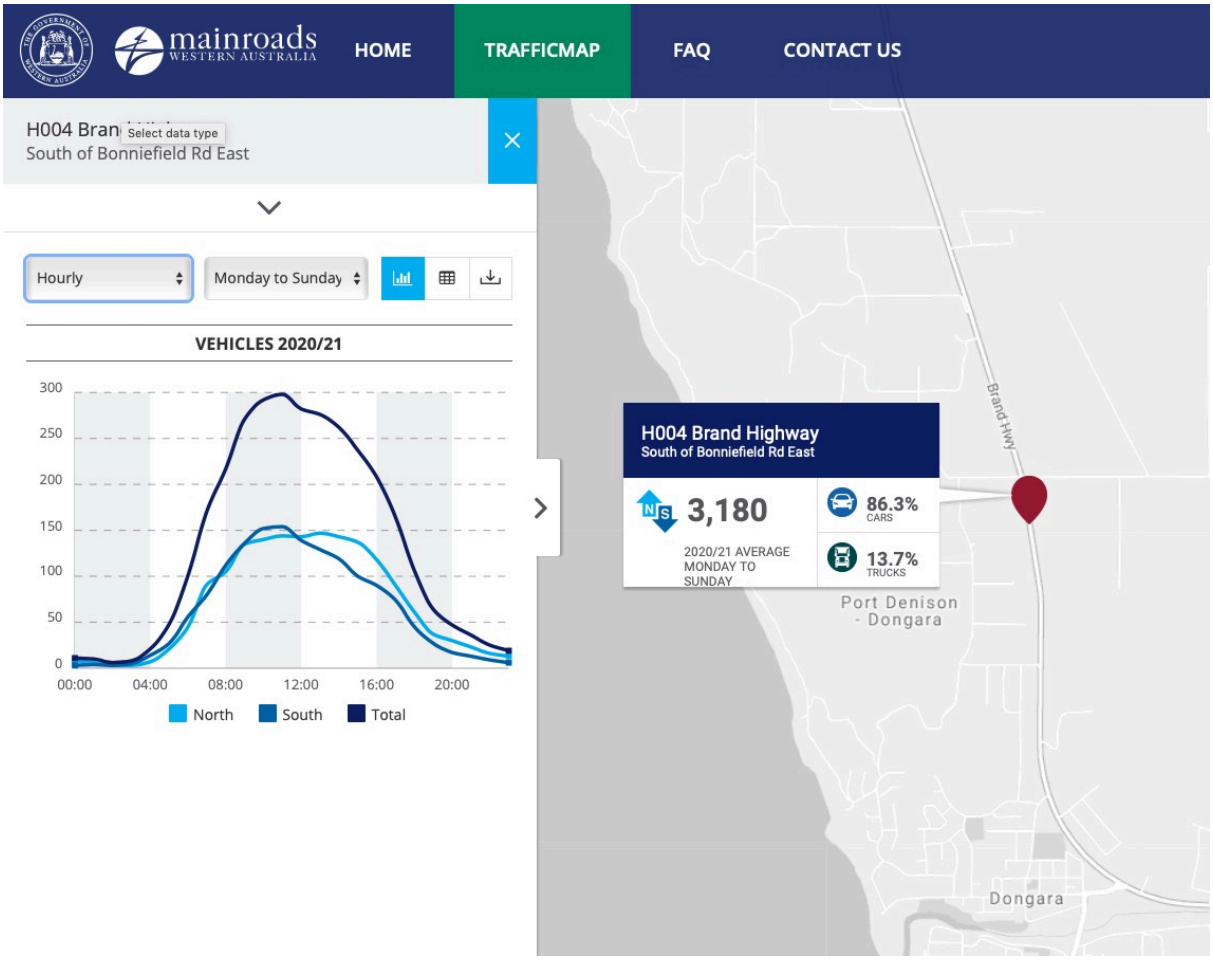
5.1. The assessment undertaken in this technical note identifies that removal of access to Lots 5 and 10 Brand Highway via Francisco Road will have no detrimental traffic impact to the operation of the proposed northern access to Brand Highway. Excellent Levels of Service are indicated based on traffic growth of 3% per annum on Brand Highway. Historically growth has been much lower and the assessment provides a robust review of future traffic operation.

5.2. Given the higher traffic speeds on Brand Highway at Francisco Road, the removal of collision points at the existing four-way intersection is a desirable outcome from a road safety perspective.

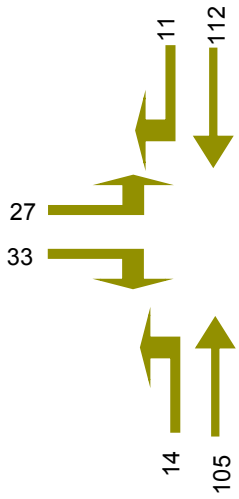
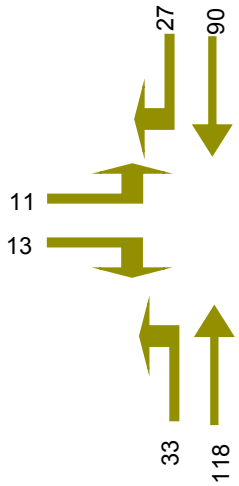
5.3. It is concluded therefore that the removal of access via Francisco Road is a preferable outcome for the local road network.

5.4. It is noted that as an existing road reservation, emergency access maybe retained via Francisco Road.

APPENDIX A Main Roads Data

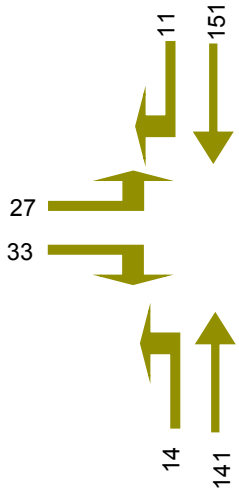
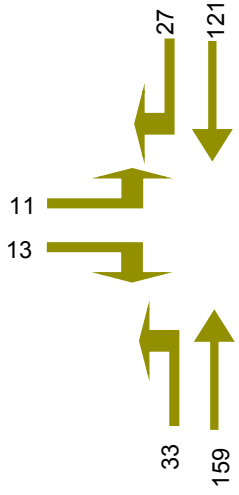


APPENDIX B Access Peak Hour Demand and Highway Volumes 2020

	
AM Peak (8am – 9am)	**PM Peak (4pm-5pm)**

Note: Development flows based on 10% generation during peak periods.

Access Peak Hour Demand Volumes 2030 @ 3%pa

	
AM Peak (8am – 9am)	**PM Peak (4pm-5pm)**

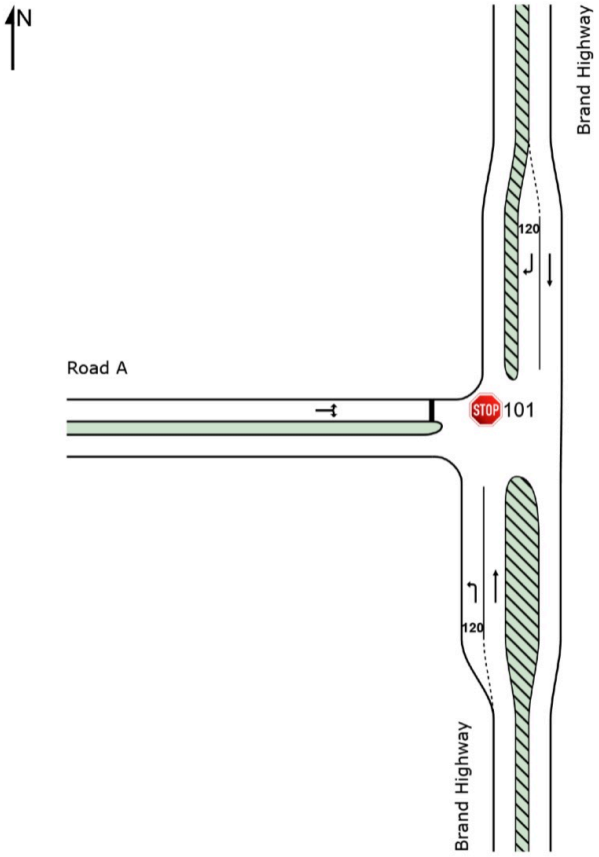
APPENDIX C SIDRA ASSESSMENT

SITE LAYOUT

Site: 101 [Lot5-10 Brand Highway (Site Folder: General)]

Road A / Brand Highway
AM Peak with Full Development
Site Category: Base Year
Stop (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: 101 [Lot5-10 AM 2030 (Site Folder: General)]

Road A / Brand Highway
AM Peak with Lot 5 - 10 Development
Future Year 2030
Site Category: Base Year
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Brand Highway														
1	L2	14	0.0	15	0.0	0.008	8.2	LOS A	0.0	0.0	0.00	0.67	0.00	79.7
2	T1	176	14.0	185	14.0	0.104	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach		190	13.0	200	13.0	0.104	0.6	NA	0.0	0.0	0.00	0.05	0.00	107.0
North: Brand Highway														
8	T1	156	14.0	164	14.0	0.092	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
9	R2	11	0.0	12	0.0	0.010	8.5	LOS A	0.0	0.3	0.30	0.62	0.30	62.9
Approach		167	13.1	176	13.1	0.092	0.6	NA	0.0	0.3	0.02	0.04	0.02	104.8
West: Road A														
10	L2	27	0.0	28	0.0	0.089	9.0	LOS A	0.3	2.3	0.41	0.90	0.41	59.6
12	R2	33	0.0	35	0.0	0.089	11.5	LOS B	0.3	2.3	0.41	0.90	0.41	59.5
Approach		60	0.0	63	0.0	0.089	10.4	LOS B	0.3	2.3	0.41	0.90	0.41	59.5
All Vehicles		417	11.1	439	11.1	0.104	2.0	NA	0.3	2.3	0.07	0.17	0.07	95.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Lot5-10 PM 2030 (Site Folder: General)]

Road A / Brand Highway
PM Peak with Lot 5 - 10 Development
Future Year 2030
Site Category: Base Year
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Brand Highway														
1	L2	33	0.0	35	0.0	0.019	8.2	LOS A	0.0	0.0	0.00	0.67	0.00	79.7
2	T1	159	14.0	167	14.0	0.094	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach		192	11.6	202	11.6	0.094	1.4	NA	0.0	0.0	0.00	0.11	0.00	103.2
North: Brand Highway														
8	T1	121	14.0	127	14.0	0.071	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
9	R2	27	0.0	28	0.0	0.024	8.5	LOS A	0.1	0.7	0.31	0.63	0.31	62.8
Approach		148	11.4	156	11.4	0.071	1.6	NA	0.1	0.7	0.06	0.12	0.06	96.7
West: Road A														
10	L2	11	0.0	12	0.0	0.036	8.9	LOS A	0.1	0.9	0.37	0.87	0.37	59.9
12	R2	14	0.0	15	0.0	0.036	10.9	LOS B	0.1	0.9	0.37	0.87	0.37	59.8
Approach		25	0.0	26	0.0	0.036	10.0	LOS B	0.1	0.9	0.37	0.87	0.37	59.8
All Vehicles		365	10.7	384	10.7	0.094	2.1	NA	0.1	0.9	0.05	0.17	0.05	95.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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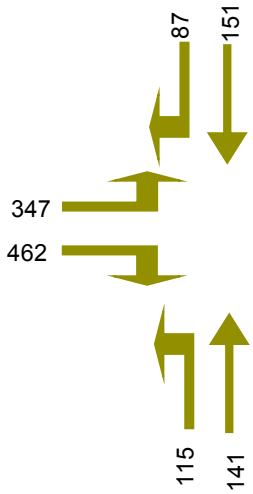
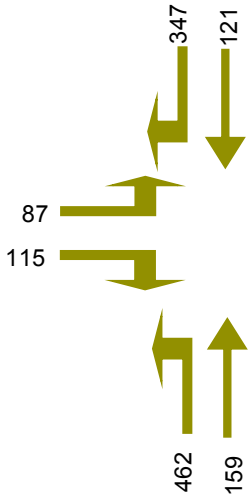
APPENDIX D LONG TERM ASSESSMENT – INFORMATION ONLY

Potential Ultimate Demands with External Development to West 2030

	
AM Peak (8am – 9am)	**PM Peak (4pm-5pm)**

MOVEMENT SUMMARY

Site: 101 [Ultimate AM 2030 (Site Folder: General)]

Road A / Brand Highway
AM Peak with All Development
Future Year 2030
Site Category: Base Year
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Brand Highway														
1	L2	115	0.0	121	0.0	0.065	8.2	LOS A	0.0	0.0	0.00	0.67	0.00	79.7
2	T1	141	14.0	148	14.0	0.083	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach		256	7.7	269	7.7	0.083	3.7	NA	0.0	0.0	0.00	0.30	0.00	93.9
North: Brand Highway														
8	T1	151	14.0	159	14.0	0.090	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
9	R2	87	0.0	92	0.0	0.084	8.9	LOS A	0.3	2.3	0.37	0.67	0.37	62.6
Approach		238	8.9	251	8.9	0.090	3.2	NA	0.3	2.3	0.14	0.25	0.14	86.1
West: Road A														
10	L2	347	0.0	365	0.0	1.310	296.5	LOS F	149.3	1045.2	1.00	4.83	11.90	10.3
12	R2	462	0.0	486	0.0	1.310	306.7	LOS F	149.3	1045.2	1.00	4.83	11.90	10.3
Approach		809	0.0	852	0.0	1.310	302.3	LOS F	149.3	1045.2	1.00	4.83	11.90	10.3
All Vehicles		1303	3.1	1372	3.1	1.310	189.0	NA	149.3	1045.2	0.65	3.10	7.42	15.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Note- for other structure plans to address

MOVEMENT SUMMARY

Site: 101 [Ultimate PM 2030 (Site Folder: General)]

Road A / Brand Highway
PM Peak with All Development
Future Year 2030
Site Category: Base Year
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Brand Highway														
1	L2	462	0.0	486	0.0	0.262	8.2	LOS A	0.0	0.0	0.00	0.67	0.00	79.7
2	T1	159	14.0	167	14.0	0.094	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach		621	3.6	654	3.6	0.262	6.1	NA	0.0	0.0	0.00	0.50	0.00	85.7
North: Brand Highway														
8	T1	121	14.0	127	14.0	0.072	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
9	R2	347	0.0	365	0.0	0.534	14.7	LOS B	3.5	24.3	0.70	0.99	1.13	57.0
Approach		468	3.6	493	3.6	0.534	10.9	NA	3.5	24.3	0.52	0.74	0.84	65.1
West: Road A														
10	L2	87	0.0	92	0.0	0.602	15.6	LOS C	3.9	27.0	0.61	1.11	1.17	48.2
12	R2	115	0.0	121	0.0	0.602	32.6	LOS D	3.9	27.0	0.61	1.11	1.17	48.1
Approach		202	0.0	213	0.0	0.602	25.2	LOS D	3.9	27.0	0.61	1.11	1.17	48.2
All Vehicles		1291	3.0	1359	3.0	0.602	10.8	NA	3.9	27.0	0.28	0.68	0.49	69.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Organisation: RILEY CONSULTING | Licence: NETWORK / 1PC | Processed: Tuesday, 20 April 2021 9:53:29 AM
Project: C:\SIDRA\PROJECTS\Dongara.sip9

Bushfire Management Plan

Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address: lots 5 and 10 and portion of Lot 15 Brand Highway, Dongara

Site visit: Yes ☑ No ☐

Date of site visit (if applicable): Day 27th Month March Year 2021

Report author or reviewer: Rohan Carboon (BPAD 23160)

WA BPAD accreditation level (please circle):

Not accredited ☐ Level 1 BAL assessor ☐ Level 2 practitioner ☐ Level 3 practitioner ☑

If accredited please provide the following.

BPAD accreditation number: 23160 Accreditation expiry: Month January Year 2022

Bushfire management plan version number: 2.0

Bushfire management plan date: Day 6 Month May Year 2021

Client/business name: CLE Town Planning and Design

	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?		✔
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the bushfire protection criteria elements)?		✔

Is the proposal any of the following (see SPP 3.7 for definitions)?	Yes	No
Unavoidable development (in BAL-40 or BAL-FZ)		✔
Strategic planning proposal (including rezoning applications)		✔
High risk land-use		✔
Vulnerable land-use		✔

None of the above ☑

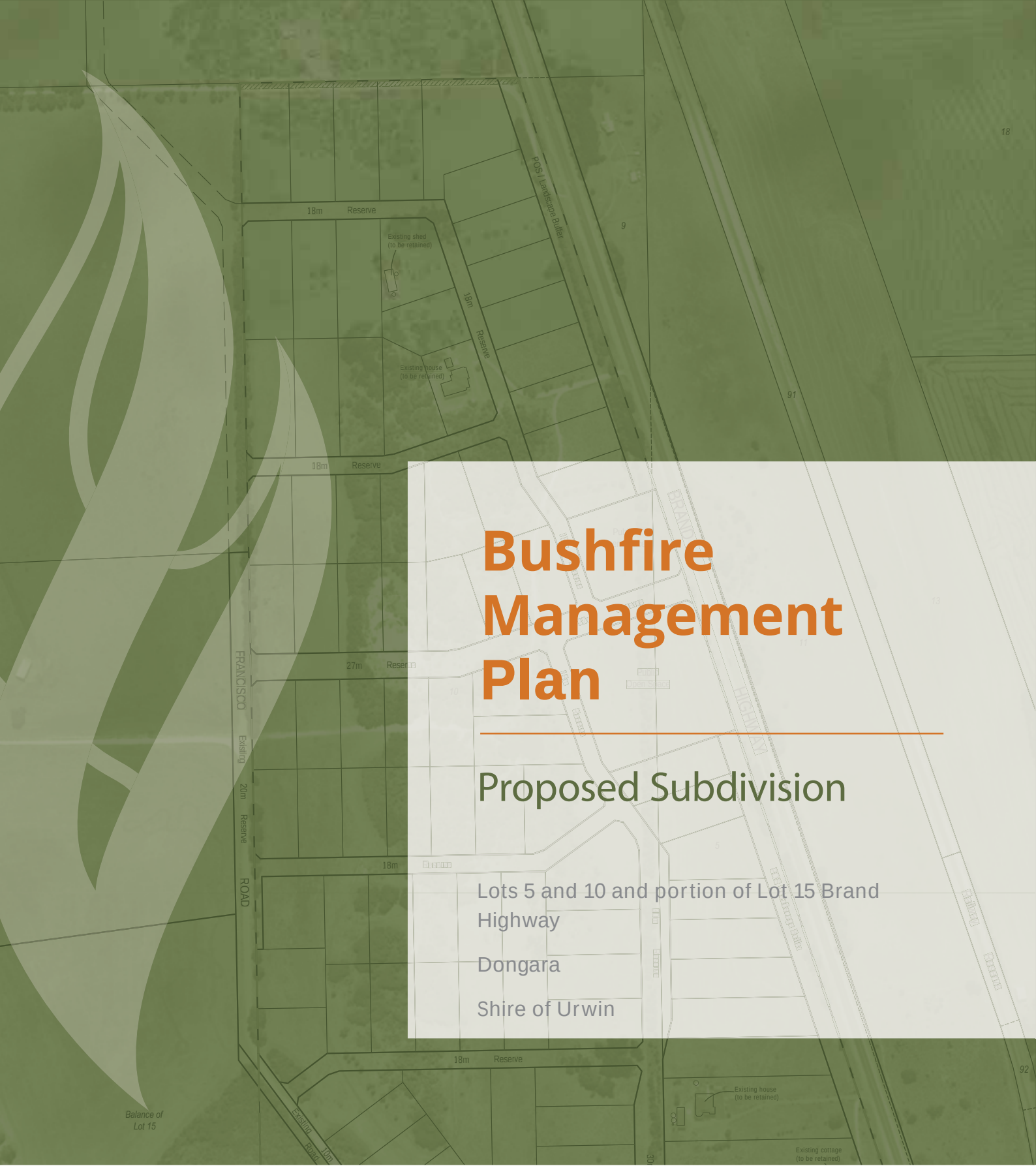
Note: Only if one (or more) of the above answers in the tables is yes should the decision maker (e.g. local government or the WAPC) refer the proposal to DFES for comment.

Why has it been given one of the above listed classifications (E.g. Considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

The information provided within this bushfire management plan to the best of my knowledge is true and correct:

Signature of report author or reviewer 

Date 6/05/2021



Bushfire Management Plan

Proposed Subdivision

Lots 5 and 10 and portion of Lot 15 Brand Highway

Dongara

Shire of Urwin

bushfire safety CONSULTING

Science. Culture. Solutions.

Prepared For:

CLE Town Planning and Design

6 May 2021

Version 2.0

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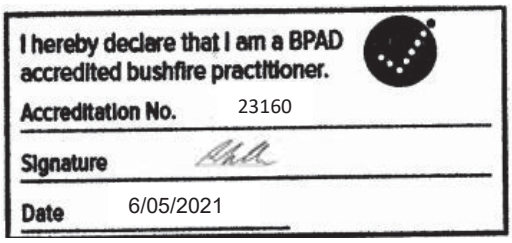
Document Information

Prepared for:	CLE Town Planning and Design
Project Name:	Residential Subdivision
Address:	Lot 5, Lot 10 and portion of Lot 15 Brand Highway, Dongara
Prepared by:	Rohan Carboon & Dr Karen Brown
	Bushfire Safety Consulting Pty Ltd





Document Control

Bushfire Management Plan – Lot 5, Lot 10 and portion of Lot 15 Brand Highway, Dongara			
REPORT VERSION	**PURPOSE**	**AUTHOR/REVIEWER AND ACCREDITATION DETAILS**	**DATE SUBMITTED**
V1	Draft for Review	Rohan Carboon (Level 3 BPAD 32160) Dr Karen Brown (Level 1 BPAD 48364)	30/04/2021
V2	Final for Submission	Rohan Carboon (Level 3 BPAD 32160)	06/05/2021

Front cover photo: PROPOSED SUBDIVISION

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EXECUTIVE SUMMARY

This Bushfire Management Plan (BMP) has been prepared to support a proposed subdivision at Lot 5, Lot 10 and a portion of Lot 15 Brand Highway, Dongara (herein referred to as 'the site'). The site is approximately 57 hectares in size and is currently surrounded predominately by agricultural land to the east and immediate west, with areas of native vegetation to the north and south-west. There are three existing dwellings with associated structures present on the site and these will be retained within the proposed subdivision. A total of 91 residential lots are proposed, ranging in size from 4000 to 20,000m^2. In addition, there are five Public Open Space areas proposed ranging in size from 8837m^2 to 1.993 hectares.

The vegetation and fuel load management strategy proposed over the site includes each lot establishing an internal Asset Protection Zone to their lot boundaries in all directions. This has an accumulative effect of providing an overlapping APZ across the entire estate and collectively results in a safer subdivision for future residents and fire fighters to defend. Areas of Public Open Space will have trees retained and established however, the understorey vegetation will be retained as open so grass slashing and mowing machinery can safely operate and keep low fuels within the open space areas. This results in the establishment of Low Threat Vegetation that is classed as Exclusion Clause 2.2.3.2 (f) in AS3959:2018.

A Method 1 BAL assessment has been undertaken to determine predicted radiant heat flux levels on the site. All lots can accommodate a dwelling with exposure levels of BAL-29 and lower, some lots on the perimeter require a small internal lot setback. A total of 36 lots are exposed to BAL-LOW.

The area will be reticulated with hydrants provided within regulated access and there is good vehicular access proposed which links to the existing public road network.

The proposed subdivision can achieve all of the Acceptable Solutions and Performance Principles in the Guidelines for Planning in Bushfire Prone Areas V1.3 (2107) once conditions are met.

The developer is responsible for ensuring requirements for the provision of water and vehicular access are met and maintaining the Asset Protection Zone until lots are sold. Fuel loads and responsibility for APZ standards then transfers to the new owners / occupiers of the land.

It is expected that the implementation of this BMP will reduce the threat to residents, the public and fire fighters in the area addressed by this BMP. The proposal complies with the *State Planning Policy No. 3.7: Planning in Bushfire Prone Areas (SPP 3.7)* and the *Guidelines for Planning in Bushfire Prone Areas* (WAPC 2017 V1.3).

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1 PROPOSAL DETAILS

This Bushfire Management Plan (BMP) has been prepared to support a proposed subdivision application for Lot 5, Lot 10 and a portion of Lot 15 Brand Highway, Dongara (herein referred to as 'the site'). The 56.8958 hectare site is proposed to be subdivided into 91 lots with 65 lots ranging in size from 4000 – 4999m^2, 24 lots between 5000m^2 and 9999m^2, and two lots between 10,000 – 20,000m^2. The proposal includes the creation of six public roads and the widening of an existing public road. Five areas of Public Open Space (POS) are also proposed, with a 1.993 hectare area containing retained native vegetation in a reserve to the south-west, two strips of maintained low threat parkland in POS areas along the Brand highway, and two maintained low threat parkland POS areas to the east which are 8467m^2 and 1.9542 hectares in size respectively (**Figure 1**). All lots will have direct driveway access onto proposed or existing public roads.

The site is located 2.9 kilometres north of the Dongara township and approximately 60 kilometres south-east of the Geraldton City Centre (**Figure 2**).

The site is zoned 'Develoopment' under the Shire of Irwin Local Planning Scheme Number 5 (LPS5). It is adjacent to land similarly zoned to the west, with 'Rural residential' lots to the south, land zoned 'Rural Small Holdings' to the east and 'General Farming' zoned land to the north. There are areas of land zoned 'Conservation' and 'Local Reserve' containing native vegetation to the south-west.

The area will be serviced by a reticulated water supply, and scheme water provided. There are at least two entry/egress routes using existing public roads and fire hydrants will be within regulated access.

This BMP addresses future subdivision conditions by providing responses to the performance criteria in the *Guidelines for Planning in Bushfire Prone Areas* V1.3 (WAPC *et.al.* 2017).

If there is a bushfire within or near the site, implementing this BMP will reduce the threat to residents, property and emergency response personnel.



Location details:	Lots 5 & 10 Brand Highway, Dongara
Assessment date:	March, 2021
Prepared by:	Bushfire Safety Consulting
Accreditation level:	Level 3 BPAD Practitioner
Accreditation number:	BPAD 23160
Accreditation expiry date:	31st January, 2022
Date aerial photo:	April 2014

FIGURE 1
PROPOSED SUBDIVISION

0 50 100 150 200m

SCALE 1:4000 @ A3
DATE: APRIL 2021

NORTH

LEGEND:
SUBJECT LAND

SOURCE OF PHOTOGRAPHY: NEARMAP

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Location details:	Lots 5 & 10 Brand Highway, Dongara
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Date aerial photo:	April 2014

FIGURE 2
SITE LOCATION PLAN

0 200 400 600m

SCALE 1:20 000 @ A4
DATE: MARCH 2021

NORTH

LEGEND

SUBJECT LAND

Base mapping supplied by Nearmap & Google Maps

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1.1 Policy and Guidelines

1.1.1 Application of SPP 3.7

The *State Planning Policy No. 3.7: Planning in Bushfire Prone Areas (SPP 3.7)* provides the foundation for land use planning to address bushfire risk management in Western Australia. It is used to inform and guide decision makers, referral agencies and land owners/ proponents to help achieve acceptable bushfire protection outcomes.

The policy contains objectives and policy measures as well as reference to the bushfire protection criteria as outlined in the Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 V1.3; the 'Guidelines'). The policy applies to this subdivision application proposal because the site is located in a designated bushfire prone area on the WA Map of Bushfire Prone Areas (Figure 3).

The following policy measures will need to comply with SPP 3.7:

- *Table 1. Policy measures*

Policy Measure 6.2	The site is located within a designated bushfire prone area (Figure 3) and will have a Bushfire Hazard Level above low and a Bushfire Attack Level rating above BAL-LOW.
Policy Measure 6.4	Policy 6.4 applies meaning the Subdivision application will be accompanied by: - BAL Contour Plan; - BAL ratings; - Identification of relevant issues; and - Demonstration of compliance with the guidelines.

The subdivision proposal does not propose vulnerable or high-risk land use and is not considered as minor or unavoidable development under *SPP 3.7.* If a future Development Application proposed high risk or a vulnerable development compliance with SPP 3.7 will be assessed.

1.1.2 Guidelines for Planning in Bushfire Prone Areas V1.3 (2017)

The Department of Planning has released the *Guidelines for Planning in Bushfire Prone Areas V1.3 (2017).* The requirements of this document are accommodated within this BMP. The *Guidelines for Planning in Bushfire Prone Areas V 1.3 (2017)* is intended to inform and guide decision makers, referral authorities and proponents to achieve acceptable bushfire protection outcomes, including expectations at the different stages of planning.



Location details:	Lots 5 & 10 Brand Highway, Dongara
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Accreditation expiry date:	31st January, 2022
Date aerial photo:	April 2014

FIGURE 3
BUSHFIRE PRONE AREAS

0 50 100 150 200 250m

SCALE 1:5000 @ A3

DATE: MARCH 2021

NORTH

LEGEND:

- SUBJECT LAND
- ASSESSMENT AREA (150m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE
- ASSESSMENT AREA (100m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE
- BUSHFIRE PRONE AREAS

SOURCE OF PHOTOGRAPHY: NEARMAP

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2 ENVIRONMENTAL CONSIDERATIONS

2.1 Native Vegetation – Modification and Clearing

Central areas of the site contain remnant and regrowth scrub and woodland vegetation and significant modification of the fuel loads and fuel structure to establish the Asset Protection Zone (APZ) across the entire site. There appears to be no environmental, biodiversity or conservation values on the subject site that restrict the intensification of land use proposed.

2.2 Re-vegetation/Landscape Plans

There are no re-vegetation plans for or adjacent to the site. Internal Public Open Spaces (POS) to the east will be maintained to a managed parklands standard which complies with Exclusion Clause 2.2.3.2 (f) of the Australian Standards AS3959:2018. The POS will contain existing and planted shade trees with canopy separation and under pruning to 2 metres from ground level. Grass will be slashed annually prior to summer in perpetuity.

3 BUSHFIRE ASSESSMENT RESULTS

Bushfires are common in the Shire of Irwin and local brigades respond to numerous bushfires in the district annually. Given the bushfire threat in the area this BMP plays a critical role in ensuring that the development of the land appropriately mitigates the risk from bushfire.

3.1 Assessment Inputs

The methodology used to assess the site is outlined in the *Guidelines for Planning in Bushfire Prone Areas V1.3 (2017).* The lot layout is known, and a strategic level bushfire hazard assessment is not required. A BAL Contour map is provided in accordance with Appendix 3 of the guidelines.

Assessing bushfire threat at the site-specific level accounts for the predominant class of vegetation on the site and surrounding area for a minimum of 150m, as shown in the Vegetation Classification Map at Figure 4.

3.1.1 Vegetation Classification

The post development classified vegetation with the highest fuels loads is found in the POS adjacent to the south west corner of the site. There is a public road separation between the vegetation and future lots. The other area with elevated fuel structure occurs in the Class D Scrub vegetation north of the site, this area is a private lot and expected to be a long term hazard.

Rural paddocks occur to the east and west of the site so the bushfire fuels are dominated by grass fuels with strips or clumps of scrub or woodland vegetation. Grass fires are fast moving so threats of a fast moving grass fire are real and considered in this assessment.

The vegetation plots on and surrounding the site within 150 metres of the site boundary once adjacent land is cleared for development is found in Figure 4 with plot descriptions below.

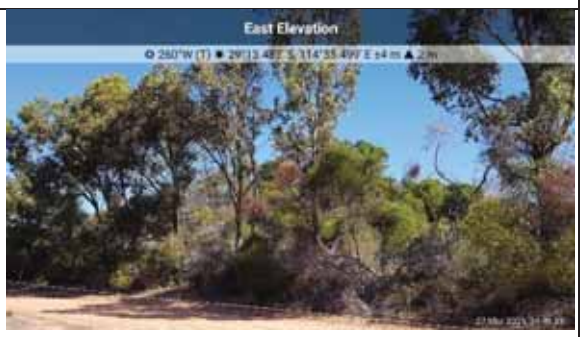
Photo ID: 1 **Plot Number:** 1 **Vegetation classification or exclusion clause:** Class A Forest **Description/justification of classification:** Overstorey of eucalypts with extensive intermediate and elevated fuels and accumulated leaf litter.	
Photo ID: 2 **Plot Number:** 1 **Vegetation classification or exclusion clause:** Class A Forest **Description/justification of classification:** Overstorey of eucalypts with extensive intermediate and elevated fuels and accumulated leaf litter.	
Photo ID: 3 **Plot Number:** 2 **Vegetation classification or exclusion clause:** Class A Forest **Description/justification of classification:** Overstorey of eucalypts with some intermediate and elevated fuels and accumulated leaf litter and grassy understorey.	
Photo ID: 4 **Plot Number:** 3 **Vegetation classification or exclusion clause:** Class D Scrub **Description/justification of classification:** Acacia scrub vegetation 4-5m high forming a uniform thicket of vegetation.	

Photo ID: 5 **Plot Number:** 3 **Vegetation classification or exclusion clause:** Class D Scrub **Description/justification of classification:** Acacia scrub vegetation 4-5m high forming a uniform thicket of vegetation.	
Photo ID: 6 **Plot Number:** 3 **Vegetation classification or exclusion clause:** Class D Scrub **Description/justification of classification:** Acacia scrub vegetation 4-5m high forming a uniform thicket of vegetation.	
Photo ID: 7 **Plot Number:** 3 **Vegetation classification or exclusion clause:** Class D Scrub **Description/justification of classification:** Acacia scrub vegetation 4-5m high forming a uniform thicket of vegetation.	
Photo ID: 8 **Plot Number:** 3 **Vegetation classification or exclusion clause:** Class D Scrub **Description/justification of classification:** Acacia scrub vegetation 4-5m high forming a uniform thicket of vegetation.	
Photo ID: 9 **Plot Number:** 3 **Vegetation classification or exclusion clause:** Class D Scrub **Description/justification of classification:** Acacia scrub vegetation 4-5m high forming a uniform thicket of vegetation.	

Photo ID: 10 **Plot Number:** 4 **Vegetation classification or exclusion clause:** Class D Scrub **Description/justification of classification:** Acacia scrub vegetation 4-5m high forming a uniform thicket of vegetation.	
Photo ID: 11 **Plot Number:** 4 **Vegetation classification or exclusion clause:** Class D Scrub **Description/justification of classification:** Acacia scrub vegetation 4-5m high forming a uniform thicket of vegetation.	
Photo ID: 12 **Plot Number:** 4 **Vegetation classification or exclusion clause:** Class D Scrub **Description/justification of classification:** Acacia scrub vegetation 4-5m high forming a uniform thicket of vegetation.	
Photo ID: 13 **Plot Number:** 6 **Description/justification of classification:** Class B Woodland **Description/justification of classification:** Scattered eucalypt trees and some scrub vegetation in the corridor.	
Photo ID: 14 **Plot Number:** 8 **Description/justification of classification:** Class G Grassland **Description/justification of classification:** Single rows of eucalypt trees on paddock boundary acting as a wind break with dominant grassland fuels in adjacent paddock.	

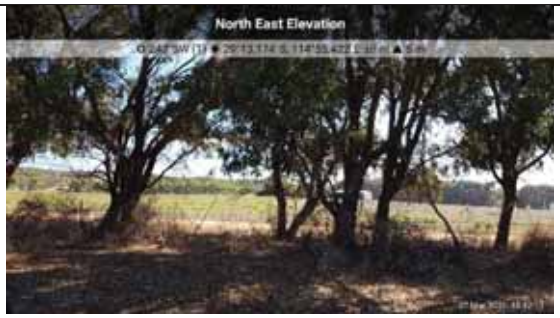
Photo ID: 15 **Plot Number:** 8 **Description/justification of classification:** Class G Grassland **Description/justification of classification:** Single rows of eucalypt trees on paddock boundary acting as a wind break with dominant grassland fuels in adjacent paddock.	
Photo ID: 16 **Plot Number:** 8 **Description/justification of classification:** Class G Grassland **Description/justification of classification:** Single rows of eucalypt trees on paddock boundary acting as a wind break with dominant grassland fuels in adjacent paddock.	
Photo ID: 17 **Plot Number:** 7 **Description/justification of classification:** Class G Grassland **Description/justification of classification:** Pasture and grassy weeds in the paddock south of the site.	
Photo ID: 18 **Plot Number:** 7 **Description/justification of classification:** Class G Grassland **Description/justification of classification:** Pasture and grassy weeds in the paddock south of the site.	
Photo ID: 19 **Plot Number:** 7 **Description/justification of classification:** Class G Grassland **Description/justification of classification:** Pasture and grassy weeds in the paddock south of the site.	

Photo ID: 20 **Plot Number:** 8 **Description/justification of classification:** Class G Grassland **Description/justification of classification:** Pasture grasses, crops and grassy weeds in the paddock west of the site.	
Photo ID: 21 **Plot Number:** 8 **Description/justification of classification:** Class G Grassland **Description/justification of classification:** Pasture grasses, crops and grassy weeds in the paddock west of the site.	
Photo ID: 22 **Plot Number:** 8 **Description/justification of classification:** Class G Grassland **Description/justification of classification:** Pasture grasses, crops and grassy weeds in the paddock west of the site.	
Photo ID: 23 **Plot Number:** 8 **Description/justification of classification:** Class G Grassland **Description/justification of classification:** Pasture grasses, crops and weeds in the paddock south east of the site.	
Photo ID: 24 **Plot Number:** 8 **Description/justification of classification:** Class G Grassland **Description/justification of classification:** Pasture grasses, crops and weeds in the paddock east of the site.	

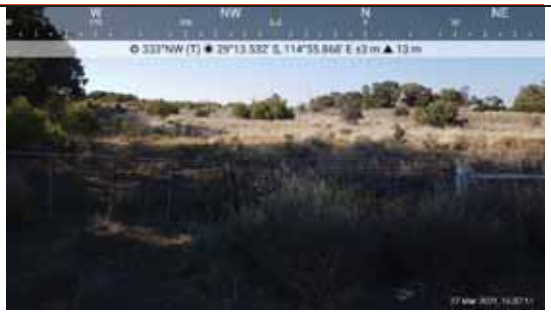
Photo ID: 25 **Plot Number:** 8 **Description/justification of classification:** Class G Grassland **Description/justification of classification:** Pasture grasses, crops and weeds in the paddock east of the site.	
Photo ID: 26 **Plot Number:** 9 **Description/justification of classification:** Exclusion Clause 2.2.3.2(f) **Description/justification of classification:** irrigated mown lawns around residential dwelling.	
Photo ID: 27 **Plot Number:** 9 **Description/justification of classification:** Exclusion Clause 2.2.3.2(f) **Description/justification of classification:** irrigated mown lawns around residential dwelling.	
Photo ID: 28 **Plot Number:** 9 **Description/justification of classification:** Exclusion Clause 2.2.3.2(f) **Description/justification of classification:** slashed grasses in Brand Highway.	
Photo ID: 29 **Plot Number:** 9 **Description/justification of classification:** Exclusion Clause 2.2.3.2(f) **Description/justification of classification:** slashed grasses in Brand Highway.	

Photo ID: 30 **Plot Number:** 9 **Description/justification of classification:** Exclusion Clause 2.2.3.2(f) **Description/justification of classification:** Gravel and slashed grasses in Brand Highway.	+ 
Photo ID: 31 **Plot Number:** 9 **Description/justification of classification:** Exclusion Clause 2.2.3.2(f) **Description/justification of classification:** Gravel and slashed grasses in Brand Highway.	
Photo ID: 32 **Plot Number:** 10 **Description/justification of classification:** Exclusion Clause 2.2.3.2(f) **Description/justification of classification:** Remnant vegetation inside future lots that will be managed to APZ standards to each lot boundary across the entire site.	
Photo ID: 33 **Plot Number:** 10 **Description/justification of classification:** Exclusion Clause 2.2.3.2(f) **Description/justification of classification:** Remnant vegetation inside future lots that will be managed to APZ standards to each lot boundary across the entire site..	
Photo ID: 34 **Plot Number:** 10 **Description/justification of classification:** Exclusion Clause 2.2.3.2(f) **Description/justification of classification:** Remnant vegetation inside future lots that will be managed to APZ standards to each lot boundary across the entire site.	

Photo ID: 35 **Plot Number:** 10 **Description/justification of classification:** Exclusion Clause 2.2.3.2(f) **Description/justification of classification:** Remnant vegetation inside future lots that will be managed to APZ standards to each lot boundary across the entire site.	
Photo ID: 36 **Plot Number:** 10 **Description/justification of classification:** Exclusion Clause 2.2.3.2(f) **Description/justification of classification:** Remnant vegetation inside future lots that will be managed to APZ standards to each lot boundary across the entire site.	
Photo ID: 37 **Plot Number:** 10 **Description/justification of classification:** Exclusion Clause 2.2.3.2(f) **Description/justification of classification:** Remnant vegetation inside future lots that will be managed to APZ standards to each lot boundary across the entire site.	
Photo ID: 38 **Plot Number:** 10 **Description/justification of classification:** Exclusion Clause 2.2.3.2(f) **Description/justification of classification:** Remnant vegetation inside future lots that will be managed to APZ standards to each lot boundary across the entire site.	
Photo ID: 39 **Plot Number:** 10 **Description/justification of classification:** Exclusion Clause 2.2.3.2(f) **Description/justification of classification:** Remnant vegetation inside future lots that will be managed to APZ standards to each lot boundary across the entire site.	

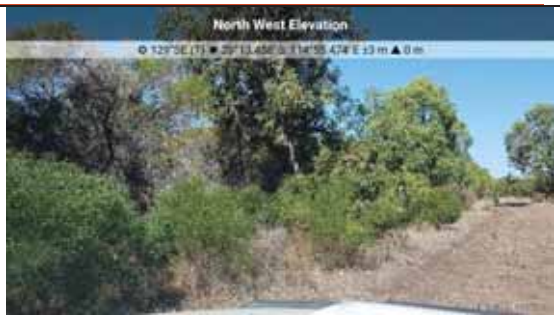
Photo ID: 40 **Plot Number:** 10 **Description/justification of classification:** Exclusion Clause 2.2.3.2(f) **Description/justification of classification:** Remnant vegetation inside future lots that will be managed to APZ standards to each lot boundary across the entire site.	
Photo ID: 41 **Plot Number:** 10 **Description/justification of classification:** Exclusion Clause 2.2.3.2(f) **Description/justification of classification:** Remnant vegetation inside future lots that will be managed to APZ standards to each lot boundary across the entire site.	
Photo ID: 42 **Plot Number:** 10 **Description/justification of classification:** Exclusion Clause 2.2.3.2(f) **Description/justification of classification:** Remnant vegetation inside future lots that will be managed to APZ standards to each lot boundary across the entire site.	
Photo ID: 43 **Plot Number:** 10 **Description/justification of classification:** Exclusion Clause 2.2.3.2(f) **Description/justification of classification:** Remnant vegetation inside future lots that will be managed to APZ standards to each lot boundary across the entire site.	
Photo ID: 44 **Plot Number:** 11 **Description/justification of classification:** Exclusion Clause 2.2.3.2(d) **Description/justification of classification:** This strip of vegetation will be retained inside the future road reserve, it will be less than 20m in width and future dwellings will not be constructed within 20 metres of it.	

Photo ID: 45 **Plot Number:** 11 **Description/justification of classification:** Exclusion Clause 2.2.3.2(d) **Description/justification of classification:** This strip of vegetation will be retained inside the future road reserve, it will be less than 20m in width and future dwellings will not be constructed within 20 metres of it.	

3.1.2 Effective Slope

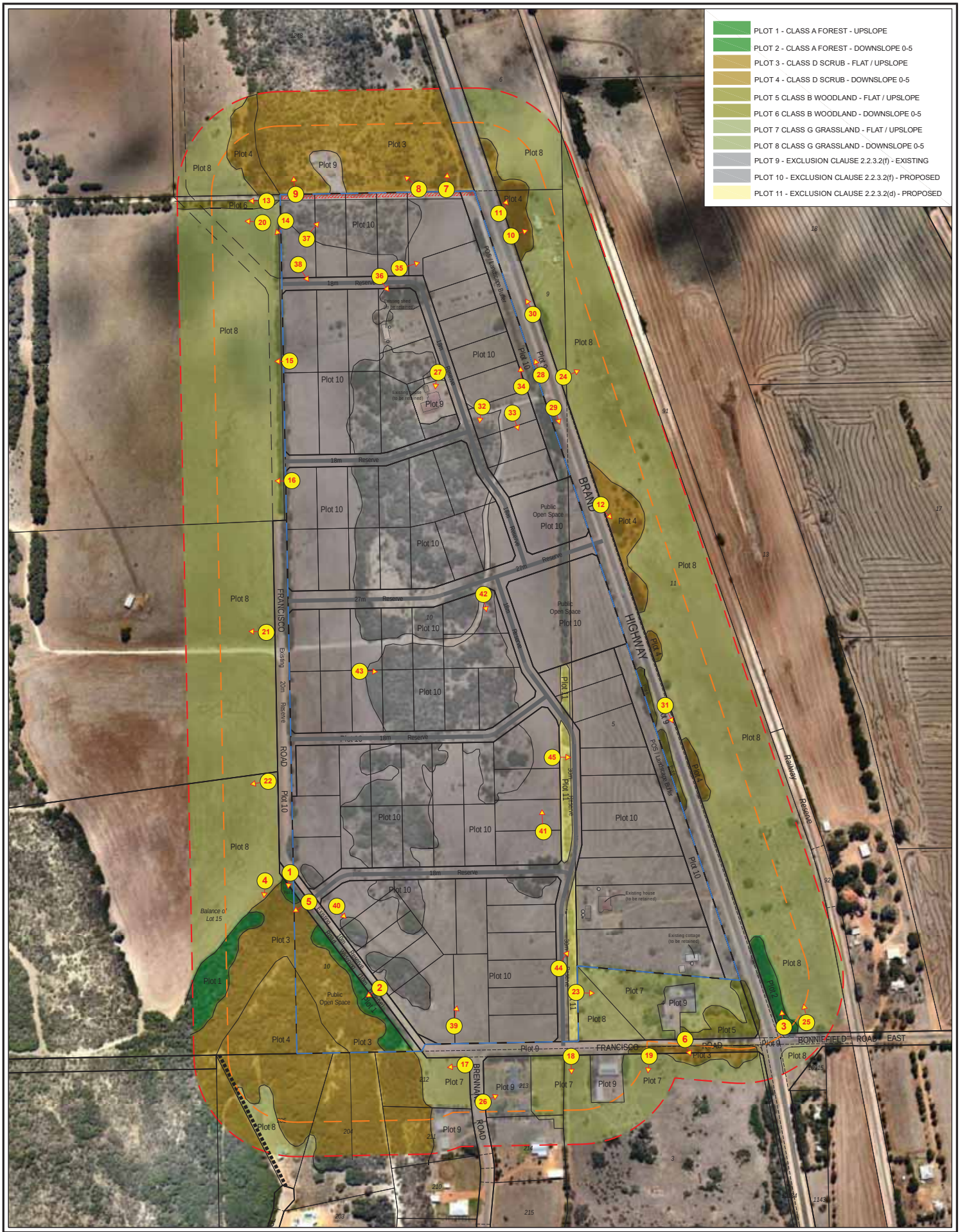
The site is dominated by a broad ridge that runs through the middle north to south. This is the zone that contains most of the remnant vegetation. From this ridge, the land gently falls to the east and west and effective slopes of vegetation in these directions adjacent to the site are downslope 0-5 degrees.

Areas of retained vegetation north and south of the site and mostly parallel with the contours and are thus assessed as flat. The topography of the surrounding landscape has a small influence on an approaching bushfire or grassfire.

Effective slope under the classified vegetation surrounding the site is found in Table 2.

Table 2. Summary of vegetation type and effective slope

Plot	Applied Vegetation Classification	Effective Slope under the Classified Vegetation
1	Class A Forest	Upslope
2	Class A Forest	Downslope 0-5
3	Class D Scrub	Upslope
4	Class D Scrub	Downslope 0-5
5	Class B Woodland	Upslope
6	Class B Woodland	Downslope 0-5
7	Class G Grassland	Upslope
8	Class G Grassland	Downslope 0-5
9	Exclusion Clause 2.2.3.2 (f)	N/A
10	Exclusion Clause 2.2.3.2 (f)	N/A
11	Exclusion Clause 2.2.3.2 (d)	N/A



Location details:	Lots 5 & 10 Brand Highway, Dongara
Assessment date:	March, 2021
Prepared by:	Bushfire Safety Consulting
Accreditation level:	Level 3 BPAD Practitioner
Accreditation number:	BPAD 23160
Accreditation expiry date:	31st January, 2022
Date aerial photo:	April 2014

FIGURE 4 - VEGETATION CLASSIFICATION MAP (BAL CONTOUR MAP)

0 50 100 150 200 250m

SCALE 1:5000 @ A3
DATE: MAY 2021

NORTH

LEGEND:
SUBJECT LAND
ASSESSMENT AREA (150m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE
ASSESSMENT AREA (100m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE

SOURCE OF PHOTOGRAPHY: NEARMAP

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3.2 Assessment Outputs

A BAL contour assessment was undertaken for the site post development according to Appendix 3 of the Guidelines, with the results found in the BAL Contour Map in Table 3 and Figure 5.

A Method 1 BAL Assessment was undertaken to determine the BAL contours impacting the site. All lots can accommodate a dwelling with exposure levels of BAL-29 and lower, some lots on the perimeter require a small internal lot setback. A total of 36 lots are exposed to BAL-LOW.

Table 3. Summary of assessment outputs

Lot	Applied Vegetation Classification	Plot No. & Effective slope	Separation Distance to Classified Vegetation		Highest BAL Contour
			external	internal	
1	Class G Grassland	Plot 7 – Upslope	20 metres		BAL – 12.5
2 & 3	Class G Grassland	Plot 8 – Down 0-5	30 metres		BAL – 12.5
4	Class G Grassland	Plot 8 – Down 0-5	35 metres		BAL – 12.5
5 - 8	Class G Grassland	Plot 8 – Down 0-5	>50m		BAL – LOW
	Class A Forest	Plot 1 – Upslope	>100m		
9-13	Class A Forest	Plot 1 – Upslope	20 metres	1 metre	BAL – 29
14	Class G Grassland	Plot 7 – Upslope	>50m		BAL – LOW
15-23 & 28-31	Class A Forest	Plot 1 – Upslope	>100m		
	Class G Grassland	Plot 8 – Down 0-5	>50m		
24-25	Class G Grassland	Plot 8 – Down 0-5	20 metres		BAL – 12.5
26	Class A Forest	Plot 1 – Upslope	20 metres	1 metre	BAL – 29
27	Class A Forest	Plot 1 – Upslope	77 metres		BAL – 12.5
32	Class G Grassland	Plot 7 – Upslope		8 metres	BAL – 29
33	Class A Forest	Plot 2 – Down 0-5	63 metres		BAL – 12.5
34	Class B Woodland	Plot 6 – Down 0-5	64 metres		BAL – 12.5
35	Class B Woodland	Plot 6 – Down 0-5	27 metres		BAL – 19
36-41	Class B Woodland	Plot 6 – Down 0-5		17 metres	BAL – 29
42-47, 50-55, 56-61, 65-68 77-80 83-86	Class G Grassland	Plot 8 – Down 0-5	>50m		BAL – LOW
91	Class B Woodland	Plot 6 – Down 0-5		17 metres	BAL-29
48 & 49	Class G Grassland	Plot 8 – Down 0-5	20 metres		BAL – 12.5
62,	Class G Grassland	Plot 8 – Down 0-5	13 metres		BAL – 19
63, 81, 82	Class G Grassland	Plot 8 – Down 0-5	3 metres	14 metres	BAL - 29
64	Class G Grassland	Plot 6 – Down 0-5	45 metres		BAL – 12.5
69	Class D Scrub	Plot 4 – Down 0-5	50 metres		BAL –12.5
70	Class D Scrub	Plot 4 – Down 0-5	63 metres		BAL – 12.5
71	Class D Scrub	Plot 4 – Down 0-5	97 metres		BAL –12.5
72-73	Class G Grassland	Plot 8 – Down 0-5	50 metres		BAL – LOW

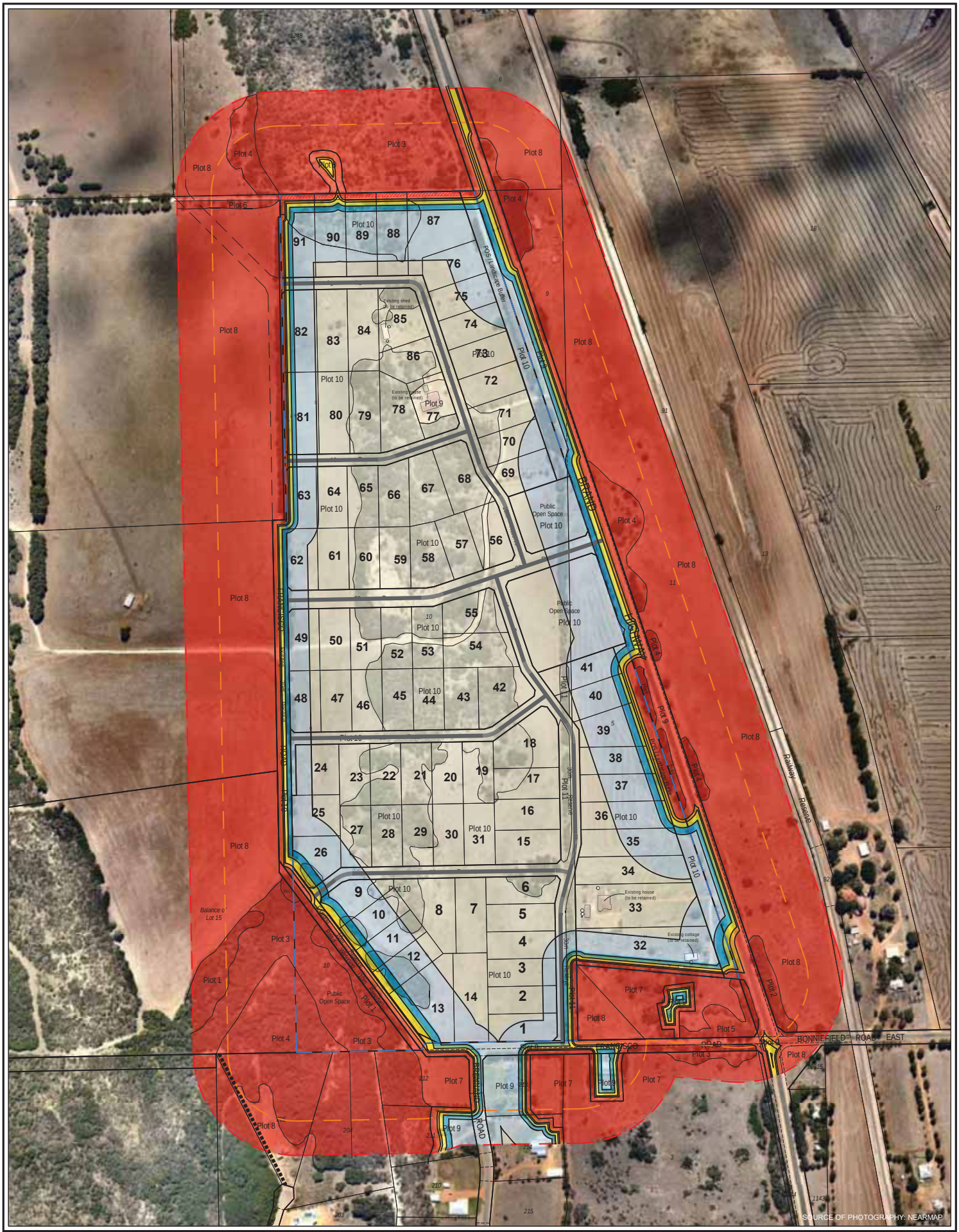
74	Class D Scrub	Plot 4 – Down 0-5	70 metres		BAL – 12.5
75-76	Class D Scrub	Plot 4 – Down 0-5	50 metres		BAL – 12.5
87-90	Class D Scrub	Plot 3 – Upslope	9 metres	4 metres	BAL – 29

The final developed scenario is outlined in Figure 6 as a Spatial Representation of the Bushfire Management Strategies.

4 IDENTIFICATION OF BUSHFIRE HAZARD ISSUES

Bushfire hazard issues surround the site, extreme hazard occurs north and south-west of the site and moderate grass fuels occur largely east and west of the site. The issue of potential fire run into the site which could threaten life and property situated in the middle of the site is mitigated with the lot X lot APZ strategy which provides overlapping protection across the site. This also provides benefits to fire fighters as they have a larger safe zone to defend life and property.

Predicted radiant heat and ember attack could impact the site as evident in the BAL contour plan (Figure 5).



Location details:	Lots 5 & 10 Brand Highway, Dongara
Assessment date:	March, 2021
Prepared by:	Bushfire Safety Consulting
Accreditation level:	Level 3 BPAD Practitioner
Accreditation number:	BPAD 23160
Accreditation expiry date:	31st January, 2022
Date aerial photo:	April 2014

FIGURE 5
BAL CONTOUR MAP

0 50 100 150 200 250m

SCALE 1:5000 @ A3
DATE: MAY 2021

NORTH

INDICATIVE BUSHFIRE ATTACK LEVELS

- BAL LOW
- BAL 12.5
- BAL 19
- BAL 29
- BAL 40
- BAL FLAME ZONE

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5 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA

This report adopts an acceptable solution and performance-based system of control for each Bushfire Protection Criteria. This methodology is consistent with Appendix 4 of the *Guidelines for Planning in Bushfire Prone Areas, Version 1.3 (2017).* The management issues are:

- Location of the Development.
- Siting and Design of Development.
- Vehicular access.
- Water.

Acceptable solutions are proposed for all of the Bushfire Protection Criteria and each illustrates a means of satisfactorily meeting the corresponding performance criteria.

5.1 Compliance Table

Land use planning bushfire risk mitigation strategies are comprehensively detailed in the following sections by providing responses to the performance criteria that fulfil the intent of the bushfire hazard management issues outlined in the *Guidelines for Planning in Bushfire Prone Areas V1.3(2017).* The compliance checklist is shown in Table 4.

Table 4: Compliance Table

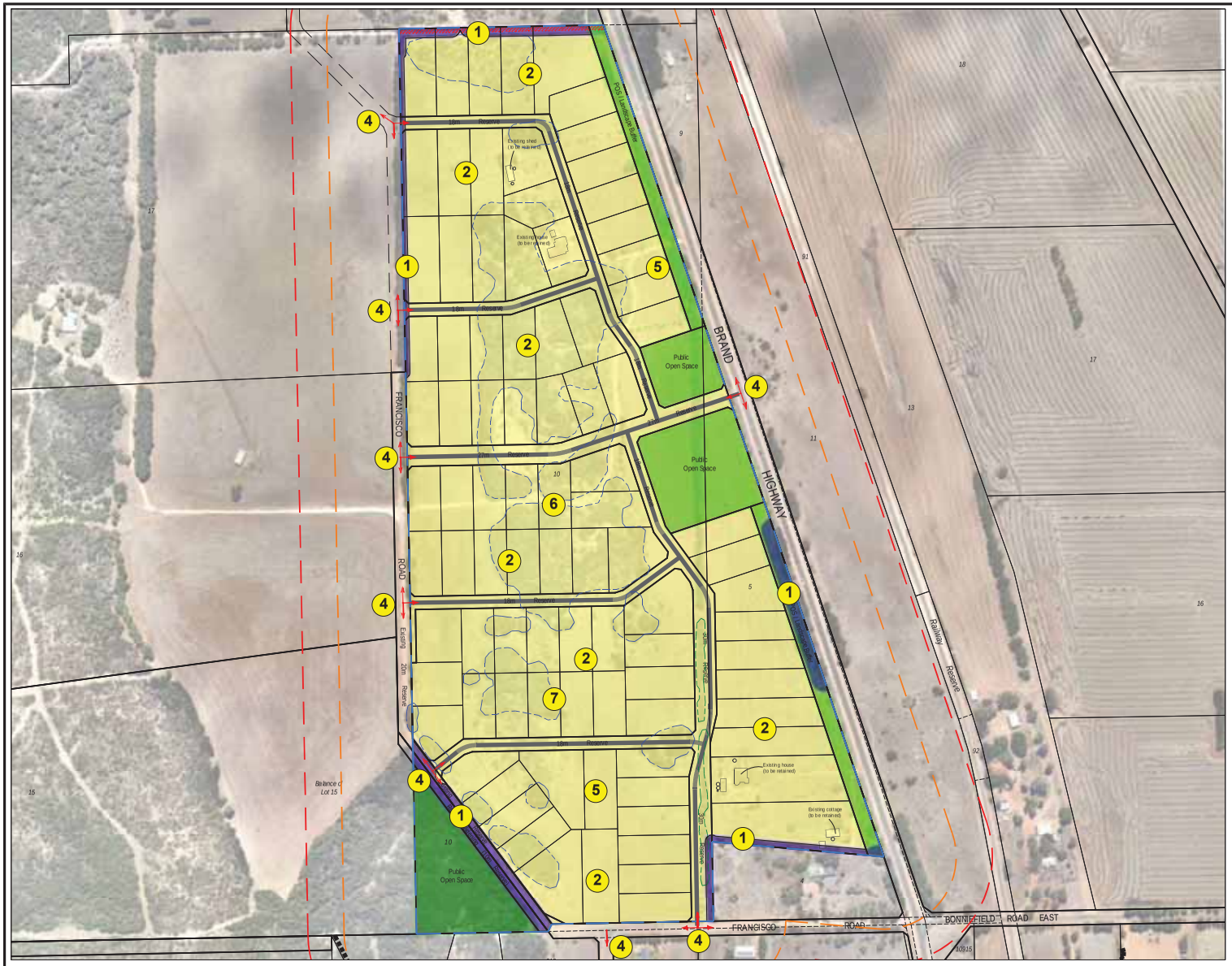
Bushfire Protection Criteria	**Method of compliance**	**Proposed bushfire management strategies**
	Acceptable Solutions	
Element 1: Location	AQ1.1 Development Location	The Method 1 BAL Assessment in this report demonstrates the classified vegetation in the area surrounding the site does impact perimeter lots, however all lots can comfortably accommodate a dwelling with a rating of BAL-29 or lower.
Element 2: siting and Design	A2.1 Asset Protection Zone (APZ)	All residential lots and road reserves will be established and maintained to Asset Protection Zone (APZ) standards to the lot boundary. This has the accumulative effect of ensuring there is an overlapping APZ throughout the entire subdivision which provides a larger overlapping low fuel zone. Future dwellings can be achieved on each lot exposed to BAL-29 and lower. The APZ is managed in accordance with the requirements of the standards in Appendix 1.

Element 3: Vehicular Access	A3.1 Two access routes	All the lots at the site will have direct driveway access to one of six proposed new public roads which provide access to Brand Highway to the east and Francisco Road to the south. Brand Highway provides good access to the north and south, while Francisco Road provides access to the east and south. Therefore, there will be provision for a minimum of two access routes. Additional egress to the north could occur in the future once planned development adjacent to the site occurs. During the staging of the subdivision it is important two access ways are provided at all times.
Element 3: Vehicular Access (cont)	A3.2 Public Road	Each lot fronts a proposed or existing public road that complies with minimum public road standards as outlined in Appendix 2. All surrounding roads also comply with minimum public road standards.
	A3.3 Cul-de-sac	There are no cul-de-sacs proposed. If temporary cul-de-sacs are required during the staged development of the site then minimum standards in Appendix 2 will be achieved.
	A3.4 Battle-axe	There are no battle-axe lots proposed.
	A3.5 Private drive-way longer than 50 metres	Some lots may require private driveways longer than 50m proposed. If required, these will need to meet standards shown in Appendix 3, including 4 metres width, 6 metres vertical clearance, and a compliant turnaround for fire fighting appliances located within 50 metres of the dwelling.
	A3.6 Emergency Access Way	There are no Emergency Access Ways proposed in this subdivision. If a temporary EAW is required during the staged development of the site then minimum standards in Appendix 2 will be achieved
	A3.7 Fire Emergency Access Routes	There are no Fire Emergency Access Ways proposed.
	A3.8 Firebreak width	Compliance is achieved with the current Shire of Irwin Firebreak Notice (Appendix 2).
Element 4: Water	A4.1 Reticulated areas	The development will have access to a reticulated water supply. Hydrants will be spaced according to the Water Corporation's No. 63 Water Reticulation Standard.
	A4.2 Non-reticulated areas	Not applicable.
	A4.3 Individual lots within non-reticulated areas	Not applicable.

5.2 Additional Management Strategies

APZ standards will be established and maintained within the site by the developer prior to the creation of titles until the sale of lots. Asset Protection Zone (APZ) standards will be maintained on all lots by new owners. During the staging of development, it may be necessary to manage a minimum 100 metre interface at low fuel levels to ensure any dwellings are not exposed to temporary hazards and a higher BAL rating. The Public Open Space areas to the east of the site will be established and maintained as Low Threat Vegetation as per AS3959:2018 Exclusion Zone 2.2.3.2 (f) with separated trees and managed grass in parkland structure.

A summary of management strategies is outlined in **Figure 6**.



REQUIREMENTS

1. The perimeter APZ exists in areas exposed to BAL-FZ and BAL-40 and the siting of dwellings is excluded from this zone. The APZ will be managed in accordance with the Standards given in Appendix 1.

2. The lot specific APZ extends from the walls of future dwellings and sheds on each lot to the lot boundary. This effectively creates an overlapping APZ across the entire site, providing increased protection to residents and fire fighters. This lot X lot APZ will be established by the developer, and maintained by each future resident. During the staging of the development a 100 metre APZ buffer will be maintained by the developer within the site to ensure temporary bushfire hazards do not threaten the development interface. The APZ will be managed in accordance with the Standards given in Appendix 1.

3. Four of the five Public Open Spaces are will be revegetated with trees however the landscape is designed to allow grass mowing under the tree canopies to ensure ground fuels are maintained at lower levels and compliant with Exclusion clause 2.2.3.2(f)

4. Existing public roads are found on the eastern (Brand highway) and southern interface including providing access to Dongara townsite and to the north, south and east. A grid like internal road layout ensures each resident has two access ways to two different destinations.

5. The area is provided with a reticulated water supply and future development of the lots can comply with required water supply standards.

6. If required during development stages, temporary Emergency Access Way and cul-de-sacs can be provided to ensure complaince with SPP 3.7.

7. Driveways to proposed future dwellings that are greater than 50 metres from a public road will consist of an all-weather surface, contain a compliant turn-around for fire-fighting appliances, and comply with standards given in Appendix 3.

LEGEND:

- SUBJECT LAND
- INTERNAL PUBLIC ROADS
- MULTIPLE ACCESS AND EGRESS OPTIONS
- INTERNAL AREA OF BUSHLAND WILL BE REDUCED TO COMPLY WITH APZ STANDARDS
- STRIP OF RETAINED VEGETATION INSIDE ROAD RESERVE < 20m IN WIDTH
- POS AREAS REVEGETATED WITH TREES, BUT MAINTAINED AS LOW THREAT WITH MOWING REGIME UNDER CANOPY
- RETAINED BUSHLAND AND LONG TERM BUSHFIRE HAZARD
- EACH LOT HAS AN APZ TO THE LOT BOUNDARY WHICH CREATES OVERLAPPING APZ ACROSS THE SITE
- PERIMETER ASSET PROTECTION ZONE

FIGURE 6 - SPATIAL REPRESENTATION OF BUSHFIRE MANAGEMENT STRATEGIES

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0 50 100 150 200 250m

SCALE 1:6000 @ A3
DATE: MAY 2021

NORTH

Location details:	Lots 5 & 10 Brand Highway, Dongara
Assessment date:	March, 2021
Prepared by:	Bushfire Safety Consulting
Accreditation level:	Level 3 BPAD Practitioner
Accreditation number:	BPAD 23160
Accreditation expiry date:	31st January, 2022
Date aerial photo:	April 2014

6 RESPONSIBILITIES FOR IMPLEMENTATION AND MANAGEMENT OF THE BUSHFIRE MEASURES

Table 5 outlines the initial and ongoing responsibilities, actions and associated works that need to be undertaken by the Developer, future landowners and the Shire of Irwin. The check boxes for implementation actions will be used for subdivision clearance. A Bushfire Planning Practitioner will certify the BAL ratings are correct and necessary implementation actions have been completed.

Table 5. Responsibility for bushfire measures

DEVELOPER – PRIOR TO ISSUE OF CERTIFICATE OF TITLES FOR NEW LOTS			
No.	**Implementation action**	**Local government clearance**	**Bushfire consultant clearance**
1	Construct the new public roads to the standards stated in the BMP.	☐	
2	Establish the Public Open Space areas to the east of the site in a 'low threat' state as stated in the BMP.		☐
3	Maintain fuel loads and vegetation structure standards to comply with Asset Protection Zone Standards outlined in this report.		☐
4	Ensure that all lots comply with the Shire of Irwin's Firebreak Notice as published.	☐	
5	A notification, pursuant to Section 70A of the Transfer of Land Act 1893 is to be placed on the certificate(s) of title of the lots within the Bushfire Prone Area. Notice of this notification is to be included on the diagram or plan of survey (deposited plan). The notification is to state as follows: 'The lot(s) is/are subject to a Bushfire Management Plan.' (Local Government)".		
6	Ensure water supply is established to standards as specified in this document.		
LANDOWNER/DEVELOPER – PRIOR TO SALE OR OCCUPANCY			
No.	**Implementation action**		
7	Ensure the site complies with the Shire of Irwin's Firebreak Notice as published.		
8	As part of the building license application stage, have any proposed building(s) assessed or undertake a BAL assessment for a group of lots, by a qualified consultant to support the building license applications.		
9	Ensure construction of buildings complies with AS 3959:2018.		

10	If buildings are subject to additional construction in the future, AS 3959:2018 compliance is required.
11	Update the Bushfire Management Plan if requested by the Shire of Irwin if it has reason to believe site conditions have substantially changed, or new methodologies or practice are adopted, as identified in future revisions of the "Guidelines".
DEVELOPER – AT SALE OF LOTS	
No.	**Management action**
12	Make a copy of this BMP available to each lot along with the Shire of Irwin's Firebreak Notice.
LANDOWNER/OCCUPIER – ONGOING	
No.	**Management action**
13	Maintain the Asset Protection Zone (APZ) to the dimensions and standard stated in the BMP.
14	Comply with the Shire of Irwin's annual Firebreak Notice issued under s33 of the *Bush Fires Act 1954*.
SHIRE OF IRWIN – ONGOING MANAGEMENT	
No.	**Management action**
15	The Public Open Space area is to be managed to ensure the vegetation remains as low threat vegetation, in accordance with Exclusion Clause 2.2.3.2 (f) in AS3959–2018.
16	Maintain public roads to appropriate standards and ensure compliance with the Shire of Irwin's Firebreak Notice.
17	Provide fire prevention and preparedness advice to landowners upon request and the Shire of Irwin's Firebreak Notice.

Certification by bushfire consultant

I _____, certify that at the time of inspection, the BAL ratings contained within this BMP are correct; and implementation Actions 2–3 have been undertaken in accordance with the BMP.

Clearance by local government is recommended.

Signature: _____ Date: _____

7 CONCLUSION

This Plan provides acceptable solutions and responses to the performance criteria that fulfil the intent of the bushfire hazard management issues outlined in the Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 V1.3). However, community bushfire safety is a shared responsibility between governments, fire agencies, communities and individuals.

The subdivision is located in the Bushfire Prone Area (i.e. within 100m of classified vegetation) and risk is reduced via compliance with *AS 3959:2018* standards. BAL-29 will not be exceeded by any dwellings. An APZ incorporates all residential lots and road reserves, and will be maintained to standards stated in this plan.

A minimum of two access options and fire hydrant spacing requirements for fire-fighting are met. The proposed development will fall within the acceptable level of risk.

REFERENCES

Department of Fire and Emergency Services (DFES), 2014, *The Home Owner's Bushfire Survival Manual, https://www.dfes.wa.gov.au/safetyinformation/fire/bushfire/BushfireManualsandGuides/DFES_Bushfire-Homeowners_Survival_Manual.pdf ,* Department of Fire and Emergency Services, Government of Western Australia.

Standards Australia, 2018, *Construction of buildings in bushfire-prone areas (Amendments 1-3)*, AS 3959-2018, Standards Australia International Ltd, Sydney.

Western Australian Planning Commission (WAPC), 2015, *State Planning Policy No. 3.7: Planning in Bushfire Prone Areas (SPP3.7)*, December 2015, Western Australian Planning Commission and Department of Planning WA, Government of Western Australia.

Western Australian Planning Commission (WAPC), 2017, *Guidelines for Planning in Bushfire Prone Areas*, December 2017 V1.3, Western Australian Planning Commission and Department of Planning WA, Government of Western Australia.

APPENDICES

Appendix 1: Asset Protection Zone Standards
Appendix 2: Shire of Irwin Firebreak Notice
Appendix 3: Vehicular Access Technical Requirements

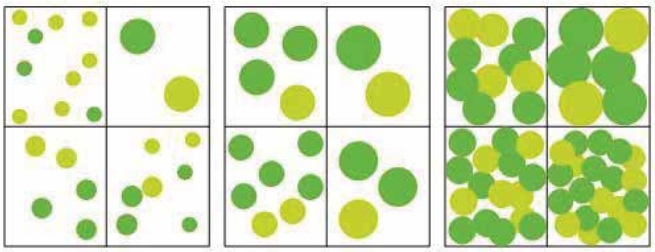
Appendix 1: Asset Protection Zone Standards

ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

- **Fences:** within the APZ are constructed from non-combustible materials (e.g. iron, brick, limestone, metal post and wire). It is recommended that solid or slatted non-combustible perimeter fences are used.
- **Objects:** within 10 metres of a building, combustible objects must not be located close to the vulnerable parts of the building i.e. windows and doors.
- **Fine Fuel load:** combustible dead vegetation matter less than 6 millimetres in thickness reduced to and maintained at an average of two tonnes per hectare.
- **Trees (> 5 metres in height):** trunks at maturity should be a minimum distance of 6 metres from all elevations of the building, branches at maturity should not touch or overhang the building, lower branches should be removed to a height of 2 metres above the ground and or surface vegetation, canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 metres apart as to not form a continuous canopy.

Figure 18: Tree canopy cover – ranging from 15 to 70 per cent at maturity



- **Shrubs (0.5 metres to 5 metres in height):** should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m^2 in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 5 metres in height are to be treated as trees.
- **Ground covers (<0.5 metres in height):** can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 metres of a structure, but 3 metres from windows or doors if greater than 100 millimetres in height. Ground covers greater than 0.5 metres in height are to be treated as shrubs.
- **Grass:** should be managed to maintain a height of 100 millimetres or less.

Appendix 2: Shire of Irwin Firebreak Notice

SHIRE OF IRWIN
DONGARA-PORT DENISON
A BRILLIANT BLEND

FIREBREAK NOTICE 2020 - 2021

First and final notice - Deadline 15 October 2020

TO ALL LAND OWNERS AND/OR OCCUPIERS OF LAND IN THE SHIRE OF IRWIN

Firebreaks must be installed and maintained clear of flammable materials from
15 OCTOBER 2020 up to and including **30 APRIL 2021**

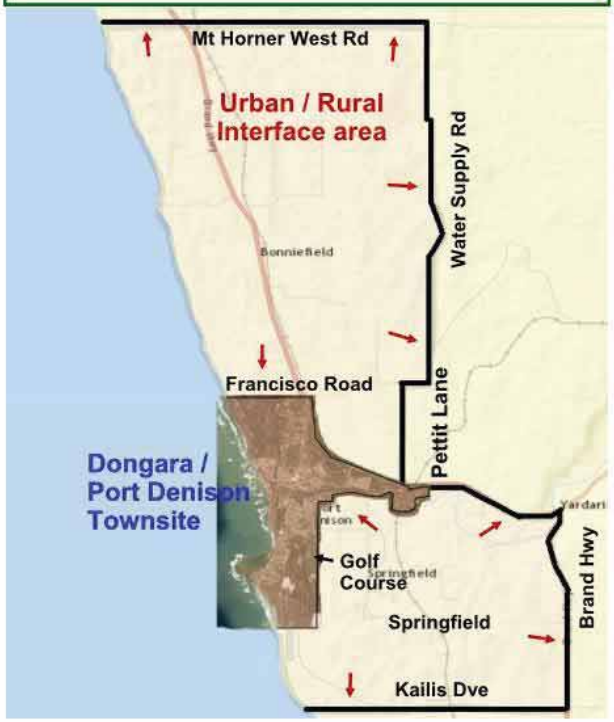
1. **RURAL LAND** (Land other than that within the Dongara Port Denison and Irwin Town Sites):
On or before 15 October 2020 and thereafter up until and including 30 April 2021 you shall observe the following:

1.1 Have firebreaks not less than two (2) metres in width and within one hundred (100) metres of the perimeter of any building or haystack or groups of buildings or haystacks situated on the land. Such firebreaks must completely encircle the said buildings and/or hay stacks.

1.2 Have firebreaks not less than two (2) metres in width immediately abutting any building or haystack or groups of buildings or haystacks situated on the land.

1.3 Have firebreaks not less than five (5) metres in width around all uncleared land that is in contact with a boundary, including land upon which the regeneration of bush has occurred.

1.4 All landowners in the **Urban/Rural Interface Area** (All land south from Mt Horner West Road, west of Water Supply Road and Pettit Lane and thereafter south and west of Brand Highway to Kailis Drive) have the option of either installing a two metre firebreak, or a twenty metre slashed or heavily grazed firebreak to a maximum height of 100mm immediately inside and along all boundaries of land.



2. **TOWN SITE LAND** (Land situated within the Town Sites of Dongara Port Denison and Irwin).
On or before 15 October 2020 and thereafter up until and including 30 April 2021 you shall observe the following:

2.1 Have vacant land cleared of all flammable material (Slashed to a maximum height of 100mm) where the area of the land is 5000 square metres or less.

2.2 Have firebreaks not less than three (3) metres in width immediately inside and along all boundaries of land exceeding 5000 square metres in area.

2.3 Have firebreaks not less than three (3) metres in width immediately abutting all buildings

2.4 Have firebreaks not less than five (5) metres in width around all uncleared land that is in contact with a boundary, including land upon which the regeneration of bush has occurred.



HARVESTING

No person shall operate harvesting machinery during the restricted or prohibited burning period on any land unless they have a mobile and operational fire fighting unit with a capacity of at least 400 litres, situated in or immediately adjacent to the paddock where harvesting operations are being conducted.

VARIATIONS TO FIREBREAK NOTICE

If it is impracticable to clear firebreaks or to remove flammable material from the land, you may apply in writing to the Shire of Irwin or its duly authorised officer by 16 September for an alternative solution.

THE PURPOSE OF FIREBREAKS IS TO STOP FIRE SPREADING, TO ALLOW ENTRY FOR FIRE FIGHTING VEHICLES AND TO PROVIDE A BREAK FROM WHICH BACK BURNING CAN TAKE PLACE .

SHIRE OF IRWIN
DONGARA-PORT DENISON
A BRILLIANT BLEND

FIRE INFORMATION 2020 - 2021

IMPORTANT DATES

FIREBREAKS - required by 15 October

BURNING

RESTRICTED - 15 October to 30 November (inclusive)
PROHIBITED - 1 December to 28 February (inclusive)
RESTRICTED - 1 March to 30 April (inclusive)
Burning PROHIBITED on Very High to Catastrophic FDR

CAMPFIRES - Prohibited 1 October to 30 April



FIRE DANGER RATING (FDR)

PERMITS

Not valid on days of Very High to Catastrophic FDR

When to obtain permits
Permits are required for burning of windrows, stubble, grass or bush at any time during the restricted burning periods. Permits are required for all areas.

How to obtain permits
Permits can be obtained from the Shire Office or from your local Permit Issuing Officer if you live in other areas of the Shire. When applying for a permit you will need to provide the lot number and street name of the property for which the permit is to apply.

Permit Issuing Officers

TOWNSITE AREAS

SHIRE OFFICE	9927 0000
Community Ranger	(M) 0427 110 237
M Butcher	(M) 0408 956 741

RURAL AREAS

Andrew Gillam	(M) 0427 717 174
Geoff Crabb	(M) 0427 150 072

GARDEN REFUSE AND RUBBISH

Prohibited on days of Very High to Catastrophic FDR

PROHIBITED BURNING SEASON
No garden rubbish or refuse is permitted to be burnt in an open fire during the prohibited burning season. It may only be burnt in an approved incinerator.

RESTRICTED BURNING SEASON
Small heaps (up to one cubic metre) of garden refuse may be burnt on the ground between 6:00 pm and 11:00 pm BUT ONLY AFTER a 5 metre wide, fire-break has been cleared around the fire and at least one able bodied person is in attendance at all times. A permit is not required.

Approved incinerator
The incinerator is to be constructed of steel, brick or a combination of these materials. Every incinerator shall be constructed or covered to prevent the emission of sparks or burning material.

Barbecues
Gas and electric barbecues are permitted at any time.

ADVICE IS AVAILABLE

Further advice on how to protect your home and when and how to burn off is available from the Shire Office or your local Bush Fire Control Officer. Please call with any queries you may have.

Failure to comply with this Firebreak Notice may result in a penalty of up to $5,000.
A person is also liable to pay the direct costs of performing the work specified in this Notice.
Penalties also apply for offenses related to burning.

TELEPHONE NUMBERS

EMERGENCY: 000 (in case of fire)
Shire of Irwin: Community Ranger 0427 110 237
Administration 9927 0000

In the event of not being able to contact anyone on these numbers, please refer to the Permit Issuing Officers listed above.

Appendix 3: Vehicle Access Technical Requirements

TECHNICAL REQUIREMENTS	1 Public road	2 Cul-de-sac	3 Private driveway	4 Emergency access way	5 Fire service access routes
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal clearance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5
Maximum grade <50 metres	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum crossfall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius (m)	8.5	8.5	8.5	8.5	8.5
*Refer to E3.2 Public roads: Trafficable surface					

Land Capability and Geotechnical Assessment

LAND CAPABILITY and GEOTECHNICAL ASSESSMENT

LOTS 10, 15, 16 and 17, FRANCISCO ROAD, DONGARA

June 2005

Landform Research
Land Systems - Quarries - Environment
ABN 29 841 445 694

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1.0 INTRODUCTION

Dongara is a popular fishing, beach and holiday location, that is growing in popularity. The land north of Dongara is one of the areas that have been identified as suitable for a node of development.

The site (Lots 10, 15, 16 and 17) lies just inland from the coast, some 2 km north of Dongara.

Methodology

Lindsay Stephens of Landform Research visited the area on 13 April 2005 during which traverses were made across the site, the geology and soils were investigated and the vegetation communities noted. During that study the soils were mapped to confirm soil type or gain information on the soils, the geology, and hydrology.

The site was also investigated by ARC Energy as part of their assessment for a 3D Seismic Survey conducted in early 2005. The ARC Assessment was subjected to Public Environmental Review through the Environmental Protection Authority and covered, in particular, the environmental issues associated with that survey, particularly disruptions to soils an vegetation.

Soils have also previously been assessed as part of the Geraldton Region, Land Resources Survey, (Rogers, 1996).

Site Description

The site straddles a zone of coastal dunes extending from the coastal Quindalup Dunes to the older Tamala Dunes in the east.

The eastern part (Tamala) dunes are cleared and used for rural activities with the more hilly western dunes generally remaining covered by coastal vegetation.

2.0 EXISTING ENVIRONMENT

2.1 Geology and Geomorphology

The coast at this location consists of a series of old sand ridges ranging from those developed at various time in the Pleistocene and Recent. The oldest are the limestone ridges to the east of the Greenough Flats, well to the east of the study site.

The site straddles a portion of Pleistocene Tamala Limestone and soil system in the east which is an interdunal swale of degraded older dunes, and portion of the younger coastal Quindalup Dunes in the west, which rise some 20 to 30 metres above the eastern portion of the site. The eastern portion of the site is gently sloping dropping slightly from a low ridge along the eastern edge of the site towards the centre and to the eastern boundary.

The Older eastern Tamala dunes are part of an older coastal dune sequence of calcareous sands that has been lithified and weathered to form limestone with associated brown sands.

The dunes are formed from quartz or calcium carbonate in the form of shell fragments or foraminifer skeletons and marine organism skeletal remnants such as sponge spicules.

Superimposed on this older system of dunes is a younger set of dunes. The younger dunes parallel the pre existing dunes as a series of stabilised dunes formed at a time when the beach was accreting (having sand added to it).

Over time the calcium carbonate is dissolved leading to hardening of the underlying dunal materials and thus the older the dunes the more cemented and rock like the underlying sediments are. The "Tamala" Dunes along the eastern edge have limestone (calc-arenite) bases which can be seen protruding up through the soil on the low eastern ridge.

The dunes in the west are younger but are the oldest of the Quindalup system. They consist of brown coloured sands with variable amounts of silica and calcium carbonate. With exposure to the atmosphere, rainwater percolates down through the sands dissolving the calcium carbonate through the action of weak acids derived from organic matter and depositing the calcium carbonate lower in the profile. The deposition of the calcium carbonate forms cemented deposits in the base of these dunes.

Dune Stability

The lithified Tamala dunes and brown sands are underlain by limestone and are stable.

The Quindalup dunes are younger and less lithified and are therefore less stable than the Tamala dunes. The dune on the western side of the site is the oldest of the Quindalup Dune System and has therefore been stabilised by soil formation processes to be stable particularly in the swales. They are much more stable than new coastal sands being deposited at the rear of the current beaches, with the only areas of likely instability being the two high ridges in the south.

2.2 Soils

General information on the soil and land units can be found in Rogers, 1996.

Soils developed on the western Quindalup Dunes are sandy but have grey quartz rich surface horizons stained by organic matter. The age of the soils has an impact on the colour of the soils. The older the soils the more grey and brown they become, with the grey being due to accumulation of organic matter in the upper soil horizons and the brown due to goethite (a form of iron oxide) coating sand grains in older soils and originating from a break down of heavy minerals in the sands. A small amount of clay may also be present in the subsoils of older dunes due to a break down of feldspar grains.

As the Quindalup Dunes on site are the oldest of the system the sand is brown to cream brown sand containing minor clay and calcareous material, makes the soil stable. Existing tracks have cut down due to the impact of vehicles but have not eroded significantly.

The older Tamala system soils are brown sands grading to earthy sands and overlying limestone at variable depth. There has been little bleaching of the sand in the A horizon and minor accumulation of humus. In general the porous nature of the sand allows the humus to be broken down and clay to be washed down to lower levels in the soil profile.

Phosphate Retention

The goethite coatings of the sand grains in the older dunes has capability for absorbing phosphate, as does the calcium carbonate content of the soils.

Phosphate Retention Index (PRI) tests can frequently be misleading because all materials greater than 2 mm are sieved from the sample prior to testing. This means that a coarse sand for example will have the larger phosphate retaining particles removed from the sample prior to testing.

On the other hand the calcareous sand may have a better PRI, but in the field water movement may be so fast that the grains have little opportunity to adsorb nutrients.

Phosphate retention therefore cannot be considered in isolation, because the type of land use, type and placement of nutrients, flow paths and distances all contribute to variations in the behaviour of nutrients.

The phosphate retention (PRI) of the brown eastern Tamala System sands in the eastern half of the site is similar to Spearwood Sands which are rated at 5 - 20 during research by the Chemistry Centre. The soils on the eastern portion of the site would have similar PRI and the whole soil profile will be highly phosphate adsorption when the whole soil profile is taken into account and the flow paths of water are considered.

The soils western half consist of brown sands with variable composition of quartz or calcium carbonate in the form of shell fragments or foraminifer skeletons and marine organism skeletal remnants such as sponge spicules. The phosphate retention of soils such as this can normally vary from 2 - 5 (PRI) but can go higher when more lime is present. Sorption by calcareous soils is dominated by precipitation and sorption reactions with calcium carbonate and the formation and precipitation of minerals such as di-calcium phosphate, $CaHPO_4.2H_2O$.

Permeability and porosity of the soils is moderate to high, reduced slightly by non wetting and the small clay content, but microbial purification is high because of the depth of sand above the water table.

The generalised soil properties are summarised below.

Soil Characteristics	**Brown Sand over Limestone (Tamala)**	**Grey Coastal Sands over Limestone (Quindalup)**
Location	Eastern portion of site	Western portion of site
Topsoil Texture	Brown sand	Grey calcareous sand
Subsoil Texture	Brown medium grained silica sand that becomes earthy and loamy on the lower elevation	Light brown to cream medium grained silica and calcareous sand with up to 80% calcareous sand grains.
Stone	Low apart from some patches of weathered weakly lithified limestone that occurs on the ridge in the east	Nil
Depth to Bedrock	Limestone (calc-arenite) from 1 to perhaps 5 metres	Weakly lithified limestone is possibly present to depths greater than 10 metres
Hardpan	No evidence in the soils apart from underlying limestone and some compaction effects in the more loamy soils	No evidence in the soils
pH	Neutral to alkaline	Alkaline
Salinity	Low	Low

Soil Permeability	High	High
Soil Shrinkage	Very low	Minor compaction possible

Land Qualities	**Brown Sand over Limestone (Tamala)**	**Grey Coastal Sands over Limestone (Quindalup)**
Slope	Gentle to moderate on localised dune slopes	Gentle to steep localised dune slopes
Slope Stability	High	Moderate. There are two ridge areas that have potentially unstable soils but the remainder have brown sands that are relatively stable
Rock/Gravel	Present on ridge in the east	Not obvious but may be present as weakly lithified limestone generally below 500 mm
Wind Erosion Risk	Moderate to high if the vegetation is removed and the soils are exposed to wind	Moderate to high if the vegetation is removed and the soils are exposed to wind. There are two potentially unstable areas on steeper ridges.
Water Erosion Risk	Low, but as the sands can be non wetting summer storm events can cause minor water erosion rills on sloping dune sands that have no vegetation cover. The extent of this is minimal.	Low, but as the sands can be non wetting summer storm events can cause water erosion rills on steeply sloping dune sands that have no vegetation cover. The extent of this is minimal.
Drainage	Rapid to water table	Rapid to water table
Moisture Availability	Moderate to low	Low
Water Logging	Nil	Nil
Wetability	Moderate to high. Non wetting behaviour depending on the season	Moderate to low. Non wetting behaviour depending on the season
Flood Risk	Nil	Nil
Surface Water - Availability/Quality	Nil	Nil
Ground Water - Availability/Quality	Groundwater is present at about 3.0 metres below the lowest elevation. Quality varies from 1925 mg/L to 3 575 mg/L	Groundwater is present at about 3.0 metres below the lowest elevation. Quality varies from 1925 mg/L to 3 575 mg/L
Salinity Risk	Nil	Nil
Microbial Purification	High based on the depths of sand and depth to the water table. Higher elevations have longer travel distances and therefore better purification ability.	High based on the depths of calcareous sand and depth to the water table. Higher elevations have longer travel distances and therefore better purification ability.
Water Pollution Risk	Moderate. Design and management can reduce the potential for water pollution risk	Moderate. Design and management can reduce the potential for water pollution risk
Soil Profile; Phosphate absorption	High based on the proportion of calcium carbonate, minor clay, sesquioxides, porosity and permeability and distance of water travel.	Moderate based on the proportion of the calcium carbonate depth of soils, travel distances, porosity and permeability Can be improved by use of an alternative waste water treatment system.
Soil Profile; Nitrogen Removal	High based on the travel distances	Moderate based on the travel distances. Can be improved by use of an alternative waste water treatment system.
Degradation	Low, but cleared	Low, uncleared apart from strategic fire breaks.

2.3 Climate

Weather data is recorded at the Geraldton Airport which is slightly inland. Onsite temperatures can therefore be expected to have slightly lower summer maxima and slightly higher winter minima than Geraldton.

Geraldton averages show maxima of 32 degrees C. in summer, down to an average of 19 degrees C. in winter. Minima range from 18 degrees C. to 9 degrees C.

Rainfall averages 472 min per annum at Geraldton and 462 at Dongara.

9.00 am wind data shows a predominantly east to south east direction in summer and lighter north easterly directions in winter. At 3.00 pm there is a predominance of south westerly sea breezes which exceed 30 km/h for over 30% of the time. Strong northerly winds can occur ahead of cold fronts in autumn to spring and can be significant but short term events.

Swell directions are predominantly from the south west with storms from the north west in winter and occasional cyclonic storms from the decaying remnants of cyclones in late summer.

2.4 Vegetation

The vegetation was assessed briefly on 13 April 2005.

The eastern half of the site is cleared apart from *Acacia rostelfifera* regrowth that is now coming back on the limestone ridge.

The western portion has been previously cleared in the swales for grazing but is regrowing strongly as *Acacia rostellifera* Thicket. The tops of the ridges and the steeper slopes have largely been uncleared although grazed in the past. They are also regrowing.

The vegetation is dominated by *Acacia rostellifera* Ticket.
The species are typical of the older Quindalup Dunes, grading to more coastal species towards the west .

Common Species are;

Acacia rostellifera predominates, particularly in regrowth over previously cleared areas.

Additional species generally as understorey include *Acacia cyclops, Acanthocarpus praise, Alyxia buxifolia, Anthoceris littorea, Atriplex cinerea, Atriplex isatidea, Beyeria viscosa, Nitraria billardierei, Olearia axillaris, Rhagodia baccata, Desmocladus flexuosa, Leucopogon parviflorus, Cassytha racemosa, Alyogyne* spp, *Exocarpus sparteus, Tetragonia decumbens, Dianella divaricata, Westringia dampieri,* some *Melaleuca systena and Templetonia retusa.* Some *Melaleuca huegelii* is added to the communities of the ridge tops.

Eucalyptus decipiens occurs on site in scattered locations, and one plant *of Eucalyptus obtusifolia* was observed in the north.

A stable swale area in the north has a stand of *Melaleuca lanceolata* that is worthy of preservation.

Towards the coast the vegetation remains predominantly *Acacia rostellifera* Thicket but more coastal species are added to the communities with a higher component of *Spinifex longifolius, Myoporum insulare, Scaevola crassifolia , Acanthocarpus preissi Olearia axillaris, Carpobrotus virescens, Alyxia buxifolia, Anthoceris littorea, Salsola kali, Atriplex cinerea, Atriplex isatidea, Beyeria viscosa, Cassytha racemosa Exocarpus sparteus, Leucopogon parviflorus, Ozothamnus cordatus, Ficina nodosa, Dianella divaricata Scaevola anchusifolia, Nitraria billardierei, Rhagodia baccata* and *Tetragonia decumbens*.

Rare and Priority Species

It was the wrong time of year to search for Rare or Priority species, and a definitive search was therefore not possible. However the chances of recording any Priority or Declared species in these coastal vegetation communities is low because the species are widespread and common.

ARC Energy investigated the Declared Rare and Priority Species and made a list of the species likely to occur within their seismic area which covered the subject land, but also included large areas of land to the south of Dongara and different inland soil types. The Declared Rare and Priority species are listed in Table 4.14 of their report. None of the species is likely to occur in coastal dunes.

Therefore there is regarded to be a very low chance of there being any Declared Rare and Priority Species occurring on the subject land.

Dieback

CALM generally recognises that Dieback is less likely to impact on vegetation on limestone and Spearwood/Cottesloe Land Systems, Podger F D and K R Vear, 1998, *Management of Phytophthora and disease caused by it*, IN *Phytophthora cinnamomi* and the disease caused by it - protocol for identifying protectable areas and their priority for management, EPA 2000.

There are, however, other plant diseases caused by fungus such as *Armillaria* that can cause dieback symptoms.

No evidence of significant plant diseases was observed during the brief traverses.

Vegetation Condition

The vegetation of the majority of the western portion of the site appears to have been cleared in the swales and or significantly grazed. It is however regrowing as *Acacia rostellifera* Regrowth Thicket. Its condition ranges from small areas of Completely Degraded to Degraded - Good.

The vegetation condition is improving as stock remain excluded from the vegetation

The small high ridges in the south east are covered by vegetation in better condition, probably because of the steeper slopes. This vegetation appears to range from locally Degraded to Very Good with the majority above Good. The condition scale is taken from Bush Forever 2000.

2.5 Surface and Groundwater

There is no surface drainage on the site with all infiltration moving vertically downwards to the water table.

Two bores are located on site with water available at 14 metres depth in the north and 6.5 metres in the south, making the water table at about 2 metres AHD.

These bores are associated with the cleared land. The water quality is 2475 mg/L in the north and 1705 mg/L in the south. The water is suitable for stock and some more hardy plants but is not generally suited to horticulture.

The quality was apparently better in the past and may have decreased due to reduced rainfall in recent years or mixing with a more saline water body, perhaps by general overpumping in the Dongara area.

The quality is, however, well suited to stock on small rural holdings.

3.0 HYDROLOGICAL ASSESSMENT - WATER AVAILABILITY

Bore water on site is suitable for stock but is not potable.

Potable water can therefore be provided by scheme water, tanks or desalination and/or bore water combined with a UV steriliser.

4.0 ALTERNATIVE LANDUSES

The site is adjacent to special rural lots and the eastern portion of the site is well suited to that purpose. The western area of higher dunes is suited to rural residential whilst retaining the significant amounts of vegetation to maintain soil cover and managing the fire risk

Alternatively the site is suited to urban development on smaller lots and is no different to many areas that have been developed in coastal towns. The same vegetation community is retained on the coastal reserve.

The Local Planning Strategy has identified Lot 10 as suitable for rural residential with the balance being urban.

Some management of the less stable soils and steeper slopes is recommended.

5.0 GEOTECHNICAL FACTORS

5.1 Foundation Stability

The eastern area is deep silica sand over limestone. These soils provide good foundation stability. According to AS 2870, Site Class A to S would probably apply to the silica sands. Site Class P will apply when slopes require > 800 mm sand fill, particularly on filled sites where differential levels of fill are required or a section of dwelling is located on limestone.

There are however situations on the limestone ridge where some care needs to be taken. See points 5 and 6 below.

The western portion of he site is underlain by calcareous coastal dunes which include some steeper slopes. This can raise some foundation issues that can be addressed at the time of dwelling construction. Constructions on these sands will vary from AS 2870 Site Class S to P. Site Class P will apply when slopes require > 800 mm sand fill, particularly on filled sites where differential levels of fill are required or a section of dwelling is located on limestone after cut.

The main issues with foundation stability on the calcareous sands are;

1. Calcium carbonate sands can crush or settle under load. For example where one corner of a dwelling is located on limestone at shallow depth and another corner is located on calcareous sand fill.

2. Calcium carbonate can dissolve in acidic garden conditions or acidic waste water conditions.

3. Underlying limestone may be less competent.

4. Earthworks should be sympathetic to any potential to destabilise sand. For example roads and paths should be located in areas where wind erosion is less likely and or the verges, revegetated or covered to minimise the risks.

5. There is potential for a dwelling on a concrete slab to be located with one portion of the slab located on limestone, with less potential for settlement, and other portions of the slab on calcareous sands which can settle. This might lead to differential settlement of the slab and the potential for cracking.

6. Calcareous sands can be non wetting and need to be treated appropriately to ensure adequate compaction.

7. When levelling a dune ridge for construction the original part of the dune is potentially more competent and compacted than the fill area, which should be filled and compacted and tested to ensure adequate compaction and a lack of potential for differential settling.

8. Undermining of footings during strong wind events or storms. There is also the risk of local undermining of isolated piers such as a carport through excessive stormwater from roof drainage. This should be managed by sympathetic disposal of stormwater away from the footings and maintaining good groundcover at all times.

Management Actions that may be used to improve foundation stability could include management of the points above and following.

Other techniques that can be of assistance are

- Provide retaining walls and structures for fill.
- Retain shrubs and deeper rooted vegetation on slopes.
- Consider the use of flexible or split level structures

- Design for lateral creep pressures on slopes.
- Ensure adequate compaction of all areas and to depth.
- Use rows of piers or strip footings orientated up slope on sloping ground.
- Minimise the potential for acidic water loading of footings.
- Prevent undermining and removal of sand from around or from under constructions, particularly on exposed steeper slopes in the western portion.

	GEOTECHNICAL ISSUE	MANAGEMENT
5.1.1	Foundation stability	• See the above Management Actions for some methods of reducing potential foundation limitations on calcareous soils and dune ridges. • Each dwelling site will need to be individually assessed at the time of design and construction to determine any potentially deleterious conditions and to incorporate methods to mitigate them. • AS 2870 Site Class S - P depending on the location of the potential dwelling from a low sand swale to a steep calcareous sand ridge. • The adequate ground cover is recommended to minimise the risk of undermining structures.

- Site Class P may apply. For example constructions requiring more than 400 mm natural fill and/or 800 mm sand should be classified as Site Class P to ensure adequate compaction to prevent differential settling.
- Individual site assessment may be required for any dwelling or development because of lateral and vertical soil changes that may be present and because of previous soil disturbance that cannot be detected by visual assessment.

5.2 Drainage and Flood Risk

Almost the whole site is well drained with no risk of inundation or flooding. The exception is a small area in the central south where heavy rainfall can cause pools of water on the surface for a short time.

	GEOTECHNICAL ISSUE	MANAGEMENT
5.2.1	Inundation	• Some consideration of surface water may need to be made in the area marked on the aerial photograph. This can be through drainage or fill.
5.2.2	Flood risk	• No issues.

5.3 Capability for On Site Effluent Disposal

The critical issues in the design and placement of effluent disposal systems is to ensure adequate microbial purification and adequate protection from bores. The soils are very permeable.

Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974, require 1.2 metres of free draining soil under a waste water disposal system and a location not closer than 30 metres to a bore. Normal practice is to allow 5 metres of sand travel for adequate microbial purification.

The separation distances between the water table, at about 2.0 metres AHD, is 4 - 5 metres at the small low point on the site in the central south. The separation then increases to 8 metres in the east and to over 35 metres in the west. This would comply for lot sizes down to 2 000 m^2. Smaller lot sizes in the future would require connection to sewerage.

There are only two bores, and waste water systems can be located over 30 metres from any bore. This would particularly apply to any bore used for a domestic supply. Water from such a bore that is closer than 30 metres could be sterilised using an in line UV steriliser.

Under land systems such as this the main nutrient loss is nitrate, with phosphorous being taken up by the iron oxides and calcium carbonate in the calcareous sands and basal limestone. This is discussed in 2.2 Soils.

The soils comply with the Government Country Sewerage Policy, the Health Act Regulations (1974) and Health Department Guidelines for the installation of both conventional septic systems and, alternative waste water systems and the Greywater Disposal Guidelines.

	GEOTECHNICAL ISSUE	MANAGEMENT
5.3.1	Site Capability for Effluent Disposal	• Conventional septic systems or alternative waste water systems are acceptable and comply with the Health Regulations 1974 and the Country Sewerage Policy. • Alternative effluent system disposal areas are to be sized at 10L/m^2 . • Appropriate setbacks are recommended from domestic bores of at least 30 metres.

5.4 Landslip Risk

Whilst the steeper slopes are sandy they are more susceptible to having structures undermined by wind if unprotected rather than slippage. Undermining could lead to unacceptable movements if allowed to occur. The only risk to structures is from foundation stability.

	GEOTECHNICAL ISSUE	MANAGEMENT
5.4.1	Landslip Risk	• Covered by the considerations in 5.1 Foundation stability.

6.0 ENVIRONMENTAL MANAGEMENT

The following items are identified as the most likely to impact on the environment. These items can be managed by the implementation of the management recommendations. Other items are unlikely to impact or the impact is regarded as small.

6.1 Aesthetics

The aesthetics depend on the level of visibility that can be obtained of dwellings and other developments, particularly from the beach, Brand Highway and other dwellings. The use of Lot 10 for rural residential will provide a buffer to Brand Highway.

The site has setbacks and reserve land separating it from the beach. It is unlikely that few dwellings will be able to be seen from ground level from the beach because of coastal dunes and vegetation, even though the dwellings may well have ocean views. Some may be able to be seen from the ocean.

The low ridge in the east protects a significant portion of the site from Brand Highway. In addition trees are normally planted on smaller rural lots and lifestyle lots. Retention of vegetation in the west can be addressed as part of the subdivision approval process.

The colour, height and style of dwellings and other structures should be visually compatible with the area and to this end developments should be coloured, painted or colour bond sheeting used where applicable. The use of grey galvanised or zinc/alum sheeting should be avoided unless as an integral part of a development such as a roof on a "country style" home or shielded from key sight lines.

	ENVIRONMENTAL ISSUE	MANAGEMENT
6.1.1	Remnant vegetation	• The identification of areas of vegetation to be retained can be established as part of the subdivision approval process. • The eastern portion of the site is cleared and all the swale areas on the western half were previously cleared and are now occupied by regrowing *Acacia rostellifera* Thicket. • Dongara townsite is growing and the subject land is a logical extension of urban and rural living lots to the south.
6.1.2	Dwellings, fences and other developments are to be aesthetically compatible with the area.	• The Shire of Irwin can place restrictions on the use of visually non compatible materials at the time of Development Approval. • Appropriate conditions can be placed during the Subdivision approval process.

6.2 Preservation of Agricultural Land

The western half is substandard agricultural land only suited to grazing in the swales. The cleared land in the east is cropping and grazing land, but is dissected by the limestone ridge. A portion was used for horticulture in the past but the bore water has become brackish to the point where it is not suitable for sensitive crops.

The amount of agricultural land that will be lost is small and offset by an extension to the Dongara townsite.

	ENVIRONMENTAL ISSUE	MANAGEMENT
6.2.1	Protection of agricultural land	• A small area of agricultural land will be impacted on.

6.3 Land Use Buffers

As the use of the site is proposed to be rural living, and possibly for future urban development, no particular buffers are required, The land adjoins reserve land and is bordered on the east by the Brand Highway.

The buffer to the coast is a minimum of 450 metres at its closest point. Management actions are suggested to minimise impacts on the coastal reserves in 6.8 Stormwater, Erosion Potential and Soil Management. It is suggested that the western boundaries of lots be fenced and that there only be one permitted and defined track to the beach from the subject land. Uncontrolled access could lead to destabilisation of some coastal reserve land.

The other potential issue is the dumping of garden waste over the back fences. This can lead to significant weed issues, but is little different to other areas. The best means of managing this is to have a hard paved surface separating the lots from the coastal reserves. This tends to discourage the dumping of weeds and provides a better opportunity for management, including access.

A hard surface track along the western boundary will also provide fire access.

	ENVIRONMENTAL ISSUE	MANAGEMENT
6.3.1	Rural land	• No particular buffers are required.
6.3.2	Buffers to Agriculture	• Buffered by reserve land and Brand Highway.
6.3.3	Buffers to Coast	• Buffered by reserve land, fences and defined pathways. • See recommendations in 6.8 Stormwater, Erosion Potential and Soil Management.

6.4 Flora and Fauna

Flora

The vegetation was assessed briefly on 13 April 2005.

The eastern half of the site is cleared apart from *Acacia rostelfifera* regrowth that is now coming back on the limestone ridge. This has minimal to generally no understorey species.

The western portion has been previously cleared in the swales for grazing but is regrowing strongly as *Acacia rostellifera* Thicket. The tops of the ridges and the steeper slopes have largely been uncleared although grazed in the past. They are also regrowing.

The vegetation of the western portion is dominated by *Acacia rostellifera* Thicket as discussed in 2.4 Vegetation. The same vegetation communities occur along much of the Western Australian coastal dunes and is generally well reserved.

The species are typical of the older Quindalup Dunes, grading to more coastal species towards the west.

ARC Energy investigated the Declared Rare and Priority Species and made a list of the species likely to occur within their seismic area which covered the subject land, but also included large areas of land to the south of Dongara and different inland soil types. The Declared Rare and Priority species are listed in Table 4.14 of their report. None of the species is likely to occur in coastal dunes and therefore none are expected to occur on site.

Fauna

The fauna was not assessed and is related to habitat. The more remnant vegetation remaining the greater the amount and chances of fauna. The adjoining land to the west and south are reserves, Reserve 25581, 23600 and 45038.

The best means of minimising impact on fauna is to retain habitat and minimise disruptions to fauna usage by fences and tracks. However the site is a logical extension of the Dongara townsite and this has to be balanced against the need for urban and rural living properties and town expansion.

The amount of habitat to be retained will be determined as part of the subdivision approval process.

	ENVIRONMENTAL ISSUE	MANAGEMENT
6.4.1	Flora	• Some remnant vegetation to link the existing reserves to the north and west and the remnant vegetation along the eastern boundary is desirable. • Fire breaks and fuel reduction zones will apply to the western edge of the site and could be formed on existing cleared/slashed areas and existing tracks. This can be determined as part of a Fire Management Plan to be prepared. • Onsite firebreaks could be located in already cleared or disturbed areas and existing tracks. • The better vegetation on the steeper south eastern corner could be considered when allocating public open space. • The same vegetation community is retained in the coastal reserve.
6.4.2	Fauna	• Fauna depends on the retention of habitat and providing habitat linkages and corridors. See 6.5.1 above.

6.5 Nutrient Management

The main issues with nutrient impacts is from waste water disposal and the potential for increased nutrients on the cleared land of the eastern half.

Phosphorous is the main nutrient implicated in algal blooms in waterways. Nitrates are normally taken up by vegetation, denitrified by bacteria under anoxic soil conditions or lost through volatilisation of ammonia. Microbial material is normally deactivated by soil micro-organisms.

Phosphorous will be taken up by the iron oxides and calcium carbonate in the calcareous sands and basal limestone. The soils of the site are coloured sands over limestone which together have sufficient phosphate retention capability to minimise phosphorous export. Sorption by calcareous soils is dominated by precipitation and sorption reactions with calcium carbonate and the formation and precipitation of minerals such as di-calcium phosphate, $CaHPO_4.2H_2O$.

Nitrogen and microbial material are dealt with during travel through the subsoils.

The depth to groundwater is a minimum of 4 - 5 metres in a small area in the central south with the majority of the site having a separation of 5 to 15 metres in the eastern half and 15 plus metres in the western half.

Phosphate Retention Index (PRI) is a measure of the potential adsorption of phosphorous by soils. At a low PRI of 2 each cubic metre of soils and limestone can adsorb 3.0 kg phosphorous. At a PRI of 5 the potential adsorption is 12 kg. This provides for substantial adsorption capability for the soils, even at the lowest PRI.

A typical septic system loses at least half the nitrogen through denitrification in the two tanks. This brings the concentration down to 10 - 40 mg/L. Conventional septic systems release 5 - 6 kg phosphorous per year. As such all the phosphorous will be adsorbed within 1 metre of a standard dual 9 metre leach drain system for a period of 33 years at a soil PRI of 2.

Further denitrification occurs in moist sands in the presence of organic matter. Therefore it is also unlikely that nitrogen will either reach the coast or reach it in significant concentrations.

Considering the travel distances to the water table and coast it is most unlikely that phosphorous will be exported to the marine environment, or the concentration will be below significant levels. The closest corner of the site to the ocean is 450 metres and the majority of the site is 10 to 15 plus metres to the water table.

On reaching the coast there will be additional very large dilution by the ocean.

Change of landuse

The eastern portion of the site is currently used for broad acre cropping and grazing.

With a current average stocking rate on the eastern half of 5 DSE, the estimated nutrient loading when fully stocked with sheep or equivalent numbers of stock could be 53 kg/N/ha/year and 7.3 kg/P/ha/year.

The use of nutrients on broad acre crops is not dissimilar to these levels, but will vary depending on the existing nutrient status of the soils and the type of crop grown, for example if a legume or green manure crop had been used in rotation and if stubble is retained. Phosphorous rates could be 10 - 30 kg P/ha (20 kg requires 220 kg superphosphate). Nitrogen requirements can be 100 to 200 kg/ha depending on the quality and protein content of the cereal crop. These fertiliser application rates are discounted for stubble retained (eg 40 kgN), and the existing retained soil levels from past cropping, and thus the actual application rates can be substantially less, particularly in the case of nitrogen.

Lantzke and Summers, 2005, state that the measured nutrient inputs for various land uses near Bunbury for cereal cropping was 30 kg/N/ha/year and 30 kg/P/ha/year.

With rural living the behaviours of nutrients is influenced by denitrification, volatilisation of ammonia, recycling, uptake by vegetation and phosphate absorption by sesqui-oxides.

To gain some idea of nutrient changes a typical conventional septic system releases 5.5 kg P year and 18 kg N/year. However allowing for six chickens, a dog and cat and a 250 m^2 area of fertilised gardens, a further loading of 12.3 kg N/year and 5.2 kg P/year can be added for the dwelling area. (Data from Select Committee on Metropolitan Development and Groundwater Supplies, Legislative Assembly 1994 and Nitrate management in the Jandakot UWPCA, Dames and Moore, undated).

One horse is estimated at 60 kg/N/year and 11 Kg/P/year, and one sheep 10.06 kg/N/year and 1.47 Kg/P/year. Data for cattle from Select Committee on Metropolitan Development and Groundwater Supplies shows cattle as 57.4 kg/N/year and 17.6 kg/P/year. The value for phosphorous may be too high for cattle not fed introduced feed.

Data for typical land uses listed below, which might be used at some stage in the future, show that overall nutrient loading is unlikely to rise with changes in land use, and with continued grazing there will also be no change.

For the western areas covered by remnant vegetation the inputs are likely to be less because a substantial portion of the existing vegetation is likely to be retained and stock reduced or excluded. For example a horse can release double the phosphorous of a conventional septic tank and three times the nitrogen when fed introduced feed. This is normally spread across paddocks but can be concentrated at a point source when a horse is stabled.

For smaller or urban lot sizes stock are normally removed, sewerage is provided and therefore the input rates of nutrients reduce.

Typical nutrient loadings of some land uses

Possible lot size and activity	Nitrogen loading per hectare	Phosphorous loading per hectare	Likely nutrient scenario
Estimated average current stocking rate over the whole property 5 DSE per hectare	53 kg/N/ha/year	7.3 kg/P/ha/year	Possible nutrient loss through washing of dung down slope during waterlogged conditions and during storms.
Cereal cropping	30 kg/N/ha/year	30 kg/P/ha/year	
2 hectare rural residential property, conventional septic system, garden, dog and cat as listed above and 1 horse	45.2 kg/N/ha/year	10.9 kg/P/ha/year	Unlikely to be nutrient export when correctly established.
0.5 hectare rural residential property, conventional septic system, no stock, but garden and dog and cat as listed above	60.6 kg/N/ha/year	21.4 kg/P/ha/year	Unlikely to be nutrient export when correctly established.

0.1 hectare urban lot with reticulated sewerage, 250 m^2 high nutrient garden and 50% of lots having a dog and cat as listed above	60.0 kg/N/ha/year	27.0 kg/P/ha/year	Unlikely to be nutrient export when correctly established.

	ENVIRONMENTAL ISSUE	MANAGEMENT
6.5.1	Effluent disposal	• Interpretations of the groundwater movement, input of nutrients and soils suggest that it is unlikely that there will be any or minimal export of phosphorous or nitrogen to the coast. Any concentrations arriving there are likely to be insignificant and readily diluted by sea water.

6.6 Salinity

There is no evidence of salinity on site and, with the free draining soils, salinity is not regarded as a significant issue.

	ENVIRONMENTAL ISSUE	MANAGEMENT
6.6.1	Salinity	• Unlikely to be any significant changes to the current regime.

6.7 Stormwater, Erosion Potential and Soil Management

The potential for wind erosion of the site is high in soils such as this.

Potential water erosion is minimal and confined to storm events when the soils are non wetting.

Some site conditions and management activities that will minimise the potential for wind erosion and prevent further dune degradation are;

- Constructing roads, fences and firebreaks in locations which are less likely to lead to soil erosion.
- The swales of the western areas have lower wind erosion risk. The two high sand ridges shown on the attached aerial photograph have higher risk and may require additional management.
- Existing roads in coastal areas such as Mulloway and Red Emperor Drive at Flat Rocks in the Greenough Shire demonstrate that construction of access is possible without leading to soil erosion.
- Unnecessary tracks can be closed with the exception of one track to allow public access to the beach.
- The access track to the coast should be defined by fencing, poles or some other mechanism where it is likely that the track will be breached or additional tracks formed.
- A perimeter fence along the lots, particularly in the west will minimise the incursions into the coastal vegetation.
- Some remnant vegetation on the remainder of the western portion of the site can be incorporated into the subdivision design.

- Firebreaks should be strategic and consist of low fuel zones through slashing rather than removal of vegetation.

	ENVIRONMENTAL ISSUE	MANAGEMENT
6.7.1	Water erosion	• Runoff from roads is to the sand along the verges and drainage detention basins.
6.7.2	Wind erosion	• The management actions listed in the dot points above will be implemented. No special recommendations required.

6.9 Fire Control

Fire Control falls under the Bush Fires Control Act (as amended) and the Shire of Irwin.

The remnant vegetation will pose a High risk, and fuel reduction zones between the vegetation and dwellings will be required.

The main issues with fire management are the reduction in fuel by slashing to minimise the potential for soil erosion.

A condition of subdivision could be for a tank holding at least 10 000 litres or a rainwater tank to at all times, or a standpipe facility to be available for fire fighting

	ENVIRONMENTAL ISSUE	MANAGEMENT
6.9.1	Fire Risk	• Dwellings could have adequate Building Protection Zones and be protected by a strategic fire break and/or fuel reduction zones. • Access and fire management could be discussed with the relevant fire control officer and addressed in a Fire Management Plan. • Guidelines in Planning for Bush Fire Protection, 2001 (FESA and DPI) and Shire of Irwin can be implemented. • Provision of an emergency water supply is possible either through standpipe or similar mechanism or agreed to by the proponent and can be a condition of development or subdivision.

7.0 CONCLUSIONS

The proposed development of Lots 10, 15, 16 and 17 Francisco Road, Dongara to rural residential or conventional residential development is sustainable.

The amount of land removed from agricultural production is small. Some vegetation in the west will require clearing, but this is typical coastal vegetation of which a substantial portion was previously cleared and is now regrowing to *Acacia rostellifera* Thicket.

Previous studies suggest that there are unlikely to be any Declared Rare or Priority species likely to be present. The coastal vegetation is common all along the coast and its taking of portion of an area such as this must be weighed against the planning consideration for the potential future expansion of the Dongara Townsite, this being the next closest land to the existing townsite.

The potential for nutrient export is assessed to be low either from rural living, special rural or urban lots.

The proposed subdivision is set well back from the coast at a minimum of 450 metres and is not likely to have significant impact on the coast, and may provide an opportunity to manage uncontrolled coastal access.

The use of Lot 10 for rural residential will provide a visual buffer between urban land and the Brand Highway.

There are no significant reasons why Lots 10, 15, 16 and 17 Francisco Road, Dongara cannot be rezoned to rural residential or at some point in the future, an expansion of the urban townsite.

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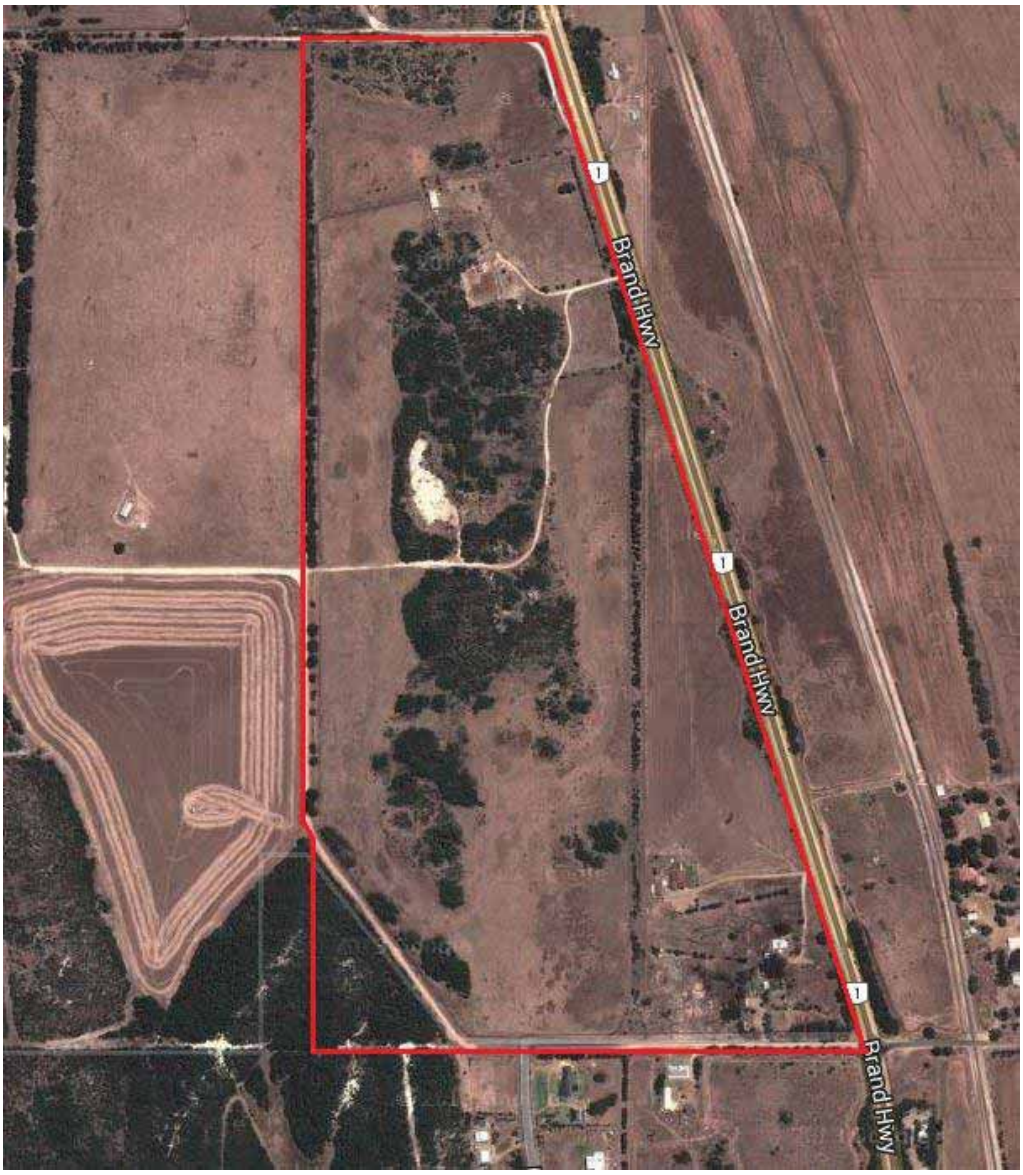
Local Water Management Strategy

LOCAL WATER MANAGEMENT STRATEGY

for the proposed subdivision of:

Lots 4, 5 & 10 Francisco Road, Bonniefield



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1 EXECUTIVE SUMMARY

The owners of Lots 4, 5 and 10 located on the corner of Brand Highway and Francisco Road, Bonniefield (located in the Shire of Irwin) have instructed Civil Technology to prepare a Local Water Management Strategy (LWMS) for a proposed Structure Plan prepared by CLE Town Planners and Design (refered to on the Structure Plan as a "Development Concept Plan").

This LWMS has been prepared for the purpose of being submitted together with the proposed structure plan in accordance to clause 5.35.6.1 (f) viii of Amendment 15 of the Shire of Irwin Town Planning Scheme No. 5 which requires that a proposed structure plan should include a written report addressing the urban water management of the land the subject of the proposed structure plan.

The existing water environment involves stormwater discharging into the surrounding environment. Due to the topography of the site, stormwater flows to the west and east of the site and discharges into adjacent land.

This LWMS outlines the proposed approach in implementing a drainage design if development were to proceed in accordance with the structure plan and establishing that this can be done without any adverse impacts to the existing local water environments.

It is proposed that stormwater be transported to four discharge points via vegetated road side swales. This is to encourage ground infiltration of the stormwater runoff enroute to the discharge points enabling distributed groundwater recharge over the site.

As the topography of the site need not be altered to any great degree as part of any development, the location of the post development stormwater discharge points are identical to that of the pre development condition with similar flow rates. Due to potable water reticulation being able to be provided by the Water Corporation, which will reduce reliance on groundwater extraction, and coupled together with the stormwater hierachy being maintained, impacts on the groundwater environment are likely to be negligable.

This LWMS demostrates that there will be no adverse impacts on the environment as a result of implementing the subdisvion of the proposed structure plan.

2 INTRODUCTION

2.1 Subject Site Description

The subject site is located in Bonniefield, 3 km north of the Dongara town centre, within the Shire of Irwin.

The site is bounded by Brand Highway to the east and local reserves to the south and west. The Indian Ocean is only approximately 1.5km away from the site boundary to the west. The locality of the site is shown in Figure 1.

The north boundary consists of General Farming lots while south boundary comprises Francisco Road and a conservation area. A small rural residential subdivision with lot sizes that range from 1 to 4 hectares is located directly south of the site along Brennand Road. Figure 2 shows a close-up of the subject site.

Total site is approximately 57 hectares in total area and consists of the following lots:

- Lot 4 Francisco Road, Bonniefield (Area 2.4103ha)
- Lot 5 Brand Highway, Bonniefield (Area 8.5761ha)
- Lot 10 Francisco Road, Bonniefield (Area 48.245ha)

Each of these lots has an existing dwelling or structure.

2.2 Design Objectives

Total water cycle management, also referred to as integrated water cycle management, 'recognises that water supply, stormwater and sewage services are interrelated components of catchment systems and therefore must be dealt with using a holistic water management approach that reflects the principles of ecological sustainability' (Stormwater Management Manual for Western Australia, 2004-07, DoW).

The State planning policy 2.9: Water resources (WAPC, 2004), outlines the key principles of integrated water cycle management as:

- Consideration of all water resources, including wastewater in water planning;

- Integration of water and land use planning;

- The sustainable and equitable use of all water sources, having consideration of the needs of all water users, including the community, industry and the environment;

- Integration of human water use and natural water processes; and

- A whole of catchment integration of natural resource use and management.

The principles and objectives for managing urban water as stated in the Stormwater management manual for Western Australia (DoW, 2004-2007) are as follows:

- **Water quality**: to maintain or improve the surface and groundwater quality within the Development Areas relative to pre-development conditions.

- **Water quantity**: to maintain the total water cycle balance within the Development Areas relative to the predevelopment conditions.

- **Water conservation**: to maximise the reuse of stormwater.

- **Ecosystem health**: to retain natural drainage systems and protect ecosystem health.

- **Economic viability**: to implement stormwater management systems that are economically viable in the long term.

- **Public health**: to minimise the public risk, including risk from injury or loss of life, to the community.

- **Protection of property**: to protect the built environment from flooding and waterlogging.

- **Social values**: to ensure that social, aesthetic and cultural values are recognised and maintained when managing stormwater.

- **Development**: to ensure the delivery of best practice stormwater management through planning and development of high quality developed areas in accordance with sustainability and precautionary principles.

2.3 Planning Background

The owners propose to subdivide the land into residential lots ranging in size from approximately 0.4ha to 1.4ha each.

The site was previously zoned “General Farming” under the Shire of Irwin’s Local Planning Scheme No. 5, and on 18th June 2013 was rezoned to “Development” as per Amendment No. 15 of the Shire of Irwin Town Planning Scheme No. 5.

2.4 Previous Studies

The following studies have been carried out in relation to the subject site. Most have been conducted as desktop studies and outline the necessary elements required to support the application for the recent successful rezoning of the land to support subdivisional development. These include the following:

Land Capability and Geotechnical Assessment: Lots 10, 15, 16 and 17 Francisco Road, Dongara (June 2005). This report, prepared by Landform Research, covers various aspects of the existing environment including Geology and Geomorphology, water availability, alternative land uses, geotechnical factors, and environmental management.

Francisco Road Proposed Rezoning - Desktop Preliminary Engineering Services Review, Revision 3 (June 2012) was prepared by AECOM Australia, Geraldton office. The desktop study briefly addressed aspects of the larger subject site (including Lots 1409 Brand Highway, and Lots 15, 16 and 17 Francisco Road, Bonniefield) dealing with Earthworks and Topography, Drainage and Groundwater, Water Supply, Sewer, Power, Gas and Telecommunications.

Bushfire Management Plan: Francisco Road, Dongara (October 2013) was prepared by York Gum Services on behalf of the developer and addresses the bushfire risk and threat and an action plan.

3 PROPOSED DEVELOPMENT

3.1 Zoning and Structure Plan

A proposed structure plan has been prepared by CLE (see figure 3) and which is the subject of this Local Water Management Strategy (LWMS). This LWMS deals with the following land:

- Lot 4 Francisco Road, Bonniefield (Area 2.4103ha)
- Lot 5 Brand Highway, Bonniefield (Area 8.5761ha)
- Lot 10 Francisco Road, Bonniefield (Area 48.245ha)

The revised Structure Plan was lodged together with the application for rezoning from "General Farming" to "Development" as per The Shire of Irwin's Town Planning Scheme No. 5, Amendment No. 15. The structure plan is yet to be formally adopted by the shire under the provisions of Amendment 15.

3.2 Existing Land Use

An examination of aerial photos (Figure 4) clearly indicates how the site has been extensively cleared and used for various rural / agricultural pursuits, namely cropping and grazing of livestock. Furthermore, each of the lots contains residential dwellings and associated outbuildings.

The aerial photos clearly depict the unmade road reserves and various driveways and tracks that traverse the landholdings.

3.3 Landscaping

As per the Structure Plan, it is proposed to have an adequate amount of landscaping elements incorporated into the design. Although there is no requirement to provide public open space within Rural Residential type subdivisions, the conical hill / landscape feature on the southern boundary is proposed to be retained as public open space (conservation purposes). This will link in with the existing conservation reserve to the south and coastal foreshore reserve to the west. The public open space which is approximately 5.1ha will be bordered by the proposed roads.

In addition to the public open space, the site will be enhanced with street scaping within the road reserves and tree planting and landscaping within the individual Rural Residential home sites.

4 DESIGN CRITERIA

The design criteria for this LWMS have been based on the design objectives outlined in the WAPC's Better Urban Water Management document (WAPC, 2008) and also the Shire of Irwin's draft District Water Management Strategy (GHD, 2012).

The following design criteria are to be used as a guide for development of the urban water management system for strategic planning, subdivision and development (unless other specific objectives have been defined in other approved water management plans/strategies).

Water conservation — potable and wastewater

Objective

Minimising total water use and ensuring that potable water is used as efficiently as possible by sustainable management of all aspects of the water cycle.

Design criteria

Consumption target for water of 100 kL/person/yr – as outlined in the *State Water Plan* (2007) – with an aspirational target of not more than 40–60 kL/person/yr scheme water, as provided in *Better Urban Water Management* (2008).

Minimising potable water use outside of buildings by substituting potable water with fit-for purpose water for all non-drinking uses.

Ensuring that all potable water is used as efficiently as possible by recommending all new fittings meet an efficiency rating of 5 stars or more.

Promoting the use of native plants to minimise water consumption

And also recommending rainwater tanks so that the water consumption targets can be achieved and also assist in the storage of stormwater on site.

Water quantity management

Objective

Post-development annual discharge volume and peak flow be maintained relative to pre-development conditions, unless otherwise established through determination of ecological water requirements for sensitive environments.

Design criteria

Ecological protection – For the critical 1-in-1-year ARI storm event, the post-development discharge volume and peak stormwater flow rates shall be maintained relative to predevelopment conditions in all parts of the catchment. Where there are identified impacts on significant ecosystems, maintain or restore desirable environmental flows and/or hydrological cycles as specified by the Department of

Water. This will be done using rural style open road shoulder drains and vegetated swales during the subdivision phase of development and during the future domestic phase of development it will be achieved by using soakwells and rainwater tanks.

Serviceability of roads and infrastructure in minor ARI events (up to the 1 in 5 year ARI) – runoff from the entire catchment area generated by up to a 5 year ARI event will be managed using stormwater conveyance systems comprising of rural style open drains and, where road pavements intersect such drains, using piped culverts.

Flood management – Manage the stormwater catchment runoff for up to the 1-in-100-year ARI event within the development area to pre-development peak flows unless otherwise indicated in an approved water management strategy or as negotiated with the relevant drainage service provider.

Water quality management

Objective

Maintain surface-water and ground water quality at pre-development levels (winter concentrations) and, if possible, improve the quality of water leaving the development area to maintain and restore ecological systems in the (sub) catchment in which the development is located.

Design criteria

Contaminated sites – To be managed in accordance with the *Contaminated Sites Act 2003* (WA).

All other land – If the pollutant outputs of the development (measured or modelled concentrations) exceed catchment ambient conditions, the proponent shall achieve water quality improvements within the development area or, alternatively, arrange equivalent water quality improvement offsets within the catchment. If catchment ambient conditions have not been determined, the development should meet relevant water quality guidelines stipulated in the *National water quality management strategy* (AWWA, ANZECC & ARMCANZ, 1994).

Drainage – To ensure that all runoff contained within the drainage infrastructure network receives treatment prior to discharge to a receiving environment consistent with the *Stormwater management manual for Western Australia* (2004–07). Swales/vegetated bio-retention systems (also referred to as rain gardens) are to be sized at 2 per cent of the constructed impervious area from which they receive runoff. In addition, all outflows from subsoils should receive treatment prior to discharge to the stormwater system.

Stormwater modelling criteria

If it is proposed to use a computer stormwater modelling tool to demonstrate compliance with design objectives, the following design modelling parameters are recommended.

- At least 80% reduction of total suspended solids
- At least 60% reduction of total phosphorus
- At least 45% reduction of total nitrogen
- At least 70% reduction of gross pollutants

Disease vector and nuisance insect management

To reduce the health risk from mosquitoes, retention and detention treatments should be designed to ensure that between the months of November and May, detained immobile stormwater is fully infiltrated within a time period not exceeding 96 hours.

Permanent water bodies are discouraged, but may be accepted by the Department of Water, where issues outlined in the *Interim position statement: Constructed Lakes* (2007) are adequately addressed. Any water body must be designed to maximise predation of mosquito larvae by native fauna.

5 PRE-DEVELOPMENT ENVIRONMENT

5.1 Site Conditions

Based upon an examination of contours (derived by aerial mapping) and aerial photos available of the site, it is apparent that the land has undulating topography with open fields and hills. A substantial area in the middle of the site has been cleared for livestock grazing. These are the low lying areas which are generally flat or with gentle slopes.

The site levels range from a RL of 6 to 30. Adjacent to the open field is a steep ridge which runs from north to south, which has an average gradient of 1 in 6 and maximum gradient of 1 in 4.

Geological series maps (Surface Geology of Australia Map Cat. No. 73360 – Geoscience Australia, 2012) indicate that the site characteristics consist of dunes with calcareous and quartz sand, limestone and sandstone which is typical in much of the town of Dongara. Ground conditions are expected to consist of generally deep sand over Tamala Limestone. A small amount of clay may also be present in the subsoils of older dunes due to a breakdown of feldspar grains (Reference: *Land Capability and Geotechnical Assessment – Lots 10, 15, 16 and 17, Francisco Road, Dongara* – Landform Research (June 2005)).

It is anticipated that a desirable site grading suitable for subdivision can be achieved with some earthworks being applied to the site. The potential presence in some areas of limestone and small amounts of clay can be managed during the design and construction phases of the development.

Due to the amount of earthworks and clearing required, site stabilisation will be an important factor that will be considered at detailed design and construction stage to avoid dust nuisance and ground erosion principally from wind.

Figure 5 illustrates the site contour plan.

5.2 Climate

The subject site is located in the mid-west region of Western Australia, where the climate transitions from Mediterranean to semi-arid. The climate is characterised by warm dry summers and mild wet winters. The nearest weather station is located in Mingenew which is approximately 55 km east from Dongara, however as Dongara is located directly on the WA coast the nearest weather station which would have a similar climate is located at Geraldton Airport approximately 65 Km to the north of Dongara. The mean recorded annual rainfall is 442.7mm. Figure A below shows the climatic data for the region. (BOM, 2014)

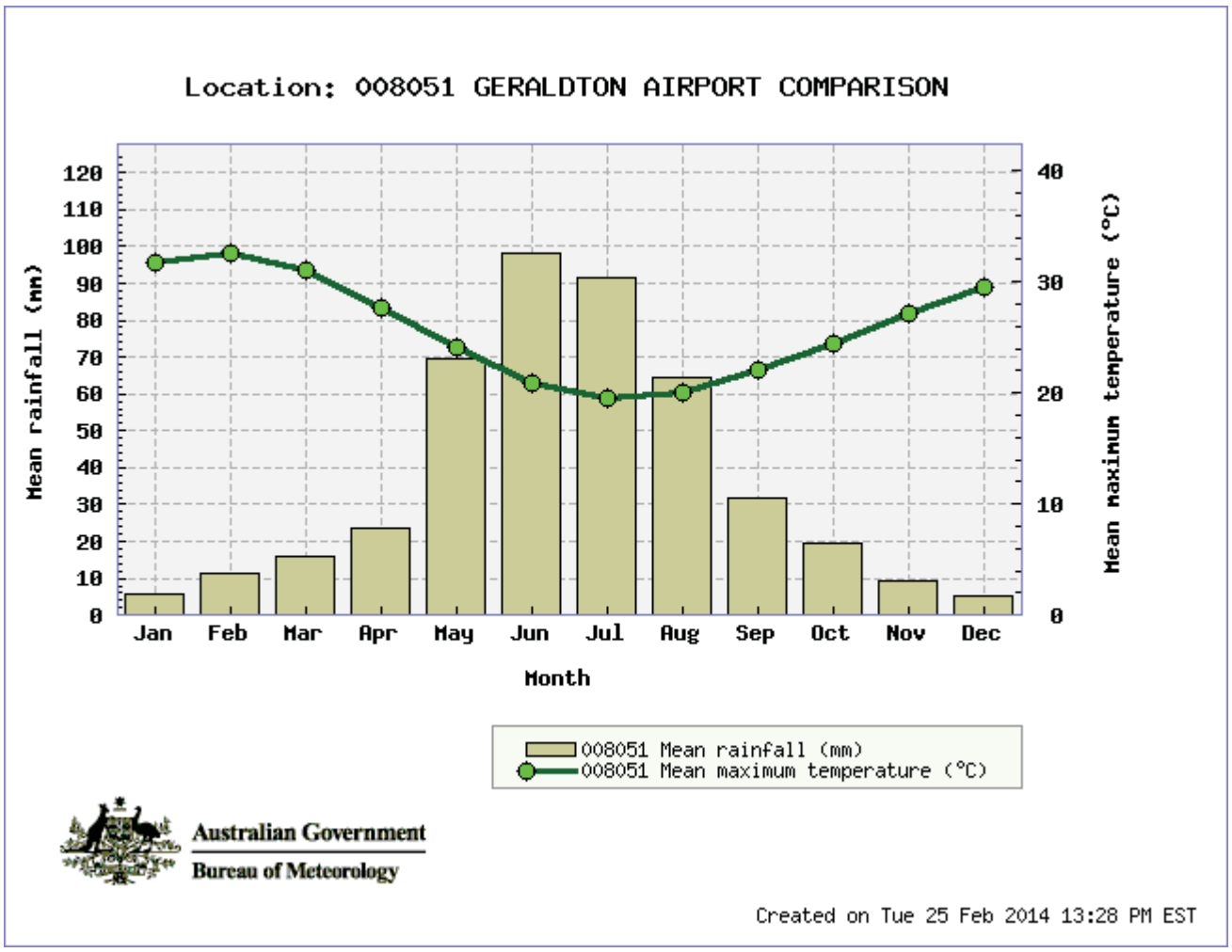

Figure A: Climatic data of nearest relevant weather station (BOM, 2014)

5.3 Geotechnical Plan

As previously mentioned in Section 1.4 of this report, all relevant geotechnical information has been covered by the Land Capability and Geotechnical Assessment: Lots 10, 15, 16 and 17 Francisco Road, Dongara (June 2005). This report, prepared by Landform Research, covers various aspects of the existing environment including Geology and Geomorphology, water availability, alternative land uses, geotechnical factors, and environmental management.

5.4 Surface Water

Figure 6 illustrates the catchment delineation for the existing pre-development site with an indication of stormwater flow paths. Due to the highly permeable nature of the soils within the subject site and the existing contours which allow surface water to drain freely across the land it is unlikely to encounter any perched water tables within the proposed development area.

The Land Capability and Geotechnical Assessment report prepared by Landform Research in 2005 states that there is no surface drainage on the site with all infiltration moving vertically downwards to the water table. From this analogy it is reasonable to

assume that in the predevelopment condition, due to the relatively high permeability of the spoils present throughout the site, stormwater runoff will only occur in major storm events such as the 1 in 100yr ARI event.

Tests measuring the absorptive capacity of the soils in the subdivision of Lot 1 Kailis Drive, Springfield were conducted by Blacktop Materials Engineering in 2007 (the test certificate is included hereto as Appendix A. Whilst the location of these soil tests is approximately 11km south of the subject site, the site soil conditions are similar to that of the subject site, Lot 1 Kailis Drive being situated on the same coastal dune system to the subject site. These test result show that the dunal system soils have absorptive capacities ranging from $1.6x10^{-4}$ m/s (13.82 m/day) in the valley of sand dune foundations to $3.3x10^{-4}$ m/s (28.51 m/day) at the top of the dune formations. It is reasonable to assume the subject site will have soils of similar absorptive capabilities. For the purposes of preparing this report an infiltration rate of $1.8x10^{-4}$ m/s (15.55 m/day) has been adopted for drainage calculations.

5.5 Groundwater

There is one inactive bore within the site previously installed by the Department of Water. The recorded drill depth was 6.10 metres deep making the water table at about 2 metres AHD. There are also existing Department of Water groundwater bores in operation located on the east side of Brand Highway, and these show water levels between 6 to 8 metres deep. Six metres from groundwater level is considered as sufficient separation distance from the existing surface level.

Despite the proximity of the site from the ocean, it is unlikely to encounter shallow groundwater due to the elevation of the site above the ground water table.

The bore water quality on site has been tested and results indicate a groundwater salinity of 2,475mg/L in the north and 1,705mg/L in the south. The water is suitable for stock and hardy plants but is not generally suited for horticultural purposes (Reference: *Land Capability and Geotechnical Assessment – Lots 10, 15, 16 and 17, Francisco Road, Dongara* – Landform Research (June 2005)

5.6 Acid Sulphate Soils

The Shire of Irwin's Draft District Water Management Strategy states that Acid Sulphate soils are wetland soils and unconsolidated settlements that contain iron sulphides which form in protected low energy environments such as barrier estuary's, coastal lakes and costal alluvial valleys. It also states there is a high to moderate risk of acid sulphate soils occurring within 3m of the surface along the Irwin River and its banks. This risk extends to approximately 2.5km inland or the river mouth. Given that;

a) The subject site is approximately 3.6 Km north of the Irwin River.
b) There are no nearby wetlands.
c) And due to the dry sandy nature of the soils located in the subject site.

There is a low to no risk of encountering Acid sulphate soils within 3 m of the surface.

6 WATER SUSTAINABILITY INITIATIVES

6.1 Water Efficiency Measures

Water-wise landscaping will be maximised throughout the subject site by way of the utilisation of water sensitive measures that maximise efficiency and reduce wastage, spillage and leakage.

These water sensitive measures are to be applied to irrigation requirements for both public and private spaces, as well as water sustainability initiatives within the development. Particular consideration should be made to imported drinking water, rainwater harvesting, groundwater extraction and waste water recycling opportunities.

Road surface runoff is proposed to be collected by roadside swales, running parallel the road, and redirected into bio-retention swales where it is utilised for watering the vegetation and recharging of the groundwater table.

6.2 Water Supply

Due to high salinity levels, bore water on site is suitable for stock but is not potable.

Potable water for domestic use can therefore be provided by scheme water, roof water collection tanks, desalination and/or bore water combined with a UV steriliser.

Due to the size of the proposed lots and their low density residential nature of the proposal, it is unlikely that any significant stocking on the lots will occur.

In turn, the above mentioned factors place a low level of reliance upon groundwater extraction.

6.2.1 Potable Water Reticulation

Based on information provided by the Water Corporation, a 150mm diameter water main is present on Francisco Road with two water services for Lot 10 and Lot 17. Presently, these services have special arrangements in place between the Water Corporation and the landowner because they do not meet the usual standards for a normal water supply service in respect of pressure and flow rate.

Discussions with the Water Corporation (Mark Willson *pers comm 29/8/2014)* reveal that the Water Corporation are prepared to supply reticulated water to the proposed new lots being produced out of subdivision of the subject site on a staged basis (4 stages over 15 years) and provided that network upgrades are in place and the developer funds the local reticulation network extensions. Much of the network upgrade work will be funded by the Water Corporation and, based on present work programming of the Water Corporation, is likely to be completed before each phase of the proposed subdivision is commenced.

6.2.2 Potable on site water supply

The use of rainwater storage tanks for potable water supply is encouraged to reduce the demand on the proposed reticulation water supply.

An analysis has been conducted as to whether rainwater collection is a viable method for potable water supply. This analysis is set below.

The following data has been relied upon to determine whether the use of on-site potable water supply is feasible:

- A study conducted by the Water Corporation in 2003 which measured the typical domestic water consumption.

- The historical average monthly rainfall data provided by the Bureau of Meteorology (BOM) for the subject site (this can be seen in Figure A).

- The census data collected by the Australian Bureau of Statistics (ABS) which has determined the average person per dwelling for the Dongara locality.

Set out below as Figure B is an extract of Water Corporation's 2003 Domestic Water Use study which shows the percentage of water used in a typical domestic situation and allocates percentages of water consumed for several facets of domestic water use compared to the total domestic water use.

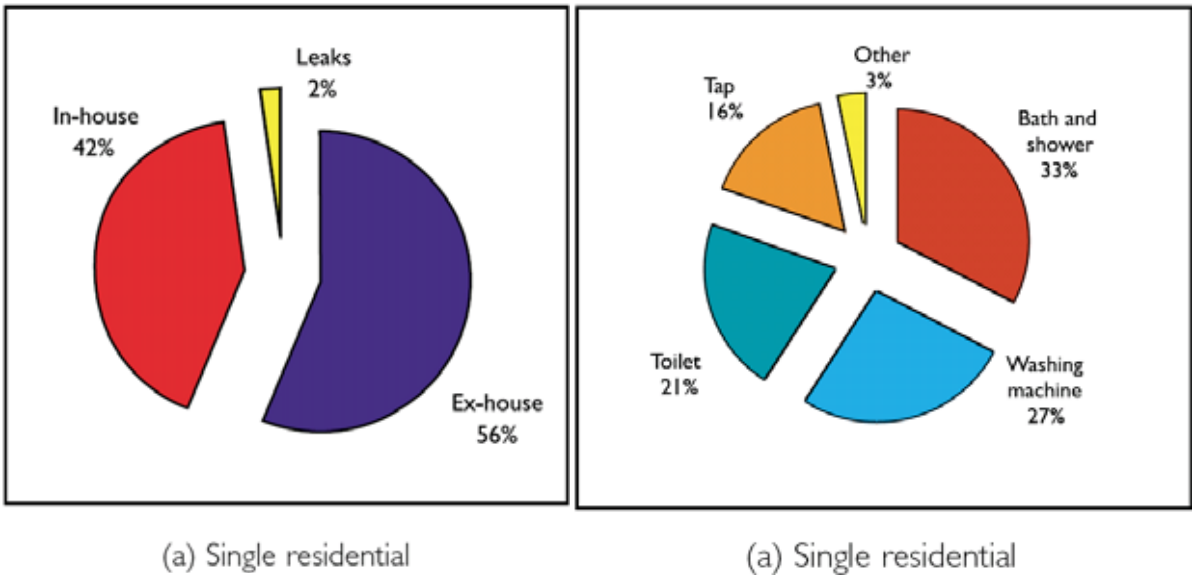

Figure B: The above images show the proportion of total water usage (left) and allocation of in-house use (right). Taken from the 2003 Water Corporations Domestic Water Use Study.

The study found that on average an average household consumes 1227 litres of water per day. This figure is split into two categories consisting of 523 litres per day for in-house uses and 707 litres per day for ex-house uses. In-house refers to the use of water for human consumption and other potable water uses (some more examples shown above in Figure B). Ex-house refers to the consumption of water mainly for watering of gardens. The study also concluded that on average there were 3.4 people per dwelling in the confined study area. Thus, it can be established that on average a

person will consume 155 litres per day for in-house uses and 208 litres per day for ex-house uses, totalling to 363 L/person/day.

In calculating the optimum design capacity of rainwater storage unit required for a typical lot, the ex-house use defined by the pie charts shown above as Figure B above was ignored because the rainwater collected is to be used for in-house applications only. That assumption was made based on the fact that the Water Corporations study was done in Perth and in a sewer area whereas the domestic wastewater from proposed lots will be treated by ATU treatment units and that those units have the capability of providing for garden reticulation. As mentioned above, the average consumption of water for in-house uses per person per day was found to be 155 litres. For the purposes of the analysis set out in this report, a consumption rate of 160L/person/day was adopted, in order to be conservative.

The ABS 2011 Census found that the average number of people per household, in the Dongara region, was 2.5. Therefore, in order to be conservative and account for the possible increase in number of people per household, the average number of people per household was assumed to be 3.

The available areas for collection of roof water were determined by studying the roof areas generated within a local subdivision located on Tyford Road, Dongara which is approximately 2.5 km south of the subject site. From satellite images of the Tyford Road subdivision (which has 2000m^2 sized lots) it can be seen that, on average, the dwelling roof catchment area on each lot is about 500m^2 and each lot has a shed with a roof catchment area of about 150 m^2. It would be reasonable to assume the lots produced from the subdivision of the subject site will produce roof and shed catchment areas of about the same size.

This data (modified by the author to allow for the likely facets of consumption in respect of the particular uses likely to be conducted on the subject site), taken together with the BOM and ABS data was collated into the spreadsheet which is annexed hereto as *Appendix B.* This spreadsheet provides a basic model of the net capacity of stored rainwater based on expected inflow from storm events versus the expected consumption and a graphical model is produced.

From the data obtained from the spreadsheet and graph included hereto as *Appendix B*, it has been determined that a domestic dwelling located on a propose new lot produced by the subdivision of the subject site could entirely depend on rainwater alone for a sufficient potable water supply, but would require the installation of a rainwater tank (or tanks) with a total capacity of 150 kilolitres. This would allow the efficient use of the rainfall within the proposed lot and allow a sufficient buffer in the event of an extended dry period. Further, because it will take some time to fill the tanks from naturally occurring rainfall, it would be necessary that to source at least 80,000 litres of water to partially fill the proposed rainwater tanks to begin with. A starting capacity any less than that amount may result in initial consumption outstripping received rainfall to the point where storage will not properly accumulate.

6.3 Wastewater Management

The pre development wastewater disposal on the subject site was undertaken by the utilisation of onsite effluent disposal systems. This method of wastewater disposal is not proposed to change.

A Land Capability and Geotechnical Assessment conducted by Landform Research found that the subject site was suitable for onsite effluent disposal for proposed lots down to 2000m^2 in area. However smaller lots in the future would need to be connects to reticulated sewer system.

Wastewater is proposed to be treated, using onsite wastewater treatment systems (Alternate Treatment Units), and discharged into the surrounding ground where it will eventually reach the groundwater environment. Although some water will be lost in the wastewater treatment process, due to evapotranspiration, the input of water into each lot being drained from the reticulated water supply into the proposed subdivision should provide a reasonable groundwater balance

7 STORMWATER MANAGEMENT STRATEGY

The potential presence of deep sands within the development provides for adequate stormwater drainage disposal and, in addition, the opportunity to apply water sensitive stormwater design principles that encourages stormwater to be contained at source as far as practicable.

Some of the drainage controls preferred by the Department of Water include the use of swales, soakwells and landscaped infiltration basins. An effective drainage strategy can be developed for the site given that the high level of soil permeability do not allow for surface drainage to accumulate on the site, with all infiltration moving vertically downwards to the water table. The existing rural subdivision south of the site utilises swales on the road reserve, and a similar arrangement can be adopted for the development of the site.

Predevelopment flow paths will be determined and compared to the re-direction of flows in the post-development scenario as part of this LWMS.

7.1 Pre-Development Surface Drainage

Almost the whole site is well drained by means of ground infiltration, with no risk of inundation or flooding because of the presence of deep sands overlying Tamala Limestone. Figure 6 illustrates the pre-development catchment delineation for the subject site including direction of the surface runoff flow paths.

Catchment characteristics for each of the four pre-development catchments (A, B, C and D) are analysed, including area, mainstream lengths, slope, ground imperviousness, rainfall data, and ultimately the surface runoff flow rates for each design ARI storm event.

These are generated using hydrological analysis based on methodology provided in “Australian Rainfall and Runoff - A Guide to Flood Estimation” (1987). The Rational Method was used together with the Kinematic Wave Equation for generating times of concentration. This formula incorporates the majority of site specific data and parameters available for hydrological analysis.

Appendix C is a brief write-up explaining the Rational Method used by AR&R (1987) in generating hydrological design data.

Appendix D shows the rainfall IFD data generated for the site using the Bureau of Meteorology website tools. The nearest meteorological location to the subject site was selected by the website tool to be on the edge of the proposed POS area at the south-western corner of the subject site.

Appendix E illustrates the catchment details including the generated equal slope areas and the mainstream profile for each pre-development catchment within the subject site.

Appendix F shows the hydrological and drainage data for all catchments. The following values were used in the generation of peak stormwater flows for the pre-development scenario:

- The Runoff Coefficient selected for Roads (%) = 90%
- The Runoff Coefficient selected for Verges (%) = 20%
- The Runoff Coefficient selected for Lots (%) = 5%

Table 1 below shows the site-specific pre-development catchment analysis including surface runoff flow rates generated for each design ARI storm event.

TABLE 1:
PRE-DEVELOPMENT CATCHMENT DETAILS

CATCH.	Area, A (m^2)	Mainstream Length, L (km)	Mainstream Equal Area Slope, s (m/km)	Time of concentration t_c (mins)	PEAK STORMWATER FLOW, Q (m^3/s)			
					1 yrs ARI	5 yrs ARI	50 yrs ARI	100 yrs ARI
A	317,134	0.710	17	38	**0.06**	**0.12**	**0.18**	**0.27**
B	85,582	0.260	50	12	**0.04**	**0.07**	**0.10**	**0.15**
C	171,838	0.550	18	31	**0.04**	**0.08**	**0.11**	**0.17**
D	50,187	0.258	54	11	**0.02**	**0.04**	**0.06**	**0.09**

The pre-development receiving environment for the stormwater runoff can be classified into three as follows:

a) Groundwater

The groundwater table receives stormwater directly by way of stormwater infiltrating into the ground from all 4 existing surface catchments within the subject site. In the case of the ODP area, the ground surface slopes and soil types are such that it is unlikely to create run-off of any significance and as such all stormwater received by the soils of the site will result in an evenly distributed collection of that stormwater for groundwater recharge.

b) Public Open Space - Landscape Buffer Zone

This buffer zone is 20m wide and exists along the entire stretch of subject site boundary along Brand Highway. It receives pre-development stormwater runoff from Catchments B, C and D.

c) Public Open Space

This is considered to be the outflow point on the western edge of the subject site boundary, along the north-south stretch of Francisco Road. It receives pre-development stormwater runoff from Catchment A.

The following table analyses the stormwater runoff for the pre-development receiving environment.

TABLE 2:
PRE-DEVELOPMENT RECEIVING ENVIRONMENT

RECEIVING ENVIRONMENT	Pre-Development Contributing Catchment/s	PEAK STORMWATER FLOW, Q (m^3/s)			
		1 yrs ARI	5 yrs ARI	50 yrs ARI	100 yrs ARI
Public Open Space (western edge of site boundary)	A	0.06	0.12	0.18	0.27
	TOTAL FLOW, Q (m^3/s)	**0.06**	**0.12**	**0.18**	**0.27**
Landscape Buffer Zone (eastern edge of site boundary)	B	0.04	0.07	0.10	0.15
	C	0.04	0.08	0.11	0.17
	D	0.02	0.04	0.06	0.09
	TOTAL FLOW, Q (m^3/s)	**0.10**	**0.19**	**0.27**	**0.41**

7.2 Post-Development Drainage Scenario

Given the soil conditions on site and the high permeability achieved for all surface runoff, it is inevitable that most of the stormwater received at the surface of the site will infiltrate on site, with the exception of hardstand areas such as roads, footpaths, driveways and paved areas (with an impervious fraction of catchment area, f = 0.8 (80%)) which will be conveyed by roadside swales (A typical cross-section is illustrated in Figure 8) to the proposed discharge points. The roadside swales are proposed to be 500mm deep with 1 in 3 batter slopes. The sizing calculations for the proposed road side swales are attached hereto as *Appendix G*

Within individual lots, it is expected to have all stormwater runoff from the roof areas directed into soakwells which enables the infiltration and seepage of stormwater back into the natural groundwater environment. This direct routing of part of the surface runoff within the individual lots into the groundwater will virtually mirror the ground infiltration rate so that it does not differ from the pre-development scenario.

All other stormwater runoff generated within the subject site (including paddocks located within the individual lot areas) has be designed so that it is redirected, using a roadside swale drainage system located in the road shoulder running parallel to the proposed pavements. Where necessary the stormwater will be piped under intersecting road pavements by way of concrete culverts. The system will discharge by way of bubble up pits (with pervious slab bases to allow stormwater to seep through) that overflow into the bio-infiltration swales located within the 20 m landscape buffer to the east. The post-development stormwater runoff will also discharge into two bio-infiltration swales located along the western boundary of the subject site (refer to Figure 7). The stormwater will then, by process of ground infiltration, ultimately find its way into the natural groundwater environment. This method of stormwater disposal ensures that all post-development stormwater runoff that exceeds the amount of the predevelopment condition is, in any event, disposed of within the subject site and does not run off onto neighbouring land, thus maintaining the predevelopment scenario.

This method of stormwater disposal further encourages infiltration and also redirects any runoff from large stormwater events (more than 5yr ARI storms) to the proposed bio-infiltration swales located on western boundary of the subject site, as well as to the 20m landscape buffer alongside Brand Highway. This is further illustrated in Figure 7.

Table 3 below shows the site-specific pre-development catchment analysis including surface runoff flow rates generated for each design ARI storm event. Also refer to *Appendix F* for the hydrological and drainage data for all catchments.

TABLE 3:
POST-DEVELOPMENT CATCHMENT DETAILS

CATCH.	Area, A (m^2)	Mainstream Length, L (km)	Mainstream Equal Area Slope, s (m/km)	Time of concentration t_c (mins)	PEAK STORMWATER FLOW, Q (m^3/s)			
					1 yrs ARI	5 yrs ARI	50 yrs ARI	100 yrs ARI
A_1	331,000	0.900	29	32	**0.16**	**0.31**	**0.45**	**0.67**
B_1	67,300	0.36	67	11	**0.03**	**0.05**	**0.08**	**0.12**
C_1	212,500	0.830	30	29	**0.12**	**0.23**	**0.34**	**0.50**
D_1	43,900	0.270	37	11	**0.04**	**0.07**	**0.11**	**0.16**

The post-development receiving environment for the stormwater runoff can also be classified into 4 disposal areas as follows:

a) Groundwater

The groundwater will receive stormwater that directly infiltrates into the ground from all the soakwells servicing the proposed new dwellings that will be developed within the individual developed lots within the subject site. Although

this cannot be quantitatively assessed through standard hydrological methods until the size of the development in each proposed lot is known, the post development value for ground infiltration would be identical to that of the pre-development scenario for the following reasons:

- The ground composition for the pre-development land and the post-development individual lots is the same, i.e. sandy soil.

- All rainfall and stormwater runoff from the roof areas within the post-development individual lots will be directed into the groundwater via soakwell disposal systems, whereas in the pre-development scenario, the stormwater will directly infiltrate into the ground. Thus, the only difference between the post development and pre development scenario will be that there could be point concentration of stormwater where soakwells are located but this will quickly dissipate into the groundwater table below due to the high permeability of the site. This will not affect groundwater condition as the overall volume of infiltration into the groundwater does not change and, given the depth of soil between the surface and the groundwater, the infiltration in the post development condition will distribute evenly through that separation depth.

b) Public Open Space - Landscape Buffer Zone

This buffer zone is 20m wide and exists along the entire stretch of subject site boundary along the Brand Highway frontage. It will receive post-development stormwater runoff from Catchments B_1, C_1 and D_1. It is proposed to have two stormwater discharge points within the Landscape Buffer Zone, one located near the centre of the eastern boundary, to receive stormwater discharge from Catchment C_1, and the other at the southeast corner of the subject site, to receive stormwater runoff from catchment D_1 (as shown in Figure 7). As Catchment B_1 does not generate any more stormwater runoff than the pre-development condition, there is no need to detain the stormwater runoff generated within this post-development catchment area (refer to *Appendix F* for pre and post-development analysis).

A typical cross-section of the proposed stormwater discharge point located within the Landscape Buffer Zone is illustrated in Figure 8.

Design calculations used for the sizing and capacity of these swales are included in *Appendix F.* The design details of these calculations are described below.

c) Bio-Infiltration Swale

In the post development scenario the topographical low points for the subject site remain in the same location, thus it is deemed logical to detain the excess stormwater runoff, produced as a result of the proposed development, at these locations. Therefore, it is proposed to detain the stormwater runoff, produced as a result of this development, by means of a bio-infiltration swale located within the locally widened road reserve, the location of which is shown in Figure 7.

The proposed bio-infiltration swale will receive stormwater runoff from Catchment A_1, which consists of most of the western part of the subject site. However, when the land to the west of the subject site is developed this catchment will also consist of Catchment E_1 as well as the land to the east of the future road alignment (this future catchment area is shown in Figure 7)

A typical layout of the proposed bio-infiltration swale is shown in Figure 9.

Design calculations used for the sizing and capacity of this swale are included in Appendix F. These calculations compare the predevelopment drainage condition with the proposed post development to determine how much stormwater runoff needs to be retained within the subject site so that the post development runoff does not differ to that of the predevelopment condition. This is done by using the IFD data for Bonniefield, provided by the Bureau of Meteorology (included hereto as Appendix D), and establishing the predevelopment and post development rainfall intensity. From this data, it is possible to calculate the stormwater inflow for the pre and post development conditions which enables a determination of the volume of water to be retained.

d) Temporary Bio-Infiltration Swale

It is proposed to have a temporary bio-infiltration swale located in an easement within a proposed lot (shown on Figure 7) to capture the stormwater runoff from Catchment E_1. Ultimately, as mentioned previously, this area will form part of Catchment A_1 when the land to the west of the subject site is developed. However, until this time the stormwater runoff will be detained in the temporary bio-infiltration swale.

The proposed temporary bio-infiltration swale is designed to be 600mm deep and have a total footprint area of approximately 70m^2 in area, therefore it will not impact the lot on which it is proposed to be located which has a total area of 8000m^2. A typical layout of the proposed temporary bio-infiltration swale is shown on Figure 9.

Design calculations used for the sizing and capacity of this swale are included in *Appendix F.* The details of these calculations are described above.

The following table analyses the stormwater runoff for the pre-development receiving environment.

TABLE 4:
POST-DEVELOPMENT RECEIVING ENVIRONMENT

RECEIVING ENVIRONMENT	Pre-Development Contributing Catchment/s	PEAK STORMWATER FLOW, Q (m^3/s)			
		1 yrs ARI	5 yrs ARI	50 yrs ARI	100 yrs ARI
Bio-Infiltration Swales (western edge of site boundary)	A	0.16	0.31	0.45	0.67
	TOTAL FLOW, Q (m^3/s)	**0.16**	**0.31**	**0.45**	**0.67**
Landscape Buffer Zone (eastern edge of site boundary)	B	0.03	0.05	0.08	0.12
	C	0.12	0.23	0.34	0.50
	D	0.04	0.07	0.11	0.16
	TOTAL FLOW, Q (m^3/s)	**0.19**	**0.35**	**0.53**	**0.78**

7.3 Water Quantity Management

From the above analyses of pre-development versus post-development scenarios, a comparison is made between the two for each category of receiving environment, in order to ascertain the stormwater management objective of achieving water quantity management. The following table demonstrates this comparison.

TABLE 5:
WATER QUANTITY MANAGEMENT AT RECEIVING ENVIRONMENTS

RECEIVING ENVIRONMENT	SCENARIOS	PEAK STORMWATER FLOW, Q (m^3/s)			
		1 yrs ARI	5 yrs ARI	50 yrs ARI	100 yrs ARI
Public Open Spaces (Pre) Bio-Infiltration Swales (Post) (western edge of site boundary)	**Pre-Development**	**0.06**	**0.12**	**0.18**	**0.27**
	Post-Development	**0.16**	**0.31**	**0.45**	**0.67**
Landscape Buffer Zone (eastern edge of site boundary)	**Pre-Development**	**0.10**	**0.19**	**0.27**	**0.41**
	Post-Development	**0.19**	**0.35**	**0.53**	**0.78**

This comparison clearly shows that as far as the overland stormwater runoff to the POS areas is concerned, the post-development peak flows are to a certain extent maintained, and are relatively comparable to the pre-development condition. The excess stormwater runoff will be detained in bio-infiltration swales located in easements on the western boundary as shown in Figure 7.

As far as the Landscape Buffer Zone is concerned, the relative peak flows are also maintained and relatively comparable to pre-development conditions. The excess stormwater runoff will be detained in bio-infiltration swales located in the POS landscape buffer zone as shown in Figure 7.

Since groundwater comprises a major component of the receiving environment, it can be deduced that the overall receiving environment (including POS areas, Landscape Buffer Zones and Groundwater) would not be affected in terms of stormwater quantity maintenance when comparing the pre-development condition to the post-development scenario.

7.4 Water Quality Management & Disposal Strategies

Given that the general topographical environment, geological formation (i.e. sandy soils) and stormwater re-direction strategies will not be significantly altered between the pre-development conditions to the post-development scenario, it is reasonable to deduce that the surface water and groundwater quality will be maintained.

However, it is preferable to improve the water leaving the development area, especially from those hardstand areas that are created as part of the development, such as internal roads, footpaths, driveways and paved areas so that the water quality does not diminish below the pre-development quality. As illustrated in Figure 7, all the stormwater generated from these areas will initially be redirected to via roadside swales into bio-infiltration swales before eventually being discharged into the receiving environment. The bio-infiltration swales are sized using the calculations attached hereto as *Appendix F*. Each bio-infiltration point will have a vegetated storage footprint area not less than 2% of the total catchment area.

Furthermore, the soakwell disposal systems within the individual lots will provide a means of stormwater detention and filtration before final disposal into the groundwater environment through gradual seepage and infiltration.

In this manner, stormwater management objective of achieving water quality management is achieved by ensuring that runoff contained within the drainage infrastructure network receives treatment prior to discharge to a receiving environment consistent with the *Stormwater Management Manual for Western Australia (2004-07)*.

8 MONITORING

8.1 Monitoring and Contingencies

8.1.1 Surface Water Monitoring

The existence of surface water in the bio-infiltration swales will be ephemeral, and therefore only opportunistic sampling and testing of surface water from the bio-infiltration swales will be possible. This will be conducted as and when practicable, and the results monitored to ensure continuing quality improvement.

8.1.2 Groundwater Quality Monitoring

A monitoring program will be implemented to provide an ongoing assessment of development impacts on groundwater levels and groundwater quality.

Monitoring will be undertaken by the sub-divider annually during each year that the development is being constructed plus an additional period of two years in order to assess the impact of water quality arising from urbanization of the Site.

Groundwater will be extracted from bore locations as used in the original baseline testing, and tested for pollutants.

The monitoring program sets performance criteria against which the results of monitoring can be assessed, and identifies contingency actions to be taken in the event that any of the criteria is breached. If any result reaches the trigger level an additional test will be conducted. If confirmed, appropriate action will be taken in consultation with a suitably qualified environmental consultant.

The proposed monitoring program is shown in Table 6.

TABLE 6:
MONITORING SCHEDULE & REPORTING

Monitoring Type	Parameter	Source Location	Method	Frequency & Timeframe
Groundwater Level	Water level (m AHD)	Groundwater sampling from monitoring bores	Electrical depth probe or similar	Annually from start of project until 2 years post completion of subdivision
Groundwater Quality	pH, EC, TSS, Nitrogen, Phosphorus			Annually from start of project until 2 years post completion of subdivision

An annual report will be submitted by the sub-divider to the Department of Water and Shire of Irwin for the duration of the development-related monitoring program.

Following handover it will be the responsibility of the Shire of Irwin to determine an appropriate monitoring frequency.

8.1.3 Bio-infiltration Swale Soil Monitoring

The bio-infiltration swales will be inspected after every significant storm event (or at least annually) by the subdivider for signs of sediment accumulation, weed invasion and poor plant health, and remedial action will be taken to remove sediment and weeds and replace diseased and deceased plants.

Responsibility for the bio-infiltration swale soil monitoring will revert to the Shire of Irwin after a period of 24 months from completion of the relevant stage of the project where the bio-infiltration swale/s have, as part of that stage, been constructed.

9 IMPLEMENTATION AND MAINTENANCE

9.1 Implementation

The subdivider shall be responsible for the implementation of an Urban Water Management Plan (once subdivision of the land is approved), implementation of the monitoring program and maintenance in accordance with Table 7 below.

9.2 Ongoing Maintenance

It is proposed that the Shire of Irwin will assume responsibility for the ongoing operation and maintenance of the proposed drainage system following a period of 24 months from the completion of the site works, with the subdivider being responsible for maintaining the system during the 24 month prior period.

The maintenance regime will include erosion control, sediment removal, weed control, plant inspection and plant replacement in the bio-infiltration swale.

9.3 Maintenance Schedule

Table 7 below provides a maintenance schedule for the infrastructure proposed to be installed as part of the subdivision.

TABLE 7:
MAINTENANCE SCHEDULE - DRAINAGE

Maintenance Requirement	Specific Requirement	Responsibility
Pits and gullies	Inspect after significant storm events or quarterly as a minimum to ensure correct functioning.	Subdivider up until final inspection of roadworks, then Shire of Irwin
Street sweeping	Remove silt from road surface at completion of the roads constructed in the subdivision	As per pits and gullies
Monitoring plants	Inspect monthly, remove invading exotic plants and weeds, and re-plant as required.	Subdivider for a period of 24 months, then Shire of Irwin
Bio-infiltration swale	Inspect monthly and remove excess sediment and litter as required to maintain function	Subdivider for a period of 24 months, then Shire of Irwin

10 SUMMARY

Previous studies indicate the extensive sandy nature of the soils, which promotes ground infiltration of stormwater runoff into the groundwater table. Soakwells located within the individual lots of the proposed subdivision will further ensure that the stormwater runoff from rooftops will be redirected into the groundwater receiving environment.

The topography of the subject site will result in similar catchment delineations as between the pre-development and post-development scenarios. The comparisons of peak design stormwater flow rates show a similarity between the pre-development and post-development conditions.

To ensure that there is sufficient area for nutrient management and stormwater runoff disposal for the proposed development; two disposal points have been created on the western edge of Lot 10, one being located in a very small easement within a Lot and the other within a widened section of the existing Francisco Road road reserve. These two disposal points will service the western half of the proposed development. This will be achieve through the construction of a roadside swale drainage system (with piped culverts where the drains need to pass under road/footpath pavements) where the stormwater runoff is directed into the proposed bio-infiltration swales and which will ultimately discharge into the groundwater environment by process of infiltration.

Similarly, the eastern half of the proposed development will have its post-development surface runoff directed to the 20m landscape buffer area between the proposed development and Brand Highway. Stormwater runoff disposal management will also be achieved within this landscape buffer zone by first directing the runoff through a roadside swale drainage system (again with piped culverts where the drains need to pass under road/footpath pavements) connected to bubble-up pits, then discharging into bio-retention swales within the buffer zone.

An ongoing monitoring and maintenance schedule coupled with the proposed development infrastructure will aid in providing an ongoing assessment of development impacts on groundwater levels and groundwater quality.

11 CONCLUSION

The proposed development of Lots 4, 5 and 10 Francisco Road, Bonniefield is sustainable from a water management perspective. Given the existing ground and environmental conditions of the subject site, a total water cycle management is achievable by integrating the various components of the stormwater drainage system directing runoff into the receiving public open space environment in a controlled and sustainable way.

This is achieved by using a stormwater management system which will maintain water quantity and quality matching that of the pre-development condition in accordance with the principles and objectives outlined in this Local Water Management Strategy.

Signed by:



Christopher Elms *(BSc. Civil Eng. (Hons))*
Design Manager

Date: 3 September 2014

Signed by:



Ian McKellar
Project Manager

Date: 3 September 2014

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Fig. 3: Development Concept Plan

Fig. 4: Aerial Photo of Subject Site

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Figure 1: Locality of Subject Site

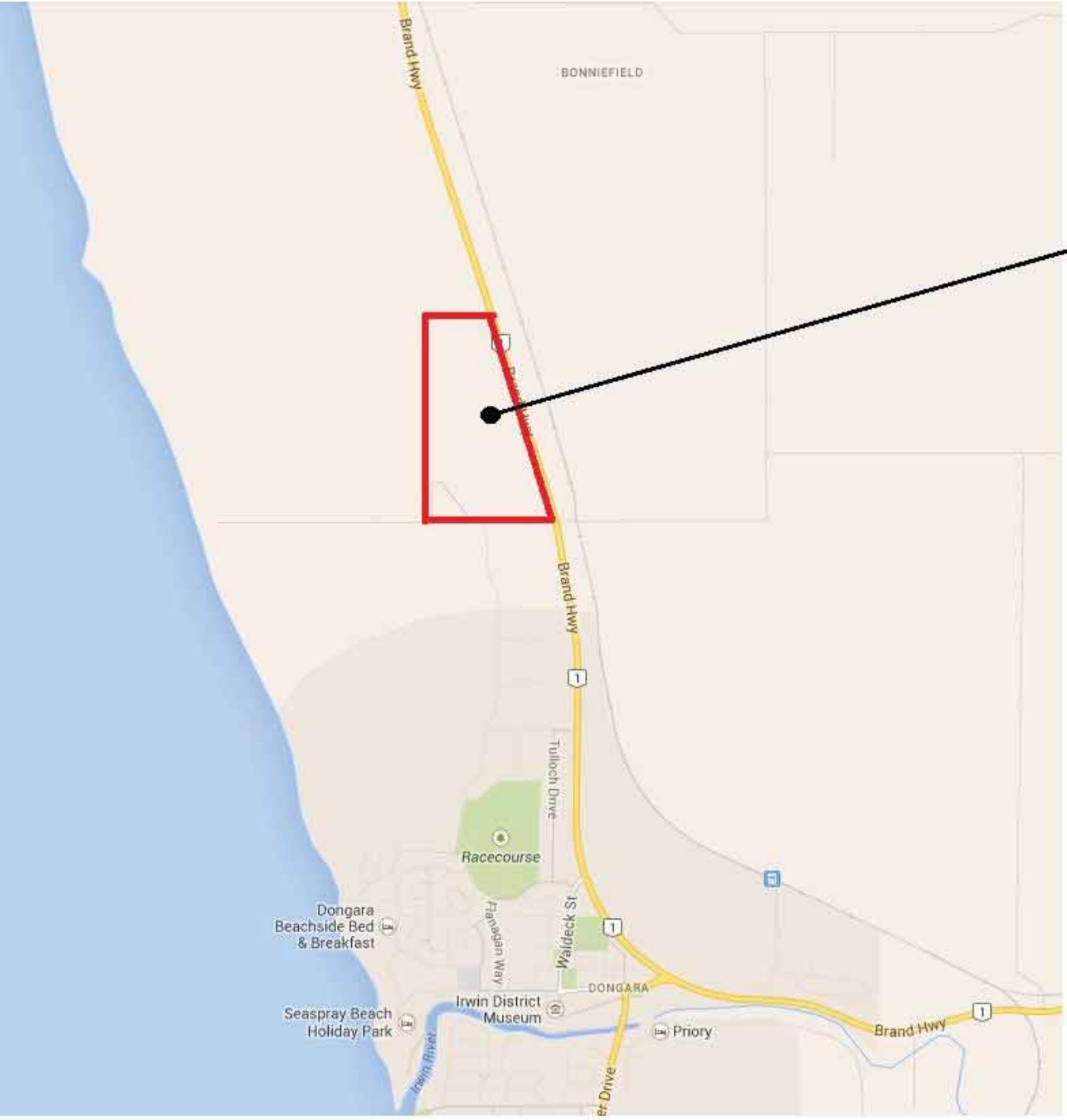


Figure 2: Subject Site Boundary



DEVELOPMENT CONCEPT PLAN

2172-94B-01 (07.05.2014), nts

Francisco Road, Dongara: Figure 8

Figure 3: Development Concept Plan *(courtesy CLE - 2014)*

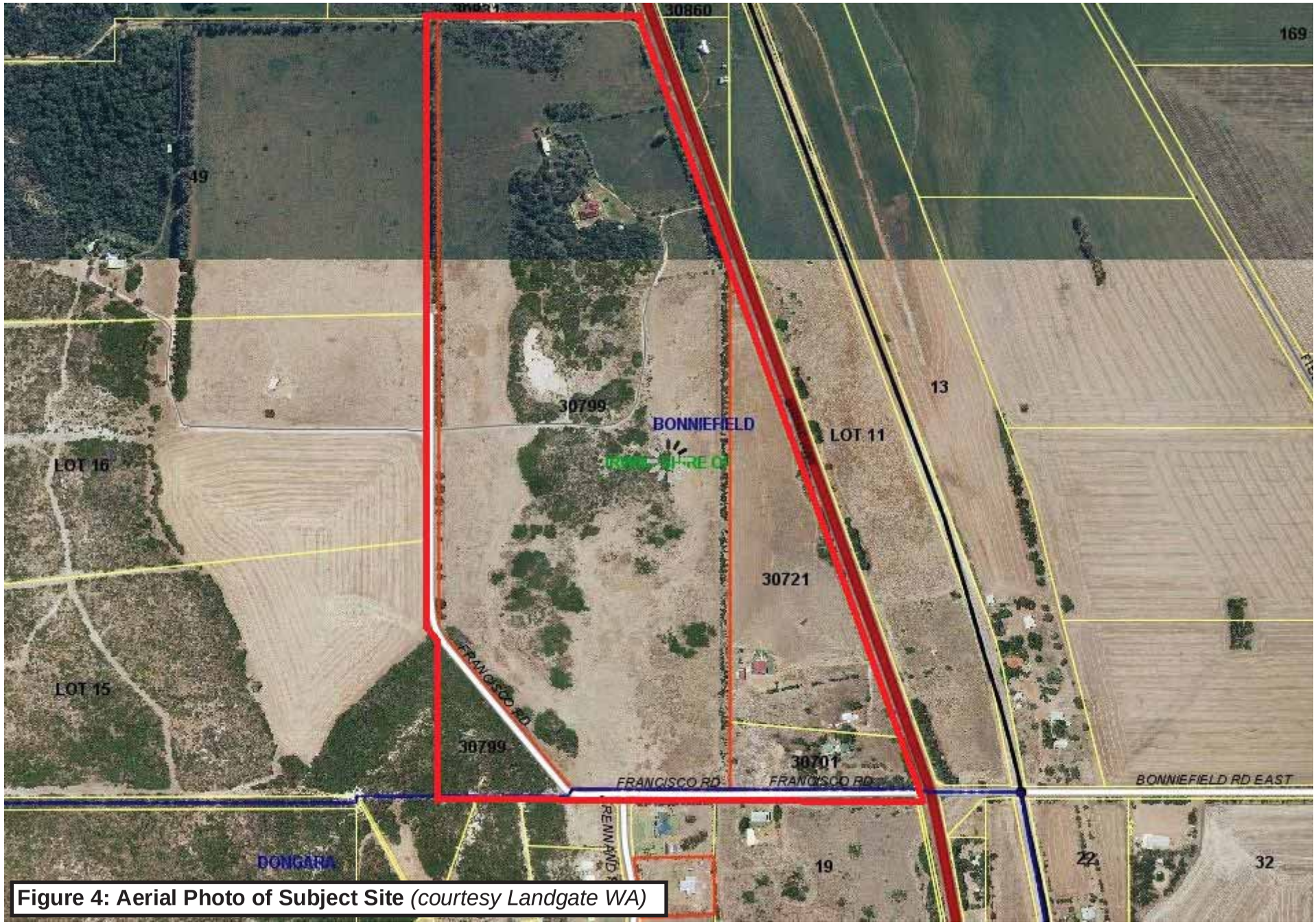
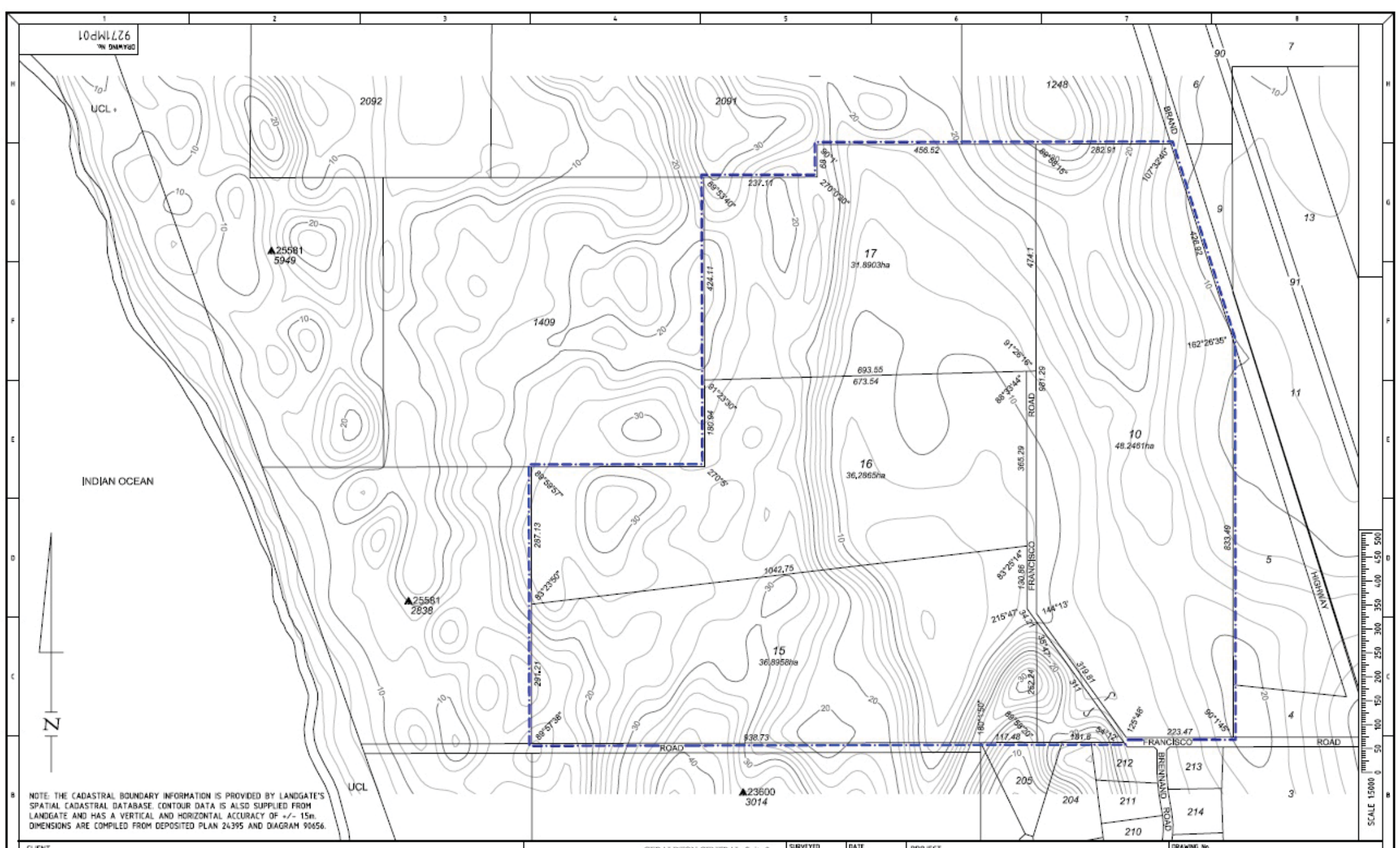


Figure 4: Aerial Photo of Subject Site *(courtesy Landgate WA)*



CLIENT

CLARKE & Co REAL ESTATE

Figure 5: Site Contour Plan
(courtesy Quantum Surveys - 2009)

Quantum SURVEYS PTY LTD
GERALDTON CENTRAL, Suite 2
65 Chapman Road, GERALDTON WA 6530
PO Box 695, GERALDTON WA 6531
Email: info@quantumsurveys.com.au
PHONE: (08) 9965 0077
FAX: (08) 9965 0088
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DRAWN	S. D'MELLO	21/07/2009
CHECKED	R. HUNT	21/07/2009
APPROVED	R. HUNT	21/07/2009

PROJECT

TITLE
CONTOUR PLAN
LOTS 10, 15, 16 & 17
FRANCISCO ROAD,
BONNIEFIELD

DRAWING No. 9271MP01

JOB No. 9271	SCALE 15000 @ A2	REV.
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FIELD BOOK	LEVEL BOOK	
ADDITIONAL INFORMATION		

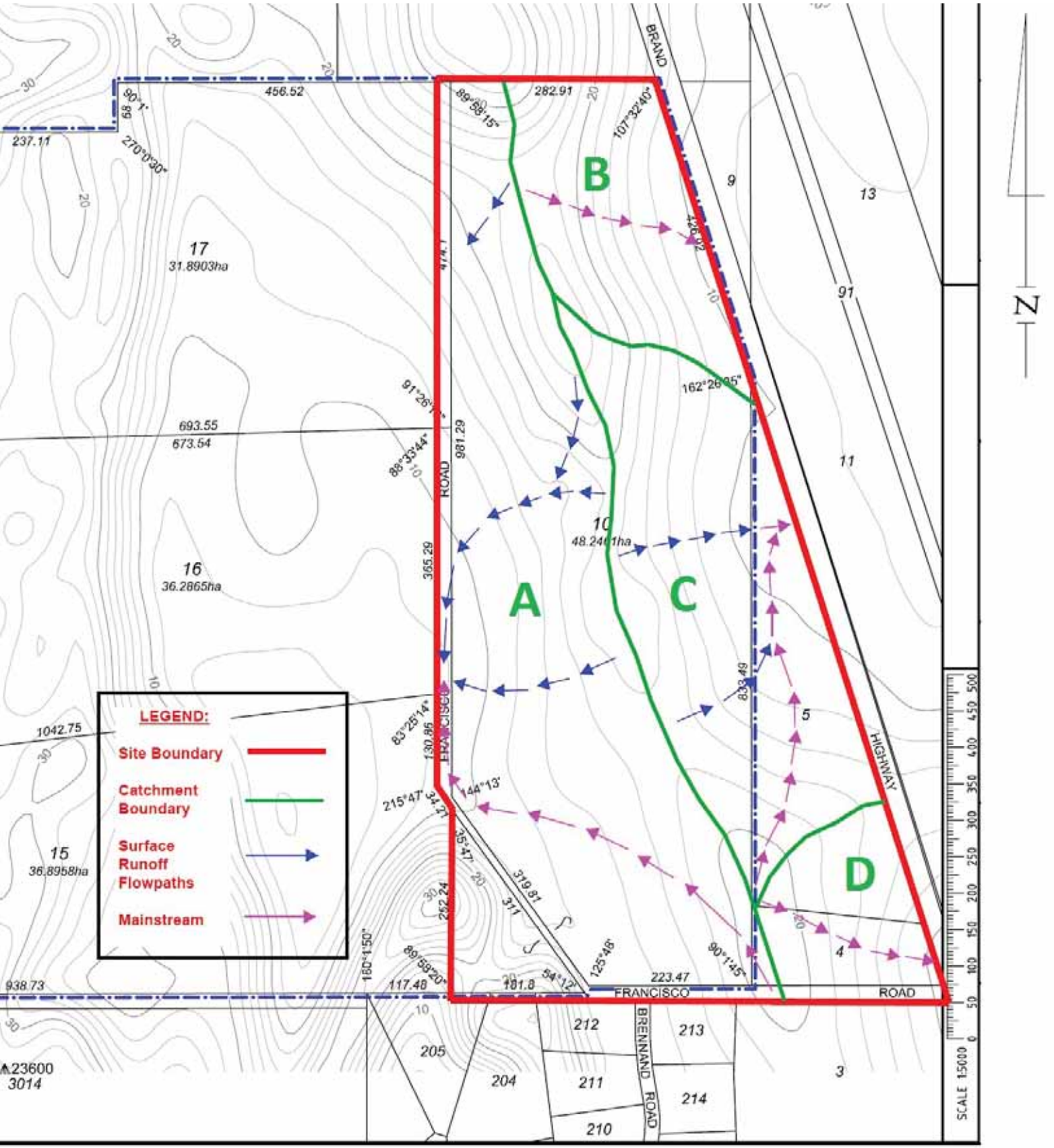


Figure 6: Pre-development Catchment Delineation and Surface Runoff

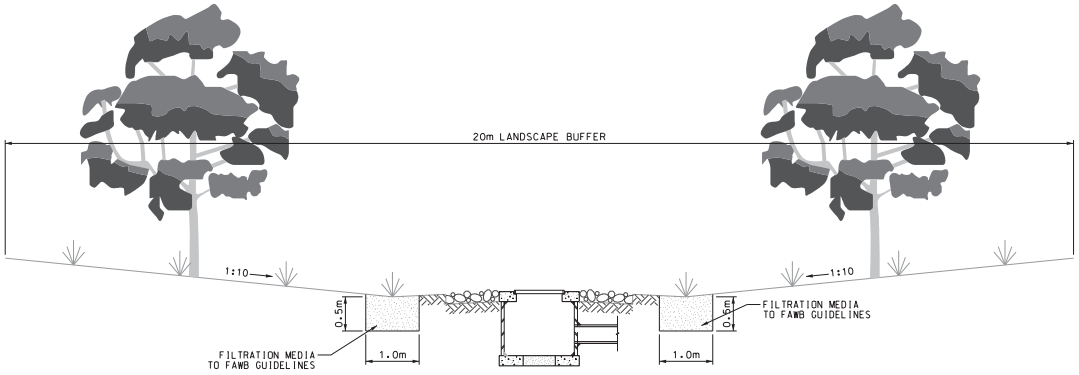


DEVELOPMENT CONCEPT PLAN

2172-69F-01 (02.10.2012). nts

Francisco Road, Dongara: Figure 10

Figure 7: Post-development Surface Runoff and Disposal



TYPICAL CROSS-SECTION OF A
BIO-RETENTION BASIN IN THE
VEGETATION BUFFER

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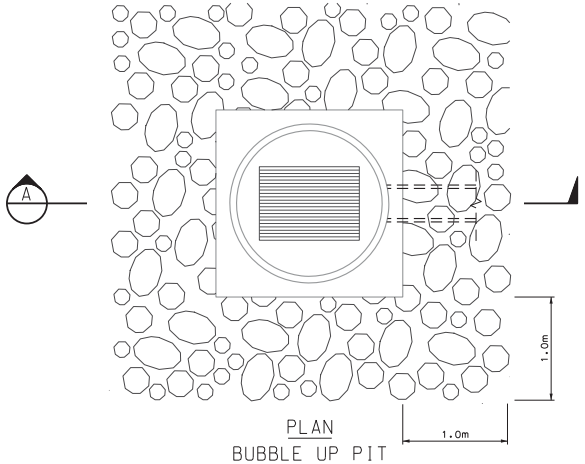

PLAN
BUBBLE UP PIT

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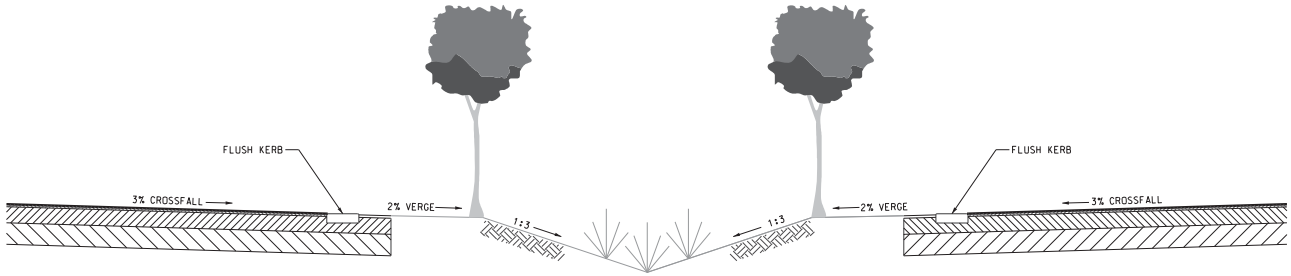

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CENTRALLY LOCATED DRAINAGE SWALE

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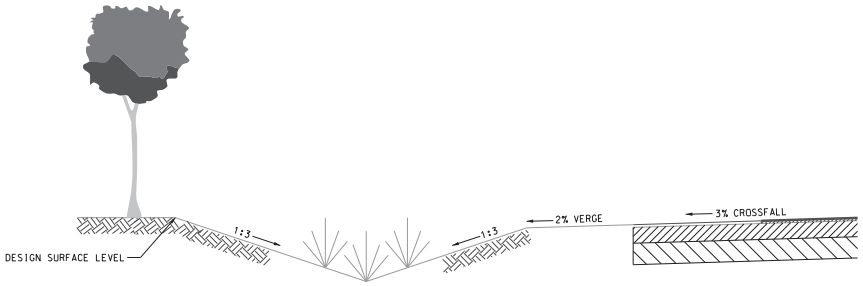

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ROADSIDE SWALE

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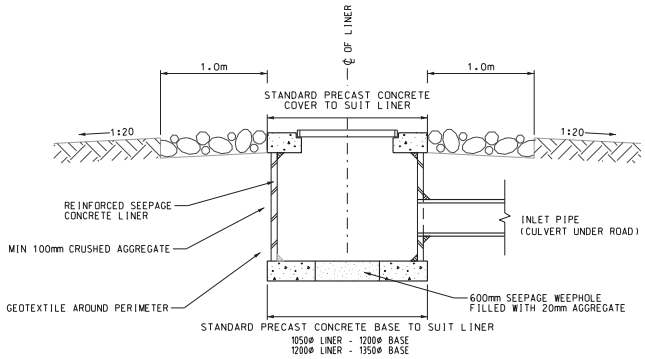

SECTION A

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DRAWN: C. ELMS

CHECKED: I. MCKELLAR

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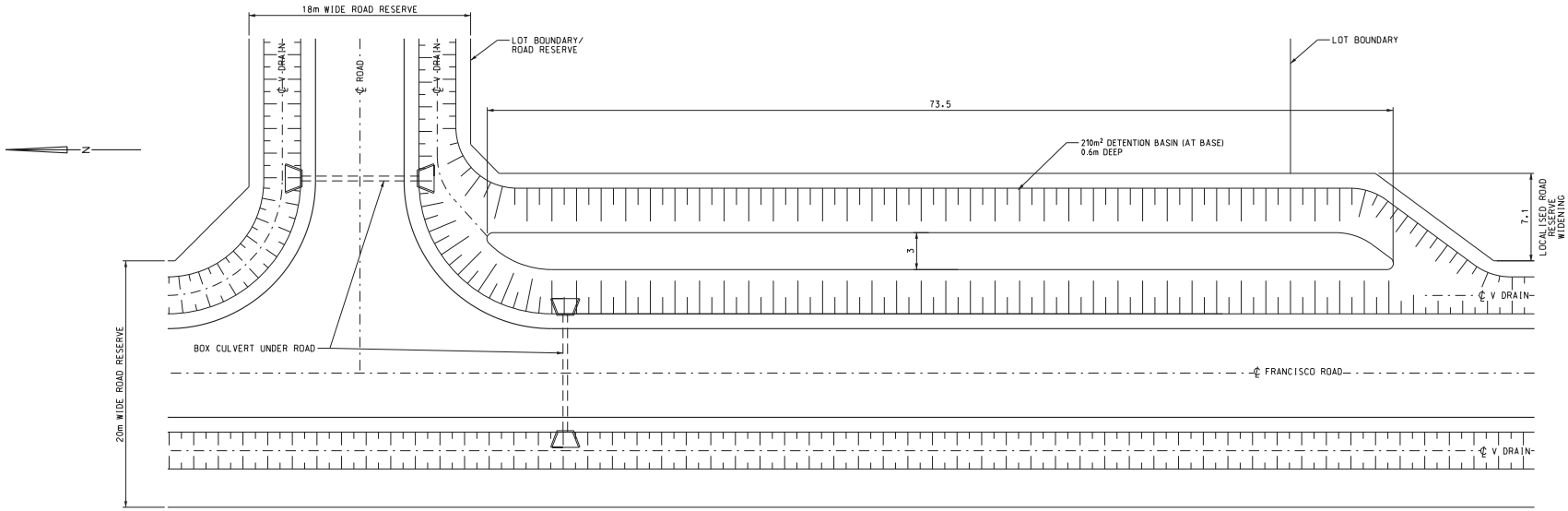
W.A.P.C. No.:

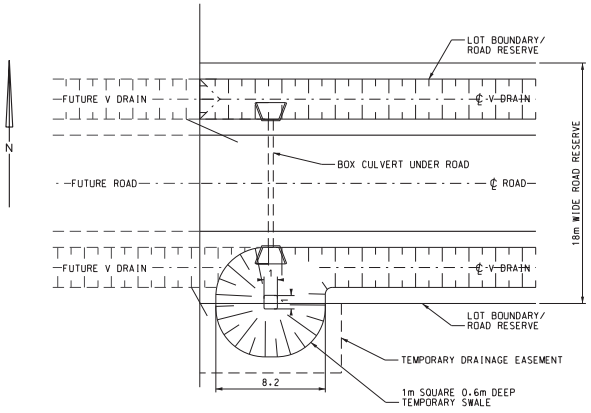
BEN CLARKE

PROPOSED SUBDIVISION OF
LOTS 4, 5 AND 10
FRANCISCO ROAD, BONNIEFIELD
TYPICAL DRAINAGE DETAILS

FILE NAME:	DATE:	DRAWING No.:	AMDT No.:
796-01-FIGURE 8.dgn	10.04.14	FIGURE 8	A



BIO-INFILTRATION SWALE
WESTERN EDGE OF SUBJECT SITE



TEMPORARY BIO-INFILTRATION SWALE
WESTERN EDGE OF SUBJECT SITE

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AMENDMENTS

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DRAWN: D.CLUBB
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PROPOSED SUBDIVISION OF
LOTS 4, 5 AND 10
FRANCISCO ROAD, BONNIEFIELD
DETENTION BASIN - GENERAL ARRANGEMENT

FILE NAME:	DATE:	DRAWING No.:	AMDT No.:
796-01-FIGURE 9.DGN	02.09.14	FIGURE 9	A

APPENDIX A: Lot 1 Kailis Drive Permeability Certificate

BCE

BLACKTOP CONSULTING ENGINEERS
ACN: 098 257 071 ABN: 52 098 257 071
PO Box 1018 Geraldton WA 6531
PHONE : (08) 9921 1878
FAX: (08) 9965 5730

FACSIMILE MESSAGE

To: Civil Technology
Att: Mr Ian McKellar
Date: 8/08/07
Job No.

Fax: 9367 8046
No. of pages: 3
Your ref:

Dear Ian

Project: Lot 1 Kailis Drive
Permeability

Please find attached permeability test certificate and site plan as requested.

Any queries please do not hesitate to contact me on 99 211 878.

Yours faithfully,

Lester Smith
Engineering Manager
Attach Report

02/08/2007 12:23 0899655730 BLACKTOP ENGINEERING PAGE 01/03

BME

BLACKTOP MATERIALS ENGINEERING
ACN: 098 257 071 ABN: 52 098 257 071
PO BOX 1018 GERALDTON WA 6531
PHONE: (08) 9921 1878
FAX: (08) 99655730

TEST CERTIFICATE

CLIENT:	Civil Technology 17 Lyall Street South Perth WA 6151	**JOB NO.:**	BCE263
PROJECT:	Proposed subdivision of Lot 1 Kailis Drive Port Denison	**CLIENT ORDER NO.:**	-
LOCATION:	Refer to attached test pit locality plan	**DATE FIELD TESTED**	31/07/07
DESCRIPTION:	Brown silty sand, similar in appearance to wattle sand (dune sand with degraded organic material from Acacia species)	**DATE LAB RECIEVED** **DATE LAB TESTED**	N/A N/A
SAMPLE NO:	07BME2118	**CERTIFICATE No.**	07BME2118

Method for determining the absorptive capacity of a soil in accordance with Schedule 8 – Health Regulations 1974

Test Site Location (Refer to site plan)	Soil Description	Moisture condition of soil	Time taken for water level to fall 25mm	Calculated infiltration rate (m/s)
Test Location 1 (Test depth 300mm below ground surface)	Wattle sand	Moist from recent rainfall	2 minutes & 16 seconds	1.8×10^{-4} m/s
Test Location 2 (Test depth 300mm below ground surface)	Wattle sand	Moist from recent rainfall	2 minutes & 37 seconds	1.6×10^{-4} m/s
Test Location 3 (Test depth 300mm below ground surface)	Wattle sand	Moist from recent rainfall	1 minute & 22 seconds	3.0×10^{-4} m/s
Test Location 4 (Test depth 300mm below ground surface)	Wattle sand	Moist from recent rainfall	1 minute & 16 seconds	3.3×10^{-4} m/s

Notes:
Site is heavily vegetated and site access was difficult beyond established tracks. Tests were spread as far apart as was possible to achieve with existing site access tracks.
Test sites 1 & 2 were situated in the valley of sand dune formations.
Test sites 3 & 4 were situated on top of sand dune formations.

Notes: This information does not conform to any Australian Standard test method and is not NATA endorsed.

Authorised Signatory : _____ (L. Smith) **Date :** 2/8/07

Form No.: R-AS-14-00

02/08/2007 12:23 0899655730 BLACKTOP ENGINEERING PAGE 02/03

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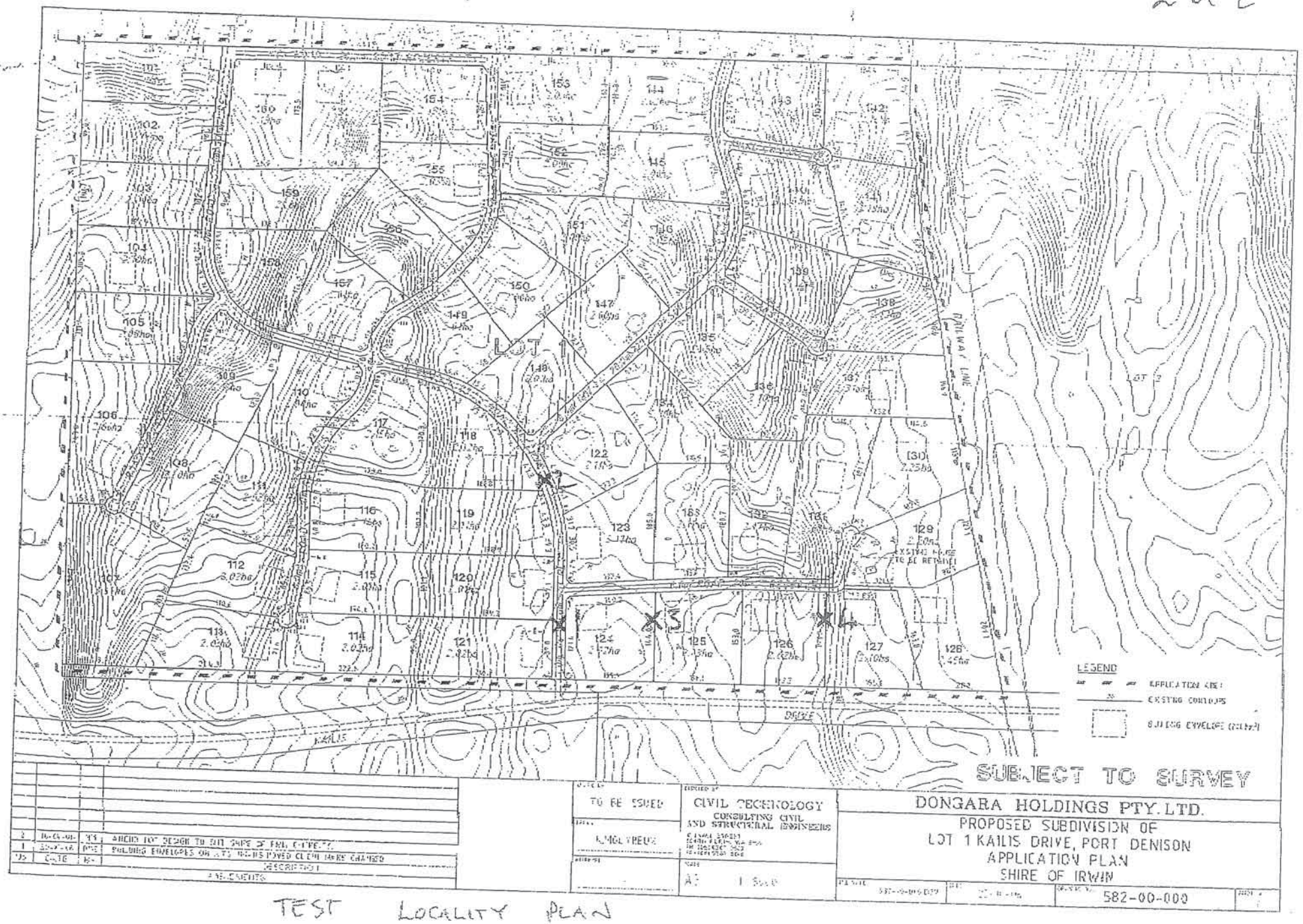

TEST LOCALITY PLAN

APPENDIX B: On-site Potable Water Supply Study

PROJECT: SUBDIVISION OF LOTS 4, 5 AND 10 FRANCISCO ROAD, BONNIEFIELD

APPENDIX B

ROOF RAINWATER CAPTURE AND DOMESTIC USE ANALYSIS

Average number of persons per household: 3 persons
Insitu water tank storage volume: 150 kilolitres
Assumed built form dwelling roof sub-catchment area: 500 m2
Assumed built form shed roof sub-catchment area: 150 m2
Storage tank roof sub-catchment area (2.5m depth tank): 60 m2
Total catchment area: 710 m2
System losses (House consumption per person per day) -160 litres

Other notes: 1 Rainfall Data extracted from Australian Bureau of Meteorology site number 008051 recorded since 1941 reduced by 6.8% to account for possible rainfall average decrease by 2030.*
2 Runoff co-oefficient logarithmic based on minimum 20% at lowest rainfall and maximum 90% at highest rainfall
3 System loss based on a flat total household usuage of 160 litres per person per day at 3 persons per household, grey water re-used for garden reticulation
4 System Loss is based on the Water Corporations Domestic Water Use Study and the number of people per household is based on the 2011 Census provided by the Australian Bureau of Statistics

	Month	Starting storage at beginning of month (litres)	Added volume from other source	Average Rainfall in month (mm)[1]	Estimated runoff collection efficiency %[2]	Gross volume delivered to storage tank per month (litres)	System losses House consumption per person per day (litres)[3]	Number of persons per house	System losses Total consumption per house per day (litres)	System losses Total household consumption per month (litres)	Leakage per month (at 2% of consumption) (litres)[5]	Losses from tank overflow (litres)	Net volume added to storage for the month (litres)	Net volume in storage (litres)
Year 1	January	**80000**		5.3	-43	-1630	-160.0	3.0	-480	-14880	-298	0	-16808	63192
	February	63192		10.3	-12	-858	-160.0	3.0	-480	-13440	-269	0	-14566	48626
	March	48626		14.8	5	561	-160.0	3.0	-480	-14880	-298	0	-14616	34009
	April	34009		22.2	24	3847	-160.0	3.0	-480	-14400	-288	0	-10841	23169
	May	23169		64.8	75	34565	-160.0	3.0	-480	-14880	-298	0	19388	42557
	June	42557		90.6	91	58555	-160.0	3.0	-480	-14400	-288	0	43867	86424
	July	86424		85.1	88	53210	-160.0	3.0	-480	-14880	-298	0	38033	124456
	August	124456		60.3	72	30728	-160.0	3.0	-480	-14880	-298	0	15550	140007
	September	140007		29.8	38	8141	-160.0	3.0	-480	-14400	-288	0	-6547	133459
	October	133459		18.3	15	1976	-160.0	3.0	-480	-14880	-298	0	-13201	120258
	November	120258		8.5	-21	-1269	-160.0	3.0	-480	-14400	-288	0	-15957	104301
	December	104301		4.9	-47	-1637	-160.0	3.0	-480	-14880	-298	0	-16814	87486
Year 2	January	87486		5.3	-43	-1630	-160.0	3.0	-480	-14880	-298	0	-16808	70678
	February	70678		10.3	-12	-858	-160.0	3.0	-480	-14880	-298	0	-16035	54643
	March	54643		14.8	5	561	-160.0	3.0	-480	-14880	-298	0	-14616	40027
	April	40027		22.2	24	3847	-160.0	3.0	-480	-14880	-298	0	-11330	28697
	May	28697		64.8	75	34565	-160.0	3.0	-480	-14880	-298	0	19388	48084
	June	48084		90.6	91	58555	-160.0	3.0	-480	-14880	-298	0	43378	91462
	July	91462		85.1	88	53210	-160.0	3.0	-480	-14880	-298	0	38033	129495
	August	129495		60.3	72	30728	-160.0	3.0	-480	-14880	-298	0	15550	145045
	September	145045		29.8	38	8141	-160.0	3.0	-480	-14880	-298	0	-7037	138008
	October	138008		18.3	15	1976	-160.0	3.0	-480	-14880	-298	0	-13201	124807
	November	124807		8.5	-21	-1269	-160.0	3.0	-480	-14880	-298	0	-16447	108360
	December	108360		4.9	-47	-1637	-160.0	3.0	-480	-14880	-298	0	-16814	91545
Year 3	January	91545		5.3	-43	-1630	-160.0	3.0	-480	-14880	-298	0	-16808	74737
	February	74737		10.3	-12	-858	-160.0	3.0	-480	-14880	-298	0	-16035	58702
	March	58702		14.8	5	561	-160.0	3.0	-480	-14880	-298	0	-14616	44086
	April	44086		22.2	24	3847	-160.0	3.0	-480	-14880	-298	0	-11330	32756
	May	32756		64.8	75	34565	-160.0	3.0	-480	-14880	-298	0	19388	52143
	June	52143		90.6	91	58555	-160.0	3.0	-480	-14880	-298	0	43378	95521
	July	95521		85.1	88	53210	-160.0	3.0	-480	-14880	-298	0	38033	133554
	August	133554		60.3	72	30728	-160.0	3.0	-480	-14880	-298	0	15550	149104
	September	149104		29.8	38	8141	-160.0	3.0	-480	-14880	-298	0	-7037	142067
	October	142067		18.3	15	1976	-160.0	3.0	-480	-14880	-298	0	-13201	128866
	November	128866		8.5	-21	-1269	-160.0	3.0	-480	-14880	-298	0	-16447	112419
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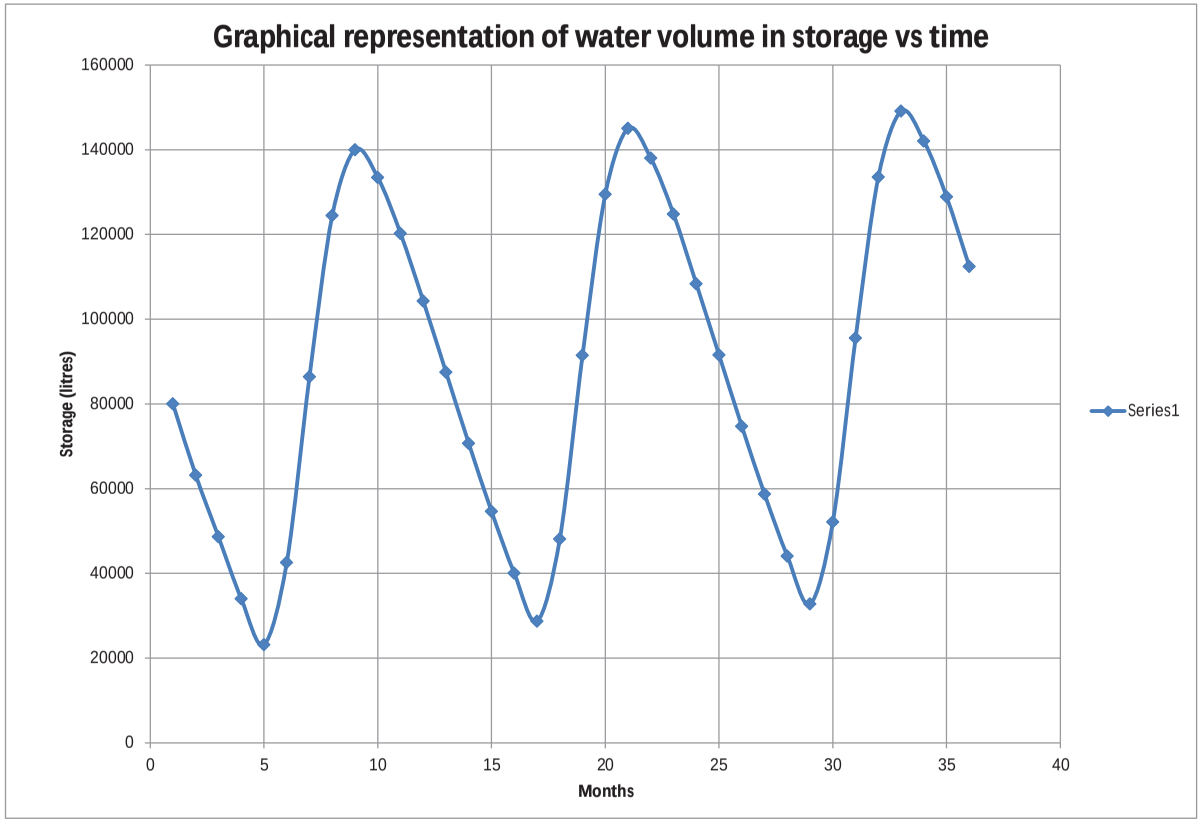
GRAPH OF APPENDIX B



APPENDIX C: Brief Write-up on Rational Method Used as per AR&R 1987.

Brief write-up on the Rational Method used as per AR&R 1987

by John Rostom (2013)

The Rational Method is a relatively conservative method for analysing stormwater surface runoff flows for various storm events. It is also the most commonly used approach. It is a probabilistic or statistical method for estimating design floods and peak flows of selected Average Recurrence Intervals (ARI) from an average rainfall intensity.

The peak flow rate (m^3/s) of average recurrence interval (ARI) of Y years, Q_y, is derived using the following equation:

$$Q_y = C_y \cdot I_{tc\,,y} \cdot A$$

where C_y = runoff coefficient (dimensionless) for ARI of Y years;
$I_{tc\,,y}$ = average rainfall intensity (mm/h) for design duration of t_c hours and ARI of Y years;
A = area of catchment (km^2).

Selection of C_y:

Runoff coefficient C for urban stormwater drainage can be interpreted in different ways. Fig. 14.13 of AR&R (1987) illustrates the preferred runoff coefficient relationship based on experience of drainage authorities and evidenced gauging from urban catchments. It relates the coefficient for a 10 year ARI, C_{10}, to the pervious and impervious fractions of the catchment, and to its rainfall climate, expressed through the 10 year ARI, 1 hour duration rainfall intensity, ${}^{10}I_1$.

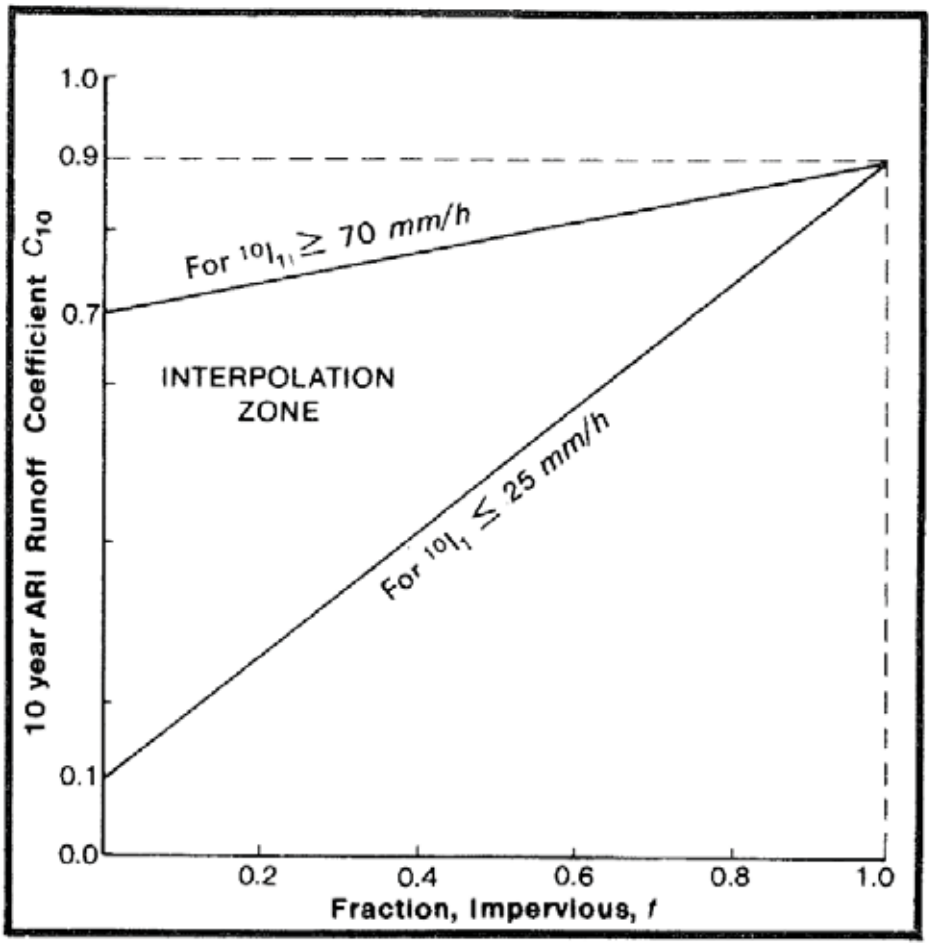


Figure 14.13 – Runoff Coefficients

The Runoff coefficient C is calculated as follows:

$$C_y = F_y \cdot C_{10}$$

where F_y = Frequency Factor for Rational Method Runoff Coefficients;
C_{10} = Runoff Coefficient for a 10 year ARI.

F_y is selected from the following table:

ARI (*years*)	Frequency Factor, F_y
1	0.8
2	0.85
5	0.95
10	1.0
20	1.05
50	1.15
100	1.2

C_{10} is calculated as follows:

$$C_{10} = 0.9 \text{ x } f + C^1_{10} \text{ x } (1 - f)$$

and

$$C^1_{10} = 0.1 + 0.0133 \text{ x } ({}^{10}I_1 - 25)$$

where C^1_{10} = Pervious Area Runoff Coefficients;
${}^{10}I_1$ = Fraction Impervious (0.0 to 1.0).

Selection of $I_{tc,y}$:

Over the years, various procedures have been used to estimate the value of t_c, which is considered to be the travel time from the most remote point on the catchment to the outlet, or the time taken from the start of rainfall until all of the catchment is simultaneously contributing flow to the outlet. The procedure considered for the Rational Method analysis is the Bransby Williams procedure.

The following formula is used for deriving t_c:

$$t_c = \frac{58L}{A^{0.1} S_e^{0.2}}$$

where t_c = time of concentration (*min.*)
L = mainstream length measured to the catchment divide (*km*)
A = catchment area (km^2)
S_e = equal area slope of the mainstream projected to the catchment divide (*m/km*)

For the procedure above, a unique $I_{tc,y}$ value is selected depending on the estimated t_c and C_y values.

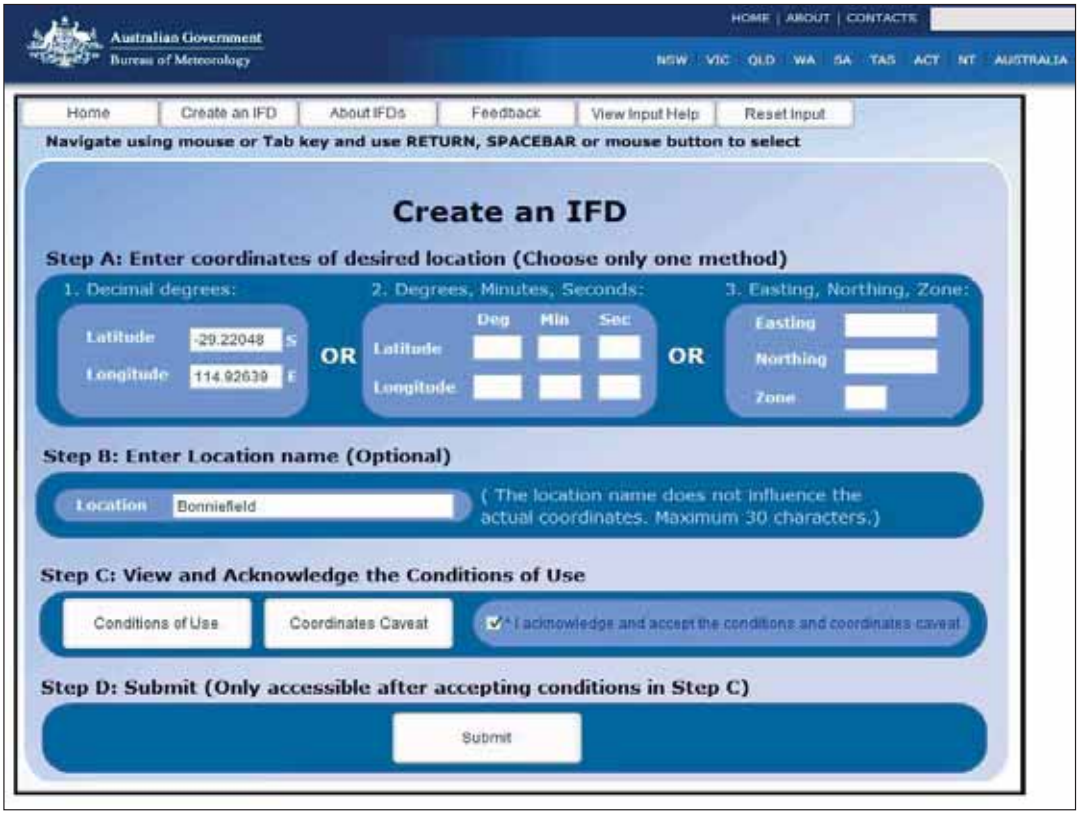
APPENDIX D: Design IFD Rainfall Data – Bureau of Meteorology

Design Intensity-Frequency-Duration (IFD) Rainfall Data

By: John Rostom
Date: 31st October 2013

Source: Bureau of Meteorology: Web-based Tool: Rainfall IFD Data System
Location: Bonniefield

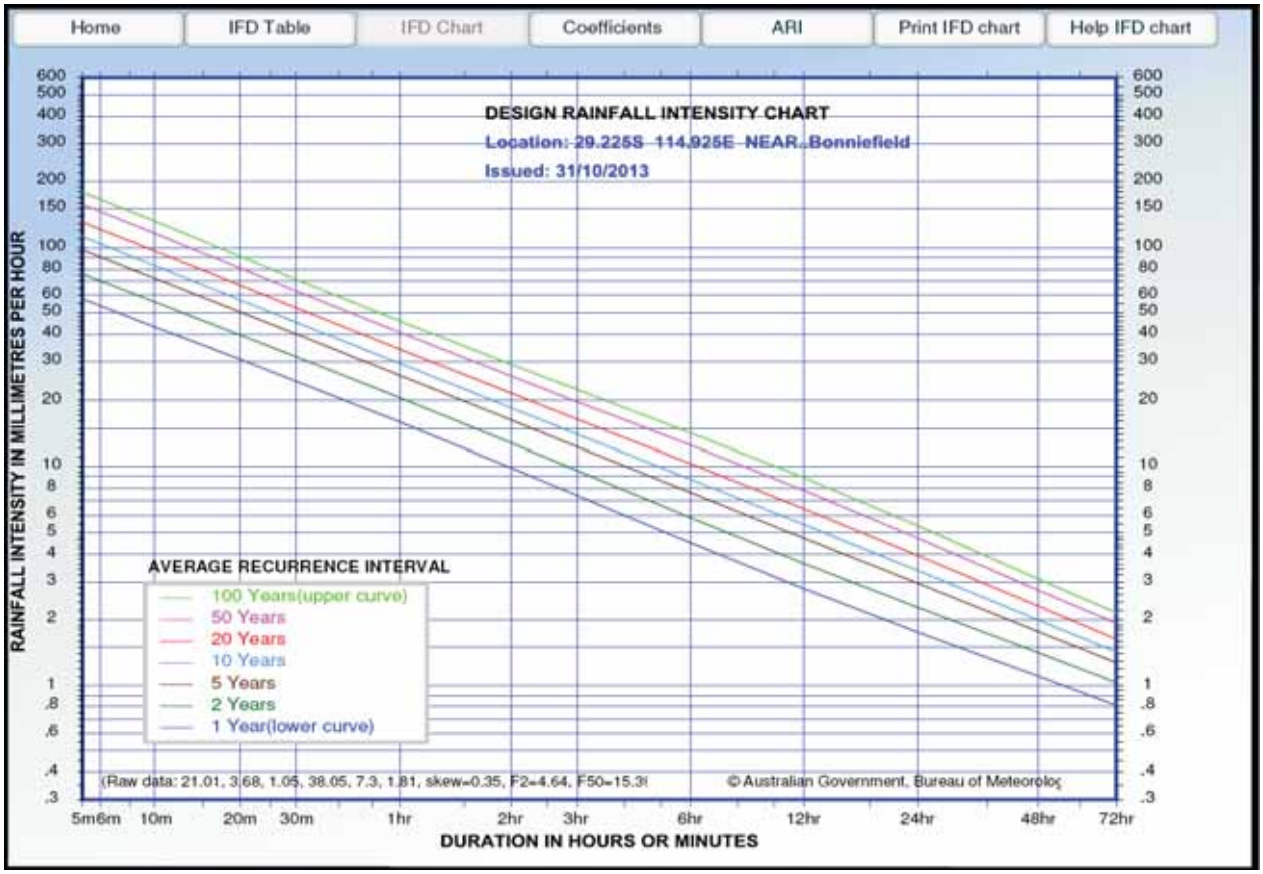
			Latitude	*Longitude*
Inputs:	**Geographic Coordinates:**	Decimal Degrees:	-29.22048° S	114.92639° E
IFD Tool Selection:	**Geographic Coordinates:**	Decimal Degrees:	-29.225° S	114.925° E



Design Intensity-Frequency-Duration (IFD) Rainfall Data

By: John Rostom
Date: 31st October 2013

Source: Bureau of Meteorology: Web-based Tool: Rainfall IFD Data System
Location: Bonniefield



Design Intensity-Frequency-Duration (IFD) Rainfall Data

By: John Rostom
Date: 31st October 2013

Source: Bureau of Meteorology: Web-based Tool: Rainfall IFD Data System
Location: Bonniefield

Polynomial Coefficients Table

Location: 29.225S 114.925E NEAR. Bonniefield Issued: 31/10/2013

List of coefficients to equations of the form

$$\log_e(I) = A + B \times (\log_e(T)) + C \times (\log_e(T))^2 + D \times (\log_e(T))^3 + E \times (\log_e(T))^4 + F \times (\log_e(T))^5 + G \times (\log_e(T))^6$$

T = Time in hours and I = Intensity in millimetres per hour

YEARS	A	B	C	D	E	F	G
1	2.7653331757	-6.5761656E-1	-4.6487994E-2	8.4572183E-3	2.0212787E-3	-1.9751323E-4	-6.0452916E-5
2	3.02054739	-6.5514797E-1	-4.2871047E-2	7.3963557E-3	1.7703272E-3	-6.6952320E-5	-7.8525030E-5
5	3.255695343	-6.5385479E-1	-3.2302871E-2	8.9688348E-3	2.8445110E-4	-2.7972783E-4	-4.1769400E-6
10	3.3803436756	-6.5240002E-1	-2.6748074E-2	9.2602381E-3	-4.0829750E-4	-3.2711477E-4	2.1444281E-5
20	3.5300955772	-6.5121728E-1	-2.1613294E-2	9.6158953E-3	-1.0782350E-3	-3.7923179E-4	4.7622714E-5
50	3.7057449818	-6.4978689E-1	-1.5788674E-2	9.9562742E-3	-1.8504282E-3	-4.3431760E-4	7.8021709E-5
100	3.8266773224	-6.4937431E-1	-1.1371864E-2	1.0492197E-2	-2.4563114E-3	-5.0131162E-4	1.0521018E-4

(Raw data: 21.01, 3.68, 1.05, 38.05, 7.3, 1.81, skew=0.35, F2=4.64, F50=15.39)

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ARI in years	coefficient A	coefficient B	coefficient C	coefficient D	coefficient E	coefficient F	coefficient G
1	2.7653331757E+00	-6.5761656000E-01	-4.6487994000E-02	8.4572183000E-03	2.0212787000E-03	-1.9751323000E-04	-6.0452916000E-05
2	3.0205473900E+00	-6.5514797000E-01	-4.2871047000E-02	7.3963557000E-03	1.7703272000E-03	-6.6952320000E-05	-7.8525030000E-05
5	3.2556953430E+00	-6.5385479000E-01	-3.2302871000E-02	8.9688348000E-03	2.8445110000E-04	-2.7972783000E-04	-4.1769400000E-06
10	3.3803436756E+00	-6.5240002000E-01	-2.6748074000E-02	9.2602381000E-03	-4.0829750000E-04	-3.2711477000E-04	2.1444281000E-05
20	3.5300955772E+00	-6.5121728000E-01	-2.1613294000E-02	9.6158953000E-03	-1.0782350000E-03	-3.7923179000E-04	4.7622714000E-05
50	3.7057449818E+00	-6.4978689000E-01	-1.5788674000E-02	9.9562742000E-03	-1.8504282000E-03	-4.3431760000E-04	7.8021709000E-05
100	3.8266773224E+00	-6.4937431000E-01	-1.1371864000E-02	1.0492197000E-02	-2.4563114000E-03	-5.0131162000E-04	1.0521018000E-04

Design Intensity-Frequency-Duration (IFD) Rainfall Data

By: John Rostom
Date: 31st October 2013

Source: Bureau of Meteorology: Web-based Tool: Rainfall IFD Data System
Location: Bonniefield

Intensity-Frequency-Duration Table

Location: 29.225S 114.925E NEAR.. Bonniefield Issued: 31/10/2013

Rainfall intensity in mm/h for various durations and Average Recurrence Interval

	Average Recurrence Interval						
Duration	**1 YEAR**	**2 YEARS**	**5 YEARS**	**10 YEARS**	**20 YEARS**	**50 YEARS**	**100 YEARS**
5Mins	58.2	75.6	97.5	112	131	157	179
6Mins	54.1	70.4	90.6	104	121	146	166
10Mins	43.3	56.3	72.2	82.5	96.5	116	132
20Mins	30.7	39.7	50.6	57.5	67.1	80.3	90.9
30Mins	24.4	31.6	40.1	45.4	52.9	63.1	71.3
1Hr	15.9	20.5	25.9	29.4	34.1	40.7	45.9
2Hrs	9.88	12.8	16.3	18.5	21.6	25.8	29.2
3Hrs	7.39	9.59	12.3	14.0	16.4	19.7	22.4
6Hrs	4.49	5.85	7.61	8.75	10.3	12.5	14.2
12Hrs	2.77	3.61	4.72	5.44	6.42	7.79	8.91
24Hrs	1.75	2.27	2.93	3.35	3.92	4.72	5.37
48Hrs	1.10	1.41	1.76	1.99	2.30	2.72	3.06
72Hrs	.809	1.03	1.27	1.42	1.63	1.92	2.15

(Raw data: 21.01, 3.68, 1.05, 38.05, 7.3, 1.81, skew=0.35, F2=4.64, F50=15.39)

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			Design Average Rainfall Intensities (mm/hr)						
			ARI (yrs):						
Duration, T (minutes)	Duration, T (hours)	*ln* T	1	2	5	10	20	50	100
1	0.02	-4.094	100.3	107.9	173.8	206.5	252.6	319.1	386.4
2	0.03	-3.401	81.3	100.3	135.9	156.5	184.7	224.1	258.1
3	0.05	-2.996	70.6	90.2	118.0	135.3	158.8	191.5	218.6
4	0.07	-2.708	63.5	82.1	106.2	121.7	142.6	171.8	195.6
5	**0.08**	**-2.485**	**58.2**	**75.6**	**97.5**	**111.6**	**130.8**	**157.5**	**179.1**
6	**0.10**	**-2.303**	**54.1**	**70.4**	**90.6**	**103.6**	**121.4**	**146.1**	**166.1**
7	0.12	-2.148	50.7	66.0	84.8	97.0	113.7	136.8	155.4
8	0.13	-2.015	47.9	62.3	80.0	91.5	107.1	128.8	146.4
9	0.15	-1.897	45.4	59.1	75.9	86.7	101.5	122.0	138.6
10	**0.17**	**-1.792**	**43.3**	**56.3**	**72.2**	**82.5**	**96.5**	**116.0**	**131.7**
11	0.18	-1.696	41.4	53.9	69.0	78.8	92.1	110.7	125.7
12	0.20	-1.609	39.8	51.6	66.1	75.5	88.2	105.9	120.2
13	0.22	-1.529	38.2	49.7	63.6	72.5	84.7	101.6	115.3
14	0.23	-1.455	36.9	47.8	61.2	69.8	81.5	97.8	110.9
15	0.25	-1.386	35.6	46.2	59.1	67.3	78.6	94.2	106.8
16	0.27	-1.322	34.5	44.7	57.1	65.0	75.9	91.0	103.1
17	0.28	-1.261	33.4	43.3	55.3	62.9	73.4	88.0	99.7
18	0.30	-1.204	32.4	42.0	53.6	61.0	71.2	85.2	96.6
19	0.32	-1.150	31.5	40.8	52.1	59.2	69.0	82.7	93.6
20	**0.33**	**-1.099**	**30.7**	**39.7**	**50.6**	**57.5**	**67.1**	**80.3**	**90.9**
21	0.35	-1.050	29.9	38.7	49.2	56.0	65.2	78.1	88.4
22	0.37	-1.003	29.1	37.7	48.0	54.5	63.5	76.0	86.0
23	0.38	-0.959	28.4	36.8	46.8	53.1	61.9	74.0	83.8
24	0.40	-0.916	27.8	35.9	45.7	51.9	60.4	72.2	81.7
25	0.42	-0.875	27.1	35.1	44.6	50.6	59.0	70.5	79.7
26	0.43	-0.836	26.5	34.3	43.6	49.5	57.6	68.8	77.8
27	0.45	-0.799	26.0	33.6	42.6	48.4	56.3	67.3	76.1
28	0.47	-0.762	25.4	32.9	41.7	47.4	55.1	65.8	74.4
29	0.48	-0.727	24.9	32.2	40.9	46.4	54.0	64.4	72.8
30	**0.50**	**-0.693**	**24.4**	**31.6**	**40.1**	**45.4**	**52.9**	**63.1**	**71.3**
31	0.52	-0.660	24.0	31.0	39.3	44.6	51.8	61.9	69.9
32	0.53	-0.629	23.5	30.4	38.5	43.7	50.8	60.7	68.5
33	0.55	-0.598	23.1	29.8	37.8	42.9	49.9	59.5	67.2
34	0.57	-0.568	22.7	29.3	37.2	42.1	49.0	58.4	66.0
35	0.58	-0.539	22.3	28.8	36.5	41.4	48.1	57.4	64.8
36	0.60	-0.511	21.9	28.3	35.9	40.7	47.3	56.4	63.7
37	0.62	-0.483	21.6	27.8	35.3	40.0	46.5	55.4	62.6
38	0.63	-0.457	21.2	27.4	34.7	39.3	45.7	54.5	61.5
39	0.65	-0.431	20.9	27.0	34.1	38.7	45.0	53.6	60.5
40	0.67	-0.405	20.6	26.5	33.6	38.1	44.3	52.8	59.6
41	0.68	-0.381	20.3	26.1	33.1	37.5	43.6	52.0	58.7
42	0.70	-0.357	20.0	25.8	32.6	36.9	42.9	51.2	57.8
43	0.72	-0.333	19.7	25.4	32.1	36.4	42.3	50.4	56.9
44	0.73	-0.310	19.4	25.0	31.7	35.9	41.7	49.7	56.1
45	0.75	-0.288	19.1	24.7	31.2	35.4	41.1	49.0	55.3
46	0.77	-0.266	18.9	24.3	30.8	34.9	40.5	48.3	54.5
47	0.78	-0.244	18.6	24.0	30.4	34.4	40.0	47.6	53.8
48	0.80	-0.223	18.4	23.7	30.0	33.9	39.4	47.0	53.0
49	0.82	-0.203	18.1	23.4	29.6	33.5	38.9	46.4	52.3
50	0.83	-0.182	17.9	23.1	29.2	33.1	38.4	45.8	51.7
51	0.85	-0.163	17.7	22.8	28.8	32.6	37.9	45.2	51.0
52	0.87	-0.143	17.4	22.5	28.5	32.2	37.4	44.6	50.4
53	0.88	-0.124	17.2	22.2	28.1	31.8	37.0	44.1	49.8
54	0.90	-0.105	17.0	22.0	27.8	31.5	36.5	43.6	49.2
55	0.92	-0.087	16.8	21.7	27.4	31.1	36.1	43.0	48.6
56	0.93	-0.069	16.6	21.4	27.1	30.7	35.7	42.5	48.0
57	0.95	-0.051	16.4	21.2	26.8	30.4	35.3	42.1	47.5
58	0.97	-0.034	16.2	21.0	26.5	30.0	34.9	41.6	46.9
59	0.98	-0.017	16.1	20.7	26.2	29.7	34.5	41.1	46.4
60	**1.00**	**0.000**	**15.9**	**20.5**	**25.9**	**29.4**	**34.1**	**40.7**	**45.9**
61	1.02	0.017	15.7	20.3	25.7	29.1	33.8	40.2	45.4
62	1.03	0.033	15.5	20.1	25.4	28.8	33.4	39.8	44.9
63	1.05	0.049	15.4	19.9	25.1	28.5	33.1	39.4	44.5
64	1.07	0.065	15.2	19.7	24.9	28.2	32.7	39.0	44.0
65	1.08	0.080	15.1	19.4	24.6	27.9	32.4	38.6	43.6
66	1.10	0.095	14.9	19.3	24.4	27.6	32.1	38.2	43.2
67	1.12	0.110	14.8	19.1	24.1	27.3	31.8	37.9	42.7

			Design Average Rainfall Intensities (mm/hr)						
			ARI (yrs):						
Duration, T (minutes)	Duration, T (hours)	*ln* T	1	2	5	10	20	50	100
68	1.13	0.125	14.6	18.9	23.9	27.1	31.4	37.5	42.3
69	1.15	0.140	14.5	18.7	23.7	26.8	31.1	37.1	41.9
70	1.17	0.154	14.3	18.5	23.4	26.6	30.9	36.8	41.5
71	1.18	0.168	14.2	18.3	23.2	26.3	30.6	36.5	41.1
72	1.20	0.182	14.1	18.2	23.0	26.1	30.3	36.1	40.8
73	1.22	0.196	13.9	18.0	22.8	25.8	30.0	35.8	40.4
74	1.23	0.210	13.8	17.8	22.6	25.6	29.7	35.5	40.0
75	1.25	0.223	13.7	17.7	22.4	25.4	29.5	35.2	39.7
76	1.27	0.236	13.6	17.5	22.2	25.1	29.2	34.9	39.4
77	1.28	0.249	13.4	17.4	22.0	24.9	29.0	34.6	39.0
78	1.30	0.262	13.3	17.2	21.8	24.7	28.7	34.3	38.7
79	1.32	0.275	13.2	17.1	21.6	24.5	28.5	34.0	38.4
80	1.33	0.288	13.1	16.9	21.4	24.3	28.3	33.7	38.1
81	1.35	0.300	13.0	16.8	21.3	24.1	28.0	33.4	37.8
82	1.37	0.312	12.9	16.6	21.1	23.9	27.8	33.2	37.5
83	1.38	0.324	12.8	16.5	20.9	23.7	27.6	32.9	37.2
84	1.40	0.336	12.7	16.4	20.7	23.5	27.4	32.6	36.9
85	1.42	0.348	12.6	16.2	20.6	23.3	27.1	32.4	36.6
86	1.43	0.360	12.5	16.1	20.4	23.2	26.9	32.1	36.3
87	1.45	0.372	12.4	16.0	20.3	23.0	26.7	31.9	36.0
88	1.47	0.383	12.3	15.9	20.1	22.8	26.5	31.7	35.8
89	1.48	0.394	12.2	15.7	20.0	22.6	26.3	31.4	35.5
90	1.50	0.405	12.1	15.6	19.8	22.5	26.1	31.2	35.2
91	1.52	0.417	12.0	15.5	19.7	22.3	25.9	31.0	35.0
92	1.53	0.427	11.9	15.4	19.5	22.1	25.8	30.7	34.7
93	1.55	0.438	11.8	15.3	19.4	22.0	25.6	30.5	34.5
94	1.57	0.449	11.7	15.2	19.2	21.8	25.4	30.3	34.3
95	1.58	0.460	11.6	15.0	19.1	21.7	25.2	30.1	34.0
96	1.60	0.470	11.6	14.9	19.0	21.5	25.0	29.9	33.8
97	1.62	0.480	11.5	14.8	18.8	21.4	24.9	29.7	33.6
98	1.63	0.491	11.4	14.7	18.7	21.2	24.7	29.5	33.3
99	1.65	0.501	11.3	14.6	18.6	21.1	24.5	29.3	33.1
100	1.67	0.511	11.2	14.5	18.4	20.9	24.4	29.1	32.9
101	1.68	0.521	11.2	14.4	18.3	20.8	24.2	28.9	32.7
102	1.70	0.531	11.1	14.3	18.2	20.7	24.0	28.7	32.5
103	1.72	0.540	11.0	14.2	18.1	20.5	23.9	28.5	32.3
104	1.73	0.550	10.9	14.1	18.0	20.4	23.7	28.4	32.1
105	1.75	0.560	10.9	14.0	17.8	20.3	23.6	28.2	31.9
106	1.77	0.569	10.8	13.9	17.7	20.1	23.4	28.0	31.7
107	1.78	0.578	10.7	13.9	17.6	20.0	23.3	27.8	31.5
108	1.80	0.588	10.6	13.8	17.5	19.9	23.1	27.7	31.3
109	1.82	0.597	10.6	13.7	17.4	19.8	23.0	27.5	31.1
110	1.83	0.606	10.5	13.6	17.3	19.6	22.9	27.3	30.9
111	1.85	0.615	10.4	13.5	17.2	19.5	22.7	27.2	30.7
112	1.87	0.624	10.4	13.4	17.1	19.4	22.6	27.0	30.5
113	1.88	0.633	10.3	13.3	17.0	19.3	22.5	26.8	30.4
114	1.90	0.642	10.2	13.3	16.9	19.2	22.3	26.7	30.2
115	1.92	0.651	10.2	13.2	16.8	19.0	22.2	26.5	30.0
116	1.93	0.659	10.1	13.1	16.7	18.9	22.1	26.4	29.8
117	1.95	0.668	10.1	13.0	16.6	18.8	21.9	26.2	29.7
118	1.97	0.676	10.0	12.9	16.5	18.7	21.8	26.1	29.5
119	1.98	0.685	9.9	12.9	16.4	18.6	21.7	25.9	29.4
120	**2.00**	**0.693**	**9.9**	**12.8**	**16.3**	**18.5**	**21.6**	**25.8**	**29.2**
121	2.02	0.701	9.8	12.7	16.2	18.4	21.4	25.7	29.0
122	2.03	0.710	9.8	12.6	16.1	18.3	21.3	25.5	28.9
123	2.05	0.718	9.7	12.6	16.0	18.2	21.2	25.4	28.7
124	2.07	0.726	9.7	12.5	15.9	18.1	21.1	25.3	28.6
125	2.08	0.734	9.6	12.4	15.8	18.0	21.0	25.1	28.4
126	2.10	0.742	9.5	12.4	15.7	17.9	20.9	25.0	28.3
127	2.12	0.750	9.5	12.3	15.7	17.8	20.8	24.9	28.1
128	2.13	0.758	9.4	12.2	15.6	17.7	20.7	24.7	28.0
129	2.15	0.765	9.4	12.2	15.5	17.6	20.5	24.6	27.8
130	2.17	0.773	9.3	12.1	15.4	17.5	20.4	24.5	27.7
131	2.18	0.781	9.3	12.0	15.3	17.4	20.3	24.4	27.6
132	2.20	0.788	9.2	12.0	15.2	17.4	20.2	24.2	27.4
133	2.22	0.796	9.2	11.9	15.2	17.3	20.1	24.1	27.3
134	2.23	0.803	9.1	11.8	15.1	17.2	20.0	24.0	27.2

			Design Average Rainfall Intensities (mm/hr)						
			ARI (yrs):						
Duration, T (minutes)	Duration, T (hours)	*ln* T	1	2	5	10	20	50	100
135	2.25	0.811	9.1	11.8	15.0	17.1	19.9	23.9	27.0
136	2.27	0.818	9.0	11.7	14.9	17.0	19.8	23.8	26.9
137	2.28	0.826	9.0	11.7	14.9	16.9	19.7	23.6	26.8
138	2.30	0.833	8.9	11.6	14.8	16.8	19.6	23.5	26.6
139	2.32	0.840	8.9	11.5	14.7	16.8	19.5	23.4	26.5
140	2.33	0.847	8.9	11.5	14.6	16.7	19.5	23.3	26.4
141	2.35	0.854	8.8	11.4	14.6	16.6	19.4	23.2	26.3
142	2.37	0.861	8.8	11.4	14.5	16.5	19.3	23.1	26.2
143	2.38	0.869	8.7	11.3	14.4	16.4	19.2	23.0	26.0
144	2.40	0.875	8.7	11.2	14.4	16.4	19.1	22.9	25.9
145	2.42	0.882	8.6	11.2	14.3	16.3	19.0	22.8	25.8
146	2.43	0.889	8.6	11.1	14.2	16.2	18.9	22.7	25.7
147	2.45	0.896	8.6	11.1	14.2	16.1	18.8	22.6	25.6
148	2.47	0.903	8.5	11.0	14.1	16.1	18.7	22.5	25.5
149	2.48	0.910	8.5	11.0	14.0	16.0	18.7	22.4	25.3
150	2.50	0.916	8.4	10.9	14.0	15.9	18.6	22.3	25.2
151	2.52	0.923	8.4	10.9	13.9	15.8	18.5	22.2	25.1
152	2.53	0.930	8.3	10.8	13.8	15.8	18.4	22.1	25.0
153	2.55	0.936	8.3	10.8	13.8	15.7	18.3	22.0	24.9
154	2.57	0.943	8.3	10.7	13.7	15.6	18.2	21.9	24.8
155	2.58	0.949	8.2	10.7	13.6	15.6	18.2	21.8	24.7
156	2.60	0.956	8.2	10.6	13.6	15.5	18.1	21.7	24.6
157	2.62	0.962	8.2	10.6	13.5	15.4	18.0	21.6	24.5
158	2.63	0.968	8.1	10.5	13.5	15.4	17.9	21.5	24.4
159	2.65	0.975	8.1	10.5	13.4	15.3	17.9	21.4	24.3
160	2.67	0.981	8.0	10.4	13.4	15.2	17.8	21.3	24.2
161	2.68	0.987	8.0	10.4	13.3	15.2	17.7	21.3	24.1
162	2.70	0.993	8.0	10.3	13.2	15.1	17.6	21.2	24.0
163	2.72	0.999	7.9	10.3	13.2	15.0	17.6	21.1	23.9
164	2.73	1.006	7.9	10.3	13.1	15.0	17.5	21.0	23.8
165	2.75	1.012	7.9	10.2	13.1	14.9	17.4	20.9	23.7
166	2.77	1.018	7.8	10.2	13.0	14.8	17.4	20.8	23.6
167	2.78	1.024	7.8	10.1	13.0	14.8	17.3	20.7	23.5
168	2.80	1.030	7.8	10.1	12.9	14.7	17.2	20.7	23.4
169	2.82	1.036	7.7	10.0	12.9	14.7	17.1	20.6	23.3
170	2.83	1.041	7.7	10.0	12.8	14.6	17.1	20.5	23.3
171	2.85	1.047	7.7	10.0	12.8	14.5	17.0	20.4	23.2
172	2.87	1.053	7.6	9.9	12.7	14.5	16.9	20.3	23.1
173	2.88	1.059	7.6	9.9	12.7	14.4	16.9	20.3	23.0
174	2.90	1.065	7.6	9.8	12.6	14.4	16.8	20.2	22.9
175	2.92	1.070	7.5	9.8	12.6	14.3	16.7	20.1	22.8
176	2.93	1.076	7.5	9.7	12.5	14.3	16.7	20.0	22.7
177	2.95	1.082	7.5	9.7	12.5	14.2	16.6	20.0	22.7
178	2.97	1.087	7.5	9.7	12.4	14.2	16.6	19.9	22.6
179	2.98	1.093	7.4	9.6	12.4	14.1	16.5	19.8	22.5
180	**3.00**	**1.099**	**7.4**	**9.6**	**12.3**	**14.0**	**16.4**	**19.7**	**22.4**
181	3.02	1.104	7.4	9.6	12.3	14.0	16.4	19.7	22.3
182	3.03	1.110	7.3	9.5	12.2	13.9	16.3	19.6	22.2
183	3.05	1.115	7.3	9.5	12.2	13.9	16.3	19.5	22.2
184	3.07	1.121	7.3	9.4	12.1	13.8	16.2	19.5	22.1
185	3.08	1.126	7.2	9.4	12.1	13.8	16.1	19.4	22.0
186	3.10	1.131	7.2	9.4	12.0	13.7	16.1	19.3	21.9
187	3.12	1.137	7.2	9.3	12.0	13.7	16.0	19.3	21.9
188	3.13	1.142	7.2	9.3	11.9	13.6	16.0	19.2	21.8
189	3.15	1.147	7.1	9.3	11.9	13.6	15.9	19.1	21.7
190	3.17	1.153	7.1	9.2	11.9	13.5	15.8	19.0	21.6
191	3.18	1.158	7.1	9.2	11.8	13.5	15.8	19.0	21.6
192	3.20	1.163	7.1	9.2	11.8	13.4	15.7	18.9	21.5
193	3.22	1.168	7.0	9.1	11.7	13.4	15.7	18.9	21.4
194	3.23	1.174	7.0	9.1	11.7	13.3	15.6	18.8	21.3
195	3.25	1.179	7.0	9.1	11.6	13.3	15.6	18.7	21.3
196	3.27	1.184	7.0	9.0	11.6	13.3	15.5	18.7	21.2
197	3.28	1.189	6.9	9.0	11.6	13.2	15.5	18.6	21.1
198	3.30	1.194	6.9	9.0	11.5	13.2	15.4	18.5	21.1
199	3.32	1.199	6.9	8.9	11.5	13.1	15.4	18.5	21.0
200	3.33	1.204	6.9	8.9	11.4	13.1	15.3	18.4	20.9
201	3.35	1.209	6.8	8.9	11.4	13.0	15.3	18.4	20.8

			Design Average Rainfall Intensities (mm/hr)						
			ARI (yrs):						
Duration, T (minutes)	Duration, T (hours)	*ln* T	1	2	5	10	20	50	100
202	3.37	1.214	6.8	8.8	11.4	13.0	15.2	18.3	20.8
203	3.38	1.219	6.8	8.8	11.3	12.9	15.2	18.2	20.7
204	3.40	1.224	6.8	8.8	11.3	12.9	15.1	18.2	20.6
205	3.42	1.229	6.7	8.7	11.2	12.9	15.1	18.1	20.6
206	3.43	1.234	6.7	8.7	11.2	12.8	15.0	18.1	20.5
207	3.45	1.238	6.7	8.7	11.2	12.8	15.0	18.0	20.5
208	3.47	1.243	6.7	8.7	11.1	12.7	14.9	17.9	20.4
209	3.48	1.248	6.6	8.6	11.1	12.7	14.9	17.9	20.3
210	3.50	1.253	6.6	8.6	11.1	12.6	14.8	17.8	20.3
211	3.52	1.258	6.6	8.6	11.0	12.6	14.8	17.8	20.2
212	3.53	1.262	6.6	8.5	11.0	12.6	14.7	17.7	20.1
213	3.55	1.267	6.5	8.5	11.0	12.5	14.7	17.7	20.1
214	3.57	1.272	6.5	8.5	10.9	12.5	14.6	17.6	20.0
215	3.58	1.276	6.5	8.4	10.9	12.4	14.6	17.6	20.0
216	3.60	1.281	6.5	8.4	10.8	12.4	14.5	17.5	19.9
217	3.62	1.286	6.5	8.4	10.8	12.4	14.5	17.4	19.8
218	3.63	1.290	6.4	8.4	10.8	12.3	14.4	17.4	19.8
219	3.65	1.295	6.4	8.3	10.7	12.3	14.4	17.3	19.7
220	3.67	1.299	6.4	8.3	10.7	12.3	14.4	17.3	19.7
221	3.68	1.304	6.4	8.3	10.7	12.2	14.3	17.2	19.6
222	3.70	1.308	6.4	8.3	10.6	12.2	14.3	17.2	19.5
223	3.72	1.313	6.3	8.2	10.6	12.1	14.2	17.1	19.5
224	3.73	1.317	6.3	8.2	10.6	12.1	14.2	17.1	19.4
225	3.75	1.322	6.3	8.2	10.5	12.1	14.1	17.0	19.4
226	3.77	1.326	6.3	8.2	10.5	12.0	14.1	17.0	19.3
227	3.78	1.331	6.3	8.1	10.5	12.0	14.1	16.9	19.3
228	3.80	1.335	6.2	8.1	10.4	12.0	14.0	16.9	19.2
229	3.82	1.339	6.2	8.1	10.4	11.9	14.0	16.8	19.1
230	3.83	1.344	6.2	8.1	10.4	11.9	13.9	16.8	19.1
231	3.85	1.348	6.2	8.0	10.4	11.8	13.9	16.7	19.0
232	3.87	1.352	6.2	8.0	10.3	11.8	13.9	16.7	19.0
233	3.88	1.357	6.1	8.0	10.3	11.8	13.8	16.6	18.9
234	3.90	1.361	6.1	8.0	10.3	11.7	13.8	16.6	18.9
235	3.92	1.365	6.1	7.9	10.2	11.7	13.7	16.6	18.8
236	3.93	1.369	6.1	7.9	10.2	11.7	13.7	16.5	18.8
237	3.95	1.374	6.1	7.9	10.2	11.6	13.7	16.5	18.7
238	3.97	1.378	6.0	7.9	10.1	11.6	13.6	16.4	18.7
239	3.98	1.382	6.0	7.8	10.1	11.6	13.6	16.4	18.6
240	4.00	1.386	6.0	7.8	10.1	11.5	13.5	16.3	18.6
241	4.02	1.390	6.0	7.8	10.1	11.5	13.5	16.3	18.5
242	4.03	1.395	6.0	7.8	10.0	11.5	13.5	16.2	18.5
243	4.05	1.399	6.0	7.7	10.0	11.4	13.4	16.2	18.4
244	4.07	1.403	5.9	7.7	10.0	11.4	13.4	16.1	18.4
245	4.08	1.407	5.9	7.7	9.9	11.4	13.4	16.1	18.3
246	4.10	1.411	5.9	7.7	9.9	11.4	13.3	16.1	18.3
247	4.12	1.415	5.9	7.6	9.9	11.3	13.3	16.0	18.2
248	4.13	1.419	5.9	7.6	9.9	11.3	13.2	16.0	18.2
249	4.15	1.423	5.8	7.6	9.8	11.3	13.2	15.9	18.1
250	4.17	1.427	5.8	7.6	9.8	11.2	13.2	15.9	18.1
251	4.18	1.431	5.8	7.6	9.8	11.2	13.1	15.8	18.0
252	4.20	1.435	5.8	7.5	9.7	11.2	13.1	15.8	18.0
253	4.22	1.439	5.8	7.5	9.7	11.1	13.1	15.8	17.9
254	4.23	1.443	5.8	7.5	9.7	11.1	13.0	15.7	17.9
255	4.25	1.447	5.7	7.5	9.7	11.1	13.0	15.7	17.9
256	4.27	1.451	5.7	7.5	9.6	11.0	13.0	15.6	17.8
257	4.28	1.455	5.7	7.4	9.6	11.0	12.9	15.6	17.8
258	4.30	1.459	5.7	7.4	9.6	11.0	12.9	15.6	17.7
259	4.32	1.462	5.7	7.4	9.6	11.0	12.9	15.5	17.7
260	4.33	1.466	5.7	7.4	9.5	10.9	12.8	15.5	17.6
261	4.35	1.470	5.7	7.4	9.5	10.9	12.8	15.4	17.6
262	4.37	1.474	5.6	7.3	9.5	10.9	12.8	15.4	17.5
263	4.38	1.478	5.6	7.3	9.5	10.8	12.7	15.4	17.5
264	4.40	1.482	5.6	7.3	9.4	10.8	12.7	15.3	17.5
265	4.42	1.485	5.6	7.3	9.4	10.8	12.7	15.3	17.4
266	4.43	1.489	5.6	7.3	9.4	10.8	12.6	15.2	17.4
267	4.45	1.493	5.6	7.2	9.4	10.7	12.6	15.2	17.3
268	4.47	1.497	5.5	7.2	9.3	10.7	12.6	15.2	17.3

			Design Average Rainfall Intensities (mm/hr)						
			ARI (yrs):						
Duration, T (minutes)	Duration, T (hours)	*ln* T	1	2	5	10	20	50	100
269	4.48	1.500	5.5	7.2	9.3	10.7	12.5	15.1	17.2
270	4.50	1.504	5.5	7.2	9.3	10.7	12.5	15.1	17.2
271	4.52	1.508	5.5	7.2	9.3	10.6	12.5	15.1	17.2
272	4.53	1.511	5.5	7.1	9.2	10.6	12.4	15.0	17.1
273	4.55	1.515	5.5	7.1	9.2	10.6	12.4	15.0	17.1
274	4.57	1.519	5.5	7.1	9.2	10.5	12.4	15.0	17.0
275	4.58	1.522	5.4	7.1	9.2	10.5	12.4	14.9	17.0
276	4.60	1.526	5.4	7.1	9.1	10.5	12.3	14.9	17.0
277	4.62	1.530	5.4	7.0	9.1	10.5	12.3	14.8	16.9
278	4.63	1.533	5.4	7.0	9.1	10.4	12.3	14.8	16.9
279	4.65	1.537	5.4	7.0	9.1	10.4	12.2	14.8	16.8
280	4.67	1.540	5.4	7.0	9.1	10.4	12.2	14.7	16.8
281	4.68	1.544	5.4	7.0	9.0	10.4	12.2	14.7	16.8
282	4.70	1.548	5.3	7.0	9.0	10.3	12.1	14.7	16.7
283	4.72	1.551	5.3	6.9	9.0	10.3	12.1	14.6	16.7
284	4.73	1.555	5.3	6.9	9.0	10.3	12.1	14.6	16.6
285	4.75	1.558	5.3	6.9	8.9	10.3	12.1	14.6	16.6
286	4.77	1.562	5.3	6.9	8.9	10.2	12.0	14.5	16.6
287	4.78	1.565	5.3	6.9	8.9	10.2	12.0	14.5	16.5
288	4.80	1.569	5.3	6.9	8.9	10.2	12.0	14.5	16.5
289	4.82	1.572	5.3	6.8	8.9	10.2	12.0	14.4	16.4
290	4.83	1.576	5.2	6.8	8.8	10.1	11.9	14.4	16.4
291	4.85	1.579	5.2	6.8	8.8	10.1	11.9	14.4	16.4
292	4.87	1.582	5.2	6.8	8.8	10.1	11.9	14.3	16.3
293	4.88	1.586	5.2	6.8	8.8	10.1	11.8	14.3	16.3
294	4.90	1.589	5.2	6.8	8.8	10.0	11.8	14.3	16.3
295	4.92	1.593	5.2	6.7	8.7	10.0	11.8	14.2	16.2
296	4.93	1.596	5.2	6.7	8.7	10.0	11.8	14.2	16.2
297	4.95	1.599	5.2	6.7	8.7	10.0	11.7	14.2	16.2
298	4.97	1.603	5.1	6.7	8.7	10.0	11.7	14.1	16.1
299	4.98	1.606	5.1	6.7	8.7	9.9	11.7	14.1	16.1
300	5.00	1.609	5.1	6.7	8.6	9.9	11.7	14.1	16.1
301	5.02	1.613	5.1	6.6	8.6	9.9	11.6	14.0	16.0
302	5.03	1.616	5.1	6.6	8.6	9.9	11.6	14.0	16.0
303	5.05	1.619	5.1	6.6	8.6	9.8	11.6	14.0	15.9
304	5.07	1.623	5.1	6.6	8.6	9.8	11.5	14.0	15.9
305	5.08	1.626	5.1	6.6	8.5	9.8	11.5	13.9	15.9
306	5.10	1.629	5.0	6.6	8.5	9.8	11.5	13.9	15.8
307	5.12	1.633	5.0	6.5	8.5	9.8	11.5	13.9	15.8
308	5.13	1.636	5.0	6.5	8.5	9.7	11.4	13.8	15.8
309	5.15	1.639	5.0	6.5	8.5	9.7	11.4	13.8	15.7
310	5.17	1.642	5.0	6.5	8.4	9.7	11.4	13.8	15.7
311	5.18	1.645	5.0	6.5	8.4	9.7	11.4	13.7	15.7
312	5.20	1.649	5.0	6.5	8.4	9.7	11.3	13.7	15.6
313	5.22	1.652	5.0	6.5	8.4	9.6	11.3	13.7	15.6
314	5.23	1.655	5.0	6.4	8.4	9.6	11.3	13.7	15.6
315	5.25	1.658	4.9	6.4	8.3	9.6	11.3	13.6	15.5
316	5.27	1.661	4.9	6.4	8.3	9.6	11.3	13.6	15.5
317	5.28	1.665	4.9	6.4	8.3	9.5	11.2	13.6	15.5
318	5.30	1.668	4.9	6.4	8.3	9.5	11.2	13.5	15.4
319	5.32	1.671	4.9	6.4	8.3	9.5	11.2	13.5	15.4
320	5.33	1.674	4.9	6.4	8.3	9.5	11.2	13.5	15.4
321	5.35	1.677	4.9	6.3	8.2	9.5	11.1	13.5	15.4
322	5.37	1.680	4.9	6.3	8.2	9.4	11.1	13.4	15.3
323	5.38	1.683	4.9	6.3	8.2	9.4	11.1	13.4	15.3
324	5.40	1.686	4.8	6.3	8.2	9.4	11.1	13.4	15.3
325	5.42	1.689	4.8	6.3	8.2	9.4	11.0	13.4	15.2
326	5.43	1.693	4.8	6.3	8.2	9.4	11.0	13.3	15.2
327	5.45	1.696	4.8	6.3	8.1	9.3	11.0	13.3	15.2
328	5.47	1.699	4.8	6.2	8.1	9.3	11.0	13.3	15.1
329	5.48	1.702	4.8	6.2	8.1	9.3	11.0	13.2	15.1
330	5.50	1.705	4.8	6.2	8.1	9.3	10.9	13.2	15.1
331	5.52	1.708	4.8	6.2	8.1	9.3	10.9	13.2	15.0
332	5.53	1.711	4.8	6.2	8.1	9.2	10.9	13.2	15.0
333	5.55	1.714	4.7	6.2	8.0	9.2	10.9	13.1	15.0
334	5.57	1.717	4.7	6.2	8.0	9.2	10.8	13.1	15.0
335	5.58	1.720	4.7	6.2	8.0	9.2	10.8	13.1	14.9

			Design Average Rainfall Intensities (mm/hr)						
			ARI (yrs):						
Duration, T (minutes)	Duration, T (hours)	*ln* T	1	2	5	10	20	50	100
336	5.60	1.723	4.7	6.1	8.0	9.2	10.8	13.1	14.9
337	5.62	1.726	4.7	6.1	8.0	9.2	10.8	13.0	14.9
338	5.63	1.729	4.7	6.1	8.0	9.1	10.8	13.0	14.8
339	5.65	1.732	4.7	6.1	7.9	9.1	10.7	13.0	14.8
340	5.67	1.735	4.7	6.1	7.9	9.1	10.7	13.0	14.8
341	5.68	1.738	4.7	6.1	7.9	9.1	10.7	12.9	14.8
342	5.70	1.740	4.7	6.1	7.9	9.1	10.7	12.9	14.7
343	5.72	1.743	4.6	6.1	7.9	9.0	10.6	12.9	14.7
344	5.73	1.746	4.6	6.0	7.9	9.0	10.6	12.9	14.7
345	5.75	1.749	4.6	6.0	7.8	9.0	10.6	12.8	14.6
346	5.77	1.752	4.6	6.0	7.8	9.0	10.6	12.8	14.6
347	5.78	1.755	4.6	6.0	7.8	9.0	10.6	12.8	14.6
348	5.80	1.758	4.6	6.0	7.8	9.0	10.5	12.8	14.6
349	5.82	1.761	4.6	6.0	7.8	8.9	10.5	12.7	14.5
350	5.83	1.764	4.6	6.0	7.8	8.9	10.5	12.7	14.5
351	5.85	1.766	4.6	6.0	7.7	8.9	10.5	12.7	14.5
352	5.87	1.769	4.6	5.9	7.7	8.9	10.5	12.7	14.5
353	5.88	1.772	4.6	5.9	7.7	8.9	10.4	12.6	14.4
354	5.90	1.775	4.5	5.9	7.7	8.9	10.4	12.6	14.4
355	5.92	1.778	4.5	5.9	7.7	8.8	10.4	12.6	14.4
356	5.93	1.781	4.5	5.9	7.7	8.8	10.4	12.6	14.3
357	5.95	1.783	4.5	5.9	7.7	8.8	10.4	12.5	14.3
358	5.97	1.786	4.5	5.9	7.6	8.8	10.3	12.5	14.3
359	5.98	1.789	4.5	5.9	7.6	8.8	10.3	12.5	14.3
360	**6.00**	**1.792**	**4.5**	**5.8**	**7.6**	**8.8**	**10.3**	**12.5**	**14.2**
361	6.02	1.795	4.5	5.8	7.6	8.7	10.3	12.4	14.2
362	6.03	1.797	4.5	5.8	7.6	8.7	10.3	12.4	14.2
363	6.05	1.800	4.5	5.8	7.6	8.7	10.2	12.4	14.2
364	6.07	1.803	4.5	5.8	7.6	8.7	10.2	12.4	14.1
365	6.08	1.806	4.4	5.8	7.5	8.7	10.2	12.4	14.1
366	6.10	1.808	4.4	5.8	7.5	8.7	10.2	12.3	14.1
367	6.12	1.811	4.4	5.8	7.5	8.6	10.2	12.3	14.1
368	6.13	1.814	4.4	5.8	7.5	8.6	10.2	12.3	14.0
369	6.15	1.816	4.4	5.7	7.5	8.6	10.1	12.3	14.0
370	6.17	1.819	4.4	5.7	7.5	8.6	10.1	12.2	14.0
371	6.18	1.822	4.4	5.7	7.5	8.6	10.1	12.2	14.0
372	6.20	1.825	4.4	5.7	7.4	8.6	10.1	12.2	13.9
373	6.22	1.827	4.4	5.7	7.4	8.5	10.1	12.2	13.9
374	6.23	1.830	4.4	5.7	7.4	8.5	10.0	12.2	13.9
375	6.25	1.833	4.4	5.7	7.4	8.5	10.0	12.1	13.9
376	6.27	1.835	4.4	5.7	7.4	8.5	10.0	12.1	13.8
377	6.28	1.838	4.3	5.7	7.4	8.5	10.0	12.1	13.8
378	6.30	1.841	4.3	5.6	7.4	8.5	10.0	12.1	13.8
379	6.32	1.843	4.3	5.6	7.3	8.4	10.0	12.1	13.8
380	6.33	1.846	4.3	5.6	7.3	8.4	9.9	12.0	13.7
381	6.35	1.848	4.3	5.6	7.3	8.4	9.9	12.0	13.7
382	6.37	1.851	4.3	5.6	7.3	8.4	9.9	12.0	13.7
383	6.38	1.854	4.3	5.6	7.3	8.4	9.9	12.0	13.7
384	6.40	1.856	4.3	5.6	7.3	8.4	9.9	11.9	13.6
385	6.42	1.859	4.3	5.6	7.3	8.4	9.8	11.9	13.6
386	6.43	1.861	4.3	5.6	7.3	8.3	9.8	11.9	13.6
387	6.45	1.864	4.3	5.6	7.2	8.3	9.8	11.9	13.6
388	6.47	1.867	4.3	5.5	7.2	8.3	9.8	11.9	13.6
389	6.48	1.869	4.2	5.5	7.2	8.3	9.8	11.8	13.5
390	6.50	1.872	4.2	5.5	7.2	8.3	9.8	11.8	13.5
391	6.52	1.874	4.2	5.5	7.2	8.3	9.7	11.8	13.5
392	6.53	1.877	4.2	5.5	7.2	8.3	9.7	11.8	13.5
393	6.55	1.879	4.2	5.5	7.2	8.2	9.7	11.8	13.4
394	6.57	1.882	4.2	5.5	7.2	8.2	9.7	11.7	13.4
395	6.58	1.885	4.2	5.5	7.1	8.2	9.7	11.7	13.4
396	6.60	1.887	4.2	5.5	7.1	8.2	9.7	11.7	13.4
397	6.62	1.890	4.2	5.5	7.1	8.2	9.6	11.7	13.3
398	6.63	1.892	4.2	5.4	7.1	8.2	9.6	11.7	13.3
399	6.65	1.895	4.2	5.4	7.1	8.2	9.6	11.6	13.3
400	6.67	1.897	4.2	5.4	7.1	8.1	9.6	11.6	13.3
401	6.68	1.900	4.2	5.4	7.1	8.1	9.6	11.6	13.3
402	6.70	1.902	4.2	5.4	7.1	8.1	9.6	11.6	13.2

			Design Average Rainfall Intensities (mm/hr)						
			ARI (yrs):						
Duration, T (minutes)	Duration, T (hours)	*ln* T	1	2	5	10	20	50	100
403	6.72	1.905	4.1	5.4	7.0	8.1	9.5	11.6	13.2
404	6.73	1.907	4.1	5.4	7.0	8.1	9.5	11.5	13.2
405	6.75	1.910	4.1	5.4	7.0	8.1	9.5	11.5	13.2
406	6.77	1.912	4.1	5.4	7.0	8.1	9.5	11.5	13.1
407	6.78	1.914	4.1	5.4	7.0	8.0	9.5	11.5	13.1
408	6.80	1.917	4.1	5.4	7.0	8.0	9.5	11.5	13.1
409	6.82	1.919	4.1	5.3	7.0	8.0	9.5	11.5	13.1
410	6.83	1.922	4.1	5.3	7.0	8.0	9.4	11.4	13.1
411	6.85	1.924	4.1	5.3	6.9	8.0	9.4	11.4	13.0
412	6.87	1.927	4.1	5.3	6.9	8.0	9.4	11.4	13.0
413	6.88	1.929	4.1	5.3	6.9	8.0	9.4	11.4	13.0
414	6.90	1.932	4.1	5.3	6.9	8.0	9.4	11.4	13.0
415	6.92	1.934	4.1	5.3	6.9	7.9	9.4	11.3	13.0
416	6.93	1.936	4.1	5.3	6.9	7.9	9.3	11.3	12.9
417	6.95	1.939	4.0	5.3	6.9	7.9	9.3	11.3	12.9
418	6.97	1.941	4.0	5.3	6.9	7.9	9.3	11.3	12.9
419	6.98	1.944	4.0	5.3	6.9	7.9	9.3	11.3	12.9
420	7.00	1.946	4.0	5.2	6.8	7.9	9.3	11.3	12.9
421	7.02	1.948	4.0	5.2	6.8	7.9	9.3	11.2	12.8
422	7.03	1.951	4.0	5.2	6.8	7.9	9.3	11.2	12.8
423	7.05	1.953	4.0	5.2	6.8	7.8	9.2	11.2	12.8
424	7.07	1.955	4.0	5.2	6.8	7.8	9.2	11.2	12.8
425	7.08	1.958	4.0	5.2	6.8	7.8	9.2	11.2	12.8
426	7.10	1.960	4.0	5.2	6.8	7.8	9.2	11.1	12.7
427	7.12	1.962	4.0	5.2	6.8	7.8	9.2	11.1	12.7
428	7.13	1.965	4.0	5.2	6.8	7.8	9.2	11.1	12.7
429	7.15	1.967	4.0	5.2	6.7	7.8	9.2	11.1	12.7
430	7.17	1.969	4.0	5.2	6.7	7.8	9.1	11.1	12.7
431	7.18	1.972	4.0	5.1	6.7	7.7	9.1	11.1	12.6
432	7.20	1.974	3.9	5.1	6.7	7.7	9.1	11.0	12.6
433	7.22	1.976	3.9	5.1	6.7	7.7	9.1	11.0	12.6
434	7.23	1.979	3.9	5.1	6.7	7.7	9.1	11.0	12.6
435	7.25	1.981	3.9	5.1	6.7	7.7	9.1	11.0	12.6
436	7.27	1.983	3.9	5.1	6.7	7.7	9.1	11.0	12.5
437	7.28	1.986	3.9	5.1	6.7	7.7	9.0	11.0	12.5
438	7.30	1.988	3.9	5.1	6.6	7.7	9.0	10.9	12.5
439	7.32	1.990	3.9	5.1	6.6	7.6	9.0	10.9	12.5
440	7.33	1.992	3.9	5.1	6.6	7.6	9.0	10.9	12.5
441	7.35	1.995	3.9	5.1	6.6	7.6	9.0	10.9	12.4
442	7.37	1.997	3.9	5.1	6.6	7.6	9.0	10.9	12.4
443	7.38	1.999	3.9	5.1	6.6	7.6	9.0	10.9	12.4
444	7.40	2.001	3.9	5.0	6.6	7.6	8.9	10.8	12.4
445	7.42	2.004	3.9	5.0	6.6	7.6	8.9	10.8	12.4
446	7.43	2.006	3.9	5.0	6.6	7.6	8.9	10.8	12.4
447	7.45	2.008	3.9	5.0	6.6	7.5	8.9	10.8	12.3
448	7.47	2.010	3.8	5.0	6.5	7.5	8.9	10.8	12.3
449	7.48	2.013	3.8	5.0	6.5	7.5	8.9	10.8	12.3
450	7.50	2.015	3.8	5.0	6.5	7.5	8.9	10.7	12.3
451	7.52	2.017	3.8	5.0	6.5	7.5	8.8	10.7	12.3
452	7.53	2.019	3.8	5.0	6.5	7.5	8.8	10.7	12.2
453	7.55	2.022	3.8	5.0	6.5	7.5	8.8	10.7	12.2
454	7.57	2.024	3.8	5.0	6.5	7.5	8.8	10.7	12.2
455	7.58	2.026	3.8	5.0	6.5	7.5	8.8	10.7	12.2
456	7.60	2.028	3.8	4.9	6.5	7.4	8.8	10.6	12.2
457	7.62	2.030	3.8	4.9	6.5	7.4	8.8	10.6	12.2
458	7.63	2.033	3.8	4.9	6.4	7.4	8.8	10.6	12.1
459	7.65	2.035	3.8	4.9	6.4	7.4	8.7	10.6	12.1
460	7.67	2.037	3.8	4.9	6.4	7.4	8.7	10.6	12.1
461	7.68	2.039	3.8	4.9	6.4	7.4	8.7	10.6	12.1
462	7.70	2.041	3.8	4.9	6.4	7.4	8.7	10.6	12.1
463	7.72	2.043	3.8	4.9	6.4	7.4	8.7	10.5	12.0
464	7.73	2.046	3.8	4.9	6.4	7.4	8.7	10.5	12.0
465	7.75	2.048	3.7	4.9	6.4	7.3	8.7	10.5	12.0
466	7.77	2.050	3.7	4.9	6.4	7.3	8.7	10.5	12.0
467	7.78	2.052	3.7	4.9	6.4	7.3	8.6	10.5	12.0
468	7.80	2.054	3.7	4.9	6.4	7.3	8.6	10.5	12.0
469	7.82	2.056	3.7	4.9	6.3	7.3	8.6	10.4	11.9

			Design Average Rainfall Intensities (mm/hr)						
			ARI (yrs):						
Duration, T (minutes)	Duration, T (hours)	*ln* T	1	2	5	10	20	50	100
470	7.83	2.058	3.7	4.8	6.3	7.3	8.6	10.4	11.9
471	7.85	2.061	3.7	4.8	6.3	7.3	8.6	10.4	11.9
472	7.87	2.063	3.7	4.8	6.3	7.3	8.6	10.4	11.9
473	7.88	2.065	3.7	4.8	6.3	7.3	8.6	10.4	11.9
474	7.90	2.067	3.7	4.8	6.3	7.3	8.6	10.4	11.9
475	7.92	2.069	3.7	4.8	6.3	7.2	8.5	10.4	11.8
476	7.93	2.071	3.7	4.8	6.3	7.2	8.5	10.3	11.8
477	7.95	2.073	3.7	4.8	6.3	7.2	8.5	10.3	11.8
478	7.97	2.075	3.7	4.8	6.3	7.2	8.5	10.3	11.8
479	7.98	2.077	3.7	4.8	6.2	7.2	8.5	10.3	11.8
480	8.00	2.079	3.7	4.8	6.2	7.2	8.5	10.3	11.8
481	8.02	2.082	3.7	4.8	6.2	7.2	8.5	10.3	11.7
482	8.03	2.084	3.7	4.8	6.2	7.2	8.5	10.3	11.7
483	8.05	2.086	3.6	4.8	6.2	7.2	8.4	10.2	11.7
484	8.07	2.088	3.6	4.7	6.2	7.1	8.4	10.2	11.7
485	8.08	2.090	3.6	4.7	6.2	7.1	8.4	10.2	11.7
486	8.10	2.092	3.6	4.7	6.2	7.1	8.4	10.2	11.7
487	8.12	2.094	3.6	4.7	6.2	7.1	8.4	10.2	11.6
488	8.13	2.096	3.6	4.7	6.2	7.1	8.4	10.2	11.6
489	8.15	2.098	3.6	4.7	6.2	7.1	8.4	10.2	11.6
490	8.17	2.100	3.6	4.7	6.2	7.1	8.4	10.1	11.6
491	8.18	2.102	3.6	4.7	6.1	7.1	8.4	10.1	11.6
492	8.20	2.104	3.6	4.7	6.1	7.1	8.3	10.1	11.6
493	8.22	2.106	3.6	4.7	6.1	7.1	8.3	10.1	11.5
494	8.23	2.108	3.6	4.7	6.1	7.1	8.3	10.1	11.5
495	8.25	2.110	3.6	4.7	6.1	7.0	8.3	10.1	11.5
496	8.27	2.112	3.6	4.7	6.1	7.0	8.3	10.1	11.5
497	8.28	2.114	3.6	4.7	6.1	7.0	8.3	10.0	11.5
498	8.30	2.116	3.6	4.7	6.1	7.0	8.3	10.0	11.5
499	8.32	2.118	3.6	4.6	6.1	7.0	8.3	10.0	11.5
500	8.33	2.120	3.6	4.6	6.1	7.0	8.2	10.0	11.4
501	8.35	2.122	3.6	4.6	6.1	7.0	8.2	10.0	11.4
502	8.37	2.124	3.5	4.6	6.1	7.0	8.2	10.0	11.4
503	8.38	2.126	3.5	4.6	6.0	7.0	8.2	10.0	11.4
504	8.40	2.128	3.5	4.6	6.0	7.0	8.2	10.0	11.4
505	8.42	2.130	3.5	4.6	6.0	6.9	8.2	9.9	11.4
506	8.43	2.132	3.5	4.6	6.0	6.9	8.2	9.9	11.3
507	8.45	2.134	3.5	4.6	6.0	6.9	8.2	9.9	11.3
508	8.47	2.136	3.5	4.6	6.0	6.9	8.2	9.9	11.3
509	8.48	2.138	3.5	4.6	6.0	6.9	8.1	9.9	11.3
510	8.50	2.140	3.5	4.6	6.0	6.9	8.1	9.9	11.3
511	8.52	2.142	3.5	4.6	6.0	6.9	8.1	9.9	11.3
512	8.53	2.144	3.5	4.6	6.0	6.9	8.1	9.8	11.3
513	8.55	2.146	3.5	4.6	6.0	6.9	8.1	9.8	11.2
514	8.57	2.148	3.5	4.6	6.0	6.9	8.1	9.8	11.2
515	8.58	2.150	3.5	4.5	5.9	6.9	8.1	9.8	11.2
516	8.60	2.152	3.5	4.5	5.9	6.8	8.1	9.8	11.2
517	8.62	2.154	3.5	4.5	5.9	6.8	8.1	9.8	11.2
518	8.63	2.156	3.5	4.5	5.9	6.8	8.1	9.8	11.2
519	8.65	2.158	3.5	4.5	5.9	6.8	8.0	9.8	11.2
520	8.67	2.159	3.5	4.5	5.9	6.8	8.0	9.7	11.1
521	8.68	2.161	3.5	4.5	5.9	6.8	8.0	9.7	11.1
522	8.70	2.163	3.5	4.5	5.9	6.8	8.0	9.7	11.1
523	8.72	2.165	3.4	4.5	5.9	6.8	8.0	9.7	11.1
524	8.73	2.167	3.4	4.5	5.9	6.8	8.0	9.7	11.1
525	8.75	2.169	3.4	4.5	5.9	6.8	8.0	9.7	11.1
526	8.77	2.171	3.4	4.5	5.9	6.8	8.0	9.7	11.1
527	8.78	2.173	3.4	4.5	5.9	6.7	8.0	9.7	11.0
528	8.80	2.175	3.4	4.5	5.8	6.7	7.9	9.6	11.0
529	8.82	2.177	3.4	4.5	5.8	6.7	7.9	9.6	11.0
530	8.83	2.179	3.4	4.5	5.8	6.7	7.9	9.6	11.0
531	8.85	2.180	3.4	4.5	5.8	6.7	7.9	9.6	11.0
532	8.87	2.182	3.4	4.4	5.8	6.7	7.9	9.6	11.0
533	8.88	2.184	3.4	4.4	5.8	6.7	7.9	9.6	11.0
534	8.90	2.186	3.4	4.4	5.8	6.7	7.9	9.6	10.9
535	8.92	2.188	3.4	4.4	5.8	6.7	7.9	9.6	10.9
536	8.93	2.190	3.4	4.4	5.8	6.7	7.9	9.5	10.9

			Design Average Rainfall Intensities (mm/hr)						
			ARI (yrs):						
Duration, T (minutes)	Duration, T (hours)	*ln* T	1	2	5	10	20	50	100
537	8.95	2.192	3.4	4.4	5.8	6.7	7.9	9.5	10.9
538	8.97	2.194	3.4	4.4	5.8	6.7	7.8	9.5	10.9
539	8.98	2.195	3.4	4.4	5.8	6.6	7.8	9.5	10.9
540	9.00	2.197	3.4	4.4	5.8	6.6	7.8	9.5	10.9
541	9.02	2.199	3.4	4.4	5.7	6.6	7.8	9.5	10.8
542	9.03	2.201	3.4	4.4	5.7	6.6	7.8	9.5	10.8
543	9.05	2.203	3.4	4.4	5.7	6.6	7.8	9.5	10.8
544	9.07	2.205	3.4	4.4	5.7	6.6	7.8	9.4	10.8
545	9.08	2.206	3.4	4.4	5.7	6.6	7.8	9.4	10.8
546	9.10	2.208	3.3	4.4	5.7	6.6	7.8	9.4	10.8
547	9.12	2.210	3.3	4.4	5.7	6.6	7.8	9.4	10.8
548	9.13	2.212	3.3	4.4	5.7	6.6	7.7	9.4	10.8
549	9.15	2.214	3.3	4.3	5.7	6.6	7.7	9.4	10.7
550	9.17	2.216	3.3	4.3	5.7	6.6	7.7	9.4	10.7
551	9.18	2.217	3.3	4.3	5.7	6.5	7.7	9.4	10.7
552	9.20	2.219	3.3	4.3	5.7	6.5	7.7	9.4	10.7
553	9.22	2.221	3.3	4.3	5.7	6.5	7.7	9.3	10.7
554	9.23	2.223	3.3	4.3	5.7	6.5	7.7	9.3	10.7
555	9.25	2.225	3.3	4.3	5.6	6.5	7.7	9.3	10.7
556	9.27	2.226	3.3	4.3	5.6	6.5	7.7	9.3	10.6
557	9.28	2.228	3.3	4.3	5.6	6.5	7.7	9.3	10.6
558	9.30	2.230	3.3	4.3	5.6	6.5	7.7	9.3	10.6
559	9.32	2.232	3.3	4.3	5.6	6.5	7.6	9.3	10.6
560	9.33	2.234	3.3	4.3	5.6	6.5	7.6	9.3	10.6
561	9.35	2.235	3.3	4.3	5.6	6.5	7.6	9.3	10.6
562	9.37	2.237	3.3	4.3	5.6	6.5	7.6	9.2	10.6
563	9.38	2.239	3.3	4.3	5.6	6.4	7.6	9.2	10.6
564	9.40	2.241	3.3	4.3	5.6	6.4	7.6	9.2	10.5
565	9.42	2.242	3.3	4.3	5.6	6.4	7.6	9.2	10.5
566	9.43	2.244	3.3	4.3	5.6	6.4	7.6	9.2	10.5
567	9.45	2.246	3.3	4.3	5.6	6.4	7.6	9.2	10.5
568	9.47	2.248	3.3	4.2	5.6	6.4	7.6	9.2	10.5
569	9.48	2.250	3.3	4.2	5.6	6.4	7.6	9.2	10.5
570	9.50	2.251	3.2	4.2	5.5	6.4	7.5	9.2	10.5
571	9.52	2.253	3.2	4.2	5.5	6.4	7.5	9.1	10.5
572	9.53	2.255	3.2	4.2	5.5	6.4	7.5	9.1	10.4
573	9.55	2.257	3.2	4.2	5.5	6.4	7.5	9.1	10.4
574	9.57	2.258	3.2	4.2	5.5	6.4	7.5	9.1	10.4
575	9.58	2.260	3.2	4.2	5.5	6.4	7.5	9.1	10.4
576	9.60	2.262	3.2	4.2	5.5	6.3	7.5	9.1	10.4
577	9.62	2.263	3.2	4.2	5.5	6.3	7.5	9.1	10.4
578	9.63	2.265	3.2	4.2	5.5	6.3	7.5	9.1	10.4
579	9.65	2.267	3.2	4.2	5.5	6.3	7.5	9.1	10.4
580	9.67	2.269	3.2	4.2	5.5	6.3	7.5	9.0	10.3
581	9.68	2.270	3.2	4.2	5.5	6.3	7.4	9.0	10.3
582	9.70	2.272	3.2	4.2	5.5	6.3	7.4	9.0	10.3
583	9.72	2.274	3.2	4.2	5.5	6.3	7.4	9.0	10.3
584	9.73	2.276	3.2	4.2	5.5	6.3	7.4	9.0	10.3
585	9.75	2.277	3.2	4.2	5.4	6.3	7.4	9.0	10.3
586	9.77	2.279	3.2	4.2	5.4	6.3	7.4	9.0	10.3
587	9.78	2.281	3.2	4.2	5.4	6.3	7.4	9.0	10.3
588	9.80	2.282	3.2	4.1	5.4	6.3	7.4	9.0	10.2
589	9.82	2.284	3.2	4.1	5.4	6.3	7.4	8.9	10.2
590	9.83	2.286	3.2	4.1	5.4	6.2	7.4	8.9	10.2
591	9.85	2.287	3.2	4.1	5.4	6.2	7.4	8.9	10.2
592	9.87	2.289	3.2	4.1	5.4	6.2	7.4	8.9	10.2
593	9.88	2.291	3.2	4.1	5.4	6.2	7.3	8.9	10.2
594	9.90	2.293	3.2	4.1	5.4	6.2	7.3	8.9	10.2
595	9.92	2.294	3.2	4.1	5.4	6.2	7.3	8.9	10.2
596	9.93	2.296	3.2	4.1	5.4	6.2	7.3	8.9	10.2
597	9.95	2.298	3.1	4.1	5.4	6.2	7.3	8.9	10.1
598	9.97	2.299	3.1	4.1	5.4	6.2	7.3	8.9	10.1
599	9.98	2.301	3.1	4.1	5.4	6.2	7.3	8.8	10.1
600	10.00	2.303	3.1	4.1	5.4	6.2	7.3	8.8	10.1
601	10.02	2.304	3.1	4.1	5.3	6.2	7.3	8.8	10.1
602	10.03	2.306	3.1	4.1	5.3	6.2	7.3	8.8	10.1
603	10.05	2.308	3.1	4.1	5.3	6.2	7.3	8.8	10.1

			Design Average Rainfall Intensities (mm/hr)						
			ARI (yrs):						
Duration, T (minutes)	Duration, T (hours)	*ln* T	1	2	5	10	20	50	100
604	10.07	2.309	3.1	4.1	5.3	6.1	7.3	8.8	10.1
605	10.08	2.311	3.1	4.1	5.3	6.1	7.2	8.8	10.1
606	10.10	2.313	3.1	4.1	5.3	6.1	7.2	8.8	10.0
607	10.12	2.314	3.1	4.1	5.3	6.1	7.2	8.8	10.0
608	10.13	2.316	3.1	4.1	5.3	6.1	7.2	8.8	10.0
609	10.15	2.317	3.1	4.0	5.3	6.1	7.2	8.7	10.0
610	10.17	2.319	3.1	4.0	5.3	6.1	7.2	8.7	10.0
611	10.18	2.321	3.1	4.0	5.3	6.1	7.2	8.7	10.0
612	10.20	2.322	3.1	4.0	5.3	6.1	7.2	8.7	10.0
613	10.22	2.324	3.1	4.0	5.3	6.1	7.2	8.7	10.0
614	10.23	2.326	3.1	4.0	5.3	6.1	7.2	8.7	10.0
615	10.25	2.327	3.1	4.0	5.3	6.1	7.2	8.7	9.9
616	10.27	2.329	3.1	4.0	5.3	6.1	7.2	8.7	9.9
617	10.28	2.331	3.1	4.0	5.3	6.1	7.1	8.7	9.9
618	10.30	2.332	3.1	4.0	5.2	6.0	7.1	8.7	9.9
619	10.32	2.334	3.1	4.0	5.2	6.0	7.1	8.6	9.9
620	10.33	2.335	3.1	4.0	5.2	6.0	7.1	8.6	9.9
621	10.35	2.337	3.1	4.0	5.2	6.0	7.1	8.6	9.9
622	10.37	2.339	3.1	4.0	5.2	6.0	7.1	8.6	9.9
623	10.38	2.340	3.1	4.0	5.2	6.0	7.1	8.6	9.9
624	10.40	2.342	3.1	4.0	5.2	6.0	7.1	8.6	9.8
625	10.42	2.343	3.0	4.0	5.2	6.0	7.1	8.6	9.8
626	10.43	2.345	3.0	4.0	5.2	6.0	7.1	8.6	9.8
627	10.45	2.347	3.0	4.0	5.2	6.0	7.1	8.6	9.8
628	10.47	2.348	3.0	4.0	5.2	6.0	7.1	8.6	9.8
629	10.48	2.350	3.0	4.0	5.2	6.0	7.1	8.6	9.8
630	10.50	2.351	3.0	4.0	5.2	6.0	7.0	8.5	9.8
631	10.52	2.353	3.0	4.0	5.2	6.0	7.0	8.5	9.8
632	10.53	2.355	3.0	3.9	5.2	6.0	7.0	8.5	9.8
633	10.55	2.356	3.0	3.9	5.2	5.9	7.0	8.5	9.7
634	10.57	2.358	3.0	3.9	5.2	5.9	7.0	8.5	9.7
635	10.58	2.359	3.0	3.9	5.1	5.9	7.0	8.5	9.7
636	10.60	2.361	3.0	3.9	5.1	5.9	7.0	8.5	9.7
637	10.62	2.362	3.0	3.9	5.1	5.9	7.0	8.5	9.7
638	10.63	2.364	3.0	3.9	5.1	5.9	7.0	8.5	9.7
639	10.65	2.366	3.0	3.9	5.1	5.9	7.0	8.5	9.7
640	10.67	2.367	3.0	3.9	5.1	5.9	7.0	8.5	9.7
641	10.68	2.369	3.0	3.9	5.1	5.9	7.0	8.4	9.7
642	10.70	2.370	3.0	3.9	5.1	5.9	7.0	8.4	9.6
643	10.72	2.372	3.0	3.9	5.1	5.9	6.9	8.4	9.6
644	10.73	2.373	3.0	3.9	5.1	5.9	6.9	8.4	9.6
645	10.75	2.375	3.0	3.9	5.1	5.9	6.9	8.4	9.6
646	10.77	2.376	3.0	3.9	5.1	5.9	6.9	8.4	9.6
647	10.78	2.378	3.0	3.9	5.1	5.9	6.9	8.4	9.6
648	10.80	2.380	3.0	3.9	5.1	5.9	6.9	8.4	9.6
649	10.82	2.381	3.0	3.9	5.1	5.8	6.9	8.4	9.6
650	10.83	2.383	3.0	3.9	5.1	5.8	6.9	8.4	9.6
651	10.85	2.384	3.0	3.9	5.1	5.8	6.9	8.4	9.6
652	10.87	2.386	3.0	3.9	5.1	5.8	6.9	8.3	9.5
653	10.88	2.387	3.0	3.9	5.1	5.8	6.9	8.3	9.5
654	10.90	2.389	3.0	3.9	5.0	5.8	6.9	8.3	9.5
655	10.92	2.390	3.0	3.9	5.0	5.8	6.9	8.3	9.5
656	10.93	2.392	2.9	3.8	5.0	5.8	6.9	8.3	9.5
657	10.95	2.393	2.9	3.8	5.0	5.8	6.8	8.3	9.5
658	10.97	2.395	2.9	3.8	5.0	5.8	6.8	8.3	9.5
659	10.98	2.396	2.9	3.8	5.0	5.8	6.8	8.3	9.5
660	11.00	2.398	2.9	3.8	5.0	5.8	6.8	8.3	9.5
661	11.02	2.399	2.9	3.8	5.0	5.8	6.8	8.3	9.5
662	11.03	2.401	2.9	3.8	5.0	5.8	6.8	8.3	9.4
663	11.05	2.402	2.9	3.8	5.0	5.8	6.8	8.2	9.4
664	11.07	2.404	2.9	3.8	5.0	5.8	6.8	8.2	9.4
665	11.08	2.405	2.9	3.8	5.0	5.8	6.8	8.2	9.4
666	11.10	2.407	2.9	3.8	5.0	5.7	6.8	8.2	9.4
667	11.12	2.408	2.9	3.8	5.0	5.7	6.8	8.2	9.4
668	11.13	2.410	2.9	3.8	5.0	5.7	6.8	8.2	9.4
669	11.15	2.411	2.9	3.8	5.0	5.7	6.8	8.2	9.4
670	11.17	2.413	2.9	3.8	5.0	5.7	6.8	8.2	9.4

			Design Average Rainfall Intensities (mm/hr)						
			ARI (yrs):						
Duration, T (minutes)	Duration, T (hours)	*ln* T	1	2	5	10	20	50	100
671	11.18	2.414	2.9	3.8	5.0	5.7	6.7	8.2	9.4
672	11.20	2.416	2.9	3.8	5.0	5.7	6.7	8.2	9.4
673	11.22	2.417	2.9	3.8	4.9	5.7	6.7	8.2	9.3
674	11.23	2.419	2.9	3.8	4.9	5.7	6.7	8.2	9.3
675	11.25	2.420	2.9	3.8	4.9	5.7	6.7	8.1	9.3
676	11.27	2.422	2.9	3.8	4.9	5.7	6.7	8.1	9.3
677	11.28	2.423	2.9	3.8	4.9	5.7	6.7	8.1	9.3
678	11.30	2.425	2.9	3.8	4.9	5.7	6.7	8.1	9.3
679	11.32	2.426	2.9	3.8	4.9	5.7	6.7	8.1	9.3
680	11.33	2.428	2.9	3.8	4.9	5.7	6.7	8.1	9.3
681	11.35	2.429	2.9	3.8	4.9	5.7	6.7	8.1	9.3
682	11.37	2.431	2.9	3.7	4.9	5.7	6.7	8.1	9.3
683	11.38	2.432	2.9	3.7	4.9	5.6	6.7	8.1	9.2
684	11.40	2.434	2.9	3.7	4.9	5.6	6.7	8.1	9.2
685	11.42	2.435	2.9	3.7	4.9	5.6	6.6	8.1	9.2
686	11.43	2.437	2.9	3.7	4.9	5.6	6.6	8.1	9.2
687	11.45	2.438	2.9	3.7	4.9	5.6	6.6	8.0	9.2
688	11.47	2.439	2.9	3.7	4.9	5.6	6.6	8.0	9.2
689	11.48	2.441	2.9	3.7	4.9	5.6	6.6	8.0	9.2
690	11.50	2.442	2.8	3.7	4.9	5.6	6.6	8.0	9.2
691	11.52	2.444	2.8	3.7	4.9	5.6	6.6	8.0	9.2
692	11.53	2.445	2.8	3.7	4.9	5.6	6.6	8.0	9.2
693	11.55	2.447	2.8	3.7	4.8	5.6	6.6	8.0	9.2
694	11.57	2.448	2.8	3.7	4.8	5.6	6.6	8.0	9.1
695	11.58	2.450	2.8	3.7	4.8	5.6	6.6	8.0	9.1
696	11.60	2.451	2.8	3.7	4.8	5.6	6.6	8.0	9.1
697	11.62	2.452	2.8	3.7	4.8	5.6	6.6	8.0	9.1
698	11.63	2.454	2.8	3.7	4.8	5.6	6.6	8.0	9.1
699	11.65	2.455	2.8	3.7	4.8	5.6	6.6	8.0	9.1
700	11.67	2.457	2.8	3.7	4.8	5.6	6.6	7.9	9.1
701	11.68	2.458	2.8	3.7	4.8	5.5	6.5	7.9	9.1
702	11.70	2.460	2.8	3.7	4.8	5.5	6.5	7.9	9.1
703	11.72	2.461	2.8	3.7	4.8	5.5	6.5	7.9	9.1
704	11.73	2.462	2.8	3.7	4.8	5.5	6.5	7.9	9.1
705	11.75	2.464	2.8	3.7	4.8	5.5	6.5	7.9	9.0
706	11.77	2.465	2.8	3.7	4.8	5.5	6.5	7.9	9.0
707	11.78	2.467	2.8	3.7	4.8	5.5	6.5	7.9	9.0
708	11.80	2.468	2.8	3.7	4.8	5.5	6.5	7.9	9.0
709	11.82	2.470	2.8	3.6	4.8	5.5	6.5	7.9	9.0
710	11.83	2.471	2.8	3.6	4.8	5.5	6.5	7.9	9.0
711	11.85	2.472	2.8	3.6	4.8	5.5	6.5	7.9	9.0
712	11.87	2.474	2.8	3.6	4.8	5.5	6.5	7.9	9.0
713	11.88	2.475	2.8	3.6	4.8	5.5	6.5	7.8	9.0
714	11.90	2.477	2.8	3.6	4.8	5.5	6.5	7.8	9.0
715	11.92	2.478	2.8	3.6	4.7	5.5	6.5	7.8	9.0
716	11.93	2.479	2.8	3.6	4.7	5.5	6.4	7.8	8.9
717	11.95	2.481	2.8	3.6	4.7	5.5	6.4	7.8	8.9
718	11.97	2.482	2.8	3.6	4.7	5.5	6.4	7.8	8.9
719	11.98	2.484	2.8	3.6	4.7	5.4	6.4	7.8	8.9
720	**12.00**	**2.485**	**2.8**	**3.6**	**4.7**	**5.4**	**6.4**	**7.8**	**8.9**
730	12.17	2.499	2.7	3.6	4.7	5.4	6.4	7.7	8.8
740	12.33	2.512	2.7	3.5	4.6	5.3	6.3	7.6	8.7
750	12.50	2.526	2.7	3.5	4.6	5.3	6.2	7.6	8.7
760	12.67	2.539	2.7	3.5	4.6	5.2	6.2	7.5	8.6
770	12.83	2.552	2.6	3.5	4.5	5.2	6.1	7.4	8.5
780	13.00	2.565	2.6	3.4	4.5	5.2	6.1	7.4	8.4
790	13.17	2.578	2.6	3.4	4.4	5.1	6.0	7.3	8.4
800	13.33	2.590	2.6	3.4	4.4	5.1	6.0	7.2	8.3
810	13.50	2.603	2.6	3.3	4.4	5.0	5.9	7.2	8.2
820	13.67	2.615	2.5	3.3	4.3	5.0	5.9	7.1	8.1
830	13.83	2.627	2.5	3.3	4.3	4.9	5.8	7.1	8.1
840	14.00	2.639	2.5	3.3	4.2	4.9	5.8	7.0	8.0
850	14.17	2.651	2.5	3.2	4.2	4.9	5.7	6.9	7.9
860	14.33	2.663	2.5	3.2	4.2	4.8	5.7	6.9	7.9
870	14.50	2.674	2.4	3.2	4.1	4.8	5.6	6.8	7.8
880	14.67	2.686	2.4	3.2	4.1	4.7	5.6	6.8	7.7
890	14.83	2.697	2.4	3.1	4.1	4.7	5.5	6.7	7.7

			Design Average Rainfall Intensities (mm/hr)						
			ARI (yrs):						
Duration, T (minutes)	Duration, T (hours)	*ln* T	1	2	5	10	20	50	100
900	15.00	2.708	2.4	3.1	4.1	4.7	5.5	6.7	7.6
910	15.17	2.719	2.4	3.1	4.0	4.6	5.5	6.6	7.6
920	15.33	2.730	2.3	3.1	4.0	4.6	5.4	6.6	7.5
930	15.50	2.741	2.3	3.0	4.0	4.6	5.4	6.5	7.4
940	15.67	2.752	2.3	3.0	3.9	4.5	5.3	6.5	7.4
950	15.83	2.762	2.3	3.0	3.9	4.5	5.3	6.4	7.3
960	16.00	2.773	2.3	3.0	3.9	4.5	5.3	6.4	7.3
970	16.17	2.783	2.3	3.0	3.8	4.4	5.2	6.3	7.2
980	16.33	2.793	2.2	2.9	3.8	4.4	5.2	6.3	7.2
990	16.50	2.803	2.2	2.9	3.8	4.4	5.1	6.2	7.1
1000	16.67	2.813	2.2	2.9	3.8	4.3	5.1	6.2	7.1
1010	16.83	2.823	2.2	2.9	3.7	4.3	5.1	6.1	7.0
1020	17.00	2.833	2.2	2.9	3.7	4.3	5.0	6.1	7.0
1030	17.17	2.843	2.2	2.8	3.7	4.2	5.0	6.0	6.9
1040	17.33	2.853	2.2	2.8	3.7	4.2	5.0	6.0	6.9
1050	17.50	2.862	2.1	2.8	3.6	4.2	4.9	6.0	6.8
1060	17.67	2.872	2.1	2.8	3.6	4.2	4.9	5.9	6.8
1070	17.83	2.881	2.1	2.8	3.6	4.1	4.9	5.9	6.7
1080	18.00	2.890	2.1	2.8	3.6	4.1	4.8	5.8	6.7
1090	18.17	2.900	2.1	2.7	3.6	4.1	4.8	5.8	6.6
1100	18.33	2.909	2.1	2.7	3.5	4.1	4.8	5.8	6.6
1110	18.50	2.918	2.1	2.7	3.5	4.0	4.7	5.7	6.5
1120	18.67	2.927	2.1	2.7	3.5	4.0	4.7	5.7	6.5
1130	18.83	2.936	2.0	2.7	3.5	4.0	4.7	5.7	6.4
1140	19.00	2.944	2.0	2.7	3.4	4.0	4.6	5.6	6.4
1150	19.17	2.953	2.0	2.6	3.4	3.9	4.6	5.6	6.4
1160	19.33	2.962	2.0	2.6	3.4	3.9	4.6	5.5	6.3
1170	19.50	2.970	2.0	2.6	3.4	3.9	4.6	5.5	6.3
1180	19.67	2.979	2.0	2.6	3.4	3.9	4.5	5.5	6.2
1190	19.83	2.987	2.0	2.6	3.3	3.8	4.5	5.4	6.2
1200	20.00	2.996	2.0	2.6	3.3	3.8	4.5	5.4	6.2
1210	20.17	3.004	2.0	2.6	3.3	3.8	4.5	5.4	6.1
1220	20.33	3.012	1.9	2.5	3.3	3.8	4.4	5.3	6.1
1230	20.50	3.020	1.9	2.5	3.3	3.7	4.4	5.3	6.1
1240	20.67	3.029	1.9	2.5	3.2	3.7	4.4	5.3	6.0
1250	20.83	3.037	1.9	2.5	3.2	3.7	4.4	5.2	6.0
1260	21.00	3.045	1.9	2.5	3.2	3.7	4.3	5.2	5.9
1270	21.17	3.052	1.9	2.5	3.2	3.7	4.3	5.2	5.9
1280	21.33	3.060	1.9	2.5	3.2	3.6	4.3	5.2	5.9
1290	21.50	3.068	1.9	2.4	3.2	3.6	4.3	5.1	5.8
1300	21.67	3.076	1.9	2.4	3.1	3.6	4.2	5.1	5.8
1310	21.83	3.083	1.9	2.4	3.1	3.6	4.2	5.1	5.8
1320	22.00	3.091	1.8	2.4	3.1	3.6	4.2	5.0	5.7
1330	22.17	3.099	1.8	2.4	3.1	3.5	4.2	5.0	5.7
1340	22.33	3.106	1.8	2.4	3.1	3.5	4.1	5.0	5.7
1350	22.50	3.114	1.8	2.4	3.1	3.5	4.1	5.0	5.6
1360	22.67	3.121	1.8	2.4	3.0	3.5	4.1	4.9	5.6
1370	22.83	3.128	1.8	2.3	3.0	3.5	4.1	4.9	5.6
1380	23.00	3.135	1.8	2.3	3.0	3.5	4.0	4.9	5.5
1390	23.17	3.143	1.8	2.3	3.0	3.4	4.0	4.8	5.5
1400	23.33	3.150	1.8	2.3	3.0	3.4	4.0	4.8	5.5
1410	23.50	3.157	1.8	2.3	3.0	3.4	4.0	4.8	5.5
1420	23.67	3.164	1.8	2.3	3.0	3.4	4.0	4.8	5.4
1430	23.83	3.171	1.8	2.3	2.9	3.4	3.9	4.7	5.4
1440	24.00	3.178	1.7	2.3	2.9	3.3	3.9	4.7	5.4
1450	24.17	3.185	1.7	2.3	2.9	3.3	3.9	4.7	5.3
1460	24.33	3.192	1.7	2.3	2.9	3.3	3.9	4.7	5.3
1470	24.50	3.199	1.7	2.2	2.9	3.3	3.9	4.6	5.3
1480	24.67	3.205	1.7	2.2	2.9	3.3	3.8	4.6	5.3
1490	24.83	3.212	1.7	2.2	2.9	3.3	3.8	4.6	5.2
1500	25.00	3.219	1.7	2.2	2.8	3.3	3.8	4.6	5.2
1510	25.17	3.226	1.7	2.2	2.8	3.2	3.8	4.6	5.2
1520	25.33	3.232	1.7	2.2	2.8	3.2	3.8	4.5	5.1
1530	25.50	3.239	1.7	2.2	2.8	3.2	3.8	4.5	5.1
1540	25.67	3.245	1.7	2.2	2.8	3.2	3.7	4.5	5.1
1550	25.83	3.252	1.7	2.2	2.8	3.2	3.7	4.5	5.1
1560	26.00	3.258	1.7	2.2	2.8	3.2	3.7	4.4	5.0

			Design Average Rainfall Intensities (mm/hr)						
			ARI (yrs):						
Duration, T (minutes)	Duration, T (hours)	*ln* T	1	2	5	10	20	50	100
1570	26.17	3.264	1.6	2.1	2.8	3.1	3.7	4.4	5.0
1580	26.33	3.271	1.6	2.1	2.7	3.1	3.7	4.4	5.0
1590	26.50	3.277	1.6	2.1	2.7	3.1	3.6	4.4	5.0
1600	26.67	3.283	1.6	2.1	2.7	3.1	3.6	4.4	4.9
1610	26.83	3.290	1.6	2.1	2.7	3.1	3.6	4.3	4.9
1620	27.00	3.296	1.6	2.1	2.7	3.1	3.6	4.3	4.9
1630	27.17	3.302	1.6	2.1	2.7	3.1	3.6	4.3	4.9
1640	27.33	3.308	1.6	2.1	2.7	3.0	3.6	4.3	4.9
1650	27.50	3.314	1.6	2.1	2.7	3.0	3.5	4.3	4.8
1660	27.67	3.320	1.6	2.1	2.6	3.0	3.5	4.2	4.8
1670	27.83	3.326	1.6	2.1	2.6	3.0	3.5	4.2	4.8
1680	28.00	3.332	1.6	2.1	2.6	3.0	3.5	4.2	4.8
1690	28.17	3.338	1.6	2.0	2.6	3.0	3.5	4.2	4.7
1700	28.33	3.344	1.6	2.0	2.6	3.0	3.5	4.2	4.7
1710	28.50	3.350	1.6	2.0	2.6	3.0	3.5	4.1	4.7
1720	28.67	3.356	1.6	2.0	2.6	2.9	3.4	4.1	4.7
1730	28.83	3.362	1.5	2.0	2.6	2.9	3.4	4.1	4.6
1740	29.00	3.367	1.5	2.0	2.6	2.9	3.4	4.1	4.6
1750	29.17	3.373	1.5	2.0	2.5	2.9	3.4	4.1	4.6
1760	29.33	3.379	1.5	2.0	2.5	2.9	3.4	4.0	4.6
1770	29.50	3.384	1.5	2.0	2.5	2.9	3.4	4.0	4.6
1780	29.67	3.390	1.5	2.0	2.5	2.9	3.3	4.0	4.5
1790	29.83	3.396	1.5	2.0	2.5	2.9	3.3	4.0	4.5
1800	30.00	3.401	1.5	2.0	2.5	2.8	3.3	4.0	4.5
1810	30.17	3.407	1.5	2.0	2.5	2.8	3.3	4.0	4.5
1820	30.33	3.412	1.5	1.9	2.5	2.8	3.3	3.9	4.5
1830	30.50	3.418	1.5	1.9	2.5	2.8	3.3	3.9	4.4
1840	30.67	3.423	1.5	1.9	2.5	2.8	3.3	3.9	4.4
1850	30.83	3.429	1.5	1.9	2.4	2.8	3.3	3.9	4.4
1860	31.00	3.434	1.5	1.9	2.4	2.8	3.2	3.9	4.4
1870	31.17	3.439	1.5	1.9	2.4	2.8	3.2	3.9	4.4
1880	31.33	3.445	1.5	1.9	2.4	2.8	3.2	3.8	4.4
1890	31.50	3.450	1.5	1.9	2.4	2.7	3.2	3.8	4.3
1900	31.67	3.455	1.5	1.9	2.4	2.7	3.2	3.8	4.3
1910	31.83	3.461	1.4	1.9	2.4	2.7	3.2	3.8	4.3
1920	32.00	3.466	1.4	1.9	2.4	2.7	3.2	3.8	4.3
1930	32.17	3.471	1.4	1.9	2.4	2.7	3.1	3.8	4.3
1940	32.33	3.476	1.4	1.9	2.4	2.7	3.1	3.7	4.2
1950	32.50	3.481	1.4	1.9	2.4	2.7	3.1	3.7	4.2
1960	32.67	3.486	1.4	1.8	2.3	2.7	3.1	3.7	4.2
1970	32.83	3.491	1.4	1.8	2.3	2.7	3.1	3.7	4.2
1980	33.00	3.497	1.4	1.8	2.3	2.7	3.1	3.7	4.2
1990	33.17	3.502	1.4	1.8	2.3	2.6	3.1	3.7	4.2
2000	33.33	3.507	1.4	1.8	2.3	2.6	3.1	3.7	4.1
2010	33.50	3.512	1.4	1.8	2.3	2.6	3.1	3.6	4.1
2020	33.67	3.517	1.4	1.8	2.3	2.6	3.0	3.6	4.1
2030	33.83	3.521	1.4	1.8	2.3	2.6	3.0	3.6	4.1
2040	34.00	3.526	1.4	1.8	2.3	2.6	3.0	3.6	4.1
2050	34.17	3.531	1.4	1.8	2.3	2.6	3.0	3.6	4.1
2060	34.33	3.536	1.4	1.8	2.3	2.6	3.0	3.6	4.0
2070	34.50	3.541	1.4	1.8	2.3	2.6	3.0	3.6	4.0
2080	34.67	3.546	1.4	1.8	2.2	2.6	3.0	3.5	4.0
2090	34.83	3.551	1.4	1.8	2.2	2.5	3.0	3.5	4.0
2100	35.00	3.555	1.4	1.8	2.2	2.5	3.0	3.5	4.0
2110	35.17	3.560	1.4	1.8	2.2	2.5	2.9	3.5	4.0
2120	35.33	3.565	1.4	1.8	2.2	2.5	2.9	3.5	3.9
2130	35.50	3.570	1.3	1.7	2.2	2.5	2.9	3.5	3.9
2140	35.67	3.574	1.3	1.7	2.2	2.5	2.9	3.5	3.9
2150	35.83	3.579	1.3	1.7	2.2	2.5	2.9	3.5	3.9
2160	36.00	3.584	1.3	1.7	2.2	2.5	2.9	3.4	3.9
2170	36.17	3.588	1.3	1.7	2.2	2.5	2.9	3.4	3.9
2180	36.33	3.593	1.3	1.7	2.2	2.5	2.9	3.4	3.9
2190	36.50	3.597	1.3	1.7	2.2	2.5	2.9	3.4	3.8
2200	36.67	3.602	1.3	1.7	2.2	2.4	2.8	3.4	3.8
2210	36.83	3.606	1.3	1.7	2.2	2.4	2.8	3.4	3.8
2220	37.00	3.611	1.3	1.7	2.1	2.4	2.8	3.4	3.8
2230	37.17	3.615	1.3	1.7	2.1	2.4	2.8	3.4	3.8

			Design Average Rainfall Intensities (mm/hr)						
			ARI (yrs):						
Duration, T (minutes)	Duration, T (hours)	*ln* T	1	2	5	10	20	50	100
2240	37.33	3.620	1.3	1.7	2.1	2.4	2.8	3.3	3.8
2250	37.50	3.624	1.3	1.7	2.1	2.4	2.8	3.3	3.8
2260	37.67	3.629	1.3	1.7	2.1	2.4	2.8	3.3	3.7
2270	37.83	3.633	1.3	1.7	2.1	2.4	2.8	3.3	3.7
2280	38.00	3.638	1.3	1.7	2.1	2.4	2.8	3.3	3.7
2290	38.17	3.642	1.3	1.7	2.1	2.4	2.8	3.3	3.7
2300	38.33	3.646	1.3	1.7	2.1	2.4	2.7	3.3	3.7
2310	38.50	3.651	1.3	1.7	2.1	2.4	2.7	3.3	3.7
2320	38.67	3.655	1.3	1.6	2.1	2.4	2.7	3.2	3.7
2330	38.83	3.659	1.3	1.6	2.1	2.3	2.7	3.2	3.7
2340	39.00	3.664	1.3	1.6	2.1	2.3	2.7	3.2	3.6
2350	39.17	3.668	1.3	1.6	2.1	2.3	2.7	3.2	3.6
2360	39.33	3.672	1.3	1.6	2.1	2.3	2.7	3.2	3.6
2370	39.50	3.676	1.3	1.6	2.0	2.3	2.7	3.2	3.6
2380	39.67	3.681	1.3	1.6	2.0	2.3	2.7	3.2	3.6
2390	39.83	3.685	1.2	1.6	2.0	2.3	2.7	3.2	3.6
2400	40.00	3.689	1.2	1.6	2.0	2.3	2.7	3.2	3.6
2410	40.17	3.693	1.2	1.6	2.0	2.3	2.6	3.2	3.6
2420	40.33	3.697	1.2	1.6	2.0	2.3	2.6	3.1	3.5
2430	40.50	3.701	1.2	1.6	2.0	2.3	2.6	3.1	3.5
2440	40.67	3.705	1.2	1.6	2.0	2.3	2.6	3.1	3.5
2450	40.83	3.709	1.2	1.6	2.0	2.3	2.6	3.1	3.5
2460	41.00	3.714	1.2	1.6	2.0	2.2	2.6	3.1	3.5
2470	41.17	3.718	1.2	1.6	2.0	2.2	2.6	3.1	3.5
2480	41.33	3.722	1.2	1.6	2.0	2.2	2.6	3.1	3.5
2490	41.50	3.726	1.2	1.6	2.0	2.2	2.6	3.1	3.5
2500	41.67	3.730	1.2	1.6	2.0	2.2	2.6	3.1	3.4
2510	41.83	3.734	1.2	1.6	2.0	2.2	2.6	3.0	3.4
2520	42.00	3.738	1.2	1.6	2.0	2.2	2.6	3.0	3.4
2530	42.17	3.742	1.2	1.6	1.9	2.2	2.5	3.0	3.4
2540	42.33	3.746	1.2	1.5	1.9	2.2	2.5	3.0	3.4
2550	42.50	3.750	1.2	1.5	1.9	2.2	2.5	3.0	3.4
2560	42.67	3.753	1.2	1.5	1.9	2.2	2.5	3.0	3.4
2570	42.83	3.757	1.2	1.5	1.9	2.2	2.5	3.0	3.4
2580	43.00	3.761	1.2	1.5	1.9	2.2	2.5	3.0	3.4
2590	43.17	3.765	1.2	1.5	1.9	2.2	2.5	3.0	3.3
2600	43.33	3.769	1.2	1.5	1.9	2.2	2.5	3.0	3.3
2610	43.50	3.773	1.2	1.5	1.9	2.1	2.5	3.0	3.3
2620	43.67	3.777	1.2	1.5	1.9	2.1	2.5	2.9	3.3
2630	43.83	3.780	1.2	1.5	1.9	2.1	2.5	2.9	3.3
2640	44.00	3.784	1.2	1.5	1.9	2.1	2.5	2.9	3.3
2650	44.17	3.788	1.2	1.5	1.9	2.1	2.5	2.9	3.3
2660	44.33	3.792	1.2	1.5	1.9	2.1	2.4	2.9	3.3
2670	44.50	3.795	1.2	1.5	1.9	2.1	2.4	2.9	3.3
2680	44.67	3.799	1.2	1.5	1.9	2.1	2.4	2.9	3.2
2690	44.83	3.803	1.2	1.5	1.9	2.1	2.4	2.9	3.2
2700	45.00	3.807	1.1	1.5	1.9	2.1	2.4	2.9	3.2
2710	45.17	3.810	1.1	1.5	1.8	2.1	2.4	2.9	3.2
2720	45.33	3.814	1.1	1.5	1.8	2.1	2.4	2.9	3.2
2730	45.50	3.818	1.1	1.5	1.8	2.1	2.4	2.8	3.2
2740	45.67	3.821	1.1	1.5	1.8	2.1	2.4	2.8	3.2
2750	45.83	3.825	1.1	1.5	1.8	2.1	2.4	2.8	3.2
2760	46.00	3.829	1.1	1.5	1.8	2.1	2.4	2.8	3.2
2770	46.17	3.832	1.1	1.5	1.8	2.1	2.4	2.8	3.2
2780	46.33	3.836	1.1	1.5	1.8	2.0	2.4	2.8	3.2
2790	46.50	3.839	1.1	1.4	1.8	2.0	2.4	2.8	3.1
2800	46.67	3.843	1.1	1.4	1.8	2.0	2.3	2.8	3.1
2810	46.83	3.847	1.1	1.4	1.8	2.0	2.3	2.8	3.1
2820	47.00	3.850	1.1	1.4	1.8	2.0	2.3	2.8	3.1
2830	47.17	3.854	1.1	1.4	1.8	2.0	2.3	2.8	3.1
2840	47.33	3.857	1.1	1.4	1.8	2.0	2.3	2.8	3.1
2850	47.50	3.861	1.1	1.4	1.8	2.0	2.3	2.7	3.1
2860	47.67	3.864	1.1	1.4	1.8	2.0	2.3	2.7	3.1
2870	47.83	3.868	1.1	1.4	1.8	2.0	2.3	2.7	3.1
2880	**48.00**	**3.871**	**1.1**	**1.4**	**1.8**	**2.0**	**2.3**	**2.7**	**3.1**
2890	48.17	3.875	1.1	1.4	1.8	2.0	2.3	2.7	3.0
2900	48.33	3.878	1.1	1.4	1.8	2.0	2.3	2.7	3.0

			Design Average Rainfall Intensities (mm/hr)						
			ARI (yrs):						
Duration, T (minutes)	Duration, T (hours)	*ln* T	1	2	5	10	20	50	100
2910	48.50	3.882	1.1	1.4	1.7	2.0	2.3	2.7	3.0
2920	48.67	3.885	1.1	1.4	1.7	2.0	2.3	2.7	3.0
2930	48.83	3.888	1.1	1.4	1.7	2.0	2.3	2.7	3.0
2940	49.00	3.892	1.1	1.4	1.7	2.0	2.3	2.7	3.0
2950	49.17	3.895	1.1	1.4	1.7	2.0	2.3	2.7	3.0
2960	49.33	3.899	1.1	1.4	1.7	1.9	2.2	2.7	3.0
2970	49.50	3.902	1.1	1.4	1.7	1.9	2.2	2.7	3.0
2980	49.67	3.905	1.1	1.4	1.7	1.9	2.2	2.6	3.0
2990	49.83	3.909	1.1	1.4	1.7	1.9	2.2	2.6	3.0
3000	50.00	3.912	1.1	1.4	1.7	1.9	2.2	2.6	3.0
3010	50.17	3.915	1.1	1.4	1.7	1.9	2.2	2.6	2.9
3020	50.33	3.919	1.1	1.4	1.7	1.9	2.2	2.6	2.9
3030	50.50	3.922	1.1	1.4	1.7	1.9	2.2	2.6	2.9
3040	50.67	3.925	1.1	1.4	1.7	1.9	2.2	2.6	2.9
3050	50.83	3.929	1.1	1.4	1.7	1.9	2.2	2.6	2.9
3060	51.00	3.932	1.1	1.4	1.7	1.9	2.2	2.6	2.9
3070	51.17	3.935	1.0	1.3	1.7	1.9	2.2	2.6	2.9
3080	51.33	3.938	1.0	1.3	1.7	1.9	2.2	2.6	2.9
3090	51.50	3.942	1.0	1.3	1.7	1.9	2.2	2.6	2.9
3100	51.67	3.945	1.0	1.3	1.7	1.9	2.2	2.6	2.9
3110	51.83	3.948	1.0	1.3	1.7	1.9	2.2	2.6	2.9
3120	52.00	3.951	1.0	1.3	1.7	1.9	2.2	2.5	2.9
3130	52.17	3.954	1.0	1.3	1.7	1.9	2.1	2.5	2.8
3140	52.33	3.958	1.0	1.3	1.6	1.9	2.1	2.5	2.8
3150	52.50	3.961	1.0	1.3	1.6	1.9	2.1	2.5	2.8
3160	52.67	3.964	1.0	1.3	1.6	1.8	2.1	2.5	2.8
3170	52.83	3.967	1.0	1.3	1.6	1.8	2.1	2.5	2.8
3180	53.00	3.970	1.0	1.3	1.6	1.8	2.1	2.5	2.8
3190	53.17	3.973	1.0	1.3	1.6	1.8	2.1	2.5	2.8
3200	53.33	3.977	1.0	1.3	1.6	1.8	2.1	2.5	2.8
3210	53.50	3.980	1.0	1.3	1.6	1.8	2.1	2.5	2.8
3220	53.67	3.983	1.0	1.3	1.6	1.8	2.1	2.5	2.8
3230	53.83	3.986	1.0	1.3	1.6	1.8	2.1	2.5	2.8
3240	54.00	3.989	1.0	1.3	1.6	1.8	2.1	2.5	2.8
3250	54.17	3.992	1.0	1.3	1.6	1.8	2.1	2.5	2.8
3260	54.33	3.995	1.0	1.3	1.6	1.8	2.1	2.5	2.8
3270	54.50	3.998	1.0	1.3	1.6	1.8	2.1	2.4	2.7
3280	54.67	4.001	1.0	1.3	1.6	1.8	2.1	2.4	2.7
3290	54.83	4.004	1.0	1.3	1.6	1.8	2.1	2.4	2.7
3300	55.00	4.007	1.0	1.3	1.6	1.8	2.1	2.4	2.7
3310	55.17	4.010	1.0	1.3	1.6	1.8	2.0	2.4	2.7
3320	55.33	4.013	1.0	1.3	1.6	1.8	2.0	2.4	2.7
3330	55.50	4.016	1.0	1.3	1.6	1.8	2.0	2.4	2.7
3340	55.67	4.019	1.0	1.3	1.6	1.8	2.0	2.4	2.7
3350	55.83	4.022	1.0	1.3	1.6	1.8	2.0	2.4	2.7
3360	56.00	4.025	1.0	1.3	1.6	1.8	2.0	2.4	2.7
3370	56.17	4.028	1.0	1.3	1.6	1.8	2.0	2.4	2.7
3380	56.33	4.031	1.0	1.3	1.6	1.7	2.0	2.4	2.7
3390	56.50	4.034	1.0	1.3	1.6	1.7	2.0	2.4	2.7
3400	56.67	4.037	1.0	1.2	1.5	1.7	2.0	2.4	2.7
3410	56.83	4.040	1.0	1.2	1.5	1.7	2.0	2.4	2.6
3420	57.00	4.043	1.0	1.2	1.5	1.7	2.0	2.4	2.6
3430	57.17	4.046	1.0	1.2	1.5	1.7	2.0	2.3	2.6
3440	57.33	4.049	1.0	1.2	1.5	1.7	2.0	2.3	2.6
3450	57.50	4.052	1.0	1.2	1.5	1.7	2.0	2.3	2.6
3460	57.67	4.055	1.0	1.2	1.5	1.7	2.0	2.3	2.6
3470	57.83	4.058	1.0	1.2	1.5	1.7	2.0	2.3	2.6
3480	58.00	4.060	1.0	1.2	1.5	1.7	2.0	2.3	2.6
3490	58.17	4.063	1.0	1.2	1.5	1.7	2.0	2.3	2.6
3500	58.33	4.066	1.0	1.2	1.5	1.7	2.0	2.3	2.6
3510	58.50	4.069	1.0	1.2	1.5	1.7	1.9	2.3	2.6
3520	58.67	4.072	0.9	1.2	1.5	1.7	1.9	2.3	2.6
3530	58.83	4.075	0.9	1.2	1.5	1.7	1.9	2.3	2.6
3540	59.00	4.078	0.9	1.2	1.5	1.7	1.9	2.3	2.6
3550	59.17	4.080	0.9	1.2	1.5	1.7	1.9	2.3	2.6
3560	59.33	4.083	0.9	1.2	1.5	1.7	1.9	2.3	2.5
3570	59.50	4.086	0.9	1.2	1.5	1.7	1.9	2.3	2.5

			Design Average Rainfall Intensities (mm/hr)						
			ARI (yrs):						
Duration, T (minutes)	Duration, T (hours)	*ln* T	1	2	5	10	20	50	100
3580	59.67	4.089	0.9	1.2	1.5	1.7	1.9	2.3	2.5
3590	59.83	4.092	0.9	1.2	1.5	1.7	1.9	2.3	2.5
3600	60.00	4.094	0.9	1.2	1.5	1.7	1.9	2.3	2.5
3610	60.17	4.097	0.9	1.2	1.5	1.7	1.9	2.2	2.5
3620	60.33	4.100	0.9	1.2	1.5	1.7	1.9	2.2	2.5
3630	60.50	4.103	0.9	1.2	1.5	1.6	1.9	2.2	2.5
3640	60.67	4.105	0.9	1.2	1.5	1.6	1.9	2.2	2.5
3650	60.83	4.108	0.9	1.2	1.5	1.6	1.9	2.2	2.5
3660	61.00	4.111	0.9	1.2	1.5	1.6	1.9	2.2	2.5
3670	61.17	4.114	0.9	1.2	1.5	1.6	1.9	2.2	2.5
3680	61.33	4.116	0.9	1.2	1.5	1.6	1.9	2.2	2.5
3690	61.50	4.119	0.9	1.2	1.4	1.6	1.9	2.2	2.5
3700	61.67	4.122	0.9	1.2	1.4	1.6	1.9	2.2	2.5
3710	61.83	4.124	0.9	1.2	1.4	1.6	1.9	2.2	2.5
3720	62.00	4.127	0.9	1.2	1.4	1.6	1.9	2.2	2.5
3730	62.17	4.130	0.9	1.2	1.4	1.6	1.9	2.2	2.4
3740	62.33	4.132	0.9	1.2	1.4	1.6	1.8	2.2	2.4
3750	62.50	4.135	0.9	1.2	1.4	1.6	1.8	2.2	2.4
3760	62.67	4.138	0.9	1.2	1.4	1.6	1.8	2.2	2.4
3770	62.83	4.140	0.9	1.2	1.4	1.6	1.8	2.2	2.4
3780	63.00	4.143	0.9	1.1	1.4	1.6	1.8	2.2	2.4
3790	63.17	4.146	0.9	1.1	1.4	1.6	1.8	2.2	2.4
3800	63.33	4.148	0.9	1.1	1.4	1.6	1.8	2.1	2.4
3810	63.50	4.151	0.9	1.1	1.4	1.6	1.8	2.1	2.4
3820	63.67	4.154	0.9	1.1	1.4	1.6	1.8	2.1	2.4
3830	63.83	4.156	0.9	1.1	1.4	1.6	1.8	2.1	2.4
3840	64.00	4.159	0.9	1.1	1.4	1.6	1.8	2.1	2.4
3850	64.17	4.161	0.9	1.1	1.4	1.6	1.8	2.1	2.4
3860	64.33	4.164	0.9	1.1	1.4	1.6	1.8	2.1	2.4
3870	64.50	4.167	0.9	1.1	1.4	1.6	1.8	2.1	2.4
3880	64.67	4.169	0.9	1.1	1.4	1.6	1.8	2.1	2.4
3890	64.83	4.172	0.9	1.1	1.4	1.6	1.8	2.1	2.4
3900	65.00	4.174	0.9	1.1	1.4	1.6	1.8	2.1	2.4
3910	65.17	4.177	0.9	1.1	1.4	1.5	1.8	2.1	2.3
3920	65.33	4.180	0.9	1.1	1.4	1.5	1.8	2.1	2.3
3930	65.50	4.182	0.9	1.1	1.4	1.5	1.8	2.1	2.3
3940	65.67	4.185	0.9	1.1	1.4	1.5	1.8	2.1	2.3
3950	65.83	4.187	0.9	1.1	1.4	1.5	1.8	2.1	2.3
3960	66.00	4.190	0.9	1.1	1.4	1.5	1.8	2.1	2.3
3970	66.17	4.192	0.9	1.1	1.4	1.5	1.8	2.1	2.3
3980	66.33	4.195	0.9	1.1	1.4	1.5	1.8	2.1	2.3
3990	66.50	4.197	0.9	1.1	1.4	1.5	1.7	2.1	2.3
4000	66.67	4.200	0.9	1.1	1.4	1.5	1.7	2.1	2.3
4010	66.83	4.202	0.9	1.1	1.4	1.5	1.7	2.1	2.3
4020	67.00	4.205	0.9	1.1	1.4	1.5	1.7	2.0	2.3
4030	67.17	4.207	0.9	1.1	1.3	1.5	1.7	2.0	2.3
4040	67.33	4.210	0.9	1.1	1.3	1.5	1.7	2.0	2.3
4050	67.50	4.212	0.9	1.1	1.3	1.5	1.7	2.0	2.3
4060	67.67	4.215	0.8	1.1	1.3	1.5	1.7	2.0	2.3
4070	67.83	4.217	0.8	1.1	1.3	1.5	1.7	2.0	2.3
4080	68.00	4.220	0.8	1.1	1.3	1.5	1.7	2.0	2.3
4090	68.17	4.222	0.8	1.1	1.3	1.5	1.7	2.0	2.3
4100	68.33	4.224	0.8	1.1	1.3	1.5	1.7	2.0	2.3
4110	68.50	4.227	0.8	1.1	1.3	1.5	1.7	2.0	2.2
4120	68.67	4.229	0.8	1.1	1.3	1.5	1.7	2.0	2.2
4130	68.83	4.232	0.8	1.1	1.3	1.5	1.7	2.0	2.2
4140	69.00	4.234	0.8	1.1	1.3	1.5	1.7	2.0	2.2
4150	69.17	4.237	0.8	1.1	1.3	1.5	1.7	2.0	2.2
4160	69.33	4.239	0.8	1.1	1.3	1.5	1.7	2.0	2.2
4170	69.50	4.241	0.8	1.1	1.3	1.5	1.7	2.0	2.2
4180	69.67	4.244	0.8	1.1	1.3	1.5	1.7	2.0	2.2
4190	69.83	4.246	0.8	1.1	1.3	1.5	1.7	2.0	2.2
4200	70.00	4.248	0.8	1.1	1.3	1.5	1.7	2.0	2.2
4210	70.17	4.251	0.8	1.1	1.3	1.5	1.7	2.0	2.2
4220	70.33	4.253	0.8	1.1	1.3	1.5	1.7	2.0	2.2
4230	70.50	4.256	0.8	1.0	1.3	1.4	1.7	2.0	2.2
4240	70.67	4.258	0.8	1.0	1.3	1.4	1.7	2.0	2.2

			Design Average Rainfall Intensities (mm/hr)						
			ARI (yrs):						
Duration, T (minutes)	Duration, T (hours)	*ln* T	1	2	5	10	20	50	100
4250	70.83	4.260	0.8	1.0	1.3	1.4	1.7	2.0	2.2
4260	71.00	4.263	0.8	1.0	1.3	1.4	1.7	1.9	2.2
4270	71.17	4.265	0.8	1.0	1.3	1.4	1.6	1.9	2.2
4280	71.33	4.267	0.8	1.0	1.3	1.4	1.6	1.9	2.2
4290	71.50	4.270	0.8	1.0	1.3	1.4	1.6	1.9	2.2
4300	71.67	4.272	0.8	1.0	1.3	1.4	1.6	1.9	2.2
4310	71.83	4.274	0.8	1.0	1.3	1.4	1.6	1.9	2.2
4320	**72.00**	**4.277**	**0.8**	**1.0**	**1.3**	**1.4**	**1.6**	**1.9**	**2.2**

APPENDIX E: Pre-Development Catchement Data

Catchment: A
Mainstream Parameters

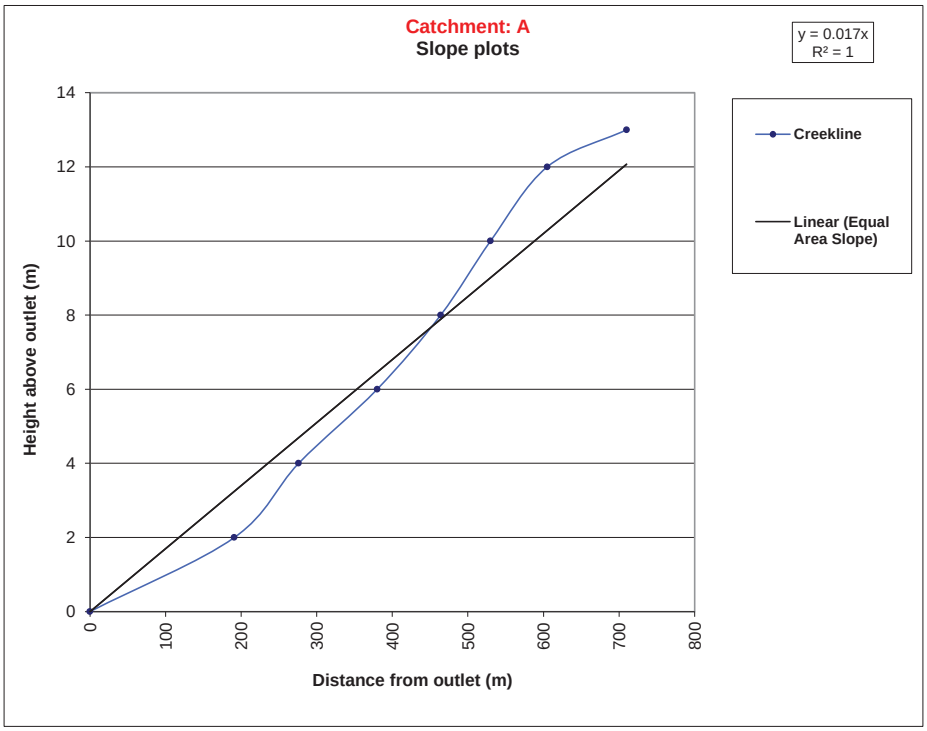
Distance from outlet (m)	Height above outlet (m)	Trapezoid areas (CREEKLINE)
0	0	191
191	2	255
276	4	520
380	6	588
464	8	594
530	10	825
605	12	1,313
710	13	**4,286**

Δ L	0.710	km

Area	317,134	m^2

Se (EQUAL AREA SLOPE)	17.00	m/km
	1.7%	%

Equal Area Ordinates	
0	0
710	12



Catchment: B
Mainstream Parameters

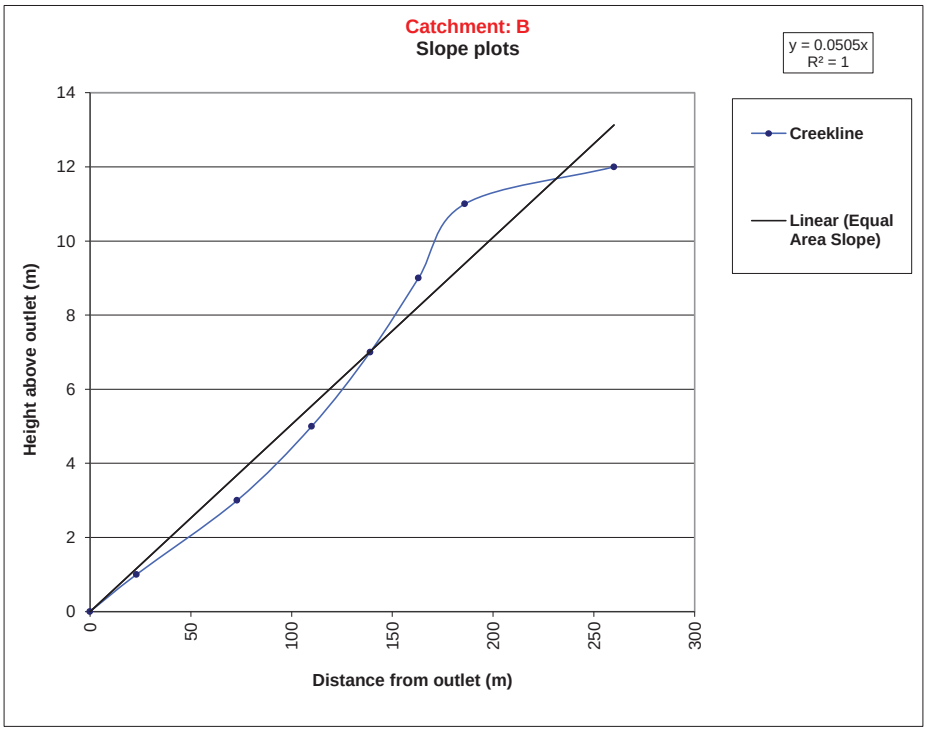
Distance from outlet (m)	Height above outlet (m)	Trapezoid areas (CREEKLINE)
0	0	12
23	1	100
73	3	148
110	5	174
139	7	192
163	9	230
186	11	851
260	12	**1,707**

Δ L	0.260	km

Area	85,582	m^2

Se (EQUAL AREA SLOPE)	50.49	m/km
	5.0%	%

Equal Area Ordinates	
0	0
260	13



Distance from outlet (m)	Height above outlet (m)	Trapezoid areas (CREEKLINE)
0	0	56
112	1	326
275	3	216
329	5	276
375	7	336
417	9	470
464	11	966
548	12	**2,646**

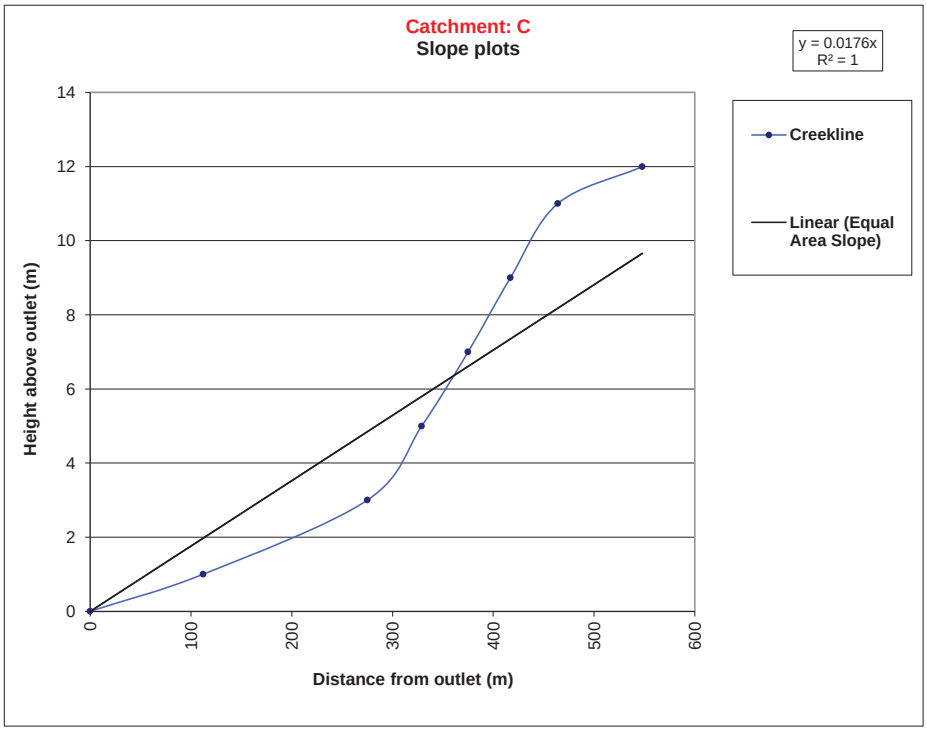
Catchment: C
Mainstream Parameters

Δ L	0.548	km

Area	171,838	m^2

Se (EQUAL AREA SLOPE)	17.62	m/km
	1.8%	%

Equal Area Ordinates	
0	0
548	10



Catchment: D
Mainstream Parameters

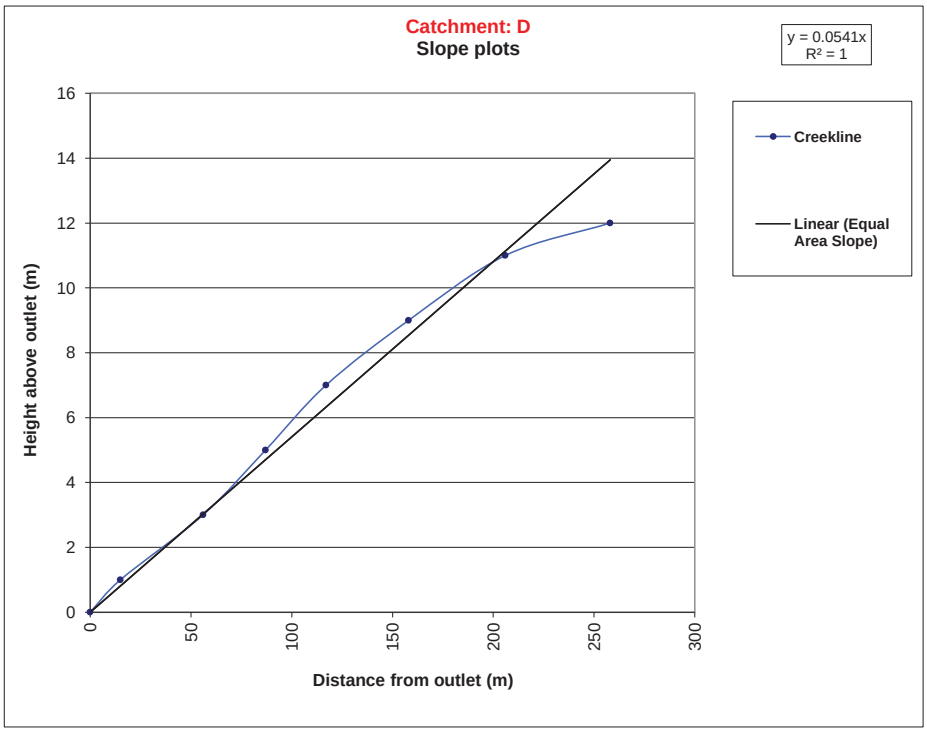
Distance from outlet (m)	Height above outlet (m)	Trapezoid areas (CREEKLINE)
0	0	8
15	1	82
56	3	124
87	5	180
117	7	328
158	9	480
206	11	598
258	12	**1,800**

Δ L	0.258	km

Area	50,187	m^2

Se (EQUAL AREA SLOPE)	54.07	m/km
	5.4%	%

Equal Area Ordinates	
0	0
258	14



APPENDIX F: Pre-Development Analysis, Basin Storage & Sizing Calculations

Civil Technology
15 Charles Street, South Perth
Ph: 9367 2533 Fax: 9367 8046 Email ian@civiltech.com.au

PROJECT: Subdivision of Lots 4, 5 & 10 Francisco Road, Bonnoefield

PRE-DEVELOPMENT ANALYSIS AND MAIN BASIN STORAGE AND SIZING CALCULATIONS

DATE: 26/08/2014

IFD data for Bonniefield 1 in 1 year event

a	b	c	d	e	f	g
2.7653331757E+00	-6.5761656000E-01	-4.6487994000E-02	8.4572183000E-03	2.0212787000E-03	-1.9751323000E-04	-6.0452916000E-05

CATCHEMNT A		CATCHMENT A1 + E1	
Predevelopment		Post development	
Catchment area - Rds ha	0.00	Catchment area - Rds ha	1.73
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0
Catchment area - Verges ha	0.00	Catchment area - Verges ha	2.39
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0
Catchment area - Lots ha	31.71	Catchment area - Lots ha	28.98
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0
Impervious area - ha	1.5855	Impervious area - ha	3.4840
Length of flow - m	710.0	Length of flow - m	900.0
Catchment top RL	20.0	Catchment top RL	34.0
Catchment Base RL	8.0	Catchment Base RL	8.0
Ground slope to culvert S	0.017	Ground slope to culvert S	0.029
Time - min	68.03	Time - min	55.56
Intensity - mm/hr	15	Intensity - mm/hr	17
Inflow - litres/sec	64.4	Inflow - litres/sec	161.7

Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA

Depth of water in basin m	Basin width m	Basin length m	Basin side slope 1 in x	Wetted area m2	Post develop basin Inflow l/sec	Soil head loss lit/sec/m2	Outflow loss infiltration l/sec	Ouflow piped to pre-dev flow l/sec	Outflow total l/sec	Ratio Inflow / Outflow	K	F_y for 1 in 1 ys	Post Develop Storage required m3	Storage available at depth m3
0.14	3.0	70.0	6.0	335.46	161.7	0.160	53.67	64.4	118.0	1.37	3.24	1.00	62.74	38.08
0.15	3.0	70.0	6.0	344.64	161.7	0.180	62.04	64.4	126.4	1.28	2.44	1.00	47.36	41.48
0.16	3.0	70.0	6.0	353.85	161.7	0.180	63.69	64.4	128.1	1.26	2.30	1.00	44.55	44.96
0.17	3.0	70.0	6.0	363.08	161.7	0.180	65.35	64.4	129.7	1.25	2.16	1.00	41.81	48.54
0.18	3.0	70.0	6.0	372.35	161.7	0.180	67.02	64.4	131.4	1.23	2.02	1.00	39.12	52.20
0.19	3.0	70.0	6.0	381.64	161.7	0.180	68.69	64.4	133.1	1.21	1.88	1.00	36.49	55.96
0.20	3.0	70.0	6.0	390.96	161.7	0.180	70.37	64.4	134.7	1.20	1.75	1.00	33.92	59.81

IFD data for Bonniefield 1 in 5 year event

a	b	c	d	e	f	g
3.2556953430E+00	-6.5385479000E-01	-3.2302871000E-02	8.9688348000E-03	2.8445110000E-04	-2.7972783000E-04	-4.1769400000E-06

CATCHEMNT A		CATCHMENT A1 + E1	
Predevelopment		Post development	
Catchment area - Rds ha	0.00	Catchment area - Rds ha	1.73
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0
Catchment area - Verges ha	0.00	Catchment area - Verges ha	2.39
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0
Catchment area - Lots ha	31.71	Catchment area - Lots ha	28.98
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0
Impervious area - ha	1.5855	Impervious area - ha	3.4840
Length of flow - m	710.0	Length of flow - m	900.0
Catchment top RL	20.0	Catchment top RL	34.0
Catchment Base RL	8.0	Catchment Base RL	8.0
Ground slope to culvert S	0.017	Ground slope to culvert S	0.029
Time - min	53.00	Time - min	43.14
Intensity - mm/hr	28	Intensity - mm/hr	32
Inflow - litres/sec	123.8	Inflow - litres/sec	310.3

Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA

Depth of water in basin m	Basin width m	Basin length m	Basin side slope 1 in x	Wetted area m2	Post develop basin Inflow l/sec	Soil head loss lit/sec/m2	Outflow loss infiltration l/sec	Ouflow piped to pre-dev flow l/sec	Outflow total l/sec	Ratio Inflow / Outflow	K	F_y for 1 in 5 ys	Post Develop Storage required m3	Storage available at depth m3
0.30	3.0	70.0	6.0	485.76	310.3	0.180	87.44	123.8	211.3	1.47	4.11	1.50	107.25	103.39
0.31	3.0	70.0	6.0	495.40	310.3	0.180	89.17	123.8	213.0	1.46	4.00	1.50	104.52	108.26
0.32	3.0	70.0	6.0	505.07	310.3	0.180	90.91	123.8	214.7	1.44	3.90	1.50	101.81	113.23
0.33	3.0	70.0	6.0	514.76	310.3	0.180	92.66	123.8	216.5	1.43	3.80	1.50	99.15	118.29
0.34	3.0	70.0	6.0	524.49	310.3	0.180	94.41	123.8	218.2	1.42	3.69	1.50	96.52	123.45
0.35	3.0	70.0	6.0	534.24	310.3	0.180	96.16	123.8	220.0	1.41	3.59	1.50	93.92	128.70
0.36	3.0	70.0	6.0	544.02	310.3	0.180	97.92	123.8	221.8	1.40	3.50	1.50	91.36	134.04

PROJECT: Subdivision of Lots 4, 5 & 10 Francisco Road, Bonnoefield

PRE-DEVELOPMENT ANALYSIS AND MAIN BASIN STORAGE AND SIZING CALCULATIONS

DATE: 26/08/2014

IFD data for Bonniefield 1 in 50 year event

a	b	c	d	e	f	g
3.5300955772E+00	-6.5121728000E-01	-2.1613294000E-02	9.6158953000E-03	-1.0782350000E-03	-3.7923179000E-04	4.7622714000E-05

CATCHEMNT A		CATCHMENT A1 + E1	
Predevelopment		Post development	
Catchment area - Rds ha	0.00	Catchment area - Rds ha	1.73
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0
Catchment area - Verges ha	0.00	Catchment area - Verges ha	2.39
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0
Catchment area - Lots ha	31.71	Catchment area - Lots ha	28.98
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0
Impervious area - ha	1.5855	Impervious area - ha	3.4840
Length of flow - m	710.0	Length of flow - m	900.0
Catchment top RL	20.0	Catchment top RL	34.0
Catchment Base RL	8.0	Catchment Base RL	8.0
Ground slope to culvert S	0.017	Ground slope to culvert S	0.029
Time - min	45.50	Time - min	37.31
Intensity - mm/hr	41	Intensity - mm/hr	46
Inflow - litres/sec	179.6	Inflow - litres/sec	447.4

Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA					Post develop		Outflow	Ouflow	Outflow				Post Develop	Storage
Depth of water in basin m	Basin width m	Basin length m	Basin side slope 1 in x	Wetted area m2	basin Inflow l/sec	Soil head loss lit/sec/m2	loss infiltration l/sec	piped to pre-dev flow l/sec	total l/sec	Ratio Inflow / Outflow	K	F_y for 1 in 20 ys	Storage required m3	available at depth m3
0.37	3.0	70.0	6.0	553.83	447.4	0.180	99.69	179.6	279.3	1.60	5.98	1.90	186.81	139.49
0.38	3.0	70.0	6.0	563.67	447.4	0.180	101.46	179.6	281.1	1.59	5.83	1.90	182.14	145.02
0.39	3.0	70.0	6.0	573.54	447.4	0.180	103.24	179.6	282.9	1.58	5.68	1.90	177.44	150.66
0.40	3.0	70.0	6.0	583.44	447.4	0.180	105.02	179.6	284.7	1.57	5.53	1.90	172.72	156.38
0.41	3.0	70.0	6.0	593.37	447.4	0.180	106.81	179.6	286.4	1.56	5.38	1.90	167.98	162.21
0.42	3.0	70.0	6.0	603.32	447.4	0.180	108.60	179.6	288.2	1.55	5.23	1.90	163.22	168.13
0.43	3.0	70.0	6.0	613.31	447.4	0.180	110.40	179.6	290.0	1.54	5.08	1.90	158.44	174.15

IFD data for Bonniefield 1 in 100 year event

a	b	c	d	e	f	g
3.8266773224E+00	-6.4937431000E-01	-1.1371864000E-02	1.0492197000E-02	-2.4563114000E-03	-5.0131162000E-04	1.0521018000E-04

CATCHEMNT A		CATCHMENT A1 + E1	
Predevelopment		Post development	
Catchment area - Rds ha	0.00	Catchment area - Rds ha	1.73
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0
Catchment area - Verges ha	0.00	Catchment area - Verges ha	2.39
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0
Catchment area - Lots ha	31.71	Catchment area - Lots ha	28.98
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0
Impervious area - ha	1.5855	Impervious area - ha	3.4840
Length of flow - m	710.0	Length of flow - m	900.0
Catchment top RL	20.0	Catchment top RL	34.0
Catchment Base RL	8.0	Catchment Base RL	8.0
Ground slope to culvert S	0.017	Ground slope to culvert S	0.029
Time - min	38.81	Time - min	31.72
Intensity - mm/hr	61	Intensity - mm/hr	69
Inflow - litres/sec	267.5	Inflow - litres/sec	666.9

Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA					Post develop		Outflow	Ouflow	Outflow				Post Develop	Storage
Depth of water in basin m	Basin width m	Basin length m	Basin side slope 1 in x	Wetted area m2	basin Inflow l/sec	Soil head loss lit/sec/m2	loss infiltration l/sec	piped to pre-dev flow l/sec	total l/sec	Ratio Inflow / Outflow	K	F_y for 1 in 100 ys	Storage required m3	available at depth m3
0.54	3.0	70.0	6.0	725.03	666.9	0.180	130.51	267.5	398.0	1.68	7.02	2.35	250.36	246.79
0.55	3.0	70.0	6.0	735.36	666.9	0.180	132.36	267.5	399.8	1.67	6.92	2.35	246.65	253.98
0.56	3.0	70.0	6.0	745.72	666.9	0.180	134.23	267.5	401.7	1.66	6.81	2.35	242.93	261.28
0.57	3.0	70.0	6.0	756.11	666.9	0.180	136.10	267.5	403.6	1.65	6.71	2.35	239.19	268.67
0.58	3.0	70.0	6.0	766.52	666.9	0.180	137.97	267.5	405.4	1.64	6.60	2.35	235.44	276.17
0.59	3.0	70.0	6.0	776.97	666.9	0.180	139.85	267.5	407.3	1.64	6.50	2.35	231.67	283.76
0.60	3.0	70.0	6.0	787.44	666.9	0.180	141.74	267.5	409.2	1.63	6.39	2.35	227.88	291.46

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PROJECT: Subdivision of Lots 4, 5 & 10 Francisco Road, Bonnoefield

PRE-DEVELOPMENT ANALYSIS AND MAIN BASIN STORAGE AND SIZING CALCULATIONS **DATE: 26/08/2014**

IFD data for Bonniefield 1 in 1 year event

a	b	c	d	e	f	g
2.7653331757E+00	-6.5761656000E-01	-4.6487994000E-02	8.4572183000E-03	2.0212787000E-03	-1.9751323000E-04	-6.0452916000E-05

CATCHMENT B		CATCHMENT B1 (POS BUFFER)	
Predevelopment		Post development	
Catchment area - Rds ha	0.00	Catchment area - Rds ha	0.00
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0
Catchment area - Verges ha	0.00	Catchment area - Verges ha	0.00
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0
Catchment area - Lots ha	8.56	Catchment area - Lots ha	6.73
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0
Impervious area - ha	0.4280	Impervious area - ha	0.3365
Length of flow - m	260.0	Length of flow - m	360.0
Catchment top RL	23.0	Catchment top RL	34.0
Catchment Base RL	10.0	Catchment Base RL	10.0
Ground slope to culvert S	0.050	Ground slope to culvert S	0.067
Time - min	20.38	Time - min	19.62
Intensity - mm/hr	30	Intensity - mm/hr	31
Inflow - litres/sec	36.1	Inflow - litres/sec	29.0

Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA					Post develop		Outflow	Ouflow	Outflow				Post Develop	Storage
Depth of water in basin m	Basin width m	Basin length m	Basin side slope 1 in x	Wetted area m2	basin Inflow l/sec	Soil head loss lit/sec/m2	loss infiltration l/sec	piped to pre-dev flow l/sec	total l/sec	Ratio Inflow / Outflow	K	F_y for 1 in 1 ys	Storage required m3	available at depth m3
0.00	0.0	0.0	6.0	0.00	29.0	0.180	0.00	36.1	36.1	0.80	-1.73	1.00	0.00	0.00
0.01	0.0	0.0	6.0	0.01	29.0	0.180	0.00	36.1	36.1	0.80	-1.73	1.00	0.00	0.00
0.02	0.0	0.0	6.0	0.06	29.0	0.180	0.01	36.1	36.1	0.80	-1.73	1.00	0.00	0.00
0.03	0.0	0.0	6.0	0.13	29.0	0.180	0.02	36.1	36.1	0.80	-1.74	1.00	0.00	0.00
0.04	0.0	0.0	6.0	0.23	29.0	0.180	0.04	36.1	36.2	0.80	-1.74	1.00	0.00	0.00
0.05	0.0	0.0	6.0	0.36	29.0	0.180	0.06	36.1	36.2	0.80	-1.74	1.00	0.00	0.00
0.06	0.0	0.0	6.0	0.52	29.0	0.180	0.09	36.1	36.2	0.80	-1.75	1.00	0.00	0.01

IFD data for Bonniefield 1 in 5 year event

a	b	c	d	e	f	g
3.2556953430E+00	-6.5385479000E-01	-3.2302871000E-02	8.9688348000E-03	2.8445110000E-04	-2.7972783000E-04	-4.1769400000E-06

CATCHMENT B		CATCHMENT B1 (POS BUFFER)	
Predevelopment		Post development	
Catchment area - Rds ha	0.00	Catchment area - Rds ha	0.00
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0
Catchment area - Verges ha	0.00	Catchment area - Verges ha	0.00
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0
Catchment area - Lots ha	8.56	Catchment area - Lots ha	6.73
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0
Impervious area - ha	0.4280	Impervious area - ha	0.3365
Length of flow - m	260.0	Length of flow - m	360.0
Catchment top RL	23.0	Catchment top RL	34.0
Catchment Base RL	10.0	Catchment Base RL	10.0
Ground slope to culvert S	0.050	Ground slope to culvert S	0.067
Time - min	15.66	Time - min	15.17
Intensity - mm/hr	58	Intensity - mm/hr	59
Inflow - litres/sec	68.7	Inflow - litres/sec	54.9

Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA					Post develop		Outflow	Ouflow	Outflow				Post Develop	Storage
Depth of water in basin m	Basin width m	Basin length m	Basin side slope 1 in x	Wetted area m2	basin Inflow l/sec	Soil head loss lit/sec/m2	loss infiltration l/sec	piped to pre-dev flow l/sec	total l/sec	Ratio Inflow / Outflow	K	F_y for 1 in 5 ys	Storage required m3	available at depth m3
0.00	0.0	0.0	6.0	0.00	54.9	0.180	0.00	68.7	68.7	0.80	-1.76	1.50	0.00	0.00
0.01	0.0	0.0	6.0	0.01	54.9	0.180	0.00	68.7	68.7	0.80	-1.76	1.50	0.00	0.00
0.02	0.0	0.0	6.0	0.06	54.9	0.180	0.01	68.7	68.7	0.80	-1.76	1.50	0.00	0.00
0.03	0.0	0.0	6.0	0.13	54.9	0.180	0.02	68.7	68.7	0.80	-1.76	1.50	0.00	0.00
0.04	0.0	0.0	6.0	0.23	54.9	0.180	0.04	68.7	68.7	0.80	-1.76	1.50	0.00	0.00
0.05	0.0	0.0	6.0	0.36	54.9	0.180	0.06	68.7	68.7	0.80	-1.76	1.50	0.00	0.00
0.06	0.0	0.0	6.0	0.52	54.9	0.180	0.09	68.7	68.8	0.80	-1.77	1.50	0.00	0.01

PROJECT: Subdivision of Lots 4, 5 & 10 Francisco Road, Bonnoefield

PRE-DEVELOPMENT ANALYSIS AND MAIN BASIN STORAGE AND SIZING CALCULATIONS

DATE: 26/08/2014

IFD data for Bonniefield 1 in 50 year event

a	b	c	d	e	f	g
3.5300955772E+00	-6.5121728000E-01	-2.1613294000E-02	9.6158953000E-03	-1.0782350000E-03	-3.7923179000E-04	4.7622714000E-05

CATCHMENT B		CATCHMENT B1 (POS BUFFER)	
Predevelopment		Post development	
Catchment area - Rds ha	0.00	Catchment area - Rds ha	0.00
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0
Catchment area - Verges ha	0.00	Catchment area - Verges ha	0.00
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0
Catchment area - Lots ha	8.56	Catchment area - Lots ha	6.73
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0
Impervious area - ha	0.4280	Impervious area - ha	0.3365
Length of flow - m	260.0	Length of flow - m	360.0
Catchment top RL	23.0	Catchment top RL	34.0
Catchment Base RL	10.0	Catchment Base RL	10.0
Ground slope to culvert S	0.050	Ground slope to culvert S	0.067
Time - min	13.56	Time - min	13.23
Intensity - mm/hr	83	Intensity - mm/hr	84
Inflow - litres/sec	98.5	Inflow - litres/sec	78.4

Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA					Post develop		Outflow	Ouflow	Outflow				Post Develop	Storage
Depth of water in basin	Basin width	Basin length	Basin side slope	Wetted area	basin Inflow	Soil head loss	loss infiltration	piped to pre-dev flow	total	Ratio Inflow /	K	F_y	Storage required	available at depth
m	m	m	1 in x	m2	l/sec	lit/sec/m2	l/sec	l/sec	l/sec	Outflow		for 1 in 20 ys	m3	m3
0.00	0.0	0.0	6.0	0.00	78.4	0.180	0.00	98.5	98.5	0.80	-1.78	1.90	0.00	0.00
0.01	0.0	0.0	6.0	0.01	78.4	0.180	0.00	98.5	98.5	0.80	-1.78	1.90	0.00	0.00
0.02	0.0	0.0	6.0	0.06	78.4	0.180	0.01	98.5	98.5	0.80	-1.78	1.90	0.00	0.00
0.03	0.0	0.0	6.0	0.13	78.4	0.180	0.02	98.5	98.5	0.80	-1.78	1.90	0.00	0.00
0.04	0.0	0.0	6.0	0.23	78.4	0.180	0.04	98.5	98.5	0.80	-1.79	1.90	0.00	0.00
0.05	0.0	0.0	6.0	0.36	78.4	0.180	0.06	98.5	98.6	0.80	-1.79	1.90	0.00	0.00
0.06	0.0	0.0	6.0	0.52	78.4	0.180	0.09	98.5	98.6	0.80	-1.79	1.90	0.00	0.01

IFD data for Bonniefield 1 in 100 year event

a	b	c	d	e	f	g
3.8266773224E+00	-6.4937431000E-01	-1.1371864000E-02	1.0492197000E-02	-2.4563114000E-03	-5.0131162000E-04	1.0521018000E-04

CATCHMENT B		CATCHMENT B1 (POS BUFFER)	
Predevelopment		Post development	
Catchment area - Rds ha	0.00	Catchment area - Rds ha	0.00
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0
Catchment area - Verges ha	0.00	Catchment area - Verges ha	0.00
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0
Catchment area - Lots ha	8.56	Catchment area - Lots ha	6.73
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0
Impervious area - ha	0.4280	Impervious area - ha	0.3365
Length of flow - m	260.0	Length of flow - m	360.0
Catchment top RL	23.0	Catchment top RL	34.0
Catchment Base RL	10.0	Catchment Base RL	10.0
Ground slope to culvert S	0.050	Ground slope to culvert S	0.067
Time - min	11.63	Time - min	11.27
Intensity - mm/hr	122	Intensity - mm/hr	124
Inflow - litres/sec	145.3	Inflow - litres/sec	116.0

Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA					Post develop		Outflow	Ouflow	Outflow				Post Develop	Storage
Depth of water in basin	Basin width	Basin length	Basin side slope	Wetted area	basin Inflow	Soil head loss	loss infiltration	piped to pre-dev flow	total	Ratio Inflow /	K	F_y	Storage required	available at depth
m	m	m	1 in x	m2	l/sec	lit/sec/m2	l/sec	l/sec	l/sec	Outflow		for 1 in 100 ys	m3	m3
0.00	0.0	0.0	6.0	0.00	116.0	0.180	0.00	145.3	145.3	0.80	-1.76	2.35	0.00	0.00
0.01	0.0	0.0	6.0	0.01	116.0	0.180	0.00	145.3	145.3	0.80	-1.76	2.35	0.00	0.00
0.02	0.0	0.0	6.0	0.06	116.0	0.180	0.01	145.3	145.3	0.80	-1.76	2.35	0.00	0.00
0.03	0.0	0.0	6.0	0.13	116.0	0.180	0.02	145.3	145.3	0.80	-1.76	2.35	0.00	0.00
0.04	0.0	0.0	6.0	0.23	116.0	0.180	0.04	145.3	145.3	0.80	-1.76	2.35	0.00	0.00
0.05	0.0	0.0	6.0	0.36	116.0	0.180	0.06	145.3	145.3	0.80	-1.77	2.35	0.00	0.00
0.06	0.0	0.0	6.0	0.52	116.0	0.180	0.09	145.3	145.4	0.80	-1.77	2.35	0.00	0.01

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PROJECT: Subdivision of Lots 4, 5 & 10 Francisco Road, Bonnoefield

PRE-DEVELOPMENT ANALYSIS AND MAIN BASIN STORAGE AND SIZING CALCULATIONS

DATE: 26/08/2014

IFD data for Bonniefield 1 in 1 year event

a	b	c	d	e	f	g
2.7653331757E+00	-6.5761656000E-01	-4.6487994000E-02	8.4572183000E-03	2.0212787000E-03	-1.9751323000E-04	-6.0452916000E-05

CATCHMENT C Predevelopment		CATCHMENT C1 Post development	
Catchment area - Rds ha	0.00	Catchment area - Rds ha	1.36
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0
Catchment area - Verges ha	0.00	Catchment area - Verges ha	1.88
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0
Catchment area - Lots ha	17.18	Catchment area - Lots ha	18.01
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0
Impervious area - ha	0.8590	Impervious area - ha	2.5005
Length of flow - m	550.0	Length of flow - m	830.0
Catchment top RL	19.0	Catchment top RL	34.0
Catchment Base RL	9.0	Catchment Base RL	9.0
Ground slope to culvert S	0.018	Ground slope to culvert S	0.030
Time - min	54.31	Time - min	52.26
Intensity - mm/hr	17	Intensity - mm/hr	17
Inflow - litres/sec	40.4	Inflow - litres/sec	120.7

Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA

Depth of water in basin m	Basin width m	Basin length m	Basin side slope 1 in x	Wetted area m2	Post develop basin Inflow l/sec	Soil head loss lit/sec/m2	Outflow loss infiltration l/sec	Ouflow piped to pre-dev flow l/sec	Outflow total l/sec	Ratio Inflow / Outflow	K	F_y for 1 in 1 ys	Post Develop Storage required m3	Storage available at depth m3
0.23	3.0	30.0	10.0	262.96	120.7	0.180	47.33	40.4	87.8	1.38	3.29	1.00	48.40	39.37
0.24	3.0	30.0	10.0	271.44	120.7	0.180	48.86	40.4	89.3	1.35	3.08	1.00	45.36	41.99
0.25	3.0	30.0	10.0	280.00	120.7	0.180	50.40	40.4	90.8	1.33	2.88	1.00	42.41	44.69
0.26	3.0	30.0	10.0	288.64	120.7	0.180	51.96	40.4	92.4	1.31	2.68	1.00	39.52	47.47
0.27	3.0	30.0	10.0	297.36	120.7	0.180	53.52	40.4	94.0	1.28	2.49	1.00	36.71	50.33
0.28	3.0	30.0	10.0	306.16	120.7	0.180	55.11	40.4	95.6	1.26	2.31	1.00	33.96	53.27
0.29	3.0	30.0	10.0	315.04	120.7	0.180	56.71	40.4	97.2	1.24	2.12	1.00	31.28	56.29

IFD data for Bonniefield 1 in 5 year event

a	b	c	d	e	f	g
3.2556953430E+00	-6.5385479000E-01	-3.2302871000E-02	8.9688348000E-03	2.8445110000E-04	-2.7972783000E-04	-4.1769400000E-06

CATCHMENT C Predevelopment		CATCHMENT C1 Post development	
Catchment area - Rds ha	0.00	Catchment area - Rds ha	1.36
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0
Catchment area - Verges ha	0.00	Catchment area - Verges ha	1.88
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0
Catchment area - Lots ha	17.18	Catchment area - Lots ha	18.01
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0
Impervious area - ha	0.8590	Impervious area - ha	2.5005
Length of flow - m	550.0	Length of flow - m	830.0
Catchment top RL	19.0	Catchment top RL	34.0
Catchment Base RL	9.0	Catchment Base RL	9.0
Ground slope to culvert S	0.018	Ground slope to culvert S	0.030
Time - min	41.65	Time - min	39.61
Intensity - mm/hr	33	Intensity - mm/hr	34
Inflow - litres/sec	78.2	Inflow - litres/sec	234.9

Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA

Depth of water in basin m	Basin width m	Basin length m	Basin side slope 1 in x	Wetted area m2	Post develop basin Inflow l/sec	Soil head loss lit/sec/m2	Outflow loss infiltration l/sec	Ouflow piped to pre-dev flow l/sec	Outflow total l/sec	Ratio Inflow / Outflow	K	F_y for 1 in 5 ys	Post Develop Storage required m3	Storage available at depth m3
0.40	3.0	30.0	10.0	418.00	234.9	0.180	75.24	78.2	153.4	1.53	4.89	1.50	96.86	95.20
0.41	3.0	30.0	10.0	427.84	234.9	0.180	77.01	78.2	155.2	1.51	4.60	1.50	91.13	99.27
0.42	3.0	30.0	10.0	437.76	234.9	0.180	78.80	78.2	157.0	1.50	4.35	1.50	86.13	103.42
0.43	3.0	30.0	10.0	447.76	234.9	0.180	80.60	78.2	158.8	1.48	4.20	1.50	83.18	107.67
0.44	3.0	30.0	10.0	457.84	234.9	0.180	82.41	78.2	160.6	1.46	4.05	1.50	80.28	112.01
0.45	3.0	30.0	10.0	468.00	234.9	0.180	84.24	78.2	162.4	1.45	3.91	1.50	77.42	116.44
0.46	3.0	30.0	10.0	478.24	234.9	0.180	86.08	78.2	164.3	1.43	3.77	1.50	74.61	120.96

PROJECT: Subdivision of Lots 4, 5 & 10 Francisco Road, Bonnoefield

PRE-DEVELOPMENT ANALYSIS AND MAIN BASIN STORAGE AND SIZING CALCULATIONS

DATE: 26/08/2014

IFD data for Bonniefield 1 in 50 year event

a	b	c	d	e	f	g
3.5300955772E+00	-6.5121728000E-01	-2.1613294000E-02	9.6158953000E-03	-1.0782350000E-03	-3.7923179000E-04	4.7622714000E-05

CATCHMENT C		CATCHMENT C1	
Predevelopment		Post development	
Catchment area - Rds ha	0.00	Catchment area - Rds ha	1.36
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0
Catchment area - Verges ha	0.00	Catchment area - Verges ha	1.88
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0
Catchment area - Lots ha	17.18	Catchment area - Lots ha	18.01
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0
Impervious area - ha	0.8590	Impervious area - ha	2.5005
Length of flow - m	550.0	Length of flow - m	830.0
Catchment top RL	19.0	Catchment top RL	34.0
Catchment Base RL	9.0	Catchment Base RL	9.0
Ground slope to culvert S	0.018	Ground slope to culvert S	0.030
Time - min	36.16	Time - min	34.22
Intensity - mm/hr	47	Intensity - mm/hr	49
Inflow - litres/sec	112.5	Inflow - litres/sec	338.8

Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA					Post develop		Outflow	Ouflow	Outflow				Post Develop	Storage
Depth of water in basin m	Basin width m	Basin length m	Basin side slope 1 in x	Wetted area m2	basin Inflow l/sec	Soil head loss lit/sec/m2	loss infiltration l/sec	piped to pre-dev flow l/sec	total l/sec	Ratio Inflow / Outflow	K	F_y for 1 in 20 ys	Storage required m3	available at depth m3
0.48	3.0	30.0	10.0	498.96	338.8	0.180	89.81	112.5	202.3	1.67	7.01	1.90	166.49	130.29
0.49	3.0	30.0	10.0	509.44	338.8	0.180	91.70	112.5	204.2	1.66	6.80	1.90	161.55	135.10
0.50	3.0	30.0	10.0	520.00	338.8	0.180	93.60	112.5	206.1	1.64	6.59	1.90	156.56	140.00
0.51	3.0	30.0	10.0	530.64	338.8	0.180	95.52	112.5	208.0	1.63	6.38	1.90	151.52	145.00
0.52	3.0	30.0	10.0	541.36	338.8	0.180	97.44	112.5	209.9	1.61	6.16	1.90	146.42	150.09
0.53	3.0	30.0	10.0	552.16	338.8	0.180	99.39	112.5	211.9	1.60	5.95	1.90	141.28	155.28
0.54	3.0	30.0	10.0	563.04	338.8	0.180	101.35	112.5	213.8	1.58	5.73	1.90	136.08	160.57

IFD data for Bonniefield 1 in 100 year event

a	b	c	d	e	f	g
3.8266773224E+00	-6.4937431000E-01	-1.1371864000E-02	1.0492197000E-02	-2.4563114000E-03	-5.0131162000E-04	1.0521018000E-04

CATCHMENT C		CATCHMENT C1	
Predevelopment		Post development	
Catchment area - Rds ha	0.00	Catchment area - Rds ha	1.36
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0
Catchment area - Verges ha	0.00	Catchment area - Verges ha	1.88
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0
Catchment area - Lots ha	17.18	Catchment area - Lots ha	18.01
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0
Impervious area - ha	0.8590	Impervious area - ha	2.5005
Length of flow - m	550.0	Length of flow - m	830.0
Catchment top RL	19.0	Catchment top RL	34.0
Catchment Base RL	9.0	Catchment Base RL	9.0
Ground slope to culvert S	0.018	Ground slope to culvert S	0.030
Time - min	30.83	Time - min	29.34
Intensity - mm/hr	70	Intensity - mm/hr	72
Inflow - litres/sec	167.4	Inflow - litres/sec	502.3

Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA					Post develop		Outflow	Ouflow	Outflow				Post Develop	Storage
Depth of water in basin m	Basin width m	Basin length m	Basin side slope 1 in x	Wetted area m2	basin Inflow l/sec	Soil head loss lit/sec/m2	loss infiltration l/sec	piped to pre-dev flow l/sec	total l/sec	Ratio Inflow / Outflow	K	F_y for 1 in 100 ys	Storage required m3	available at depth m3
0.59	3.0	30.0	10.0	618.64	502.3	0.180	111.36	167.4	278.7	1.80	8.57	2.35	232.52	188.51
0.60	3.0	30.0	10.0	630.00	502.3	0.180	113.40	167.4	280.8	1.79	8.42	2.35	228.48	194.40
0.61	3.0	30.0	10.0	641.44	502.3	0.180	115.46	167.4	282.8	1.78	8.27	2.35	224.41	200.39
0.62	3.0	30.0	10.0	652.96	502.3	0.180	117.53	167.4	284.9	1.76	8.12	2.35	220.30	206.48
0.63	3.0	30.0	10.0	664.56	502.3	0.180	119.62	167.4	287.0	1.75	7.96	2.35	216.15	212.68
0.64	3.0	30.0	10.0	676.24	502.3	0.180	121.72	167.4	289.1	1.74	7.81	2.35	211.96	218.98
0.65	3.0	30.0	10.0	688.00	502.3	0.180	123.84	167.4	291.2	1.72	7.65	2.35	207.74	225.39

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PROJECT: Subdivision of Lots 4, 5 & 10 Francisco Road, Bonnoefield

PRE-DEVELOPMENT ANALYSIS AND MAIN BASIN STORAGE AND SIZING CALCULATIONS

DATE: 26/08/2014

IFD data for Bonniefield 1 in 1 year event

a	b	c	d	e	f	g
2.7653331757E+00	-6.5761656000E-01	-4.6487994000E-02	8.4572183000E-03	2.0212787000E-03	-1.9751323000E-04	-6.0452916000E-05

CATCHMENT D		CATCHMENT D1		
Predevelopment		Post development		
Catchment area - Rds ha	0.00	Catchment area - Rds ha	0.23	
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0	
Catchment area - Verges ha	0.00	Catchment area - Verges ha	0.31	
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0	
Catchment area - Lots ha	5.02	Catchment area - Lots ha	3.85	
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0	
Impervious area - ha	0.2510	Impervious area - ha	0.4615	
Length of flow - m	260.0	Length of flow - m	270.0	
Catchment top RL	21.0	Catchment top RL	20.0	
Catchment Base RL	9.0	Catchment Base RL	10.0	
Ground slope to culvert S	0.054	Ground slope to culvert S	0.037	
Time - min	19.65	Time - min	19.69	Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
Intensity - mm/hr	31	Intensity - mm/hr	31	The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
Inflow - litres/sec	21.6	Inflow - litres/sec	39.7	The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA

Depth of water in basin m	Basin width m	Basin length m	Basin side slope 1 in x	Wetted area m2	Post develop basin Inflow l/sec	Soil head loss lit/sec/m2	Outflow loss infiltration l/sec	Ouflow piped to pre-dev flow l/sec	Outflow total l/sec	Ratio Inflow / Outflow	K	F_y for 1 in 1 ys	Post Develop Storage required m3	Storage available at depth m3
0.21	0.5	5.0	10.0	43.24	39.7	0.180	7.78	21.6	29.4	1.35	3.07	1.00	5.28	3.88
0.22	0.5	5.0	10.0	46.06	39.7	0.180	8.29	21.6	29.9	1.33	2.87	1.00	4.94	4.28
0.23	0.5	5.0	10.0	48.96	39.7	0.180	8.81	21.6	30.4	1.30	2.67	1.00	4.59	4.70
0.24	0.5	5.0	10.0	51.94	39.7	0.180	9.35	21.6	30.9	1.28	2.47	1.00	4.25	5.15
0.25	0.5	5.0	10.0	55.00	39.7	0.180	9.90	21.6	31.5	1.26	2.27	1.00	3.91	5.63
0.26	0.5	5.0	10.0	58.14	39.7	0.180	10.47	21.6	32.1	1.24	2.08	1.00	3.58	6.13
0.27	0.5	5.0	10.0	61.36	39.7	0.180	11.04	21.6	32.6	1.22	1.89	1.00	3.25	6.65

IFD data for Bonniefield 1 in 5 year event

a	b	c	d	e	f	g
3.2556953430E+00	-6.5385479000E-01	-3.2302871000E-02	8.9688348000E-03	2.8445110000E-04	-2.7972783000E-04	-4.1769400000E-06

CATCHMENT D		CATCHMENT D1		
Predevelopment		Post development		
Catchment area - Rds ha	0.00	Catchment area - Rds ha	0.23	
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0	
Catchment area - Verges ha	0.00	Catchment area - Verges ha	0.31	
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0	
Catchment area - Lots ha	5.02	Catchment area - Lots ha	3.85	
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0	
Impervious area - ha	0.2510	Impervious area - ha	0.4615	
Length of flow - m	260.0	Length of flow - m	270.0	
Catchment top RL	21.0	Catchment top RL	20.0	
Catchment Base RL	9.0	Catchment Base RL	10.0	
Ground slope to culvert S	0.054	Ground slope to culvert S	0.037	
Time - min	15.19	Time - min	15.33	Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
Intensity - mm/hr	59	Intensity - mm/hr	58	The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
Inflow - litres/sec	40.9	Inflow - litres/sec	74.9	The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA

Depth of water in basin m	Basin width m	Basin length m	Basin side slope 1 in x	Wetted area m2	Post develop basin Inflow l/sec	Soil head loss lit/sec/m2	Outflow loss infiltration l/sec	Ouflow piped to pre-dev flow l/sec	Outflow total l/sec	Ratio Inflow / Outflow	K	F_y for 1 in 5 ys	Post Develop Storage required m3	Storage available at depth m3
0.29	0.5	5.0	10.0	68.04	74.9	0.180	12.25	40.9	53.2	1.41	3.58	1.50	8.36	7.79
0.30	0.5	5.0	10.0	71.50	74.9	0.180	12.87	40.9	53.8	1.39	3.44	1.50	8.03	8.40
0.31	0.5	5.0	10.0	75.04	74.9	0.180	13.51	40.9	54.4	1.38	3.29	1.50	7.69	9.04
0.32	0.5	5.0	10.0	78.66	74.9	0.180	14.16	40.9	55.1	1.36	3.15	1.50	7.36	9.71
0.33	0.5	5.0	10.0	82.36	74.9	0.180	14.82	40.9	55.7	1.34	3.01	1.50	7.03	10.41
0.34	0.5	5.0	10.0	86.14	74.9	0.180	15.51	40.9	56.4	1.33	2.87	1.50	6.70	11.14
0.35	0.5	5.0	10.0	90.00	74.9	0.180	16.20	40.9	57.1	1.31	2.72	1.50	6.37	11.90

PROJECT: Subdivision of Lots 4, 5 & 10 Francisco Road, Bonnoefield

PRE-DEVELOPMENT ANALYSIS AND MAIN BASIN STORAGE AND SIZING CALCULATIONS

DATE: 26/08/2014

IFD data for Bonniefield 1 in 50 year event

a	b	c	d	e	f	g
3.5300955772E+00	-6.5121728000E-01	-2.1613294000E-02	9.6158953000E-03	-1.0782350000E-03	-3.7923179000E-04	4.7622714000E-05

CATCHMENT D		CATCHMENT D1	
Predevelopment		Post development	
Catchment area - Rds ha	0.00	Catchment area - Rds ha	0.23
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0
Catchment area - Verges ha	0.00	Catchment area - Verges ha	0.31
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0
Catchment area - Lots ha	5.02	Catchment area - Lots ha	3.85
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0
Impervious area - ha	0.2510	Impervious area - ha	0.4615
Length of flow - m	260.0	Length of flow - m	270.0
Catchment top RL	21.0	Catchment top RL	20.0
Catchment Base RL	9.0	Catchment Base RL	10.0
Ground slope to culvert S	0.054	Ground slope to culvert S	0.037
Time - min	13.19	Time - min	13.22
Intensity - mm/hr	84	Intensity - mm/hr	84
Inflow - litres/sec	58.6	Inflow - litres/sec	107.6

Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA					Post develop		Outflow	Ouflow	Outflow				Post Develop	Storage
Depth of water in basin m	Basin width m	Basin length m	Basin side slope 1 in x	Wetted area m2	basin Inflow l/sec	Soil head loss lit/sec/m2	loss infiltration l/sec	piped to pre-dev flow l/sec	total l/sec	Ratio Inflow / Outflow	K	F_y for 1 in 20 ys	Storage required m3	available at depth m3
0.32	0.5	5.0	10.0	78.66	107.6	0.180	14.16	58.6	72.8	1.48	4.20	1.90	11.79	9.71
0.33	0.5	5.0	10.0	82.36	107.6	0.180	14.82	58.6	73.4	1.47	4.08	1.90	11.46	10.41
0.34	0.5	5.0	10.0	86.14	107.6	0.180	15.51	58.6	74.1	1.45	3.96	1.90	11.13	11.14
0.35	0.5	5.0	10.0	90.00	107.6	0.180	16.20	58.6	74.8	1.44	3.85	1.90	10.79	11.90
0.36	0.5	5.0	10.0	93.94	107.6	0.180	16.91	58.6	75.5	1.43	3.73	1.90	10.46	12.69
0.37	0.5	5.0	10.0	97.96	107.6	0.180	17.63	58.6	76.2	1.41	3.61	1.90	10.13	13.52
0.38	0.5	5.0	10.0	102.06	107.6	0.180	18.37	58.6	77.0	1.40	3.49	1.90	9.80	14.38

IFD data for Bonniefield 1 in 100 year event

a	b	c	d	e	f	g
3.8266773224E+00	-6.4937431000E-01	-1.1371864000E-02	1.0492197000E-02	-2.4563114000E-03	-5.0131162000E-04	1.0521018000E-04

CATCHMENT D		CATCHMENT D1	
Predevelopment		Post development	
Catchment area - Rds ha	0.00	Catchment area - Rds ha	0.23
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0
Catchment area - Verges ha	0.00	Catchment area - Verges ha	0.31
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0
Catchment area - Lots ha	5.02	Catchment area - Lots ha	3.85
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0
Impervious area - ha	0.2510	Impervious area - ha	0.4615
Length of flow - m	260.0	Length of flow - m	270.0
Catchment top RL	21.0	Catchment top RL	20.0
Catchment Base RL	9.0	Catchment Base RL	10.0
Ground slope to culvert S	0.054	Ground slope to culvert S	0.037
Time - min	11.29	Time - min	11.31
Intensity - mm/hr	124	Intensity - mm/hr	124
Inflow - litres/sec	86.5	Inflow - litres/sec	158.9

Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA					Post develop		Outflow	Ouflow	Outflow				Post Develop	Storage
Depth of water in basin m	Basin width m	Basin length m	Basin side slope 1 in x	Wetted area m2	basin Inflow l/sec	Soil head loss lit/sec/m2	loss infiltration l/sec	piped to pre-dev flow l/sec	total l/sec	Ratio Inflow / Outflow	K	F_y for 1 in 100 ys	Storage required m3	available at depth m3
0.34	0.5	5.0	10.0	86.14	158.9	0.180	15.51	86.5	102.0	1.56	5.32	2.35	17.10	11.14
0.35	0.5	5.0	10.0	90.00	158.9	0.180	16.20	86.5	102.7	1.55	5.15	2.35	16.57	11.90
0.36	0.5	5.0	10.0	93.94	158.9	0.180	16.91	86.5	103.4	1.54	4.98	2.35	16.02	12.69
0.37	0.5	5.0	10.0	97.96	158.9	0.180	17.63	86.5	104.1	1.53	4.80	2.35	15.46	13.52
0.38	0.5	5.0	10.0	102.06	158.9	0.180	18.37	86.5	104.8	1.52	4.63	2.35	14.88	14.38
0.39	0.5	5.0	10.0	106.24	158.9	0.180	19.12	86.5	105.6	1.50	4.44	2.35	14.30	15.27
0.40	0.5	5.0	10.0	110.50	158.9	0.180	19.89	86.5	106.4	1.49	4.32	2.35	13.91	16.20

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PROJECT: Subdivision of Lots 4, 5 & 10 Francisco Road, Bonnoefield

PRE-DEVELOPMENT ANALYSIS AND MAIN BASIN STORAGE AND SIZING CALCULATIONS

DATE: 26/08/2014

IFD data for Bonniefield 1 in 1 year event

a	b	c	d	e	f	g
2.7653331757E+00	-6.5761656000E-01	-4.6487994000E-02	8.4572183000E-03	2.0212787000E-03	-1.9751323000E-04	-6.0452916000E-05

CATCHEMENT E1

Predevelopment		Post development		
Catchment area - Rds ha	0.00	Catchment area - Rds ha	0.09	
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0	
Catchment area - Verges ha	0.00	Catchment area - Verges ha	0.13	
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0	
Catchment area - Lots ha	1.34	Catchment area - Lots ha	1.12	
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0	
Impervious area - ha	0.0670	Impervious area - ha	0.1630	
Length of flow - m	200.0	Length of flow - m	200.0	
Catchment top RL	34.0	Catchment top RL	34.0	
Catchment Base RL	22.0	Catchment Base RL	22.0	
Ground slope to culvert S	0.060	Ground slope to culvert S	0.060	
Time - min	15.50	Time - min	13.12	Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
Intensity - mm/hr	35	Intensity - mm/hr	38	The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
Inflow - litres/sec	6.5	Inflow - litres/sec	17.2	The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA

Depth of water in basin m	Basin width m	Basin length m	Basin side slope 1 in x	Wetted area m2	Post develop basin Inflow l/sec	Soil head loss lit/sec/m2	Outflow loss infiltration l/sec	Ouflow piped to pre-dev flow l/sec	Outflow total l/sec	Ratio Inflow / Outflow	K	F_y for 1 in 1 ys	Post Develop Storage required m3	Storage available at depth m3
0.33	1.0	1.0	6.0	24.60	17.2	0.160	3.94	6.5	10.5	1.65	6.65	1.00	4.33	2.93
0.34	1.0	1.0	6.0	25.81	17.2	0.180	4.65	6.5	11.2	1.54	5.10	1.00	3.32	3.14
0.35	1.0	1.0	6.0	27.04	17.2	0.180	4.87	6.5	11.4	1.51	4.60	1.00	3.00	3.36
0.36	1.0	1.0	6.0	28.30	17.2	0.180	5.09	6.5	11.6	1.48	4.24	1.00	2.76	3.59
0.37	1.0	1.0	6.0	29.59	17.2	0.180	5.33	6.5	11.8	1.46	3.99	1.00	2.59	3.84
0.38	1.0	1.0	6.0	30.91	17.2	0.180	5.56	6.5	12.1	1.43	3.74	1.00	2.43	4.09
0.39	1.0	1.0	6.0	32.26	17.2	0.180	5.81	6.5	12.3	1.40	3.49	1.00	2.27	4.35

IFD data for Bonniefield 1 in 5 year event

a	b	c	d	e	f	g
3.2556953430E+00	-6.5385479000E-01	-3.2302871000E-02	8.9688348000E-03	2.8445110000E-04	-2.7972783000E-04	-4.1769400000E-06

CATCHEMENT E1

Predevelopment		Post development		
Catchment area - Rds ha	0.00	Catchment area - Rds ha	0.09	
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0	
Catchment area - Verges ha	0.00	Catchment area - Verges ha	0.13	
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0	
Catchment area - Lots ha	1.34	Catchment area - Lots ha	1.12	
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0	
Impervious area - ha	0.0670	Impervious area - ha	0.1630	
Length of flow - m	200.0	Length of flow - m	200.0	
Catchment top RL	34.0	Catchment top RL	34.0	
Catchment Base RL	22.0	Catchment Base RL	22.0	
Ground slope to culvert S	0.060	Ground slope to culvert S	0.060	
Time - min	12.03	Time - min	10.16	Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
Intensity - mm/hr	66	Intensity - mm/hr	72	The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
Inflow - litres/sec	12.3	Inflow - litres/sec	32.5	The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA

Depth of water in basin m	Basin width m	Basin length m	Basin side slope 1 in x	Wetted area m2	Post develop basin Inflow l/sec	Soil head loss lit/sec/m2	Outflow loss infiltration l/sec	Ouflow piped to pre-dev flow l/sec	Outflow total l/sec	Ratio Inflow / Outflow	K	F_y for 1 in 5 ys	Post Develop Storage required m3	Storage available at depth m3
0.44	1.0	1.0	6.0	39.44	32.5	0.180	7.10	12.3	19.4	1.67	6.99	1.50	6.19	5.83
0.45	1.0	1.0	6.0	40.96	32.5	0.180	7.37	12.3	19.7	1.65	6.68	1.50	5.91	6.16
0.46	1.0	1.0	6.0	42.51	32.5	0.180	7.65	12.3	19.9	1.63	6.36	1.50	5.62	6.50
0.47	1.0	1.0	6.0	44.09	32.5	0.180	7.94	12.3	20.2	1.60	6.03	1.50	5.33	6.86
0.48	1.0	1.0	6.0	45.70	32.5	0.180	8.23	12.3	20.5	1.58	5.69	1.50	5.03	7.23
0.49	1.0	1.0	6.0	47.33	32.5	0.180	8.52	12.3	20.8	1.56	5.34	1.50	4.73	7.61
0.50	1.0	1.0	6.0	49.00	32.5	0.180	8.82	12.3	21.1	1.54	4.99	1.50	4.41	8.00

PROJECT: Subdivision of Lots 4, 5 & 10 Francisco Road, Bonnoefield

PRE-DEVELOPMENT ANALYSIS AND MAIN BASIN STORAGE AND SIZING CALCULATIONS

DATE: 26/08/2014

IFD data for Bonniefield 1 in 50 year event

a	b	c	d	e	f	g
3.5300955772E+00	-6.5121728000E-01	-2.1613294000E-02	9.6158953000E-03	-1.0782350000E-03	-3.7923179000E-04	4.7622714000E-05

CATCHEMENT E1

Predevelopment		Post development	
Catchment area - Rds ha	0.00	Catchment area - Rds ha	0.09
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0
Catchment area - Verges ha	0.00	Catchment area - Verges ha	0.13
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0
Catchment area - Lots ha	1.34	Catchment area - Lots ha	1.12
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0
Impervious area - ha	0.0670	Impervious area - ha	0.1630
Length of flow - m	200.0	Length of flow - m	200.0
Catchment top RL	34.0	Catchment top RL	34.0
Catchment Base RL	22.0	Catchment Base RL	22.0
Ground slope to culvert S	0.060	Ground slope to culvert S	0.060
Time - min	10.40	Time - min	8.80
Intensity - mm/hr	95	Intensity - mm/hr	103
Inflow - litres/sec	17.6	Inflow - litres/sec	46.4

Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

SOAKAGE/STORAGE/SIZING - COPAS FORMULA					Post develop		Outflow	Ouflow	Outflow				Post Develop	Storage
Depth of water in basin m	Basin width m	Basin length m	Basin side slope 1 in x	Wetted area m2	basin Inflow l/sec	Soil head loss lit/sec/m2	loss infiltration l/sec	piped to pre-dev flow l/sec	total l/sec	Ratio Inflow / Outflow	K	F_y for 1 in 20 ys	Storage required m3	available at depth m3
0.46	1.0	1.0	6.0	42.51	46.4	0.180	7.65	17.6	25.3	1.84	8.94	1.90	9.49	6.50
0.47	1.0	1.0	6.0	44.09	46.4	0.180	7.94	17.6	25.6	1.82	8.72	1.90	9.26	6.86
0.48	1.0	1.0	6.0	45.70	46.4	0.180	8.23	17.6	25.9	1.80	8.49	1.90	9.01	7.23
0.49	1.0	1.0	6.0	47.33	46.4	0.180	8.52	17.6	26.1	1.78	8.26	1.90	8.77	7.61
0.50	1.0	1.0	6.0	49.00	46.4	0.180	8.82	17.6	26.4	1.75	8.02	1.90	8.52	8.00
0.51	1.0	1.0	6.0	50.69	46.4	0.180	9.12	17.6	26.8	1.73	7.78	1.90	8.26	8.41
0.52	1.0	1.0	6.0	52.42	46.4	0.180	9.44	17.6	27.1	1.72	7.53	1.90	8.00	8.83

IFD data for Bonniefield 1 in 100 year event

a	b	c	d	e	f	g
3.8266773224E+00	-6.4937431000E-01	-1.1371864000E-02	1.0492197000E-02	-2.4563114000E-03	-5.0131162000E-04	1.0521018000E-04

CATCHEMENT E1

Predevelopment		Post development	
Catchment area - Rds ha	0.00	Catchment area - Rds ha	0.09
Runoff Coefficient % Rds	90.0	Runoff Coefficient % Rds	90.0
Catchment area - Verges ha	0.00	Catchment area - Verges ha	0.13
Runoff Coefficient % Verges	20.0	Runoff Coefficient % Verges	20.0
Catchment area - Lots ha	1.34	Catchment area - Lots ha	1.12
Runoff Coefficient % Lots	5.0	Runoff Coefficient % Lots	5.0
Impervious area - ha	0.0670	Impervious area - ha	0.1630
Length of flow - m	200.0	Length of flow - m	200.0
Catchment top RL	34.0	Catchment top RL	34.0
Catchment Base RL	22.0	Catchment Base RL	22.0
Ground slope to culvert S	0.060	Ground slope to culvert S	0.060
Time - min	7.89	Time - min	7.57
Intensity - mm/hr	147	Intensity - mm/hr	150
Inflow - litres/sec	27.4	Inflow - litres/sec	68.0

Kinematic wave equation - Use n =0.05 for predevelopment n = 0.04 for post development)
The roughness coefficient for the pre development was chosen to be 0.05 because of the presence of sparse vegetation throughout the subject site
The roughness coefficient for the post development was chosen to be 0.04. this is because even though there will be the construction of impermeable surfaces within the subject site, when compared to the amount of permeable soils still remaining is quite insignificant, also it was chosen to include the added lag effect of the proposed weirs located within the roadside swales.

Sheet 2 of 2

SOAKAGE/STORAGE/SIZING - COPAS FORMULA					Post develop		Outflow	Ouflow	Outflow				Post Develop	Storage
Depth of water in basin m	Basin width m	Basin length m	Basin side slope 1 in x	Wetted area m2	basin Inflow l/sec	Soil head loss lit/sec/m2	loss infiltration l/sec	piped to pre-dev flow l/sec	total l/sec	Ratio Inflow / Outflow	K	F_y for 1 in 100 ys	Storage required m3	available at depth m3
0.54	1.0	1.0	6.0	55.95	68.0	0.180	10.07	27.4	37.5	1.81	8.69	2.35	10.34	9.71
0.55	1.0	1.0	6.0	57.76	68.0	0.180	10.40	27.4	37.8	1.80	8.51	2.35	10.13	10.17
0.56	1.0	1.0	6.0	59.60	68.0	0.180	10.73	27.4	38.1	1.78	8.33	2.35	9.92	10.65
0.57	1.0	1.0	6.0	61.47	68.0	0.180	11.06	27.4	38.5	1.77	8.15	2.35	9.70	11.14
0.58	1.0	1.0	6.0	63.36	68.0	0.180	11.41	27.4	38.8	1.75	7.97	2.35	9.48	11.64
0.59	1.0	1.0	6.0	65.29	68.0	0.180	11.75	27.4	39.2	1.74	7.78	2.35	9.26	12.16
0.60	1.0	1.0	6.0	67.24	68.0	0.180	12.10	27.4	39.5	1.72	7.59	2.35	9.03	12.70

APPENDIX G: Open Channel Flow Calculation Sheet

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DETAILED OPEN CHANNEL FLOW CALCULATION SHEET

PROJECT: Francisco Road, Bonniefield

SECTION: Catchment A1 + E1
DATE: 29.08.2014

IFD data for Bonniefield area

a	b	c	d	e	f	g
3.8267	-0.6494	-0.0114	0.0105	-0.0025	-0.0005	0.0001

Catchment area lots - m2	289800.0	**1 in 100 year**	
Runoff Coefficient	0.05		
Catchment area roads - m2	17300.0		
Runoff Coefficient	0.9		
Catchment area verges - m2	23900.0		
Runoff Coefficient	0.2		
Impervious area - m2	34840.0		
Length of overland flow - m	900.0		
Catchment top RL	34.0		
Catchment Base RL	9.0		
Ground slope to culvert S	0.028		
Time overland - min	32.48	(Kinematic wave equation for open paddock Flow + retardation time in V-Drains which includes weirs)	
Intensity - mm/hr	68	(ARR polynomial formula)	**n= 0.04**
Flow - litres/sec	657.3		

V-Drain FLOW ANALYSIS - MANNING FORMULA					Flow	Wetted	Hydraulic	V-Drain	Gutter Flow	Gutter Flow	Gutter Flow
Depth of flow	Left side	Right side	Flow width	Manning's	section area	perimeter	radius	S	Q	Q	Velocity
mm	%	%	m	n	a	p	a/p = r	%	m3/sec	litres/sec	m/sec
400	33.33	33.33	2.400	0.04	0.4800	2.5298	0.1897	2.000	0.560	560.3	1.167
410	33.33	33.33	2.460	0.04	0.5043	2.5931	0.1945	2.000	0.598	598.5	1.187
420	33.33	33.33	2.520	0.04	0.5292	2.6563	0.1992	2.000	0.638	638.2	1.206
430	33.33	33.33	2.580	0.04	0.5547	2.7196	0.2040	2.000	0.680	679.5	1.225
440	33.33	33.33	2.640	0.04	0.5808	2.7828	0.2087	2.000	0.722	722.5	1.244
450	33.33	33.33	2.700	0.04	0.6075	2.8460	0.2135	2.000	0.767	767.1	1.263

SECTION: Catchment C1

Catchment area lots - m2	180100.0		
Runoff Coefficient	0.05		
Catchment area roads - m2	13600.0	**1 in 100 year**	
Runoff Coefficient	0.9		
Catchment area verges - m2	18800.0		
Runoff Coefficient	0.2		
Impervious area - m2	25005.0		
Length of flow - m	495.0		
Catchment top RL	24.0		
Catchment Base RL	9.0		
Ground slope to culvert S	0.030		
Time - min	19.47	(Kinematic wave equation)	**n= 0.04**
Intensity - mm/hr	92	(ARR polynomial formula)	
Flow - litres/sec	641.3		

IFD data for Bonniefield area

a	b	c	d	e	f	g
3.8267	-0.6494	-0.0114	0.0105	-0.0025	-0.0005	0.0001

ROAD GUTTER FLOW ANALYSIS - MANNING FORMULA					Flow	Wetted	Hydraulic	V drain	V-Drain	V-Drain	V-Drain
Depth of flow	V drain	V drain	Flow width	Manning's	section area	perimeter	radius	Slope	Q	Q	Velocity
mm	x-fall LHS %	x-fall RHS %	m	n	a	p	a/p = r	%	m3/sec	litres/sec	m/sec
430	33.33	33.33	2.580	0.04	0.5547	2.7196	0.2040	2.000	0.680	679.5	1.225
440	33.33	33.33	2.640	0.04	0.5808	2.7828	0.2087	1.400	0.604	604.5	1.041
450	33.33	33.33	2.700	0.04	0.6075	2.8460	0.2135	1.400	0.642	641.8	1.056
460	33.33	33.33	2.760	0.04	0.6348	2.9093	0.2182	1.400	0.681	680.5	1.072
470	33.33	33.33	2.820	0.04	0.6627	2.9725	0.2229	1.400	0.721	720.7	1.088
480	33.33	33.33	2.880	0.04	0.6912	3.0358	0.2277	1.400	0.762	762.3	1.103

DETAILED OPEN CHANNEL FLOW CALCULATION SHEET

PROJECT: Francisco Road, Bonniefield

SECTION: **Catchment D1**

IFD data for Bonniefield area

a	b	c	d	e	f	g
3.8267	-0.6494	-0.0114	0.0105	-0.0025	-0.0005	0.0001

Catchment area lots - m2	38500.0	
Runoff Coefficient	0.05	
Catchment area roads - m2	2300.0	**1 in 100 year**
Runoff Coefficient	0.9	
Catchment area verges - m2	3100.0	
Runoff Coefficient	0.2	
Impervious area - m2	4615.0	
Length of flow - m	80.0	
Catchment top RL	20.0	**n= 0.04**
Catchment Base RL	10.0	
Ground slope to culvert S	0.125	
Time - min	3.02	(Kinematic wave equation)
Intensity - mm/hr	218	(ARR polynomial formula)
Flow - litres/sec	279.5	

ROAD GUTTER FLOW ANALYSIS - MANNING FORMULA					Flow	Wetted	Hydraulic	V drain	V-Drain	V-Drain	V-Drain
Depth of flow	V drain	V drain	Flow width	Manning's	section area	perimeter	radius	Slope	Q	Q	Velocity
mm	x-fall LHS %	x-fall RHS %	m	n	a	p	a/p = r	%	m3/sec	litres/sec	m/sec
310	33.33	33.33	1.860	0.04	0.2883	1.9606	0.1470	2.000	0.284	283.9	0.985
320	33.33	33.33	1.920	0.04	0.3072	2.0239	0.1518	1.400	0.259	258.6	0.842
330	33.33	33.33	1.980	0.04	0.3267	2.0871	0.1565	1.400	0.281	280.7	0.859
340	33.33	33.33	2.040	0.04	0.3468	2.1503	0.1613	1.400	0.304	303.9	0.876
350	33.33	33.33	2.100	0.04	0.3675	2.2136	0.1660	1.400	0.328	328.4	0.893
360	33.33	33.33	2.160	0.04	0.3888	2.2768	0.1708	1.400	0.354	354.0	0.910

7 Required information about the proposal

An application may not be accepted and will be returned to the applicant with the submitted fee if the requirements are incorrect or incomplete.

General information required for all applications

1.	Subdivision plans are based on an accurate and up-to-date feature survey that includes existing ground levels relative to AHD or topography of the subject lot/s. A feature survey is not required for amalgamation approval.	✔ Yes	
2.	Relevant copies of the subdivision plans and supporting documentation or accompanying information are attached.	✔ Yes	
3.	The subdivision plan is capable of being reproduced in black and white format.	✔ Yes	
4.	The subdivision plan is drawn to a standard scale (ie 1:100, 1:200, 1:500, 1:1000) at A3 or A4.	✔ Yes	
5.	All dimensions on the subdivision plan are in metric standard.	✔ Yes	
6.	The north point is shown clearly on the subdivision plan.	✔ Yes	
7.	The subdivision plan shows all lots or the whole strata plan (whichever is applicable).	✔ Yes	
8.	The subdivision plan shows all existing and proposed lot boundaries.	✔ Yes	
9.	The subdivision plan shows all existing and proposed lot dimensions (including lot areas).	✔ Yes	
10.	The subdivision plan shows the lot numbers and boundaries of all adjoining lots.	✔ Yes	
11.	For battleaxe lots, the subdivision plan shows the width and length of the access leg, the area of the access leg and the total area of the lot.	☐ Yes	✔ n/a (battleaxe lot not proposed)
12.	The subdivision plan shows the name/s of existing road/s.	✔ Yes	
13.	The subdivision plan shows the width of proposed road/s.	✔ Yes	☐ n/a (no road proposed)
14.	The subdivision plan shows all buildings and/or improvements, including driveways and crossovers (including setbacks) which are to be retained, or removed.	✔ Yes	☐ n/a (land is vacant)
15.	The subdivision plan shows all physical features such as watercourses, wetlands, significant vegetation, flood plains and dams.	✔ Yes	☐ n/a (land does not contain such features)
16.	The subdivision plan shows all electrical, sewer and water infrastructure. For on-site sewage disposal, the indicative disposal areas for wastewater distribution are to be shown.	☐ Yes	

17. Additional information required in the case of applications for residential infill subdivision within existing residential zoned areas

Applications which propose to create two or more residential lots in existing residential areas must show all existing features (in addition to item 16 above) located in the road reserve/s adjoining the subject land and all existing improvements on the subject land and including:

- driveways and crossovers
- kerb lines
- manholes
- bus stops
- gully pits
- boundary setbacks for dwelling/s to be retained
- fencing
- street trees
- water supply
- swimming pools
- pedestrian paths
- retaining walls
- telecommunication pillars
- electricity transmission lines and poles
- sewer, water and electricity connections
- on-site sewage disposal systems, including treatment and wastewater disposal areas

The WAPC has published a guide to applications and fees to assist applicants preparing to submit applications. The guide and other information about the planning system is available online:

www.dplh.wa.gov.au

Transport impacts

Transport Impact Statements and Transport Impact Assessments are required to determine the likely transport impact of a proposal. Information to assist proponents is available on the DPLH website at www.dplh.wa.gov.au/policy-and-legislation/state-planning-framework/fact-sheets,-manuals-and-guidelines/transport-impact-assessment-guidelines

1.	Are there 10 - 100 vehicle trips in the subdivision's peak hour? If yes, a transport Impact statement is to be provided	✔ Yes ☐ No
2.	Are there more than 100 vehicle trips in the subdivision's peak hour? If yes, a transport impact assessment is to be provided.	☐ Yes ✔ No

Access to/from right-of-way or private road

Access is to be provided from an existing right of way or private road. ☐ Yes ✔ No

If you indicate 'yes', you must provide a copy of the plan or diagram of survey on which the subject right-of-way was created to confirm its exact width and whether a right of access exists. Right of access may be an easement under section 167A of the *Transfer of Land Act 1893*, an implied easement for access or other arrangement.

Road and rail noise

Is the proposal within the trigger distance of a strategic transport route as defined by State Planning Policy 5.4? ☐ Yes ✔ No

Contaminated sites

Information to assist applicants to respond to the following questions is on the Department of Water and Environmental Regulation (DWER) website at www.der.wa.gov.au/your-environment/contaminated-sites.

1.	Has the land ever been used for a potentially contaminating activity? Appendix B of Assessment and Management of Contaminated Sites (DWER Contaminated sites guidelines) lists potentially contaminating industries, activities and land uses. The list is not exhaustive.	☐ Yes ✔ No
	If yes, please attach details of the activities/uses.	
2.	Does the land contain any site or sites that have been classified under the *Contaminated Sites Act 2003*?	☐ Yes ✔ No
3.	Does the land contain any site or sites that have been reported or are required to be reported under the *Contaminated Sites Act 2003*?	☐ Yes ✔ No

If you indicated 'yes' to question 2 or 3 you must provide a Basic Summary of Records (BSR). Where a BSR is not available from the public Contaminated Sites Database, the form requesting a BSR from DWER is available online at www.der.wa.gov.au/your-environment/contaminated-sites/57-forms or by calling DWER on 1300 762 982.

If a BSR is not available, a copy of the letter from DWER notifying the applicant that the site or the sites are under assessment must be provided, followed by the BSR when available.

Is a BSR or letter from DWER attached? ☐ Yes ✔ No

Information requirements for Liveable Neighbourhoods

Subdivision applications proposing to create 20 or more lots on greenfield and urban infill sites will be assessed against the requirements of Liveable Neighbourhoods.

Such applications should be supported by documentation addressing the relevant criteria of Liveable Neighbourhoods, as identified in the application guidelines within the policy document.

Is this application to be assessed under the Liveable Neighbourhoods policy and is supporting documentation attached? ☐ Yes ✔ No

Acid sulfate soils

Is the land located in an area where site characteristics or local knowledge lead you to form the view that there is a significant risk of disturbing acid sulfate soils at this location? ☐ Yes ✔ No

Bushfire Prone Areas

Is all, or a section of the subdivision in a designated bushfire prone area? ✔ Yes ☐ No

If 'yes', has a BAL Contour Map been prepared; and

If the BAL Contour Map indicates areas of the subject site as BAL-12.5 or above, has a Bushfire Management Plan been provided with the application? ✔ Yes ☐ No

If NA is selected and the proposal is in a designated bushfire prone area then a statement advising why SPP 3.7 does not apply should be included. ☐ n/a

On-site sewage disposal

Is on-site sewage disposal proposed? ✔ Yes ☐ No

If yes, proposals for on-site sewage disposal should be accompanied by a site and soil evaluation as per the Government Sewerage Policy. ✔ n/a (Greater than 4ha)

Has a site and soil evaluation been provided? If no, then a statement is to be provided as to why an evaluation has not been provided.

Information on preparing site and soil evaluations may be found on the Department of Health's website https://ww2.health.wa.gov.au/~/media/Files/Corporate/general%20documents/water/Wastewater/Site-Soil-Evaluation.pdf

Survey Strata Title lots

Is strata title subdivision proposed?

If yes, either the plan of subdivision or accompanying servicing plan is to show the indicative internal sewer and water connections to each lot. ☐ Yes ✔ No

If applicable, easements are to be shown.

Information on the water and sewer detail for survey-strata lots to be shown can be found on the Department of Mines, Industry Regulation and Safety website: www.commerce.wa.gov.au/publications/plumbers-technical-note-services-survey-strata-lots-0

ATTACHMENT: 9.2.1

Local Emergency Management Committee

Attachment 1
Minutes of the Local Emergency Management Committee Meeting held Wednesday 24 March 2021

Shire of Irwin Local Emergency Management Committee (LEMC) Meeting

to be held in the Council Chambers

Wednesday, 24 March 2021

at 2.00pm

Minutes

I certify that this copy of the Minutes is a true and correct record of the meeting held on
24 March 2021

Signed:.....
Mark Teale – Chairperson

Date: 22/7/21

1 DECLARATION OF OPENING/ANNOUNCEMENT OF VISITORS

2 RECORD OF ATTENDANCE/APOLOGIES/LEAVE OF ABSENCE

(please sign the attendance register on arrival)

Members

Cr M T Smith	Shire of Irwin President & Presiding Member
T Pavelka	DEMHS
T Potts	A/Officer in Charge Dongara Police
J Henriques	Parks and Wildlife Service
C McCartney	Paramedic, St Johns Ambulance
M Moerman *(via teleconference)*	DFES Area Officer Midlands

Staff

Mr S Ivers	Chief Executive Officer
Mr M Teale	Community Emergency Services Manager
Mrs N A M'Leane	Development & Executive Officer

Apologies

J Gardener	DFES
Cr H Wells	Shire of Irwin Councillor
J Calver	Dongara District High School
P Herbert	Main Roads WA
Cr G S Eva	Shire of Irwin Councillor
Mr G Crabb	Chief Bush Fire Control Officer
Mr K Shaw	Department of Communities

3 BUSINESS ARISING

3.1

COMMITTEE DECISION 010321:	
MOVED: M Teale	**SECONDED: S Ivers**
That the Minutes of the 02 December 2020 LEMC Meeting, as previously circulated, be adopted as true and accurate recording of that meeting.	

3.2 Action Items from previous minutes

- **PPE Stocks for Rec Centre Evacuation Centre**
  Business Plan moving forward – Look at the Irwin Rec Centre with DEMA and K Shaw, good asset for our and other Shire. Number of PPE for staff there, in the event we activate the site PPE is available. Work with the sites to do training.
- **DDHS as possible second evacuation centre**
  This year, investigate this in more detail.
- **LEMC Exercise**
  Need to do at least once a year, evacuation centre exercise is an option. More information for LEMC exercises to be provided that is more directed for LEMC rather than a vehicle incident etc. Activation of an Evacuation Centre could be a good exercise to carry out.
- **WHS Legislation impacts on volunteers**
  Within the region there are lots of conversation happening around the legislation and how it impacts their responsibilities. The Act has been past, the Legislation is due to go through in the next few weeks. There are harsh penalties including 10 years imprisonment. The Shire or Irwin are working to better understand the Legislation from a Shire and Volunteer point of view. CESM to investigate what action has been taken by DFES to prepare to implement the new Legislation and a request has been made for that information to be passed onto Shane, CEO.
  Action Item: Mark Teale – Follow up DFES response to the new legislation.
- **Water Hydrant Request – DFES AO Midlands**
  Mathias taken on role from Tony Keeping, conversations with Tony indicate there is another hydrant not previously identified in the area. Mark to continue investigations.

4 ANNOUNCEMENTS BY PERSON PRESIDING

5 DECLARATIONS OF INTEREST

Identify real, perceived or potential conflicts of interest experienced by any member in relation to the items on the agenda. These should be declared now and if possible raised with the chairperson prior to the meeting to determine the appropriate way to manage the conflict.

6 CORRESPONDENCE IN

6.1 Interim Contact Details for Evacuation Centre and Welfare Support (Dept Communities)

6.2 Generators on Telstra Infrastructure (DEMA)

6.3 WA Community Evacuation in Emergencies New Guideline and Amendments (SEMC)

6.4 Midwest Gascoyne DEMC Meeting Dates 2021 (DEMA)

6.5 SEMC internal Communique and Exchange of Information under EM Act fact sheet (DEMA)

6.6 COVID-19 Welfare Centre Guide V1.02 (Dept Communities)

7 CORRESPONDENCE OUT

7.1 Nil.

8 GENERAL BUSINESS

8.1 Upcoming Community Events

Easter Markets, 150th Anniversary of the Dongara Police Station.
Dongara Easter Races
Anzac Day Dawn Service
Sprint

8.2 Amendments to LEMA/Contact Details

Opportunity to update changes for updates in their departments. Welcome Matias from DFES.

8.3 Agency Updates

M Teale – Beekeeper's fire to the South of our area was a notable event, acknowledgement was made for the DPAW for their assistance. Currently reviewing the Mitigation Activity Funding and Bushfire Risk Management Plan to identify areas for funding.

C McCartney – Continue infection control and PPE training. 30 April Flu Vaccinations required. Cliff Head Defib, memory downloaded in Perth after being used at an incident by the community. New storage box to be installed to replace old AED Safe, coordinate these works with Mark Jones, Shire or Irwin. Mingenew Races went well, 2 ambulances in attendance from Leeman, Leeman will also be attending the Dongara Races to free up local volunteers and vans.

T Pavelka – Still in lockdown, restricted visits in place. Covid 19 vaccines arrive next Monday, for Staff and Residents. Staff will be undertaking training. Then volunteers and the public depending on what the local GP Practice will take on, as well as training requirements. There are specific storage compliance requirements.
Facility redevelopment, April will see the start with a preferred contractor. Have been given a 12 month – 3 years' completion timeframe. ED to be running 24/7 and will be the last area to be completed. Travel arrangements for patients, staff and families have been arranged. Sacha's on call have reduced, for telehealth still sitting at the highest user.

T Potts – 100s of PPE masks delivered to local station for storage. Station has been busy, anticipate a busy April.

M Moerman – replaced T Keeping, AO Midlands. DVRFS Station, meeting with team regarding $500,000 upgrades. Two members attended Wooroloo fires from Dongara. Yardarino Shed structure fire, combined effort by Dongara Volunteers and Geraldton Career Firefighters. Dongara Fuel Station fire, Dongara VRFS, positive outcome. Please ask for assistance with local burns if required. New district manager Chris Stewart. Advised that the agency run Avanza maps download the app before attending an incident or fire.

Shane Ivers – WHS legislation is currently our key focus.

M Smith – Prioritise and further investigate funding opportunities for town. Request to be presented at a future Ordinary Council Meeting.

8.4 COVID-19 Discussion

Captured in Agency Updates.

8.5 LEMC Membership Changes

Nil.

9 SETTING OF FUTURE MEETING DATES

9.1 The below dates are proposed for future LEMC meetings.

- Wednesday 2 June, 2021
- Wednesday 1 September, 2021
- Wednesday 1 December, 2021
- Wednesday 2 March, 2022

The proposed dates were all supported by the Committee.

10 CLOSURE

ATTACHMENT: 9.2.2

Local Emergency Management Committee

Attachment 1

Minutes of the Local Emergency Management Committee Meeting held Friday 9 April 2021

Shire of Irwin Local Emergency Management Committee (LEMC) Meeting

to be held in the Council Chambers

Friday, 9 April 2021

at 10.00am

Minutes

I certify that this copy of the Minutes is a true and correct record of the meeting held on 9 April 2021

Signed:.....
Mark Teale – Chairperson

Date: 22/7/21

1 DECLARATION OF OPENING/ANNOUNCEMENT OF VISITORS

2 RECORD OF ATTENDANCE/APOLOGIES/LEAVE OF ABSENCE

(please sign the attendance register on arrival)

Members

Mr G Crabb	Chief Bush Fire Control Officer
T Pavelka	DEMHS
J Henriques	Parks and Wildlife Service
C McCartney	Paramedic, St Johns Ambulance
A Davis	Department of Communities
Cr H Wells	Shire of Irwin Councillor
Cr G S Eva	Shire of Irwin Councillor
M Maxfield	Chief Executive Officer Shire of Coorow
Mr T Potts	Officer in Charge Dongara Police

Staff

Mr S Ivers	Chief Executive Officer
Mr K Pollitt *(chairperson)*	Community Emergency Services Manager
Mrs N A M'Leane	Development & Executive Officer
Mr P Manners	Community Ranger

Apologies

Cr M T Smith	Shire of Irwin President & Presiding Member
J Calver	Dongara District High School
P Herbert	Main Roads WA
B Cassidy	Officer in Charge Dongara Police
M Moerman	DFES Area Officer Midlands
J Gardener	DFES

3 GENERAL BUSINESS

3.1 Tropical Cyclone Seroja

K Pollitt provided updates from BOM Briefing held at 08.00am regarding the three tropical lows.

- 24 U no impact
- 23 U Odette – Category 1 before its sucked into Seroja the will drop off
- TC Seroja Category 1 currently, intensifying to a Category 2 overnight 9th, intensifying to a Category 3 11th – then back to a Category 2 – 12th April - landfall. Dissipates to a Tropical Low as it tracks SE towards Esperance.
- 3 - 6 hours of potential strong gales & rainfall between 50 – 80mm, some potential flash flooding.

BOM Advise – Blue Alert Currently
Landfall between Kalbarri and Geraldton at a Category 2. Storm Surge higher than highest astronomical tide – characteristically a Category 2 will produce 90 – 120kmh winds, max gusts for TC Seroja will be 125kmh to the North of the track, to the South will be predominantly rainfall.

Shire of Irwin closing the Indian Ocean Drive Costal Camping Nodes Friday – Monday (inclusive), Shire of Coorow have been instructed to do the same. Moving people on that are camping due to storm surge.

DFES Media Statement has been distributed to Shires, Caravan Parks, and Tourism Bureaus. BOM advise to be forwarded.

Upgrade to a Yellow alert is possible. Caravan Parks can only turn people away when a Yellow Alert is issued and in place.

Irwin Rec Creation Centre, located behind dunes (not cyclone rated) a is allocated Evacuation Centre (post Cyclone), Leeman Green-Head and Coorow are prepared.

Andrea – OSAG ISG Geraldton does not have any cyclone rated centres identified – locations available after the weather event.

People living in dwellings with a low rating are advised to stay in their own dwelling if they feel safe or to relocate with family and friends.

Dongara & Northampton can be evacuated to Geraldton Centre if required, Leeman and Green-Head to Jurien Bay potentially.

Jess – Moora District are closing campgrounds Saturday Morning. Shack tenants being informed. Pinnacles closed. Potential flooding. Patrolling Burn 85% burnt out. Rubbish Tips being made safe, contractors been to clear out loose debris.

Catherine – SJA Business as usual - checking volunteer availability. Mobile service a concern prepping with radios.

Mia – Preparing generator at Leeman and satellite phones. Responders on call for clean-up.

Andrea – Officers on standby to be deployed for welfare centre activations. ESU monitoring, attending frequent meetings to gain up to date information. Sunday to potentially initiate.

Cr Wells – The racecourse is identified as an available location for animal welfare.

Trish – Calls gone out to elderly members of the community on their service. Encouraging friends and family to assist the elderly in preparing their properties. Business as usual, open and potentially having staff stay at the Centre overnight. Focusing on oxygen dependant community

members. Fleet vehicles and bus fuelled for evacuation preparation to Three Springs or Morawa, whichever is safest.

Dongara Medical Satellite Contact Numbers – 0147 186 130 & 0417 151 110.

Tommy Potts - Direction from District Office to complete 1 – 10's.

- Vehicles, Generator & Jerry Cans fueled
- Communication Equipment charged
- Loose items at station secured
- Emergency contacts updated – Emergency Contact List to be emailed to LEMC Members.
- Staff are prepared
- Emergency Equipment checked and accessible
- Requested Traffic Volume Stats twice daily.

Peter – Pound is ready to go with pet food. Contacting Rec Jetty Pen Holders. Active building site managers to be contacted, ensure no loose material on site.

Cr Eva – Ensure community is communicated potential power outage and to have back up power prepared and water if running off a pumping system.

LED Sign – Blue alert and SES Contacts. 000 emergency. 132 500 non-life threatening.
BLUE Alert Cyclone Flags.

Shane – Shire Operations Team prepping, ensure it is communicated that SES are the primary contact for emergency response (non-life threatening). Shade sails to be taken down, Shire vehicles fuelled ready to be called upon.

4 SETTING OF FUTURE MEETING DATES

Meeting to be held at 10.00am Saturday, 10 April 2021 in the Council Chambers or via Teams.

5 CLOSURE

Meeting Closed 10.40am.