GENERAL MEETING - 526 17 March 2021

PAGE 1 Supporting Information

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.) #1 Flood Management Portfolio Asset Management Plan - March 2021



moretonbay.qld.gov.au | Phone 3205 0555

Supporting Information

Moreton Bay

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

### Flood Management Devices Portfolio Asset Management Plan

Document Reference									
Document title	Flood Management Devices Asset Management Plan								
ECM Reference	A20264514								
Date prepared	November 2020								
Adopted Date	17 March 2021								
Prepared by	Asset Management								

Version Control										
Version	Date	Revision details	Author/s	Reviewed by						
Original	December 2018	Original Content Formation	Leanne Salter/Liz Laur	J Frost						
Draft v1	January 2019	Initial draft	A Szekeres	W Field						
Draft v2	November 2020	Further Review and Development	A Szekeres/ A Evans/ W Field	J Frost						
Draft v3	25 January 2021	Final Draft	A Szekeres/ W Field	J Frost						
Draft v4	February 2021	Final Stakeholder Review	L Salter/W Field	A Charteris/J Frost						
Draft v5	3 March	Minor change to reflect feedback	W Field	J Frost						
	2021	from Councillor Briefing Session								
Version 1	17 March 2021	Adopted by Council	J Frost	A Ryan						

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Flood Management Devices Portfolio Asset Management Plan

### Table of Contents

Ex	ecutiv	ve Summary	6
1	Pur	rpose	12
2	Ass	set Information	12
	2.1	Asset Types & Hierarchy	12
	2.2	Asset Prioritisation	19
	2.3	Asset Relationships	19
	2.4	Asset Attributes	20
3	Lev	/els of Service	20
	3.1	Community Levels of Service	20
	3.2	Technical Levels of Service	21
4	Fut	ure Demand	23
5	Ass	set Lifecycle Management	24
-	5.1	Asset Capacity & Performance	24
[	5.2	Condition & Profile	25
	5.2.	.1 Condition	26
	5.2. 5.2	.2 Current Condition Inspection Plan	27 27
[	53	Defect Management	
	5.3.	.1 Current Defect Management Plan	27
	5.3.	.2 Recommended Defect Management Plan	28
	5.4	Risk Management Plan	28
	5.5	Maintenance Plan	31
	5.5.	.2 Recommended Maintenance Plan	
ļ	5.6	Resource Plan	34
	5.6.	.1 Current Resource Plan	34
	5.0.	Panawal Plan	
;	5.7 5.7.	.1 Current Renewal Plan	
	5.7.	.2 Recommended Renewal Plan	38
6	Sys	stems	40
7	Fina	ancial Summary	41
	7.1	Useful Life and Valuation Methodology	41
	7.2	Financial Statements and Ratios	42
	7.2.	.1 Valuations & Depreciation	42
	7.3	Forecast Costs	45

GENERAL MEETING - 526	PAGE 4
17 March 2021	Supporting Information
ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSE	T MANAGEMENT PLAN - 61712125 (Cont.)

Flood Management Devices Portfolio Asset Management Plan

8	Improvement and Monitoring	47
9	Appendices	50
	Appendix A - List of FMD Assets	51
	Appendix B - MBRC Telemetry Rain & Water Level Gauge Location Maps	57
	Appendix C - FMD Asset Attributes	59
	Appendix D - FMD Test Point Inspection Details	61
	Appendix E - FMD Recommended Asset Defect Types	71
	Appendix F - FMD Overall Asset Type Replacement / Renewal Graphs	72
	Appendix G - FMD Projected Condition - Overall	74
	Appendix H - FMD Projected Condition by Asset Type	75
	Appendix I - Indicative 25-year NEW Capital Plan	80
	Appendix J – Indicative 25-year RENEWAL Capital Works Plan	85

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

### Flood Management Devices Portfolio Asset Management Plan

#### **Definitions for Abbreviations**

Term	Definition
ACR	Asset Consumption Ratio
AI	Action Item
ALERT	Automated Local Evaluation in Real Time
AM	Asset Management
AMP	Asset Management Plan
AMT	Asset Management Team within Infrastructure Planning
ASR	Asset Sustainability Ratio
ВоМ	Bureau of Meteorology
CSR	Customer Service Request
DMG	Disaster Management Group
DNRME	Department of Natural Resources, Mines and Energy
DTMR	Department of Transport & Main Roads
DWCP	Drainage Waterways and Coastal Planning
ECM	Engineering Construction and Maintenance or; Enterprise Content Management component of Technology One
ePID	Electronic Project Identification Document for Project Prioritisation / Approval
ERRTS	Event Reporting Radio Telemetry System
FMD	Flood Management Device(s)
FMDPAMP	Flood Management Device Portfolio Asset Management Plan
GIS	Geographical Information System
HS40	Model of commonly used measuring device manufactured by Hyquest Solutions
IPWEA	Institute of Public Works Engineering Australasia
LGIP	Local Government Infrastructure Plan
LTFF	Long Term Financial Forecast
MBRC	Moreton Bay Regional Council
PAMP	Portfolio Asset Management Plan
RUL	Remaining Useful Life
SAM	Strategic Asset Management System
SAMP	Strategic Asset Management Plan
SIP	Strategic Infrastructure Planning
TARDIS	Torrent and Rainfall Distribution Information System
TLOS	Technical Levels of Service
TOMAS	MBRC's Asset Management System (based on Technology One platform)
TRV	Total Replacement Value

Flood Management Devices Portfolio Asset Management Plan

# **Executive Summary**

The Flood Management Devices Portfolio Asset Management Plan (FMDPAMP) outlines Moreton Bay Regional Council's (MBRC's) approach to the management of the Flood Management Device (FMD) assets located throughout the MBRC region.

This plan covers FMD assets that provide both internal and external flood related services. FMD's are typically located where raised water levels may impact multiple residential properties, or in locations where raised water levels may impact transport routes. FMD assets include flood monitoring, flood warning and flood information devices. These assets are specifically relied on for the provision of public warning messages and collectively provide information on what is occurring within the region in a flood event. This includes telemetry rain gauge service broadcasts to public portals and the BoM website.

Their function supports the MBRC Local Disaster Management Plan (flood response) and the MBRC Floodplain Risk Management Framework and Water Strategy 2012-2031.

Figures 1-3 are examples of the three primary device types within the FMD portfolio.







Figure 1 - Flood Monitoring Stations

Table 0.1 - Device Types

Figure 2 - Flood Warning Devices

Figure 3 - Flood Information Signage

FMD assets have a useful life of 15 - 20 years and collectively have an estimated total replacement value of \$3.18M. The table below summarises MBRC's FMD assets.

Device Type Asset Type Description			Expected Useful Life (Years)	Current Average Age (Years)	Current Replacement Cost					
	Telemetry Gauge	98	15-20	10.0	\$2,391,174					
	Seepage Monitoring Devices	1	20	14.3	\$11,956					
Flood Monitoring	Flooded Road Sensor	4	15	3.5	\$40,000					
	Flooded Road Warning System	10	15	1.4	\$259,700					
Elood Information	Environ Base Station	2	20	N/A	\$200,000					
	Maximum Height Gauge	10	20	2.1	\$220,000					
Flood Warning Road Closure Identification Indicators		163	15	N/A	\$61,000					
TOTAL		288			\$3,183,830					

Figure 4 shows the age profile for MBRC's FMD assets, which indicates the number of assets and their total current replacement cost within each age band. As age reflects the year in which the assets were built, the profile also indicates the pattern in which they were acquired over time. There is a high proportion of assets at or beyond the 10 to 15 year age band. This is of interest due to the useful lives for most FMD assets being within the range of 15 to 20 years.

#### **GENERAL MEETING - 526** 17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

#### Flood Management Devices Portfolio Asset Management Plan

It should also be recognised that telemetry gauges installed since 2011 use highly sophisticated and advanced HS40 measuring gauges that have an expected component life of 5 to 10 years. Many of the HS40 gauges will start reach the end of their expected life within the next 2 to 3 years.



Figure 4 - Age profile for Flood Management Devices



Figure 5 provides an extrapolation of the condition profile for the FMD assets. The condition profile has been largely extrapolated based on the age of the assets.

The current levels of funding are:

- \$46,000 per annum for planned maintenance.
- A biennial budget of circa \$250,000 for renewals/new/upgrade of assets

A lifecycle assessment was carried out to determine the future cost requirements for the FMD asset portfolio. The lifecycle analysis presented a strong case for increasing the annual maintenance expenditure and capital renewal/replacement funding for FMD assets in the medium to long term. Figures 6 summarises the results from the lifecycle modelling for the level of capital expenditure projected to be required over the next 50 years.

The long-term average funding required for renewal and replacement of FMD assets is \$206K per annum which is higher than the current funding provided.



Figure 6 -Projected 50-year lifecycle replacement costs for FMD's, before cashflow smoothing

Rainfall and river telemetry gauges will need the most funding over the next 10 years. These components make up around 80% of the portfolio's total replacement value and almost all FMD assets that have a current age of 15 years or more.

To sustain the existing FMD asset portfolio, and provide the expected community and technical levels of service described in this asset management plan, <u>the recommended budget</u> <u>allocations are outlined below</u>:

- Increase the current budgets for planned and reactive maintenance from \$46,000 to \$113,550 per annum from FY2022 onwards to address the current maintenance shortfall, allow additional inspection of assets and to allow for replacement of aging HS40 telemetry gauges.
- Minor increase to the budget for asset renewals/new/upgrade from its biennial budget of \$250k to an average annual spend of \$135K from FY2024 onwards and further increase to an average annual spend of \$227.5K from FY2030 onwards

Figure 7, Table 0.2 and Table 0.3 summarise the recommended budget requirements for the next 25 years including proposed new acquisitions.



Figure 7	7 -	Recommende	ed tota	al annua	operational	and	capital	budgets	compared	to	current	bud	gei
----------	-----	------------	---------	----------	-------------	-----	---------	---------	----------	----	---------	-----	-----

T 1 1 0 0 D 1 1 1		
Table 0.2 Recommended annual	operational and capit	al budgets: EY2022-EY2033
	oporational and oupit	a. Saagete,

Cost Type	Estimated Annual Cost, \$000's											
	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033
Operations and Maintenance	114	114	114	114	114	114	114	114	114	114	114	114
Extensions/New Assets/Upgrades	0	180	0	160	0	160	0	160	0	160	0	160
Capital Renewal/ Replacement	0	35	215	55	215	55	215	55	308	148	308	148
TOTAL	114	329	329	329	329	329	329	329	421	421	421	421

### Flood Management Devices Portfolio Asset Management Plan

						-						
Cost Type	Estimated Annual Cost, \$000's											
	FY2034	FY2035	FY2036	FY2037	FY2038	FY2039	FY2040	FY2041	FY2042	FY2043	FY2044	FY2045
Operations and Maintenance	114	114	114	114	114	114	114	114	114	114	114	114
Extensions/New Assets/Upgrades	0	160	0	160	0	160	0	160	0	160	0	160
Capital Renewal/ Replacement	308	148	308	148	308	148	308	148	308	148	308	148
TOTAL	421	421	421	421	421	421	421	421	421	421	421	421

As part of the justification for the increased maintenance spending and adjustments to the capital spend, an analysis was carried out to determine the future condition of the FMD asset portfolio with the recommended budget and if the currently adopted budgets were continued.

Figure 8 illustrates that with the currently adopted funding schedule the condition of the assets will decline to a point in time at around the year 2040 when the portfolio as a whole will fail to meet the required standard.

With the recommended funding the overall portfolio is expected to continue to meet service levels and strategic objectives well into the future.



Figure 8 - Projected condition of MBRC's FMD assets over 50 years

Figure 9 below illustrates that there are already some assets in Condition 5 and with the current funding level the extent of very poor assets will rapidly increase due insufficient investment in the replacement of poor condition assets.

#### GENERAL MEETING - 526 17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)



### Flood Management Devices Portfolio Asset Management Plan

Figure 9 - Heatmaps for projected condition with current funding



Figure 10 - Heatmaps for projected condition with recommended funding

The sustaining principles behind the recommended budgets are also illustrated through the following financial sustainability indicators:

- Asset sustainability ratio
- Asset consumption ratio

Figure 11 shows the asset sustainability ratio which measures renewal and replacement capital expenditure against depreciation of the asset. The intent is for capital investment to offset depreciation to maintain the value of the portfolio, and inherently demonstrate maintaining the portfolio itself. While not particularly relevant for new asset portfolios whereby minimal capital expenditure is required early in the life of the asset, it demonstrates that the recommended funding will rapidly lead towards achieving long term sustainability.



Figure 11 - Projected sustainability ratio based on current and recommended funding scenarios.

The Asset Consumption Ratio is the net (depreciated) value of the infrastructure assets divided by their gross current replacement cost as illustrated in Figure 12. Council's desired range is an ACR value of between 40% to 80%.

GENERAL MEETING - 526 17 March 2021

PAGE 11 Supporting Information

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Flood Management Devices Portfolio Asset Management Plan



Figure 12 - Projected asset consumption ratio based on current and recommended funding scenarios

The asset consumption ratio seeks to demonstrate that the asset portfolio is being maintained within a sustainable and economic range. With the currently adopted funding the asset portfolio would deteriorate to an unacceptable level beyond 2025, whereas the recommended funding would maintain the portfolio within the target range well into the future.

### Key Issues

- Many FMD assets are expected to reach the end of their expected life within the next 10 years.
- Water Telemetry Gauges installed since 2011 contain HS40 components which are required to be replaced within 5 to 10 years, placing further pressure on existing maintenance budget allocations.
- If budget allocations are not adjusted, there is an increased risk that the FMDs will not function as intended. This may result in substandard services being provided by the assets, ongoing customer complaints through the inability and/or failure to meet community expectations for timely flood warnings or major flood events, and inability and/or failure for MBRC to adequately plan for future or major flood events potentially leading to legal and regulatory liability and therefore impact on Council's reputation.

As per Council's strategic asset management framework, it is imperative that Council adopts a proactive approach to managing FMD assets including planned preventative and routine maintenance.

The recommended funding adjustments, both for capital renewal/replacement and routine and planned maintenance, will allow Council to achieve its strategic asset management objectives including:

- Organisational commitment to effective asset management
- Managing risk appropriately
- Delivery of services to agreed standards
- Optimise asset performance
- Minimise asset failure through earlier intervention

Regular condition inspections will be undertaken to continuously monitor the condition and performance of the assets and the budget estimates will be reviewed accordingly. Once further engineering inspections are performed, any major revisions to the renewal and maintenance budget for FMD assets will be presented to Council for further consideration.

#### Flood Management Devices Portfolio Asset Management Plan

# 1 Purpose

The purpose of the Flood Management Devices Portfolio Asset Management Plan (FMDPAMP) is to outline MBRC's approach to the management of (FMD) Flood Management Devices. In accordance with MBRC's Infrastructure Asset Management Policy<sup>1</sup> and Strategic Asset Management Plan, the FMDPAMP serves to:

- Demonstrate organisational commitment to responsible, effective, and sustainable management of the assets.
- Demonstrate informed decision making and management of risk.
- Communicate and justify funding requirements.
- Ensure compliance with regulatory requirements.
- Demonstrate continuous review and improvement of asset management processes, systems, data, and technology.
- Provide a high level of assurance to executive management, councillors and the community regarding MBRC's asset management systems, processes, practices, and outcomes.

This FMDPAMP will be reviewed and updated on a biennial basis. MBRC's approach to asset management has been aligned to the ISO 55000 series of standards for infrastructure asset management, as outlined in Council's Strategic Asset Management Plan (SAMP).

The FMD asset types included in this portfolio are listed below,

- Automated Telemetry Gauges
- Automated Flooded Road Sensors
- Automated Flooded Road Warning Systems
- Automated Base Station
- Automated Seepage Monitoring Devices
- Manual Maximum Height Gauges
- Static Road Closure Identification Indicators

# 2 Asset Information

This FMDPAMP outlines MBRC's approach to the management of FMD assets located throughout the MBRC region.

The range of FMD assets are diverse and specialised, ranging from automated telemetry units to manually operated gauges and transport road closure indicators.

# 2.1 Asset Types & Hierarchy

The Drainage, Waterways and Coastal Planning (DWCP) Manager is the nominated asset owner for FMD assets.

<sup>&</sup>lt;sup>1</sup> Policy No.: 2150-043

#### Flood Management Devices Portfolio Asset Management Plan

The asset owner is responsible for making strategic decisions in the key stages of asset management during the asset life cycle in relation to:

- Design
- Procurement (new assets)
- Operation
- Maintenance (including inspections and condition assessment)
- Renewal/Replacement
- Upgrades
- Decommission or disposal

Whilst the DWCP team is the FMD's asset owner, the Disaster Management Group (DMG) also forms an integral part of ensuring that the community are notified, informed and potentially evacuated during major flood events. FMDs provide a critical role in providing flood data and warning information to DMG. MBRC and Bureau of Meteorology (BoM) also have joint maintenance contract agreements for planned maintenance and reactive maintenance procedures to support and maintain these critical assets.

Table 2.1 below provides a breakdown of "Asset Categories" for the FMD portfolio. FMD assets are not currently componentised within the asset registers and as a future improvement further consideration needs to be given to the benefits that might be achieved through componentisation.

Asset Classification Type	Asset Hierarchy Level	Asset Function
Plant and Equipment	Asset Class-Level1	<ul> <li>Support rainfall/flood event disaster response within the region and inform actions to internal Disaster Management</li> </ul>
Flood Management	Asset Group-Level2	Group to lessen undesirable flood impacts.
→ Alert Gauges	Asset Type-Level 3	<ul> <li>Provide quality data and timely flood warnings to both internal and external customers.</li> </ul>
Transport	Asset Class-Level 1	<ul> <li>Support community rainfall/flood event warnings for roads within the region.</li> </ul>
Roads	Asset Group-Level 2	
Signage	Asset Type-Level 3 (FMDs are identified by the sign legend or type)	

Table 2.1 - Asset Types & Hierarchy

Depending on type, FMD's either have an automated functionality or they are manual or static devices. There are differences in the asset life cycle management process for the automated devices compared to the manual or static devices. FMD's owned by MBRC are presented below in Table 2.2.

#### Table 2.2 - FMD Types

Asset Classification Type	Device Type	Asset Type Description	Operation	Qty	Expected Useful Life (Years)	Current Average Age (Years)	Current Replacement Cost
Plant &		Telemetry Gauge	Auto	98	15-20	10.0	\$2,391,174
Equipment/ Flood Management	Flood Monitoring	Seepage Monitoring Devices	Auto	1	20	14.3	\$11,956

Asset Classification Type	Device Type	Asset Type Description	Operation	Qty	Expected Useful Life (Years)	Current Average Age (Years)	Current Replacement Cost
Devices/ Alert Gauges		Flooded Road Sensor	Auto	4	15	3.5	\$40,000
		Flooded Road Warning System	Auto	10	15	1.4	\$259,700
	Flood Information	Enviromon Base Station	Auto	2	20	N/A	\$200,000
		Maximum Height Gauge	Manual	10	20	2.1	\$220,000
				125			
Transport/ Roads/ Signage	Flood Warning	Road Closure Identification Indicators	Static	163	15	N/A	\$61,000
				163			
Total 288			288			\$3,183,830	

### Flood Management Devices Portfolio Asset Management Plan

Whilst there are 98 telemetry gauges represented in the table above, there are a further 55 telemetry gauges listed in the asset register that are not owned by MBRC but are part of and provide data to MBRC's flood management monitoring and warning systems.

The FMD assets owned, operated and maintained by other authorities are listed for information purposes only. A full list of FMD assets, separated into MBRC owned and non-MBRC owned assets is provided in Appendix A. The lifecycle cost projections and other information presented in this FMDPAMP only include MBRC owned assets.

### **Telemetry Gauges**

Council monitors potential flood events using a network of rainfall and water level gauges. The primary gauges utilised for this purpose are telemetry gauges designed and installed to BoM standards. These telemetry gauges include ALERT gauges and telemetry monitoring gauges. ALERT gauges provide information using the ALERT (Automated Local Evaluation in Real Time) radio telemetry system. Telemetry gauges provide information using the mobile phone network.

There are 153 telemetry gauges throughout the MBRC region (95 rain, 49 river water level gauges). The locality maps are included in Appendix B. Table 2.3 summarises ownership of telemetry gauges within the MBRC area.

Gauge Owner	Rain	River	Total Count
Moreton Bay Regional Council	61	37	98
Brisbane City Council	8	2	12
Sunshine Coast Council	6	3	9
Seqwater	20	10	30
Transport and Main Roads	2	0	2
Total	97	56	153

#### Table 2.3 - FMD Owners

#### GENERAL MEETING - 526 17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

### Flood Management Devices Portfolio Asset Management Plan

The following figures illustrate typical automatic telemetry gauges owned by MBRC.



*Figure 13* - Telemetry Gauge (Rainfall and River)



Figure 14 - Telemetry Gauge (Rainfall)

### **Base Stations**

Base stations are located at MBRC's Caboolture and Strathpine Offices. These base stations independently capture, filter and translate data from the telemetry gauges. The base stations cross populate telemetry gauge data to provide full data capture coverage across the whole region. The ALERT repeaters at Round Mountain Reservoir (MBRC owned) and Mount Glorious (Seqwater owned) are required to receive all data at these base stations. The BoM also directly capture data and the multiple points of capture provides some redundancy for receiving critical data during flood events.

The base station converts the radio signal to a digital signal that can be input into a range of digital devices including, computers, terminal servers and routers. The base stations run Enviromon software and further information on the software systems used to support operation of the FMDs is provided in Section 6.

### Flooded Road Sensor

These are secondary gauges which communicate the status of water level with respect to predetermined levels critical to flooding of roads (typically water approaching road, water at road, water over road). Messages are automatically issued in real time as the water level rises above pre-set thresholds and again when the water level falls below thresholds to enable Council officers to remotely monitor whether roads are likely to be flooded. The Flooded Road Sensors communicate data into Council's FloodMon System for viewing and analysis. Figure 15 and Figure 16 show examples of flooded road sensors.

GENERAL MEETING - 526 17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

### Flood Management Devices Portfolio Asset Management Plan



Figure 15 - Flooded Road Sensor



Figure 16 - Flooded Road Sensor

#### Flooded Road Warning System

These are automatically activated devices including automated bright flashing LED signs, automated boom gates and flashing lights. These systems may be triggered by a telemetry gauge or flooded road sensor. Figure 17 and Figure 18 shows examples of flooded road warning systems.



Figure 17 - Flooded Road Warning System (Automated Bright Flashing LED Signs)

Flood Management Devices Portfolio Asset Management Plan



Figure 18 - Flooded Road Warning System (Automated Bright Flashing LED Signs)

### **Maximum Height Gauges**

Maximum height gauges are used to measure the highest flood level at the location of the gauge. These gauges are manually checked and emptied post event and are used to confirm recorded levels to assist in post flood investigations, gauge calibration and improving gauge relationships. Figure 19 shows an example of a maximum height gauge. The gauge is read by measuring the height of the highest full cup.



Figure 19 - Maximum Height Gauge

### **Road Closure Identification Indicators**

Road Closure Identification indicators are posts showing Council's Road Closure ID for the location. These are installed to clarify the location of usual flooded road closure locations. The ID correlates to the GIS information for recording and public display of road condition information on Council's community website.



Figure 20 - Road Closure ID Indicator

### Seepage Monitoring Device

There is currently one seepage monitoring device. The seepage monitor is located in a pit at the base of the Halpine Lake embankment. The seepage monitor will broadcast an alarm using SMS when it detects significant water in the base of the pit, which is a possible indicator of excess seepage through the embankment. Figure 21 shows photos of the seepage pit.



Figure 21 - Halpine Lake Seepage Pit and Monitoring Unit

Flood Management Devices Portfolio Asset Management Plan

Action Items:	
AI-FMD1	Undertake an assessment of the current asset classifications and determine if there is benefit to further componentisation of FMD assets.
AI-FMD2	Identify and rationalise FMD asset placement within existing asset classification structures.

# 2.2 Asset Prioritisation

The type of FMDs installed is determined such that it is fit for purpose for location and identified risk. The devices are classified into a priority/importance hierarchy based on an assessment of consequences of failure to perform in a flood event. The relative importance of devices is summarised in Table 2.4.

Table 2.4 -	FMD Prioritisation	
1 01010 211		

Asset Type/Criteria	Priority	
Telemetry Gauges		
In locations where water level rises may impact multiple properties and are		
specifically relied on for the provision of public warning messages (Moreton	(Critical)	
Alerts).	(Critical)	
Telemetry Gauges with ALERT Repeaters		
Enviromon Base Stations		
Telemetry Gauges		
Telemetry gauges which collectively provide information of what is occurring		
within the region in a flood event including telemetry rain gauges.		
Telemetry Gauges	(Very High)	
Which provide back up for critical telemetry gauges.		
Telemetry Gauges		
In locations where water level rises may impact a major road.		
Seepage Monitoring Device		
Telemetry Gauges		
In locations where water level rises may impact a minor road.	(Lliab)	
Flooded Road Sensors	(rigi)	
Flooded Road Warning Systems		
Maximum Height Gauges	(Medium/Lew)	
Road Closure Identification Indicators	(weatum/Low)	

Action Items:

AI-FMD3 Investigate the use of asset risk and health inputs associated to individual assets within MBRC's corporate asset register (TOMAS), including the prioritisation of capital and maintenance works for FMD assets using asset risk and health inputs for; criticality, function, capacity and risk ratings.

# 2.3 Asset Relationships

The asset relationships can be formed between physical assets (and/or their asset components) or associated to a site within the corporate asset register (TOMAS). This will help form a diagrammatic view of the individual FMD site assets and their physical asset make-up.

FMDs generally incorporate several related 'child component' assets to that collectively operate and make-up a single 'device' at each site/location.

The configuration of asset relationships will improve the financial and operational management of FMD's.

Further asset componentisation and associated asset relationship links will be addressed as part of the improvement plan.

Action	Items:

AI-FMD4	Develop asset relationships that link "parent" and "child" asset components that
	make-up a FMD asset within TOMAS.

# 2.4 Asset Attributes

Asset attributes provide unique information regarding the characteristics, type and status of an FMD asset. Asset attribute details are listed for FMD's in Appendix C.

The current state and/or use of asset attributes to adequately identify FMD assets types has led to difficulties, both operationally and financially. Review and improvement of the FMD asset attributes is required to support their ongoing operation and management.

Action Items:

AI-FMD5	Review existing FMD asset attributes to reflect the proposed asset classification re-structure and asset componentisation updates in TOMAS.
AI-FMD6	Capture missing asset attributes on all FMD assets in TOMAS
AI-FMD7	Review and update the FMD asset attribute identification fields to enable them to be more easily queried within TOMAS and to assist with identifying the type of FMD asset.

# 3 Levels of Service

The following subsections summarise the community and technical levels of services for the FMD asset portfolio, including current and expected long term performance.

Appendix B for Council's Strategic Asset Management Plan provides definitions for Council's corporate visions, strategic priorities and associated service levels.

Customer Service Request (CSR) data is used to help assist in planning upgrades and improvements to the services provided by FMD assets. There is opportunity for further analysis of CSR data and this is proposed for completion prior to the next iteration of the FMDPAMP.

# 3.1 Community Levels of Service

Service attribute	Service objective	Performance measure process	Current performance	Expected performance in 10 years (LTFF)
Quality	FMD's provide quality and timely data for both internal and external customers fit for timely flood warning to both internal and external customers.	Number of warning messages which failed to be issued as a result of gauge failure when in demand and number of defects resolved within adopted timeframes (KPI's).	There are no current customer performance measures in place other than customer request lodgement and notification of externally facing portals/ websites being off-line. Internal feedback is provided through defect reporting.	Equipment is routinely inspected and maintained, and the current quality of service is expected to continue. There is the possibility that the quality of services could improve as technology and equipment reliability improves with time.

Table 3.1 - Community Levels of Service

Flood Management Devices Portfolio Asset Management Plan

Service attribute	Service objective	Performance measure process	Current performance	Expected performance in 10 years (LTFF)
Function	Ability to support rainfall/flood event disaster response within the region and inform actions to internal disaster management to lessen undesirable flood impacts such as loss of life.	Number of devices that failed to operate when triggered during rainfall/flood events.	Most devices/ assets are functioning as expected.	There may be some impact on the function and operation of FMDs as a result of aging equipment. The current inspection and maintenance regime, in conjunction with the recommended renewals funding allows for timely replacement of aging equipment to minimise impact on services.
Capacity/ Utilisation	Ability to provide a timely and accurate data feed available to public on BoM website/portal for all areas subject to Flood events.	Adequate number of devices available to present data on BoM website with respect to flood areas and expanding urban growth pattern.	Detailed assessment of flood hazard maps and review of customer service requests in conjunction with consultation with Disaster Management and Operations.	The FMDPAMP makes provision for future services needs as well as replacement of aged equipment to modern equivalent standards

Action Items:

AI-FMD8	Undertake further analysis of current and historical service requests relating to FMDs, including requests for additional services and flooding complaints.
AI-FMD9	Consult with Councillors to determine flood prone areas and flooding risks within their Divisions which may be suitable sites for new or upgraded FMDs.

# 3.2 Technical Levels of Service

Service attribute	Service objective	Activity measure process	Current performance	Recommended optimum position	Agreed sustainable position
Condition Assessments	Condition assessments/ inspections and associated asset register data updates to accurately plan effective maintenance strategies to meet service requirements.	Frequency - annual inspection.	All conditions inspections are completed annually in accordance with agreed schedules.	All conditions inspections are completed annually in accordance with agreed schedules. Additional detailed inspection carried out annually.	All conditions inspections are completed annually in accordance with agreed schedules. Additional detailed inspection carried out annually.

#### Table 3.2 - Technical Levels of Service

### Flood Management Devices Portfolio Asset Management Plan

Service attribute	Service objective	Activity measure process	Current performance	Recommended optimum position	Agreed sustainable position
Safety	WHS Training	Annual number of incidents.	No current schedule for this activity.	\$14.4K pa FMD WHS training completed annually	\$14.4K pa FMD WHS training completed annually
				No WHS incidents as a result of inadequate training.	No WHS incidents as a result of inadequate training.
				A budget allocation of \$5.0K.	A budget allocation of \$5.0K.
Routine maintenance	Development and undertaking of Routine Maintenance/I nspection Schedules and Asset Assessments, to ensure Optimised Asset Operation and Service provision.	Frequency - 6 monthly and 12monthly Scheduled Routine Maintenance Programmed . Work executed as part of Automated via Corporate AMS.	The maintenance activities are programmed within the current Planned Budget. The current \$46.0K annual allocation allows for this activity based off historic expenditure, except there is a routine shortfall of approx. \$4.0K pa.	The maintenance activities as recommended to occur over the 10-year existing budget allocation, plus and additional allocation for HS40 component replacement. \$75.0K pa	The maintenance activities as recommended to occur over the 10-year existing budget allocation, plus and additional allocation for HS40 component replacement. \$75.0K pa
	Annual Agency Driven Inspection & Maintenance program to maintain assets in optimal Operational condition.	Maintenance Contract - BoM (Third- Party Agency).	Limited by existing Budget restraints. Agency contract allocation NOT currently identified/provisi oned separately or claimed by Agency.	Maintenance activities recommended in Asset Management Plan/Lifecycle Forecast at \$16.0K pa.	Maintenance activities recommended in Asset Management Plan/Lifecycle Forecast at \$16.0K pa.
	Reactive Works to Repair assets to ensure assets are returned to Operation & perform to minimum	Number of Defects and Reactive/Cor rective Works Requests. FloodMon Dasboard Faulty Rain & Water	Limited by existing Budget restraints and therefore currently absorbed within annual Maintenance Budget/Plan.	\$4.0K pa. included in Lifecycle Forecast as part of additional proposed funds in existing Maintenance Allocation.	\$4.0K pa. included in Lifecycle Forecast as part of additional proposed funds in existing Maintenance Allocation.

Flood Management Devices Portfolio Asset Management Plan

Service attribute	Service objective	Activity measure process	Current performance	Recommended optimum position	Agreed sustainable position
	Service Level Requirements.	Level Gauges			
Capital Programming – New and Upgrades	New FMD's are installed to meet existing and future demand. Existing FMD's are upgraded to meet changes in BoM standards, technology, innovation and improvements	Number of upgrades and new FMDs installed in accordance with scheduled timeframes	All upgrades and new FMDs installed in accordance with scheduled timeframes Biennial allocation of \$160K from FY2021	All upgrades and new FMDs installed in accordance with scheduled timeframes Biennial allocation of \$160K from FY2021, except \$180K in FY2023	All upgrades and new FMDs installed in accordance with scheduled timeframes Biennial allocation of \$160K from FY2021, except \$180K in FY2023
(Replacements) Capital Programming	FMD's are upgraded to meet changes in BoM standards, technology, innovation and improvements	Capital Renewals - % of assets in poor/very poor condition OR reaching end of useful life.	Biennial Renewal activities are programmed within the current planned budget. Average biennial budget of circa \$89K	All planned renewals are to be completed within their scheduled year. Average annual renewal spend of \$135.0K increasing to \$227.5K pa from FY2030 onwards.	All planned renewal are to be completed within their scheduled year. Average annual renewal spend of \$135.0K increasing to \$227.5K pa from FY2030 onwards.

Action Items:

AI-FMD10	Design, implement and configure FMD's for use within Strategic Asset Management (SAM) ie. unit rates, primary dimensions, model categories, automating the prioritisation of FMD assets in TOMAS etc
AI-FMD11	Review flood mapping height projections for planning future development plans and to build contingency in for potentially affected FMD assets and urban population growth areas.

# 4 Future Demand

Moreton Bay Region is one of Australia's fastest growing regions. Its regional population is forecast to grow by a further 50% to approximately  $690,000^2$  by 2041. That means an additional 240,000 residents over the next 25 years. In accordance with the State Government's South

<sup>&</sup>lt;sup>2</sup> Medium growth series

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

#### Flood Management Devices Portfolio Asset Management Plan

East Queensland Regional Plan 2017, Moreton Bay Region is also expected to deliver an additional 88,300 dwellings by this time.



Figure 22 - Moreton Bay Region projected population growth. Source: Queensland Government

Growth management is identified as a key issue in Council's Corporate Plan and well-planned growth is emphasised in the Community Plan.

Future FMD infrastructure will be progressively delivered to service future demand within the region as determined through flood analysis, consultation with stakeholders including Disaster Management and Operations, and customer service request. Key projects currently identified through detailed assessment include:

- Flood warning systems in Deception Bay (Old Bay Rd and Blue Pacific Rd)
- Everton Hills flood monitoring station (Camelia Ave)
- Moodlu flooded road warning system (Williams Rd)
- Rocksberg flooded road warning system (Old North Rd)
- Woodford flooded road warning system (Neurum Rd)

The full list of new ePID Capital Program Projects and associated costs are provided in Appendix I.

# 5 Asset Lifecycle Management

# 5.1 Asset Capacity & Performance

The flood management device network must be effectively managed to ensure a satisfactory service standard is maintained over the entire life of the assets.

The performance of the FMD's is to achieve adequate coverage of flooding issues across the region and support flood event/disaster response and timely actions (agency and community) to lessen undesirable flood impacts such as loss of property and life. In addition to geographic coverage/reach, system redundancy is critical to this performance.

Telemetry gauges, flooded road sensors, flooded road warning systems and Enviromon base stations are automated systems and a key performance indicator is the rain and water level data received in near real time into Council's flood gauge data management system (TARDIS/FLOODMON) as well as service testing included in planned maintenance activities.

Critical devices are installed to BoM standards and comply with the performance requirements described in the draft Flood Warning Infrastructure Standard.

Supplementary systems including flooded road sensors and systems are an emerging practice and the industry is rapidly developing new systems and utilising new technologies to develop cost effective, fit for purpose installations. The performance measure for these devices is data and automatic activation of the warning mechanism (e.g. boom gate closure or illumination of flashing signs or lights).

FMD's of high criticality are operational support devices, are manual or static and are designed in accordance with industry standards.

Asset capacity & performance is not currently captured for Flood Management Devices for use in Council's Strategic Asset Management System (SAM). Development and implementation of a performance monitoring data for FMD assets is recommended and should incorporate quantitative performance indicators based on industry research and smart city dashboards. Where possible, any proven innovative technology that could assist with the provision of this service should be trialled and if successful implemented.

Action Items:

AI-FMD12	Research asset performance measurement practices appropriate to MBRC's FMDs and implement a process for capturing and recording performance data for use in Council's Strategic Asset Management System (SAM).
AI-FMD13	Assess opportunities for use of smart city dashboards and innovative technology to assist with provision of FMD services.

# 5.2 Condition & Profile

Moreton Bay Regional Council's approach to assessing the condition of its FMD assets aligns to the 1 to 5 grading scale used for other asset classes and is described in the summary table below.

Condition Score	Subjective rating	Notional Remaining Useful Life*	Description
1	<b>Very Good</b> ('as new')	90% - 100%	Free of defects with little or no deterioration evident. Only planned maintenance required.
2	Good	56% - 90%	Free of defects affecting structural performance, integrity and durability. Deterioration of a minor nature and only minor maintenance required plus planned maintenance.
3	Fair	25% - 56%	Moderate to significant deterioration. Developed defects are present but do not affect short term / medium term structural integrity. Moderate loss of hydraulic capacity. Moderate maintenance required.
4	Poor	6% - 25%	Significant deterioration and defects. Moderate maintenance is required. Rehabilitate / renew in the short term and flag for future part / full replacement. This may include moderate loss of hydraulic capacity.
5	Very Poor	0% - 6%	Failed or failure imminent. The asset is unserviceable and may be hazardous. Major work / replacement required

Table 5.1 -Condition rating scale summary

\* Remaining life is expressed as a percentage of the total expected useful life.

### 5.2.1 Condition

All telemetry gauges and automated alert and warning systems undergo a comprehensive inspection process at least annually. Any urgent maintenance or automatic alerts due to equipment failure are actioned immediately. The current maintenance regime is therefore inherently designed to continuously maintain the assets in good condition rather than simply monitor their condition.

Inspection and test point results are currently recorded in TOMAS. Further investigation is required into a methodology for translating data into a single condition score that can be used for asset management and renewal planning.

For the purpose this FMDPAMP, where a condition score was not available from the current asset register, the remaining and expected useful life of the asset has been used to estimate condition.

The condition calculations are based off the assumed upper and lower bounds for each condition rating. For example, our condition scores of 1, 2 and 3 assume a remaining useful life percentage of 90%, 70% and 50% respectively. Therefore, the upper bound for condition 2 is the average of the assumed remaining useful lives at condition 1 and 2. (90% + 70%) = 80% and the lower bound is the average of the assumed remaining useful lives at condition 2 and 3 (70% + 50%) = 60%. As a result, the assumption is that an asset with a calculated remaining useful life between 80% and 60% is at condition 2.

The condition profile from using the above approach is illustrated in Figure 23 below. It is indicated that 90% of FMD assets are in fair to very good condition. 10% of the assets, all telemetry gauges, are likely to be in poorer condition than the rest of the portfolio due to their age and are likely to required detailed assessment for replacement in the near future.



Figure 23 - FMD indicative condition profile (estimated based on age)

#### Action Items:

AI-FMD14 Re-design and conversion of the current inspection and test point data in line with proposed component structure within TOMAS to return a single condition score that can be used for renewals planning.

### 5.2.2 Current Condition Inspection Plan

Biannual condition inspection and testing is carried out by Council's external service provider, in attendance with a Council staff member to assess the condition of the FMD assets and confirm operation within required parameters.

Other issues that do not affect the integrity of the asset are identified and recorded in the Corporate asset register as "Defects", which are addressed and rectified according to the draft FMD's Defects Management Plan.

### 5.2.3 Recommended Condition Inspection Plan

Development and implementation of a condition inspection plan for FMD assets is recommended based on the condition inspection process outlined in Table 5.2. The condition inspection plan will ensure all missing condition data is captured for FMD assets. Further details for a proposed component-based condition assessment inspection are also provided in Appendix D.

Asset Type	Inspection type	Frequency	Resource
	Level 1 Inspection Visual inspection & defect identification/ monitoring.	Biannual Level 1 inspection (as part of Routine Maintenance)	Internal - DWCP
	Level 2 Inspection DWCP inspection & condition assessment.	Annual Level 2 inspection (as part of Routine Maintenance).	Internal - DWCP
FMD'S	Level 3 Inspection Detailed investigation by specialist consultant (BoM). Annual Agency Driven Inspection & Maintenance program to maintain assets in optimal Operational condition.	As required (generally triggered by observation of serious faults during a Level 2 Inspection)	Maintenance Contract - BoM (Third-Party Agency).

Table 5.2 - Recommended Condition Inspection Plan

# 5.3 Defect Management

### 5.3.1 Current Defect Management Plan

Defects are used to record issues that do not represent an immediate safety or operational risk to MBRC and are continually monitored through asset inspections. Defects for FMD assets are currently managed and prioritised according to risk. Currently recorded are defect types presented in Table 5.3.

Asset Type	Defect Type	Description	Number of Defect Types
FMD's	Device Defect	Flood Alert Gauges General Maintenance	1
	Mitigation Defect	Flood Alert Gauges Vegetation Control	1

Table 5.3 - Current Defect Types

### 5.3.2 Recommended Defect Management Plan

Currently there are only 2 defect types and a broader range of defect types is required to improve management capability for the FMD assets. Defects should be managed through a risk-based approach based on defect severity and asset priority. Defects that exceed a specified level of risk should be bundled into work packages and actioned through programmed maintenance in addition to routine maintenance activities.

Development and implementation of a defect management plan is recommended. The plan should incorporate the FMD asset defect types listed in Appendix E and document the risk-based approach and business processes for managing FMD asset defects. It is also recommended that development and improvement of the defect notification and lodgement process includes investigation into the utilisation of the FloodMon dashboard/system for fault detection and defect creation.

Action Items:

AI-FMD15	Develop a defect management plan documenting the risk-based approach, intervention levels & business processes for managing defects for all FMD assets including the rationalisation of existing defects in the system. Review & amend existing defect codes and work types for FMD assets to align with the defect management plan and asset strategy.
AI-FMD16	Investigation and implementation of FloodMon dashboard/system for fault detection and defect creation.

# 5.4 Risk Management Plan

Risks for MBRC assets are assessed using Council's Enterprise Risk Management (ERM) framework to identify and evaluate the risk. This includes assessment of the likelihood and consequence of the risk and process to eliminate or mitigate the risk. Table 5.3 summarises typical failure modes and impacts for critical FMD assets.

Critical Asset(s)	Failure Mode	Impact
Telemetry gauges	Comms/radio signal/telemetry system failure	Realtime alert notification failure and rainfall data transmission loss.
Flooded road sensors	Comms/sensor failure	Notification failure of critical flooding/rising water for roads and loss of data transfer.
Flooded road warning systems	Comms/radio signal/telemetry system and device operation failure	Automated warning lights and boom gate operation failure.
Enviromon base stations	Comms/radio signal/telemetry system failure	Primary data translation and transfer loss. (telemetry gauge dependency on base station operation)
Seepage monitoring devices	Pit /sensor obstruction	ALARM/SMS notification loss to alert council of excess seepage through embankments (early warning indicator).
Maximum height gauges	Gauge calibration or device operation fault (manual)	Loss of flood height data records.
Road closure identification indicators	Indicator identification loss or damage	Identification of Road Closure ID which correlated to council website, GIS and general public.

Table 5.3 -	FMD	Critical	Assets
-------------	-----	----------	--------

#### Flood Management Devices Portfolio Asset Management Plan

Key risks are summarised in Table 5.4 and these will be considered as part of an ongoing risk management process.

Table 5.4 - FMD Risk Management Plan

Risk Category and Type	Causation	Consequences	Existing Control Measures	Likelihood/ Consequen ce	Residual Risk Rating
Strategic – Regulatory and Legal	Lack of knowledge, technological advancement and changing regulatory changes	Failure to meet legislative requirements for disaster management and therefore potential exposure to legal action.	Continuous monitoring of changes in legislation and regulations and consultation with related bodies (eg BoM, DNRME). Implement continued development to meet best practice requirements for both disaster management and technological advancement.	Possible/ Moderate	Low
Strategic - External Political Reputation	Failure to enact best practice for maintenance, WHS, legislative and technological advances.	Failure to meet community expectations for timely flood warnings.	Continuous development to meet best practice for maintenance, WHS, legislative and technological advances.	Unlikely/ Moderate	Low
Strategic - External Regulatory and Legal	Failure to enact best practice for maintenance, WHS, legislative and technological advances.	Failure to meet legislative requirements for disaster management and therefore potential exposure to legal action.	Continuous development to meet best practice requirements for both disaster management practices and technological advances.	Unlikely/ Moderate	Low
Operational - Health & Safety	Lack of WHS Training	Risks associated with working at heights to maintain devices.	WHS training for internal staff to mitigate potential risks.	Possible/ Major	Low
Operational - Service Delivery Internal - Optimal Asset Operation & Flood Event Management	Insufficient asset operation and service	Data reporting inaccuracies/ low fidelity data impeding decision making in for DMG and ability to respond in an agile way to a disaster event (flash flooding).	Regular (12 monthly or more frequent) condition assessments.	Likely/ Major	Low

### Flood Management Devices Portfolio Asset Management Plan

Risk Category and Type	Causation	Consequences	Existing Control Measures	Likelihood/ Consequen ce	Residual Risk Rating
Strategic - Service Delivery Internal - Lack of Information	Lack of information in corporate system	Compromised decision- making and inability, to provide optimal services and asset operation.	Regular (12 monthly or more frequent) condition assessments and associated asset register data updates to accurately reflect component conditions and therefore support more accurate renewal planning to accurately plan effective/proactive maintenance strategies to adequately address future renewals and to ensure the delivery of required service levels.	Possible/ Major	Low
Strategic/ Operational - External Agency Reliance/ Responsibility	Reliance on external agency to fulfil contract requirements and ongoing maintenance partnership.	Third party reliance (BoM) - potential to withdrawal from providing maintenance services leading to significant increase in maintenance costs and asset performance issues.	Engagement with BoM and similar expert bodies to keep abreast of developing changes. Monitor contract performance and take appropriate actions if performance does not meet agreed standards.	Possible/ Moderate	Medium
Strategic - Public Safety (Flooding)	Climate change/develo pment environment changes	Inundation of critical assets from major flood events leading to service outage.	Continuous review of flood height projections and future development plans to build contingency plans for potentially affected assets.	Possible/ Moderate	Medium
Strategic/ Operational - Service Delivery	Asset deterioration due to age or lack of maintenance. Lack of renewals/ replacement forecasting information	FMD asset becomes unfit for purpose.	Continuous monitoring of inspection reports and condition data and updates to forecasts for renewal/ replacement of critical assets.	Possible/ Major	Low
Strategic - Service Delivery	Failure to apply a whole of life concept to provision of asset and services.	Compromised service performance / value for money.	Communication with stakeholders to continuously improve understanding of asset performance and use stakeholder inputs to optimise WOL costs and value for money outcomes	Possible/ Moderate	Medium

Flood Management Devices Portfolio Asset Management Plan

AI-FMD17	Implementation of continuous development program to meet best practice requirements for both disaster management practices and technological advances.
AI-FMD18	Review of revised flood height projections and future planning development plans to build contingency plans for potentially affected assets.

# 5.5 Maintenance Plan

Maintenance is performed under two categories for FMD assets;

- **Planned Maintenance** Maintenance that is planned to occur based on asset type and priority with the purpose of maintaining ongoing serviceability and extending service life. Planned maintenance involves both routine maintenance activities that are performed on regular schedules and programmed maintenance activities including the actioning of defects in a cost-effective and efficient manner.
- **Reactive Maintenance** Maintenance carried out to restore partial asset failures and is typically in response to customer service requests (CSR's).

### 5.5.1 Current Maintenance Plan

FMD asset maintenance has a heavy reliance on maintenance contract activities undertaken in conjunction with an external third party (BoM).

There are differences in the asset life cycle management process between that for the automated devices and that for the manual or static devices. In particular, no deterioration in the performance of the automated devices as indicated by rain and water level data and automated operation is acceptable. This is currently managed by planned (MBRC and BoM) maintenance and reactive maintenance procedures.

Issues with data are currently resolved through either identification at inspection or reactive maintenance activities. This includes routine systematic replacement of critical components during inspections, such as batteries before any deterioration in data is identified.

A proportion of maintenance for telemetry gauges is performed by the BoM. However, reactive maintenance is carried out in accordance with response levels of service detailed, and Council is responsible for the overall function and associated maintenance of Council owned FMD's.

Current maintenance operations for telemetry gauges and seepage monitoring device are described in the MBRC Flood Warning Stations Maintenance and Operations Manual. The Operations and Maintenance Manual should be updated/reviewed annually, and this is an action recommended as part of the FMDPAMP Improvement plan.

Telemetry gauges are inspected and subject to maintenance twice per year. Routine maintenance work has recently been scheduled in Council's corporate asset management system for automatic generation of work orders (WOs). Future review of scheduled maintenance and asset performance will enable an evaluation and continuous improvement of routine maintenance tasks.

Current maintenance activities and expenditure for FMD assets is summarised in Table 5.5.

Asset Type	Activities	Туре	Frequency	Annual Budget
Flood Gauges	Internal Maintenance	Planned (Routine)	6 Monthly	\$38k
_	Budget Allowance.	Reactive*	≈ 12 Monthly	\$Nil

Asset Type	Activities	Туре	Frequency	Annual Budget
Rainfall gauges only - Flood Gauges, Monitoring and Alert Devices.	BoM Annual Maintenance Contract - Inspections (Inspection with test points)			
Flood Gauges, Monitoring and Alert Devices. Annual BOM inspection without test points.	Contract - Inspections (Inspection with test points)	Planned (Routine)	≈ 12 Monthly	\$8k
Flood Warning Network	BoM servicing contract			
	includes ad hoc maintenance and repair services for the Flood Warning Network will be provided on a times and materials basis for items >\$3000 pa (ref Contract).	Reactive	Ad hoc	\$ Included in BoM Contract
Total (rounded)				

Flood Management Devices Portfolio Asset Management Plan

\* There is no budget allowance for reactive maintenance but annually around \$4K is needed to be sourced for this work

### 5.5.2 Recommended Maintenance Plan

The recommended maintenance plan sets out detailed maintenance requirements, procedures and scheduling frequency for performing tasks and activities for FMD assets. Maintenance planning is required to be consistent with BoM advice and any maintenance and operations manuals relevant to the installation.

As new devices utilising evolving technology are installed it is recommended that the requirement for a maintenance plan be explicitly included in the specification for procurement of any new flood management devices.

The MBRC Flood Warning Stations Maintenance and Operations Manual is to be updated. This document will provide the recommended maintenance plan for FMDs and document the following key maintenance requirements:

- Routine maintenance activities required for all FMD asset types including scheduled frequencies based on bureau of meteorology advice and any maintenance and operations manual relevant to installation.
- Programmed maintenance activities required for FMD assets including defect management procedures outlining;
  - Defect intervention levels and the process for identifying and bundling defects into programmed maintenance packages based upon risk
  - Process for escalating defects that can't be actioned through programmed maintenance for delivery through capital works programs.
  - Condition assessment criteria to component level.
- Roles and responsibilities for all maintenance activities performed for FMD assets
- Workload measurement techniques to determine adequacy levels of resources required to perform planned and reactive work. Reactive work should diminish with time as planned maintenance work increases and therefore, re-allocation of resources is essential.
- Audit processes/procedures for monitoring and reviewing contractor performance and quality of completed work.

#### Flood Management Devices Portfolio Asset Management Plan

The current operations and maintenance budget will need to be reviewed to achieve the "recommended" items as included in TLOS (Table 3.2). This includes additional condition inspections and a general increase to the maintenance budget determined through tracking actual costs from shortfalls in previous years. The following proposed measures are recommended to be linked to the activities and annual budgets covering;

- Operation the regular activities to provide services (e.g. opening hours, cleansing, mowing grass, energy, inspections, etc.
- Maintenance the activities necessary to retain an asset as near as practicable to an appropriate service condition. Maintenance activities enable an asset to provide service for its planned life (e.g. road patching, unsealed road grading, building and structure repairs)

Table 5.6 summarises the recommended maintenance activities, including extension to current activities and new activities that are not currently undertaken.

Asset Type	Activities	Type Freque		Annual Budget			
Operations:							
	FMD Specific WHS Training	Planned	12 Monthly	\$5K			
Flood Warning Network (Automatic Rain Gauges & River Level sites)	Internal condition assessments /inspections and associated asset register data updates to accurately plan effective maintenance strategies to meet service requirements.	Planned	12 Monthly	\$14.4k			
<b>Operations Sub Total</b>			Annual	\$19.5K			
Maintenance:							
Flood Gauges (FMD)	Internal maintenance budget allowance including condition assessments.	Planned (Routine)	6 Monthly	\$38k			
		Reactive	12 Monthly	\$4k			
Water Telemetry Gauges	Scheduled Maintenance - HS40 retirement swap-out and functional testing.	Planned	12 Monthly	\$25k			
<b>Rainfall gauges only</b> - Flood Gauges, Monitoring and Alert Devices.	BoM Annual Maintenance Contract - Inspections with test points						
<b>River gauges only</b> - Flood Gauges, Monitoring and Alert Devices. Annual BOM inspection without test points.	s only - s, - Inspections with test points and Alert ual BOM thout test		≈ 12 Monthly	\$8k			

#### Flood Management Devices Portfolio Asset Management Plan

Asset Type	Activities	Туре	Frequency	Annual Budget
Flood Warning Network (Automatic Rain Gauges & River Level sites)	(BoM) servicing contract includes ad hoc maintenance and repair services for the Flood Warning Network will be provided on a times and materials basis up to \$3000 pa.	Reactive	Ad hoc	\$ Included in Contract
Flood Warning Network (Automatic Rain Gauges & River Level sites)	5yr BoM Service Agreement - Contract Allowance 2017-2021 (Ref A14682528) Drainage Waterways & Costal Planning	Planned (Routine)	≈ 12 Monthly	\$16K
Maintenance Sub Total				
Operations & Maintenance Total Annual				

#### Action Items:

AI-FMD19	Review the regular (12 monthly) condition assessments and associated asset register data updates to determine if improvements could be made to more accurately reflect component conditions and therefore support more accurate renewal planning. Consider whether existing BoM Maintenance agreement could be extended to perform this function.
AI-FMD20	Generate schedules within TOMAS for recommended maintenance activities.
AI-FMD21	Create ePID and budget for planned FMD maintenance Activity inclusion.
AI-FMD22	Review and update the current operations & maintenance specifications for FMD's within the MBRC Flood Warning System Guide.

### 5.6 Resource Plan

Maintenance of FMD assets is currently performed by a mixture of internal Council staff and external contractors with roles and responsibilities falling across several Council departments. The current resource plan for FMD assets is outlined in Table 5.5.

### 5.6.1 Current Resource Plan

Table 5.5 - Existing Resource Plan

Activity	Telemetry Gauge & Enviromon Base Station	Flooded Road Sensor & Flooded Road Warning System	Maximum Height Gauges	Road Closure Identification Indicator	Seepage Monitoring Devices
Planned Maintenance (Routine & Programmed)	Internal - AM with assistance from BoM and specialist external contractors and support from DWCP	Internal - AM with assistance from external contractors and support from DWCP	Internal - AM/ DWCP	Internal - AM	Internal - AM

Flood Management Devices Portfolio Asset Management Plan

Activity	Telemetry Gauge & Enviromon Base Station	Flooded Road Sensor & Flooded Road Warning System	Maximum Height Gauges	Road Closure Identification Indicator	Seepage Monitoring Devices
Reviewing & Programming Defects	Internal - DWCP	Internal - DWCP	Internal - DWCP	Internal - AM	Internal - DWCP
Reactive Maintenance	Internal - AM with support from DWCP	Internal - AM with assistance from external contractors and support from DWCP	Internal - AM	Internal - AM	Internal - AM with support from DWCP
Reviewing Condition & Programming Renewals	Internal - Renewals Prog DWCP & AM	Internal - Renewals Prog DWCP & AM	Internal - Renewals Prog DWCP & AM	Internal - Renewals Prog DWCP & AM	Internal - Renewals Prog DWCP & AM

## 5.6.2 Recommended Resource Plan

It is recommended that most of the maintenance activities for FMD assets be performed by external contractors due to the need for specialist skills, plant & equipment. The recommended resource plan for maintenance of FMD assets is outlined in Table 5.6. Development and implementation of a process for external contractors to record maintenance activities and inspections electronically using TOMAS is recommended via e-Contractor.

Activity	Telemetry Gauge & Enviromon Base Station	Flooded Road Sensor & Flooded Road Warning System	Maximum Height Gauges	Road Closure Identification Indicator	Seepage Monitoring Devices
Planned Maintenance (Routine & Programmed)	Internal - AM with assistance from BoM and specialist external contractors and support from DWCP	Internal - AM with assistance from external contractors and support from DWCP	Internal - AM/ DWCP	Internal - AM	Internal - AM
Reviewing & Programming Defects	Internal - DWCP	Internal - DWCP	Internal - DWCP	Internal - AM	Internal - DWCP
Reactive Maintenance	Internal - AM with support from DWCP	Internal - AM with assistance from external contractors and support from DWCP	Internal - AM	Internal - AMT	Internal - AM with support from DWCP

Flood Management Devices Portfolio Asset Management Plan

Activity	Telemetry Gauge & Enviromon Base Station	Flooded Road Sensor & Flooded Road Warning System	Maximum Height Gauges	Road Closure Identification Indicator	Seepage Monitoring Devices
Reviewing Condition & Programming Renewals	Internal - DWCP & AM	Internal - DWCP & AM	Internal - DWCP & AM	Internal - DWCP & AM	Internal - DWCP & AM

Action Items:

/ totion items.	
AI-FMD23	Implement recommended resource plan for FMD assets identifying potential
	improvements to existing Council resources & necessary training requirements.

## 5.7 Renewal Plan

The purpose of developing a renewal plan is to identify assets that need to be replaced to maintain the current level of service and to avoid asset failure due to deterioration.

In preparing this asset management plan, a condition-based model was prepared to determine the base annual renewal costs associated with the FMD asset portfolio. The model developed for the FMDPAMP has a 50-year planning horizon to capture the full lifecycle of all assets. The results reported in this plan cover a 10, 25 or 50-year period as appropriate.

The deterioration curve used in the asset lifecycle model uses a parabolic deterioration scale and is based on the IPWEA asset deterioration profile as illustrated by Figure 27.

For example, assets in condition 1 (very good or 'as-new' condition) are expected to have a remaining useful life of 90-100% of their expected life. Assets in condition 2 (good condition) are expected to have a remaining useful life of 56-90% of their expected life. If a condition 2 asset has a 60-year life, its remaining life is estimated to be between 34 (56% x 60) and 54 (90% x 60) years.

For lifecycle modelling of MBRC's FMD assets the trigger for replacement was when the asset reached condition 5 (very poor





condition). This intervention level may be reviewed in future revisions of the asset management plan or, varied across different asset types to reflect the criticality and different levels of service provided by the assets.

An overview of the modelling process is provided by Figure 25 below. The model was used to project the future net value and condition of the asset portfolio for both the current funding level and recommended budget amount. Section 5.7.1 includes a comparison of the model outcomes for both the current and recommended budgets as a means of benchmarking the results and measuring the effectiveness of the recommended increased budgets. Appendix G and Appendix H demonstrate the predicted condition of the assets based on current and recommended renewal funding.
GENERAL MEETING - 526 17 March 2021

PAGE 37 Supporting Information

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)



Figure 25 - Flow chart for determining lifecycle capital costs and program

Flood Management Devices Portfolio Asset Management Plan

# 5.7.1 Current Renewal Plan

With the exception of the structural components, FMD assets are routinely renewed in order to maintain acceptable performance.

The MBRC renewals are based off existing biennial programs associated with existing funding arrangements. MBRC currently provides a circa \$250k budget allocation every 2 years for new/renewal/upgrade of FMD assets.

Modelling performed as part of this revision of the FMDPAMP has identified a need for increased renewal funding as a result of deterioration profiles and renewal triggers being met based on calculated condition and age.

## 5.7.2 Recommended Renewal Plan

Based upon the asset data currently on hand and the estimated replacement costs of these assets, the annual renewal allocation should be in the vicinity of \$88,000 per annum (on average) which forms part of the proposed budgetary allocation for FMDs of \$135,000 per annum. The increase is partly because aging of the asset portfolio and partly because only around half of the FMD's have been recorded in the financial register and included in renewal projections.

Figure 26 summarises the results from the lifecycle modelling and illustrates the estimated level of capital renewal expenditure projected to be required over the next 50 years.



Figure 26 -Projected 50-year lifecycle replacement costs for FMD's, before cashflow smoothing

Appendix J provides an indicative list of FMD asset renewals and replacements, identified through lifecycle modelling using the methodology described in the preceding sections and illustrated above.

The following chart illustrates that telemetry gauges will need the most funding over the next 10 years which is to be expected due to them representing around 80% of the asset value. These asset types typically have a shorter life than the other FMD assets.

#### GENERAL MEETING - 526 17 March 2021

PAGE 39 Supporting Information

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Flood Management Devices Portfolio Asset Management Plan



Figure 27 - 10 year estimated capital cost split by asset type

The lifecycle model identified a need to increase current capital renewal and replacement budgets if the current level of service provided by MBRC's FMD assets was to be maintained.

Figure 28 illustrates how the recommended capital budget (blue) is intended to meet the cumulative capital funding needs identified through the lifecycle modelling (orange) to help explain the need to increase funding over time. The lifecycle model outputs and recommended funding amounts have been used to develop the indicative capital works program.



Figure 28 - Capital renewal estimated lifecycle costs and recommended funding

If the above renewal plan is adopted, it will allow for a more sustainable funding model for FMD assets and a significant improvement in the future quality and condition of the assets. The

#### Flood Management Devices Portfolio Asset Management Plan

recommended renewal plan funding will allow Council to achieve its strategic asset management objectives including:

- Organisational commitment to effective asset management
- Managing risk appropriately by earlier intervention and renewal strategy
- Delivery of services to agreed standards
- Optimise asset performance
- Minimise asset failure by intervening prior to assets reaching Condition 5

As further condition data becomes available, the renewal allocation should be updated accordingly based on priority, condition, utilisation, star rating, criticality and remaining useful life.

It is also recommended that the use of smart technology be utilised where possible to assist in the capture of asset quality monitoring and condition-based information.

The current renewal/replacement plans would be enhanced by recognising the cost and useful lives of individual components associated with FMDs. Currently FMD's are not recognised/broken down to components and assets are renewed/replaced based on the FMD's in their entirety (i.e. at station/site asset as a singular entity). The replacement of FMD's in their entirety in not common practice. The recommended approach is for MBRC is to use a predictive modelling process to develop renewal/replacement programs based on true asset componentisation, condition, utilisation, criticality and remaining useful life.

#### Action Items:

AI-FMD24	Develop a periodic exception report for monitoring FMD assets in poor or very poor condition for inclusion in the future renewal programs.
AI-FMD25	Create ePID for the recommended FMD renewal programs from budget year 22/23 onwards.
AI-FMD26	Smart technology be utilised where possible to assist in the capture of asset quality monitoring and condition-based information.

# 6 Systems

The asset management processes within MBRC are supported by a number of corporate information management systems. The corporate systems that support asset management activities are described in detail in Table 6.1 in Appendix B of the SAMP. The systems include:

- Financial management system (Technology One)
- Asset management system (TOMAS/Technology One)
- Performance planning and monitoring system (built on Technology One)
- Corporate electronic document system (ECM/Technology One)
- Geographical Information System (ArcGIS) and Geoportal (corporate spatial system)

MBRC also uses/shares dedicated external proprietary systems (hardware and software) with BoM and SEQ Water for management of the FMD network. These systems comprise of;

- Enviromon software systems installed in base stations
- ALERT repeaters
- TARDIS flood gauge management systems

Enviromon is an associated software application used and developed by the BoM to enable data collection and management from telemetry gauges. Enviromon base stations comprise antenna, an Event Reporting Radio Telemetry System (ERRTS) receiver and ERRTS decoder.

#### Flood Management Devices Portfolio Asset Management Plan

Within the MBRC network, the data captured via the Enviromon Base stations is transferred to Council's flood gauge data management system (TARDIS/FLOODMON). Figure 29 summarises telemetry data capture. TARDIS is Council's original flood gauge data management system. FLOODMON is effectively the next generation of TARDIS with additional features and functionality and is currently run in parallel with TARDIS until event testing and final adoption.



Figure 29 - MBRC Telemetry Network

Lifecycle modelling carried out for this asset management plan was modelled using Excel.

# 7 Financial Summary

# 7.1 Useful Life and Valuation Methodology

When assets are initially recognised, each asset is recorded with an estimated useful life which is used as a basis for determining depreciation. Table 7.1 below outlines the estimated useful life for FMD assets and their valuation methodology<sup>3</sup>.

<sup>&</sup>lt;sup>3</sup> Refer also to MBRC's Non-current Asset Accounting Policy

#### Flood Management Devices Portfolio Asset Management Plan

Asset Type	Estimated Useful Life	Valuation Methodology			
Flood Alert Gauges	20 years				
Flooded Road Warning Systems	15 years				
Maximum Height Gauges	20 years	Fair Value methodology. The			
River and Rainfall ALERT Gauges	20 years	next revaluation will take place in FY 2021.). Last			
River and Rainfall Telemetry Monitoring Gauges	15 years	valued FY2018,			
Static Road Closure Identification Indicators	15 years				

# 7.2 Financial Statements and Ratios

# 7.2.1 Valuations & Depreciation

The financial asset register shows the current replacement value for the FMD assets as \$1,758,958. However, there are several assets with missing replacement values and often these are non-financial assets as they are below the financial recognition threshold.

For the purposes of this asset management plan and for estimating the ongoing lifecycle costs for the full portfolio, an estimate was made of the replacement values for all MBRC owned assets. The assets were valued using the average replacement cost unit rates which were determined from the assets with known replacement values and type attributes or qualities that could be established from the asset database.

The estimated total replacement value for the full FMD asset portfolio is estimated to be \$3,183,830. Rainfall and river level telemetry gauges collectively make up around 80% (\$2.4M) of the portfolios total replacement value as shown in Figure 30.



Figure 30 - Current replacement cost by asset type

The projected total replacement value is summarised in Table 7.2 and Table 7.3 and illustrated by Figure 31 below. It assumes that no disposals will take place over that period, all existing

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

#### Flood Management Devices Portfolio Asset Management Plan

assets will be replaced at end of life, and that all scheduled new and improvement projects will be built by their scheduled dates.

Table 7.2 - Projected TRV, net value and depreciation including new acquisitions (\$M) FY2022-FY2033												
Description	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033
Current Portfolio TRV	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Cumulative Value of Extensions/New Assets/Upgrades	0.2	0.3	0.3	0.5	0.5	0.7	0.7	0.8	0.8	1.0	1.0	1.1
Projected Total TRV	3.3	3.5	3.5	3.7	3.7	3.8	3.8	4.0	4.0	4.2	4.2	4.3
Projected Total Net Value	1.5	1.4	1.6	1.5	1.7	1.6	1.8	1.7	1.9	1.9	2.1	2.1
Projected Annual Depreciation	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Table 7.3 - Projected TRV, net value and depreciation including new acquisitions (\$M) FY2034-FY2045

Description	FY2034	FY2035	FY2036	FY2037	FY2038	FY2039	FY2040	FY2041	FY2042	FY2043	FY2044	FY2045
Current Portfolio TRV	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Cumulative Value of Extensions/New Assets/Upgrades	1.1	1.3	1.3	1.5	1.5	1.6	1.6	1.8	1.8	1.9	1.9	2.1
Projected Total TRV	4.3	4.5	4.5	4.6	4.6	4.8	4.8	5.0	5.0	5.1	5.1	5.3
Projected Total Net Value	2.4	2.4	2.6	2.6	2.8	2.7	2.9	2.8	2.9	2.8	2.9	2.8
Projected Annual Depreciation	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2



Figure 31 - Projected replacement and net value for current portfolio and new acquisitions

As part of the lifecycle modelling, a projection was made of the future net value of the FMD portfolio based on the current budget and recommended funding levels.

The projected net value for both funding scenarios is illustrated by Figure 32.

The projected net values demonstrate that the proposed renewal funding is adequate, but the current budget is not expected to provide a long-term sustainable outcome. The sustainability indicators in Section 7.2.2 provide further comparison of the outcomes from the two funding scenarios.

GENERAL MEETING - 526 17 March 2021

PAGE 44 Supporting Information

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)



#### Flood Management Devices Portfolio Asset Management Plan

Figure 32 - Projected net asset value based on current and recommended funding scenarios

Action Items:

AI-FMD27	Review and reconcile the operational and financial registers for FMD assets
AI-FMD28	Compare data in the financial asset register against the revised useful and
	remaining lives and update as appropriate. Reassess the replacement cost, net
	value and annual depreciation expense if changes are made to any useful lives.

# 7.2.2 Financial Sustainability Ratios

The Asset Sustainability Ratio (ASR) demonstrates the extent to which the infrastructure assets managed by Council are being replaced as they reach the end of their useful lives. This ratio measures how much capital expenditure goes toward replacing existing assets each year relative to depreciation expense. The typical target range is approximately 90% to 110%. Being a high growth Council, Council's target range is approximately 75% which allows for balancing capital expenditure on existing assets with building of new infrastructure due to population growth.



Figure 33 - Projected sustainability ratio based on current and recommended funding scenarios

#### Flood Management Devices Portfolio Asset Management Plan

Figure 33 shows the ASR for MBRC's FMD asset portfolio. The intent is for capital investment to offset depreciation to maintain the value of the portfolio, and inherently demonstrate maintaining the portfolio itself. While not particularly relevant for new asset portfolios whereby minimal capital expenditure is required early in the life of the asset, it demonstrates that the recommended funding will lead towards achieving long term sustainability. Conversely, the current capital funding (orange solid line) is not sustainable.

The Asset Consumption Ratio (ACR) is the net value of infrastructure assets divided by gross current replacement cost of infrastructure assets. This ratio seeks to highlight the extent of asset consumption. Council's desired range is between 40% to 80%.



Figure 34 - Projected asset consumption ratio based on current and recommended funding scenarios

This ACR seeks to demonstrate that the asset portfolio is being maintained within a sustainable and economic range. Figure 34 shows that if the current funding was maintained it would result in the asset portfolio deteriorating to an unacceptable level within a short period, whereas the recommended funding maintains the FMD portfolio's asset consumption ratio within the target range. It is therefore evident that the proposed funding allocations will put Council in a much stronger financial position to maintain the FMD asset portfolio as shown by these financial ratios.

# 7.3 Forecast Costs

The age profile for MBRC's FMD assets indicated that there will be a growing portion of assets reaching their expected useful lives in the near future. This is to be expected because FMD assets have shorter lives relative to many other asset classes, being within the range of 15-20. Currently around 10% of the asset portfolio is over 15 years old.

Section 5.5 described the justification and need for introducing planned preventative maintenance on top of the existing routine and reactive maintenance activities. Section 5.7 identified the funding that is predicted to be required for renewal or replacement of assets components over the next 50 years.

To sustain the existing FMD asset portfolio, and provide the expected community and technical levels of service described in this asset management plan, the recommended budget allocations are outlined below:

Flood Management Devices Portfolio Asset Management Plan

- Increase the current budgets for planned and reactive maintenance from \$46,000 to \$113,550 per annum from FY2022 onwards to address the current maintenance shortfall, allow additional inspection of assets and to allow for replacement of aging HS40 telemetry gauges.
- Minor increase to the budget for asset renewals/new/upgrade from its biennial budget of \$250k to an average annual spend of \$135K from FY2024 onwards and further increase to an average annual spend of \$227.5K from FY2030 onwards

The following chart and tables summarise the recommended funding need. The amounts shown for capital renewals and replacements align to the amounts shown in the indicative capital works plan in Appendix J. The proposed new assets and upgrades are listed in Appendix I.



Figure 35 - Recommended total annual operational and capital budget

Cost Type	Estimated Annual Cost, \$000's											
	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033
Operations and Maintenance	114	114	114	114	114	114	114	114	114	114	114	114
Extensions/New Assets/Upgrades	0	180	0	160	0	160	0	160	0	160	0	160
Capital Renewal/ Replacement	0	35	215	55	215	55	215	55	308	148	308	148
TOTAL Estimated Annual Cost	114	329	329	329	329	329	329	329	421	421	421	421

#### Table 7.5 - Recommended annual operational and capital budgets; FY2034-FY2045

Cost Type	Estimated Annual Cost, \$000's											
	FY2034	FY2035	FY2036	FY2037	FY2038	FY2039	FY2040	FY2041	FY2042	FY2043	FY2044	FY2045
Operations and Maintenance	114	114	114	114	114	114	114	114	114	114	114	114
Extensions/New Assets/Upgrades	0	160	0	160	0	160	0	160	0	160	0	160
Capital Renewal/ Replacement	308	148	308	148	308	148	308	148	308	148	308	148
TOTAL Estimated	421	421	421	421	421	421	421	421	421	421	421	421

Flood Management Devices Portfolio Asset Management Plan

# 8 Improvement and Monitoring

During the preparation of the Flood Management Devices Portfolio Asset Management Plan the following improvement items have been identified and are set out in Table 8.1 below.

Action No.	Detail	Responsibility	Due date
AI-FMD1	Undertake an assessment of the current asset classifications and determine if there is benefit to further componentisation of FMD assets.	DWCP & AMT	Q3 21/22
AI-FMD2	Identify and rationalise FMD asset placement within existing asset classification structures.	DWCP & AMT	Q3 21/22
AI-FMD3	Investigate the use of asset risk and health inputs associated to individual assets within MBRC's corporate asset register (TOMAS), including the prioritisation of capital and maintenance works for FMD assets using asset risk and health inputs for; criticality, function, capacity and risk ratings.	DWCP & AMT	Q4 21/22
AI-FMD4	Develop asset relationships that link "parent" and "child" asset components that make-up a FMD assets within TOMAS.	AMT	Q2 22/23
AI-FMD5	Review existing FMD asset attributes with asset stakeholders to reflect the proposed asset classification re-structure and asset componentisation updates in TOMAS.	AMT	Q3 22/23
AI-FMD6	Capture missing asset attributes on all FMD assets in TOMAS	AMT	Q3 22/23
AI-FMD7	Review and update the FMD asset attribute identification fields to enable them to be more easily queried within TOMAS and to assist with identifying the type of FMD asset.	DWCP & AMT	Q1 21/22
AI-FMD8	Undertake analysis of current and historical service requests relating to FMDs, including requests for additional services and flooding complaints.	DWCP & AMT	Q2 21/22
AI-FMD9	Consult with Councillors to determine flood prone areas and flooding risks within their Divisions which may be suitable sites for new or upgraded FMDs.	DWCP & AMT	Q2 21/22
AI-FMD10	Design, implement and configure FMD's for use within Strategic Asset Management (SAM) ie. unit rates, primary dimensions, model categories, automating the prioritisation of FMD assets in TOMAS etc.	DWCP & AMT	Q3 22/23
AI-FMD11	Review flood mapping height projections for planning future development plans and to build contingency in for potentially affected FMD assets and urban population growth areas.	DWCP, SIP	Q3 21/22

Table 8.1 - FMDPAMP Action Items

Action No.	Detail	Responsibility	Due date
AI-FMD12	Research asset performance measurement practices appropriate to MBRC's FMDs and implement a process for capturing and recording performance data for use in Council's Strategic Asset Management System (SAM).	DWCP & AMT	Q2 22/23
AI-FMD13	Assess opportunities for use of smart city dashboards and innovative technology to assist with provision of FMD services.	DWCP & AMT	Q4 22/23
AI-FMD14	Re-design and conversion of the current inspection and test point data in line with proposed component structure within TOMAS to return a single condition score that can be used for renewals planning.	DWCP & AMT	Q3 22/23
AI-FMD15	Develop a defect management plan documenting the risk-based approach, intervention levels & business processes for managing defects for all FMD assets including the rationalisation of existing defects in the system. Review & amend existing defect codes and work types for FMD assets to align with the defect management plan and asset strategy.	DWCP & AMT & FIN	Q4 21/22
AI-FMD16	Investigation and implementation of FloodMon dashboard/system for fault detection and defect creation.	DWCP & AMT	Q2 22/23
AI-FMD17	Implementation of continuous development program to meet best practice requirements for both disaster management practices and technological advances.	DWCP & AMT	Q3 21/22
AI-FMD18	Review of revised flood height projections and future planning development plans to build contingency plans for potentially affected assets.	DWCP & AMT & SIP	Q4 21/22
AI-FMD19	Review the regular (12 monthly) condition assessments and associated asset register data updates to determine if improvements could be made to more accurately reflect component conditions and therefore support more accurate renewal planning. Consider whether existing BoM Maintenance agreement could be extended to perform this function.	DWCP & AMT	Q3 21/22
AI-FMD20	Generate schedules within TOMAS for recommended maintenance activities.	AMT	Q1 22/23
AI-FMD21	Create ePID and budget for planned FMD maintenance Activity inclusion.	DWCP & AMT	Q4 21/22
AI-FMD22	Review and update the current operations & maintenance specifications for FMD's within the MBRC Flood Warning System Guide.	DWCP & AMT	Q4 22/23
AI-FMD23	Implement recommended resource plan for FMD assets identifying potential improvements to existing Council resources & necessary training requirements.	DWCP & AMT	Q1 22/23

Action No.	Detail	Responsibility	Due date
AI-FMD24	Develop a periodic exception report for monitoring FMD assets in poor or very poor condition for inclusion in the future renewal programs.	DWCP & AMT	Q1 22/23
AI-FMD25	Create ePID for the recommended FMD renewal programs from budget year 22/23 onwards.	DWCP & AMT	Q4 21/22
AI-FMD26	Smart technology be utilised where possible to assist in the capture of asset quality monitoring and condition-based information.	AMT & INVT	Q3 22/23
AI-FMD27	Review and reconcile the operational and financial registers for FMD assets	AMT & FIN	Q2 21/22
AI-FMD28	Compare data in the financial asset register against the revised useful and remaining lives and update as appropriate. Reassess the replacement cost, net value and annual depreciation expense if changes are made to any useful lives.	AMT & FIN	Q4 21/22

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Flood Management Devices Portfolio Asset Management Plan

# 9 Appendices

Table 9.1	- List of	Appendices
-----------	-----------	------------

Appendices	Title	Referenced Section
Appendix A	List of FMD Assets	2.1
Appendix B	MBRC Telemetry Rain Gauge Location Map	2.1, 5.1
Appendix C	FMD Asset Attributes	2.4
Appendix D	FMD Test Point Inspection Details	5.2
Appendix E	FMD Recommended Asset Defect Types	5.3
Appendix F	FMD Overall Asset Type Replacement/Renewal Graphs	5.7
Appendix G	FMD Projected Condition - Overall	5.7
Appendix H	FMD Projected Condition by Asset Type	5.7
Appendix I	Indicative 25-year New Capital Plan	4.0, 7.3
Appendix J	Indicative 25-year Renewal Capital Works Plan	5.7, 7.3

17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Flood Management Devices Portfolio Asset Management Plan

# Appendix A - List of FMD Assets

The following provides a list of all FMD assets within the Moreton Bay Region. MBRC owned and maintained assets are listed initially, followed by non-MBRC owned assets. Only the MBRC owned assets have been included in the asset replacement costs and asset capital renewal estimates included in this plan.

Table 9.2 - List of FMD Assets

Asset	Location	Model and Type	Owner	Maintenance	Year
	and and Maintained ENDs			Responsibility	Commissioned
MBRC OW	ned and Maintained FMDs				
A00314828	Halpine Lakes Reserve	Seepage Monitoring Device	MBRC	MBRC	2006
A00523637	Gympie Road, Strathpine	AL Telemetry Gauge - River	MBRC	MBRC	2012
A00523638	Lipscombe Road, Deception Bay	AL Telemetry Gauge - River	MBRC	MBRC	2008
A00523639	Rose Creek Road, Elimbah	AL Telemetry Gauge - River	MBRC	MBRC	2012
A00523640	Todds Road, Lawnton	AL Telemetry Gauge - River	MBRC	MBRC	2012
A00523989	River Oak Way, Narangba	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2012
A00523996	Bruce Highway, Caboolture	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2012
A00523999	Highcrest Street, Ocean View	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2012
A00524004	Bruce Highway, Caboolture	AL Telemetry Gauge - River	MBRC	MBRC	2012
A00524008	Trevor Street, Beachmere	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2011
A00524009	First Avenue, Bongaree	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2006
A00524010	Browns Creek Road, Narangba	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2007
A00524011	Dale Street, Burpengary	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2004
A00524012	Koel Drive, Narangba	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2004
A00524013	Norfolk Esplanade, Caboolture South	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2004
A00524014	South Pine Road, Albany Creek	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2007
A00524015	Cedar Creek Road, Closeburn	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2008
A00524016	Clear Mountain Road, Cashmere	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2007
A00524017	Saddleback Drive, Dayboro	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2007
A00524018	Old Bay Road, Deception Bay	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2006
A00524019	Sovereign Avenue, Bray Park	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2007
A00524020	Costelloe Road, Laceys Creek	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2007
A00524021	Lawnton Pocket Road, Lawnton	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2008
A00524022	Lipscombe Road, Deception Bay	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2008

#### **GENERAL MEETING - 526**

17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Asset	Location	Model and Type	Owner	Maintenance Responsibility	Year Commissioned
A00524023	Riversleigh Road, Beachmere	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2012
A00524024	Rose Creek Road, Elimbah	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2012
A00524025	Hatchman Court, Elimbah	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2004
A00524038	Station Street, Samford Village	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2007
A00524050	Gympie Road, Strathpine	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2012
A00524051	Beerburrum-Woodford Road, Woodford	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2012
A00524052	Old Toorbul Point Road, Caboolture	AL Telemetry Gauge - River	MBRC	MBRC	2012
A00524112	Mt Mee Road, Dayboro	AL Telemetry Gauge - River	MBRC	MBRC	2013
A00524129	Bruce Highway Eastern Service Road, Deception Bay	AL Telemetry Gauge - River	MBRC	MBRC	2012
A00524141	Bruce Highway Eastern Service Road, Deception Bay	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2012
A00524143	River Oak Way, Narangba	AL Telemetry Gauge - River	MBRC	MBRC	2012
A00524147	Donnybrook Road, Donnybrook	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2012
A00524148	Mt Mee Road, Dayboro	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2013
A00524151	Donnybrook Road, Donnybrook	AL Telemetry Gauge - River	MBRC	MBRC	2012
A00524152	Aurora Place, Newport	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2013
A00524155	Morayfield Road, Morayfield	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2012
A00524156	Todds Road, Lawnton	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2012
A00524157	Hausmann Lane, Upper Caboolture	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2004
A00524158	Forestcreek Place, Wamuran	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2004
A00524159	Williams Road, Moodlu	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2012
A00524160	Hornibrook Esplanade, Clontarf	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2010
A00524161	Youngs Crossing Road, Joyner	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2007
A00524169	Trevor Street, Beachmere	AL Telemetry Gauge - River	MBRC	MBRC	2010
A00524170	Dale Street, Burpengary	AL Telemetry Gauge - River	MBRC	MBRC	2004
A00524171	Koel Drive, Narangba	AL Telemetry Gauge - River	MBRC	MBRC	2004
A00524172	Norfolk Esplanade, Caboolture South	AL Telemetry Gauge - River	MBRC	MBRC	2004
A00524173	River Vista Crescent, Murrumba Downs	AL Telemetry Gauge - River	MBRC	MBRC	2007
A00524175	Oakey Flat Road, Narangba	AL Telemetry Gauge - River	MBRC	MBRC	2011
A00524191	Old Toorbul Point Road, Caboolture	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2012
A00524192	Mcclure Road, Wamuran	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2012
A00524195	Hausmann Lane, Upper Caboolture	AL Telemetry Gauge - River	MBRC	MBRC	2004

#### **GENERAL MEETING - 526**

17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Asset	Location	Model and Type	Owner	Maintenance Responsibility	Year Commissioned
A00524196	Forestcreek Place, Wamuran	AL Telemetry Gauge - River	MBRC	MBRC	1998
A00524197	Williams Road, Moodlu	AL Telemetry Gauge - River	MBRC	MBRC	2012
A00524198	Youngs Crossing Road, Joyner	AL Telemetry Gauge - River	MBRC	MBRC	2007
A00524204	Mountain View Road, Moorina	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2004
A00524205	Petersen Road, Morayfield	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2006
A00524206	Mt Samson Road, Kobble Creek	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2008
A00524207	River Vista Crescent, Murrumba Downs	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2007
A00524208	Dixon Street, Strathpine	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2007
A00524209	Oakey Flat Road, Narangba	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2011
A00524210	Pumicestone Road, Caboolture	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2012
A00524213	Pumicestone Road, Caboolture	AL Telemetry Gauge - River	MBRC	MBRC	2012
A00524214	Riversleigh Road, Beachmere	AL Telemetry Gauge - River	MBRC	MBRC	2012
A00524215	Station Street, Samford Village	AL Telemetry Gauge - River	MBRC	MBRC	2007
A00524216	Morayfield Road, Morayfield	AL Telemetry Gauge - River	MBRC	MBRC	2012
A00524247	South Pine Road, Albany Creek	AL Telemetry Gauge - River	MBRC	MBRC	2007
A00524248	Cedar Creek Road, Closeburn	AL Telemetry Gauge - River	MBRC	MBRC	2008
A00524249	Sovereign Avenue, Bray Park	AL Telemetry Gauge - River	MBRC	MBRC	2007
A00524250	Lawnton Pocket Road, Lawnton	AL Telemetry Gauge - River	MBRC	MBRC	2008
A00607311	Bleakley Road, Delaneys Creek	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2013
A00607312	Old Gympie Road, Elimbah	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2013
A00607313	Williamson Road, Morayfield	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2013
A00607314	Kremzow Road, Warner	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2013
A00607315	Talbot Drive, Kallangur	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2013
A00607316	McClintock Road, Wamuran	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2013
A00607317	Showgrounds Drive, Highvale	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2013
A00607318	Ladies Road, Samsonvale	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2013
A00607319	Finnegan Street, Rothwell	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2013
A00607320	Short Street, Caboolture	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2013
A00607324	Short Street, Caboolture	AL Telemetry Gauge - River	MBRC	MBRC	2013
A00607325	Talbot Drive, Kallangur	AL Telemetry Gauge - River	MBRC	MBRC	2013
A00607326	Finnegan Street, Rothwell	AL Telemetry Gauge - River	MBRC	MBRC	2013
A00632063	Cannington Court, Samford Valley	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2016

#### **GENERAL MEETING - 526**

17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Asset	Location	Model and Type	Owner	Maintenance Responsibility	Year Commissioned
A00632064	Machinery Parade, Caboolture	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2016
A00632065	Heathland Street, Banksia Beach	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2016
A00634316	Cannington Court, Samford Valley	AL Telemetry Gauge - River	MBRC	MBRC	2016
A00634317	Machinery Parade, Caboolture	AL Telemetry Gauge - River	MBRC	MBRC	2016
A00648562	Admiral Drive, Deception Bay	AL Telemetry Gauge - River	MBRC	MBRC	2016
A00648563	Admiral Drive, Deception Bay	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2016
A00648564	Saint-Smith Road, Beachmere	AL Telemetry Gauge - River	MBRC	MBRC	2016
A00648565	Saint-Smith Road, Beachmere	AL Telemetry Gauge - Rainfall	MBRC	MBRC	2016
A00815207	Confluence Court, Eatons Hill	TM Telemetry Gauge - Rainfall	MBRC	MBRC	2018
A00815208	Confluence Court, Eatons Hill	TM Telemetry Gauge - River	MBRC	MBRC	2018
A00815209	Confluence Court, Eatons Hill	Maximum Height Gauge	MBRC	MBRC	2018
A00815210	Alexandra Parade, Wamuran	TM Telemetry Gauge - Rainfall	MBRC	MBRC	2018
A00815211	Alexandra Parade, Wamuran	TM Telemetry Gauge - River	MBRC	MBRC	2018
A00815212	Alexandra Parade, Wamuran	Maximum Height Gauge	MBRC	MBRC	2018
A00815213	Dale Street, Burpengary	Maximum Height Gauge	MBRC	MBRC	2018
A00815214	Bruce Highway Eastern Service Road, Multiple	Maximum Height Gauge	MBRC	MBRC	2018
A00815215	Pettigrew Street, Caboolture	Maximum Height Gauge	MBRC	MBRC	2018
A00815216	Pumicestone Road, Multiple	Maximum Height Gauge	MBRC	MBRC	2018
A00815217	Visentin Road, Morayfield	Maximum Height Gauge	MBRC	MBRC	2018
A00815218	King Street, Caboolture	Maximum Height Gauge	MBRC	MBRC	2018
A00815219	McGahey Street, Rothwell	Maximum Height Gauge	MBRC	MBRC	2018
A00815220	Rowley Road, Burpengary	Maximum Height Gauge	MBRC	MBRC	2018
A00817431	Short Street, Caboolture	Maximum Height Gauge	MBRC	MBRC	2018
A00890153	Cedar Creek Road, Cedar Creek	Flooded Road Warning System	MBRC	MBRC	2019
A00890157	Lees Crossing Road, Dayboro	Flooded Road Warning System	MBRC	MBRC	2019
A00890158	Lipscombe Road, Deception Bay	Flooded Road Warning System	MBRC	MBRC	2019
A00890161	Kobble Creek Road, Kobble Creek	Flooded Road Warning System	MBRC	MBRC	2019
A00890162	Moore Road, Kurwongbah	Flooded Road Warning System	MBRC	MBRC	2019
A00890163	Browns Road, Kurwongbah	Flooded Road Warning System	MBRC	MBRC	2019
A00890164	Grogan Road, Morayfield	Flooded Road Warning System	MBRC	MBRC	2019
A00890165	Underpass Road, Morayfield	Flooded Road Warning System	MBRC	MBRC	2019
A00890167	Youngs Crossing Road, Joyner	Flooded Road Warning System	MBRC	MBRC	2019

#### **GENERAL MEETING - 526**

17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Asset	Location	Model and Type	Owner	Maintenance Responsibility	Year Commissioned
A00890169	Mott Street, Strathpine	Flooded Road Warning System	MBRC	MBRC	2019
Externally	Owned and Maintained FMDs within the M	IBRC Region (for information pu	irposes only)		
A00523643	Kuringal Drive, Ferny Hills	AL Telemetry Gauge - Rainfall	Brisbane City Council	BCC	2000
A00523644	Collins Road, Bunya	AL Telemetry Gauge - Rainfall	Brisbane City Council	BCC	2000
A00523783	Mount Nebo Road, Jollys Lookout	AL Telemetry Gauge - Rainfall	Brisbane City Council	BCC	2000
A00523790	Camelia Avenue, Everton Hills	AL Telemetry Gauge - Rainfall	Brisbane City Council	BCC	2000
A00523884	Mount Nebo Road, Jollys Lookout	AL Telemetry Gauge - Rainfall	Brisbane City Council	BCC	2000
A00524162	Collins Road, Everton Hills	AL Telemetry Gauge - River	Brisbane City Council	BCC	2000
A00524200	Gympie Road, Strathpine	AL Telemetry Gauge - Rainfall	Brisbane City Council	BCC	2000
A00524201	Chinook Street, Everton Hills	AL Telemetry Gauge - Rainfall	Brisbane City Council	BCC	2000
A00524211	Gympie Road, Strathpine	AL Telemetry Gauge - Rainfall	Brisbane City Council	BCC	2000
A00607310	Kuringal Drive, Ferny Hills	AL Telemetry Gauge - River	Brisbane City Council	BCC	2000
A00607322	Camelia Avenue, Everton Hills	AL Telemetry Gauge - River	Brisbane City Council	BCC	2000
A00607323	Mount Nebo Road, Jollys Lookout	AL Telemetry Gauge - River	Brisbane City Council	BCC	2000
A00802769	Dances Road, Caboolture	TM Telemetry Gauge - Rainfall	Dept Transport & Main Roads	DTMR	2000
A00802770	Dances Road, Caboolture	TM Telemetry Gauge - River	Dept Transport & Main Roads	DTMR	2000
A00802771	Arthur Drewett Drive, Burpengary East	TM Telemetry Gauge - Rainfall	Dept Transport & Main Roads	DTMR	2000
A00802772	Bruce Highway Eastern Service Road, Burpengary East	TM Telemetry Gauge - River	Dept Transport & Main Roads	DTMR	2000
A00523647	Doyle Road, Cedarton	AL Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000
A00523785	King Road, Neurum	AL Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000
A00523786	Wirth Road, Laceys Creek	AL Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000
A00523787	Circuit Road, Kurwongbah	AL Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000
A00523791	Alex Road, Mount Glorious	AL-B Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000
A00523792	Alex Road, Mount Glorious	AL-P Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000
A00523793	Thomason Road, Mount Mee	AL-B Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000
A00523794	Thomason Road, Mount Mee	AL-P Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000
A00523795	Mount Nebo Road, Mount Nebo	AL Telemetry Gauge - Rainfall	SEQ Water	SEQW	2012
A00523796	Vores Road, Whiteside	AL Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000
A00523797	Vores Road, Whiteside	AL-B Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000
A00523800	Redman Creek Road, Laceys Creek	AL Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000

#### **GENERAL MEETING - 526**

17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Asset	Location	Model and Type	Owner	Maintenance Responsibility	Year Commissioned
A00523801	Gibbons Road, Samford Valley	AL Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000
A00523802	Forestry Road, Mount Nebo	AL Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000
A00524005	Bellthorpe Road, Bellthorpe	AL Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000
A00524006	D'Aguilar Highway, Woodford	AL-B Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000
A00524007	D'Aguilar Highway, Woodford	AL-P Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000
A00524164	Mt Samson Road, Kobble Creek	AL Telemetry Gauge - River	SEQ Water	SEQW	2000
A00524165	Circuit Road, Kurwongbah	AL Telemetry Gauge - River	SEQ Water	SEQW	2000
A00524167	D'Aguilar Highway, Woodford	AL-B Telemetry Gauge - River	SEQ Water	SEQW	2000
A00524168	D'Aguilar Highway, Woodford	AL-P Telemetry Gauge - River	SEQ Water	SEQW	2002
A00524199	McCulloch Road, Armstrong Creek	AL Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000
A00524202	Laceys Creek Road, Laceys Creek	AL Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000
A00524212	Church Road, Eatons Hill	AL Telemetry Gauge - Rainfall	SEQ Water	SEQW	2000
A00524241	Laceys Creek Road, Laceys Creek	AL Telemetry Gauge - River	SEQ Water	SEQW	2007
A00524242	McCulloch Road, Armstrong Creek	AL Telemetry Gauge - River	SEQ Water	SEQW	2000
A00524243	Church Road, Eatons Hill	AL Telemetry Gauge -River	SEQ Water	SEQW	2000
A00524245	Vores Road, Whiteside	AL Telemetry Gauge - River	SEQ Water	SEQW	2000
A00524246	Vores Road, Whiteside	AL-B Telemetry Gauge - River	SEQ Water	SEQW	2000
A00632062	Commissioners Flat Road, Commissioners Flat	AL Telemetry Gauge - River	SEQ Water	SEQW	2000
A00523648	Gap Road, Booroobin	AL Telemetry Gauge - Rainfall	Sunshine Coast Council	SCC	2012
A00523782	Old Gympie Road, Elimbah	AL Telemetry Gauge - Rainfall	Sunshine Coast Council	SCC	2000
A00523784	Page Road, Commissioners Flat	AL Telemetry Gauge - Rainfall	Sunshine Coast Council	SCC	2000
A00523789	Eaton Road, Elimbah	AL Telemetry Gauge - Rainfall	Sunshine Coast Council	SCC	2000
A00523798	Millwood Road, Woodford	AL Telemetry Gauge - Rainfall	Sunshine Coast Council	SCC	2000
A00524163	Old Gympie Road, Elimbah	AL Telemetry Gauge - River	Sunshine Coast Council	SCC	2000
A00524244	Eaton Road, Elimbah	AL Telemetry Gauge - River	Sunshine Coast Council	SCC	2000
A00607309	Old Gympie Road, Elimbah	AL Telemetry Gauge - Rainfall	Sunshine Coast Council	SCC	2000
A00607321	Millwood Road, Woodford	AL Telemetry Gauge - River	Sunshine Coast Council	SCC	2000

Flood Management Devices Portfolio Asset Management Plan

# Appendix B - MBRC Telemetry Rain & Water Level Gauge Location Maps



GENERAL MEETING - 526 17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)



ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Flood Management Devices Portfolio Asset Management Plan

# Appendix C - FMD Asset Attributes

Table 9.3 - Flood Management Device Asset Attributes	;
------------------------------------------------------	---

Asset Group	Asset Attribute
<b>All</b> (Asset Register)	<ul> <li>*Asset Type Description/Details: Telemetry Gauge, Flooded Road Sensors, Flooded Road Warning System, Enviromon Base Station, Seepage Monitoring Device, Maximum Height Gauge, Road Closure Identification Indicators.</li> <li>Location (GIS)</li> <li>Street Address</li> <li>Install Date</li> <li>Commission Date</li> <li>Last Inspected Date</li> <li>Owner (MBRC, Seqwater, BoM, DNRM, DTMR)</li> <li>Star Rating (1, 2, 3, 4 or 5)</li> <li>*Make</li> <li>*Model (Rain, River)</li> <li>* Other Identification Telemetry Gauge, Flooded Road Sensors, Flooded Road Warning System, Enviromon Base Station, Seepage Monitoring Device, Maximum Height Gauge, Road Closure Identification Indicators.</li> <li>*Observed Condition</li> <li>*Function</li> <li>*Capacity</li> <li>*Utilisation</li> <li>*Criticality</li> <li>*Risk (Consequence &amp; Likelihood)</li> </ul>
Flood management Devices/ <b>Alert</b> <b>Gauges</b>	<ul> <li>*Bubbler System - HS40, Gas Bottle</li> <li>Datum</li> <li>Catchment</li> <li>Minor Basin: (Burpengary Creek - BUR, Caboolture River - CAB, Pumicestone Passage - PUM, Bribie Island - BRI, Brisbane Coastal Creeks - BCC, Lower Pine River - LPR, Upper Pine River - UPR, Neurum Creek - NEU, Byron Creek - BYR, Stanley River - STA, Hays Inlet - HAY, sideling Creek - SID)</li> <li>PID Number</li> <li>Gauge Zero</li> <li>Bank Full Level mAHD</li> <li>Minor Flood LvI mAHD</li> <li>Moderate Fld Lv mAHD</li> <li>Major Flood Level</li> <li>Prelim Flood Level</li> <li>BoM Station Number</li> <li>Battery Comms ID</li> <li>Radio Frequency</li> </ul>
Roads/ <b>Signage-</b> (Warning)	<ul> <li>Material</li> <li>Type - Warning</li> <li>MUTCAD Sign Code</li> <li>Sign Text</li> <li>Last Replaced Date</li> <li>Manufactured Date</li> <li>* Other Identification</li> </ul>

#### Flood Management Devices Portfolio Asset Management Plan

Asset Group	Asset Attribute
	<ul> <li>Telemetry Gauge, Flooded Road Sensors, Flooded Road Warning System, Enviromon Base Station, Seepage Monitoring Device, Maximum Height Gauge, Road Closure Identification Indicators.</li> <li>*Model (Rain, River)</li> <li>*Logger Type - Discrete, Continuous (Unique to Flooded Road *Sensor/System)</li> <li>*Automated Warning System - Illuminated Signs, Automatic Boom Gates, Flashing Light (Unique to Flooded Road System)</li> <li>*Gauge opening - Top, side (Unique to Maximum Height Gauges)</li> <li>*Ladder required to service - yes or no (Unique to Maximum Height Gauges)</li> <li>*Reference Level - Level of bottom cup. Surveyed and recorded for each MHG ID.</li> <li>*Observed Condition</li> <li>*Function</li> <li>*Capacity</li> <li>*Utilisation</li> <li>*Criticality</li> <li>*Risk (Consequence &amp; Likelihood)</li> </ul>

\* Proposed new attribute

Flood Management Devices Portfolio Asset Management Plan

# **Appendix D - FMD Test Point Inspection Details**

#### **Flood Management Device Inspection Data**

#### Source - Volume 1-3 MBRC Flood Warning System Operations & Maintenance Manual (MBRC, 2018)

The following Test Point data is configured against the FMD Maintenance Schedules for collection during the inspection process.

Test Point	Component	Description	Options
		Canister Number	#
		Battery Voltage Stand By	mA
		Battery Voltage Under Load	mA
		Consumption Stand By	mA
		Consumption Transmit	mA
		Solar Charge Current	mA
		Solar Regulated	V.
		Transmitter Power FWD	w
12-month BoM	Rainfall Gauges	Transmitter Power Ref	w
		Standing Wave Ratio	SWR
		Fade Margin	db
		TBRG Calb	mm
		River Calibration 1	m
		River Calibration 2	m
		River Calibration 4	m
		River Calibration 6	m
		River Calibration 10	m
		Battery	Alphanumeric
6-Month (Delayed	Rainfall Gauges	Gas	Alphanumeric
BoM)	Flood Gauges,	Solar Panel	Alphanumeric
Stations	Monitoring &	Graffiti	Alphanumeric
	Alert Gauges	Rain Gauge	Alphanumeric
		Cabinet	Alphanumeric

17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Flood Management Devices Portfolio Asset Management Plan

Test Point	Component	Description	Options
		Antenna	Alphanumeric
		Water Level Sensor	Alphanumeric
		Tree Canopy Cover	Alphanumeric
		Mounting Structure	Alphanumeric
		General Maintenance	Alphanumeric
		Other Notes	Alphanumeric

#### Table 9.5 – Proposed FMD Condition Assessment Methodology

Туре	Component	Expected Life	Annual BoM Inspections	Considerations for Condition Assessment
Telemetry Gauge Component	Tipping Bucket Rain Gauge	10 years (At least ten years. You can always replace the reed switch if it becomes magnetised)	At least annual calibration check. Bird spikes should be installed to reduce the chance of blockages between visits.	Age • Express as fraction of expected life expired. BoM calibration check (based on most recent BoM check) A - within acceptable ranges B - within acceptable rages but potential for emerging issue identified C - Replacement required Visual inspection. Criteria for Visual inspection: 1 - Excellent condition • like brand new 2 - Good Condition • No signs of corrosion • Aging is not evident 3 - Reasonable Condition • Some aging is evident (but unlikely to be impacting performance) 4 - Poor Condition • signs of corrosion • signs of aging 5 - Very Poor Condition • Serious signs of aging and in need of replacement (diminishing performance would be reflected in Rain data)

#### 17 March 2021

#### ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Туре	Component		Expected Life	Annual BoM Inspections	Considerations for Condition Assessment
Telemetry Gauge Component	Solar Panel	<image/> <image/>	10 years	Annual. Can see operation remotely but needs cleaning and inspection.	Age         • Express as fraction of expected life expired.         BoM check (based on most recent BoM check)         A - within acceptable ranges         B - within acceptable rages but potential for emerging issue identified         C - Replacement required         Visual inspection         Criteria for Visual inspection:         1 - Excellent condition         • Like brand new         2 - Good Condition         • No signs of corrosion         • No signs of scratching or cracking         3 - Reasonable Condition- some signs of aging         • some signs of corrosion         • some signs of aging         4 - Poor Condition         • visible corrosion         • visible cracking or scratches         • aging is evident         5 - Very Poor Condition         • Serious signs of aging and in need of replacement         (diminishing performance would be reflected in battery data)
Telemetry Gauge Component	Solar regulator		5 years (Separate to canister at sites with a HS40 or alternative data logger).	Annual checks	Age • Express as fraction of expected life expired. BoM check (based on most recent BoM check) A - within acceptable ranges B - within acceptable rages but potential for emerging issue identified C - Replacement required (diminishing performance would be reflected in battery data)

#### 17 March 2021

#### ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Туре	Component	Expected Life	Annual BoM Inspections	Considerations for Condition Assessment
Telemetry Gauge Component	Antenna and coaxial cable	5 years An average only, some last more than ten, others are destroyed by animals.	Annual forward and reflectance test of performance.	Age • Express as fraction of expected life expired. BoM check (based on most recent BoM check) A - within acceptable ranges B - within acceptable rages but potential for emerging issue identified C - Replacement required Visual inspection Criteria for Visual inspection: 1 - Excellent condition • Like brand new 2 - Good Condition • No signs of damage • No signs of aging 3 - Reasonable Condition • Some signs of aging (eg fading) 4 - Poor Condition • Signs of Damage • Aging is evident 5 - Very Poor Condition • Serious signs of aging and in need of replacement (diminishing performance would be reflected in station communications)
Telemetry Gauge Component (Alert Gauge)	Canister and associated electrical wiring	Ten years. Note that more modern products would probably not last that long. 5- 8 years for most modern loggers.	Annual checks for radio performance. Rain and river performance are checked simultaneously with that equipment.	Age • Express as fraction of expected life expired. BoM check (based on most recent BoM check) A - within acceptable ranges B - within acceptable rages but potential for emerging issue identified C - Replacement required Visual inspection Criteria for Visual inspection: 1 - Excellent condition • Like brand new 2 - Good Condition • No signs of damage • No signs of aging 3 - Reasonable Condition- • No signs of damage

17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Туре	Component	Expected Life	Annual BoM Inspections	Considerations for Condition Assessment
				<ul> <li>Some signs of aging (eg fading, perishing)</li> <li>4 - Poor Condition <ul> <li>Signs of damage</li> <li>Aging is evident</li> </ul> </li> <li>5 - Very Poor Condition <ul> <li>Serious signs of aging and in need of replacement</li> </ul> </li> <li>(diminishing performance would be reflected in station communications)</li> </ul>
Telemetry Gauge Component	HS23 Bubbler Unit	20 years with service at 10 years.	Annual leak testing is required.	Age • Express as fraction of expected life expired. BoM check (based on most recent BoM check) A - within acceptable rages B - within acceptable rages but potential for emerging issue identified C - Replacement required Visual inspection Criteria for Visual inspection: 1 - Excellent condition • Like brand new 2 - Good Condition • No signs of damage • No signs of damage • No signs of damage • No signs of damage • Some signs of aging 3 - Reasonable Condition- some signs of aging but still working • No signs of damage • Some signs of aging 4 - Poor Condition • Damage • Aging is evident 5 - Very Poor Condition • Serious signs of aging and in need of replacement (diminishing performance would be reflected in water level data)

#### 17 March 2021

#### ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Туре	Component	Expected Life	Annual BoM Inspections	Considerations for Condition Assessment
Telemetry Gauge Component	Gas regulator	5 years.	Annual checks also.	Age         • Express as fraction of expected life expired.         BoM check (based on most recent BoM check)         A - within acceptable ranges         B - within acceptable rages but potential for emerging issue identified         C - Replacement required         Visual inspection         Criteria for Visual Inspection:         1 - Excellent condition         • Like brand new         2 - Good Condition         • No signs of damage         • Some signs of aging         4 - Poor Condition         • Damage         • Aging is evident         5 - Very Poor Condition         • Serious signs of aging and in need of replacement         (diminishing performance would be reflected in water level data)
Telemetry Gauge Component	HS40 Bubbler	10 years with pump replacement every 5 years	Annual checks.	<ul> <li>Age <ul> <li>Express as fraction of expected life expired.</li> </ul> </li> <li>BoM check (based on most recent BoM check) <ul> <li>A - within acceptable ranges</li> <li>B - within acceptable rages but potential for emerging issue identified</li> <li>C - Replacement required</li> </ul> </li> <li>Visual inspection <ul> <li>Criteria for Visual Inspection:</li> <li>1 - Excellent condition</li> <li>Like brand new</li> </ul> </li> <li>2 - Good Condition <ul> <li>No signs of damage</li> <li>No signs of aging</li> </ul> </li> </ul>

17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Туре	Component	Expected Life	Annual BoM Inspection <u>s</u>	Considerations for Condition Assessment
				<ul> <li>3 - Reasonable Condition- some signs of aging but still working <ul> <li>No signs of damage</li> <li>Some signs of aging</li> </ul> </li> <li>4 - Poor Condition <ul> <li>Damage</li> <li>Aging is evident</li> </ul> </li> <li>5 - Very Poor Condition <ul> <li>Serious signs of aging and in need of replacement</li> </ul> </li> <li>(diminishing performance would be reflected in water level data)</li> </ul>
Telemetry Gauge Component	Nitrogen Gas Bottle	Almost always rented from BOC, so swapped annually	Swapped and checked annually	Swapped and checked annually as part of routine maintenance (consumable)
Telemetry Gauge Component	Stainless Steel Instrument Enclosure	15 years		<ul> <li>Age <ul> <li>Express as fraction of expected life expired.</li> </ul> </li> <li>Visual Inspection <ul> <li>Criteria for Visual Inspection:</li> <li>1 - Excellent Condition <ul> <li>Like brand new</li> </ul> </li> <li>2 - Good Condition <ul> <li>No signs of corrosion,</li> <li>Door closes and seals properly</li> <li>Solid and square</li> <li>No signs of water rain leaking into cabinet</li> </ul> </li> <li>3 - Reasonable Condition <ul> <li>some signs of corrosion</li> <li>Door damage, may need repair or aging is evident)</li> </ul> </li> <li>4 - Poor Condition <ul> <li>Damage apparent</li> <li>Signs of rain leaking into cabinet</li> </ul> </li> </ul></li></ul>

#### **GENERAL MEETING - 526**

17 March 2021

#### ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Туре	Component	Expected Life	Annual BoM Inspections	Considerations for Condition Assessment
				<ul> <li>Signs of door not closing and sealing properly 5 - Very Poor Condition</li> <li>Serious signs of aging and in need of replacement</li> </ul>
Telemetry Gauge Component	Battery	5 years	Annual, plus remote monitoring.	<ul> <li>Age</li> <li>Express as fraction of expected life expired. (diminishing performance would be reflected in battery data)</li> </ul>
Telemetry Gauge Component	Mounting Structure • Rain Tree	30 years		<ul> <li>Age <ul> <li>Express as fraction of expected life expired.</li> </ul> </li> <li>Visual Inspection <ul> <li>Criteria for Visual Inspection:</li> <li>1 - Excellent Condition <ul> <li>Like brand new</li> </ul> </li> <li>2 - Good Condition <ul> <li>Paint in good condition</li> <li>No signs of corrosion</li> <li>No visible damage</li> <li>Base Slab intact</li> </ul> </li> <li>3 - Reasonable condition <ul> <li>Some signs of corrosion</li> <li>Signs of paint deterioration e.g. flakey or wearing off</li> <li>No visible damage</li> <li>Base Slab - minor cracks or damage apparent</li> </ul> </li> <li>4 - Poor condition <ul> <li>Significant corrosion</li> <li>Deteriorated paint (flaking/worn off)</li> <li>Visible damage</li> <li>Base Slab significant cracks or damage apparent</li> </ul> </li> <li>5 - Very Poor Condition <ul> <li>Serious signs of aging and in need of replacement</li> </ul> </li> </ul></li></ul>

17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Туре	Component		Expected Life	Annual BoM Inspections	Considerations for Condition Assessment
Telemetry Gauge Component	Cable Access Pits		20 years		<ul> <li>Age <ul> <li>Express as fraction of expected life expired.</li> </ul> </li> <li>Visual inspection: <ul> <li>Criteria for Visual Inspection:</li> <li>1 - Excellent Condition <ul> <li>Like brand new</li> </ul> </li> <li>2 -Good Condition <ul> <li>No visible signs of damage</li> </ul> </li> <li>3 - Reasonable condition <ul> <li>Some signs of damage, may need repair (eg lid replacement) or aging is evident</li> </ul> </li> <li>4 - Poor condition <ul> <li>In need of repair or replacement</li> </ul> </li> <li>5 - Very Poor Condition <ul> <li>Serious signs of aging and in need of replacement</li> </ul> </li> </ul></li></ul>
Telemetry Gauge Component	Gas Line - Underground	Underground Gas Line	20 years		<ul> <li>Age</li> <li>Express as fraction of expected life expired. (diminishing condition would be reflected in water level data)</li> </ul>

#### 17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Туре	Component		Expected Life	Annual BoM Inspections	Considerations for Condition Assessment
Telemetry Gauge Component	Gas Line - Exposed	Description         Absence         Absence	10 years		<ul> <li>Age <ul> <li>Express as fraction of expected life expired.</li> </ul> </li> <li>Visual inspection: <ul> <li>Criteria for Visual Inspection:</li> <li>1 - Excellent Condition <ul> <li>like brand new</li> </ul> </li> <li>2 - Good Condition <ul> <li>No signs of corrosion</li> <li>no visible damage,</li> <li>pipe is firmly and securely mounted,</li> <li>orifice is clear of silt/mud)</li> </ul> </li> <li>3 - Reasonable condition <ul> <li>wisible damage (eg slightly bent),</li> <li>mounting instability (eg visible erosion which could undermine mounting of structure or some wobbling of the pipe)</li> <li>Potential for silt mud to build at orifice (eg tidal with minimal clearance).</li> </ul> </li> <li>4 - Poor condition - shows some signs of one or more of the following which would compromise functioning without repair or replacement</li> <li>Significant corrosion</li> <li>visible damage (eg dislodged or bent)</li> <li>mounting instability (eg pipe loose or unlikely to hold firmly in place in flood)</li> <li>silt mud to build at orifice (orifice buried).</li> </ul> </li> <li>5 - Very Poor Condition <ul> <li>No functional</li> <li>(diminishing condition would be reflected in water level data)</li> </ul> </li> </ul>
Telemetry Gauge Component (TM gauge)	Data Logger		10 years	-Recalibration every 3 years.	Age <ul> <li>Express as fraction of expected life expired.</li> <li>Service Checks</li> </ul>

#### GENERAL MEETING - 526

17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Flood Management Devices Portfolio Asset Management Plan

# Appendix E - FMD Recommended Asset Defect Types

Table 9.6 - FMD Defect Types

Defect Type	Description		
Damage	Damage to any Device		
Debris	ebris located within Device or Surroundings		
Missing	Missing FMD Device and/or Components		
Obstruction/Blockage	Obstruction / blockage of any FMD Component		
Pest	Pest species located within the FMD		
Scour	Scour affecting FMD		
Vegetation	Vegetation issues affecting any Device		

#### Table 9.7 - FMD Defect Entry Template

Defect Type	Description	Response
Location	Where is the defect located?	Component (inlet / outlet / batter etc.)
Severity	How severe is the defect?	Very High - 5 - Defect has caused complete loss of asset function High - 4 - Defect has caused significant loss of asset function Moderate - 3 - Defect has caused moderate loss of asset function Low - 2 - Defect has caused minor loss of asset function Very Low - 1 - Defect has caused negligible loss of asset function
Extent	What is the extent Is the defect?	Length / Area / %
Task Required	Work required to rectify defect?	Work activities / specialist requirements etc.

Flood Management Devices Portfolio Asset Management Plan

# Appendix F - FMD Overall Asset Type Replacement / Renewal Graphs

Lifecycle modelling has been conducted at the asset type level to determine the future costs and timing for renewal and replacement of waste assets.

The following graphs illustrate the results of the lifecycle modelling.

This appendix should also be read in conjunction with Appendices G and H that illustrate the impact of current and recommended funding on the condition of the portfolio as derived from the same models. It should also be read in conjunction with Appendix J which lists the assets identified for replacement through the lifecycle model based on their current condition.



Figure 36 - Projected 100 year lifecycle capital renewal and replacement costs



Figure 37 - Estimated total 10 year capital cost by asset type
# **GENERAL MEETING - 526**

17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)



Figure 38- Estimated total 50 year capital cost by asset type



Figure 39 - Estimated total 100 year capital cost by asset type

Flood Management Devices Portfolio Asset Management Plan

## Appendix G - FMD Projected Condition - Overall

The projected condition of MBRC's FMD's has been determined as part of the lifecycle modelling for two different scenarios. The following charts illustrate the projected condition for all assets and then individually for basins and FMD's over a 100-year period. Below condition 4 is considered to be below an acceptable level of service and a trigger for replacement.





Figure 40 - Projected condition for all asset types



Figure 41 - Condition heat maps for all assets

#### Recommended Funding:



Flood Management Devices Portfolio Asset Management Plan

# Appendix H - FMD Projected Condition by Asset Type

The projected condition of MBRC's FMD's has been determined as part of the lifecycle modelling for two different scenarios. The following charts illustrate the projected condition for each asset type over a 100-year period. Below condition 4 is considered to be an unacceptable level of service.



# Flooded Road Warning Systems

Figure 42 - Condition profiles and heat maps for Flooded Road Warning Systems

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Flood Management Devices Portfolio Asset Management Plan

## Maximum Height Gauges



Figure 43 - Condition profiles and heat maps for Maximum Height Gauges

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Flood Management Devices Portfolio Asset Management Plan

## **Rainfall Telemetry Gauges**



Figure 44 - Condition profiles and heat maps for Rainfall Telemetry Gauges

PAGE 78 Supporting Information

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Flood Management Devices Portfolio Asset Management Plan

## **River Telemetry Gauges**



Figure 45 - Condition profiles and heat maps for River Telemetry Gauges

**Recommended Funding:** 

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Flood Management Devices Portfolio Asset Management Plan

## Seepage Monitoring Devices



Figure 46 - Condition profiles and heat maps for Seepage Monitoring Devices

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Flood Management Devices Portfolio Asset Management Plan

## Appendix I - Indicative 25-year NEW Capital Plan

The table below represents an indicative plan for new capital works, based on information in the ePID systems, or estimated forward budgets. All costs are in 2020 dollar terms and do not include allowance for escalation, inflation or GST. The listed projects have been identified through assessment of flooding hazards across the Moreton Bay region. The program of works is subject to review and change as further information becomes available.

#### Table 9.8 - 25yr FMD NEW Capital Plan

Location	Description	Asset Type	Date	Total Cost
New/Upgrade Capital Works for FY	2021			
Caboolture - Bribie Island Road -	Caboolture - Bribie Island Road - Flood Monitoring Camera	Flood Monitoring	30/06/2021	20,000
Flood Monitoring Camera		Camera		
Caboolture - Bruce Highway -	Caboolture - Bruce Highway - Flood Monitoring Camera	Flood Monitoring	30/06/2021	15,000
Flood Monitoring Camera		Camera		
Donnybrook - Pumicestone	Donnybrook - Pumicestone Passage - Tide Monitoring Gauge	Tide Monitoring Gauge	30/06/2021	20,000
Passage - Tide Monitoring Gauge	Installation	Installation		
Installation				
Burpengary - Dale Street - Flood	Burpengary - Dale Street - Flood Monitoring Camera	Flood Monitoring	30/06/2021	20,000
Monitoring Camera		Camera		
Deception Bay - Old Bay Road -	Deception Bay - Old Bay Road - Flooded Road Warning System	Flooded Road Warning	30/06/2021	35,000
Flooded Road Warning System		System		
Deception Bay - Blue Pacific Road -	Deception Bay - Blue Pacific Road - Flooded Road Warning System	Flooded Road Warning	30/06/2021	35,000
Flooded Road Warning System		System		
Narangba - Narangba Road - Rain	Narangba - Narangba Road - Rain Gauge	Rain Gauge	30/06/2021	15,000
Gauge		<u>.</u>	<u>.</u>	
			Total for FY2021:	160,000
New/Upgrade Capital Works for FY	2022			
Nil	Nil		30/06/2022	0
			Total for FY2022:	0
New/Upgrade Capital Works for FY	2023			
Everton Hills - Camelia Avenue -	The project is located on Camelia Avenue, in Boundary Park, Everton	Flood Monitoring	30/06/2023	60,000
Flood Monitoring Station	Hills. The project scope includes the installation of a rain/water level	Station		
Installation	gauge, flood monitoring camera and maximum height gauge to provide			
	detailed information on Kedron Brook flooding which may impact			
	properties including high risk flood hazard properties in Camelia			
	Avenue. The objective of the project is to measure and monitor heavy			

## **GENERAL MEETING - 526**

17 March 2021

### ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Location	Description	Asset Type	Date	Total Cost
	rainfall and water level rises in Kedron Brook to increase resilience to flooding by enabling more accurate and timely flood warning and forecasts for low areas nearby the gauge.			
Moodlu - Williams Road - Flooded Road Warning System with Monitoring Camera	The project is located at Williams Road at Lagoon Creek, Moodlu. The project involves the installation of a flooded road sensor, automatically triggered illuminated signs and flood monitoring camera. The illuminated signs are to be mounted on top of existing standard Road Subject to Flooding" signs with the words "Flooded Road" programmed to illuminate based on water level sensor information. The objective of the project is to provide immediate warning of water over roads to improve motorists? awareness and safety and to provide data for monitoring water over the road to enable more timely closure and opening of roads using real-time information. The flood monitoring camera will provide visual understanding of the flood status of the road."	Flooded Road Warning System with Monitoring Camera	30/06/2023	50,000
Rocksberg - Old North Road - Flooded Road Warning System	The project is located at Old North Road at Caboolture River, Rocksberg . The project involves the installation of a flooded road sensor and automatically triggered illuminated signs to provide immediate warning to road users in the event of road flooding. The illuminated signs are to be mounted on top of existing standard "Road Subject to Flooding" signs with the words "Flooded Road" programmed to illuminate based on water level sensor information. The system will provide real time information on the status of the frequently flooded road. The objective of the project is to provide immediate warning of water over roads to improve motorists' awareness and safety, and to provide data for monitoring water over the road to enable more timely closure and opening of roads. The project will commence in July 2022 and be completed by lune 2023.	Flooded Road Warning System	30/06/2023	35,000
Woodford - Neurum Road - Flooded Road Warning System	The project is located at Neurum Road at Monkeybong Creek, Woodford . The project involves the installation of a flooded road sensor and automatically triggered illuminated signs to provide immediate warning to road users in the event of road flooding. The illuminated signs are to be mounted on top of existing standard "Road Subject to Flooding" signs with the words "Flooded Road" programmed to illuminate based on water level sensor information. The system will provide real time information on the status of the frequently flooded road. The objective	Flooded Road Warning System	30/06/2023	35,000

## **GENERAL MEETING - 526**

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Location	Description	Asset Type	Date	Total Cost
	of the project is to provide immediate warning of water over roads to			
	improve motorists' awareness and safety, and to provide data for			
	monitoring water over the road to enable more timely closure and			
	opening of roads. The project will commence in July 2022 and be			
	completed by June 2023.			
			Total for FY2023:	180,000
New/Upgrade Capital Wo	orks for FY2024		22/22/222	
NII			30/06/2024	0
			Total for FY2024:	0
New/Upgrade Capital Wo	orks for FY2025			
To be identified through a	ongoing		30/06/2025	160,000
flood hazard assessment				
			Total for FY2025:	160,000
New/Opgrade Capital Wo	orks for FY2026		20/05/2025	
NII			30/06/2026	0
			Total for FY2026:	0
New/Upgrade Capital Wo	orks for FY2027		22/22/2227	4.50.000
To be identified through a	ongoing		30/06/2027	160,000
flood hazard assessment			T-1-1 ( 5)/2027	450.000
New /Unaverale Constal M			Total for FY2027:	160,000
New/Opgrade Capital Wo	Orks for FY2028		20/05/2020	
NII			30/06/2028	0
			Total for FY2028:	0
New/Opgrade Capital Wo	orks for FY2029		22/22/2222	4.60.000
To be identified through a	ongoing		30/06/2029	160,000
flood hazard assessment	· · · · · · · · · · · · · · · · · · ·			
New /Unaverale Constal M			Total for FY2029:	160,000
New/Opgrade Capital Wo	Orks for FY2030		22/22/2222	
NII	· · · · · · · · · · · · · · · · · · ·		30/06/2030	0
Now /Ungrado Capital M	arka far FV2021		Total for FY2030:	0
Te he identified through			20/06/2021	100.000
To be identified through (	ongoing		30/06/2031	160,000
noou nazaro assessment	· · · · · · · · · · · · · · · · · · ·	-	Total for FV2021.	100 000
New/Ungrade Capital W	orks for EV2022		10tal for F12031:	160,000
Nil	0163101112032		30/06/2032	0
			Total for FV2032	0

### **GENERAL MEETING - 526**

17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Location	Description	Asset Type	Date	Total Cost
New/Upgrade Capital Wo	orks for FY2033			
To be identified through o	ongoing		30/06/2033	160,000
flood hazard assessment				
			Total for FY2033:	160,000
New/Upgrade Capital Wo	orks for FY2034			
Nil			30/06/2034	0
			Total for FY2034:	0
New/Upgrade Capital Wo	orks for FY2035			
To be identified through o	ongoing		30/06/2035	160,000
flood hazard assessment				
			Total for FY2035:	160,000
New/Upgrade Capital Wo	orks for FY2036			
Nil			30/06/2036	0
			Total for FY2036:	0
New/Upgrade Capital Wo	orks for FY2037			
To be identified through o	ongoing		30/06/2037	160,000
flood hazard assessment				
			Total for FY2037:	160,000
New/Upgrade Capital Wo	orks for FY2038			
Nil			30/06/2038	0
			Total for FY2038:	0
New/Upgrade Capital Wo	orks for FY2039			
To be identified through o	ongoing		30/06/2039	160,000
flood hazard assessment				
			Total for FY2039:	160,000
New/Upgrade Capital Wo	orks for FY2040			
Nil			30/06/2040	0
			Total for FY2040:	0
New/Upgrade Capital Wo	orks for FY2041			
To be identified through o	ongoing		30/06/2041	160,000
flood hazard assessment				
			Total for FY2041:	160,000
New/Upgrade Capital Wo	orks for FY2042			
Nil			30/06/2042	0
			Total for FY2042:	0
New/Upgrade Capital Wo	orks for FY2043			

### **GENERAL MEETING - 526**

17 March 2021

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Location	Description	Asset Type	Date	Total Cost
To be identified through o	ongoing		30/06/2043	160,000
flood hazard assessment				
			Total for FY2043:	160,000
New/Upgrade Capital We	orks for FY2044			
Nil			30/06/2044	0
			Total for FY2044:	0
New/Upgrade Capital Wo	orks for FY2045			
To be identified through o	ongoing		30/06/2044	160,000
flood hazard assessment				
			Total for FY2045:	160,000

ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Flood Management Devices Portfolio Asset Management Plan

## Appendix J – Indicative 25-year RENEWAL Capital Works Plan

The table below represents an indicative renewal and replacement capital works plan, derived from undertaking lifecycle cost modelling based on current condition and asset data. All costs are in 2020 dollar terms and do not include allowance for escalation, inflation or GST. The program of works is subject to review and change as further condition data becomes available.

Asset	Location	Description	Make	Treatment	Total Cost
Number					
Potential Capi	tal Works for FY2021				
Nil					Nil
				Total for FY2021:	0
Potential Capi	tal Works for FY2022				
Nil					Nil
		-		Total for FY2022:	0
Potential Capi	tal Works for FY2023				
A00524170	Burpengary (Dale St) AL Telemetry Gauge	Burpengary (Dale St) AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
A00524171	Burpengary (Rowley Rd) AL Telemetry Gauge	Burpengary (Rowley Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
				Total for FY2023:	42,000
Potential Capi	tal Works for FY2024				
A00524011	Burpengary (Dale St) AL Telemetry Gauge	Burpengary (Dale St) AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524012	Burpengary (Rowley Rd) AL Telemetry Gauge	Burpengary (Rowley Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524013	Caboolture WTP AL Telemetry Gauge	Caboolture WTP AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524025	Round Mt Reservoir AL Telemetry Gauge	Round Mt Reservoir AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524157	Upper Caboolture AL Telemetry Gauge	Upper Caboolture AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524158	Wamuran AL Telemetry Gauge	Wamuran AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524196	Wamuran AL Telemetry Gauge	Wamuran AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
A00524204	Moorina AL Telemetry Gauge	Moorina AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
				Total for FY2024:	220,500
Potential Capi	tal Works for FY2025				
A00314828	Seepage Monitoring Station - Halpine Lakes	Halpine Lakes Reserve - WQMS	Seepage Monitoring	Replace Seepage Monitoring Station	11,956
	Reserve		Station		
A00524205	Morayfield AL Telemetry Gauge	Morayfield AL	Telemetry Gauge	Replace Telemetry Gauge	6,420
A00524018	Deception Bay AL Telemetry Gauge	Deception Bay AL	Telemetry Gauge	Replace Telemetry Gauge	7,169
A00524009	Bribie Island AL Telemetry Gauge	Bribie Island AL	Telemetry Gauge	Replace Telemetry Gauge	7,169
A00524172	Caboolture WTP AL Telemetry Gauge	Caboolture WTP AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
				Total for FY2025:	53,714
Potential Capi	tal Works for FY2026				

17 March 2021

#### ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Asset	Location	Description	Make	Treatment	Total Cost
Number					
A00524161	Youngs Crossing AL Telemetry Gauge	Youngs Crossing AL	Telemetry Gauge	Replace Telemetry Gauge	42,520
A00524038	Samford Village AL Telemetry Gauge	Samford Village AL	Telemetry Gauge	Replace Telemetry Gauge	42,520
A00524014	Cashs Crossing AL Telemetry Gauge	Cashs Crossing AL	Telemetry Gauge	Replace Telemetry Gauge	42,520
A00524208	Normanby Way AL Telemetry Gauge	Normanby Way AL	Telemetry Gauge	Replace Telemetry Gauge	42,520
A00524207	Murrumba Downs AL Telemetry Gauge	Murrumba Downs AL	Telemetry Gauge	Replace Telemetry Gauge	42,520
				Total for FY2026:	212,600
Potential Capi	tal Works for FY2027				
A00524022	Lipscombe Rd AL Telemetry Gauge	Lipscombe Rd AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524206	Mt Samson Rd AL Telemetry Gauge	Mt Samson Rd AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
				Total for FY2027:	57,000
Potential Capi	tal Works for FY2028				
A00524010	Browns Creek Rd AL Telemetry Gauge	Browns Creek Rd AL	Telemetry Gauge	Replace Telemetry Gauge	20,042
A00524020	Laceys Creek AL Telemetry Gauge	Laceys Creek AL	Telemetry Gauge	Replace Telemetry Gauge	20,042
A00524017	Dayboro AL Telemetry Gauge	Dayboro AL	Telemetry Gauge	Replace Telemetry Gauge	20,042
A00524016	Clear Mountain AL Telemetry Gauge	Clear Mountain AL	Telemetry Gauge	Replace Telemetry Gauge	20,042
A00524112	Dayboro (Mt Mee Rd) AL Telemetry Gauge	Dayboro (Mt Mee Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	5,459
A00524173	Murrumba Downs AL Telemetry Gauge	Murrumba Downs AL	Telemetry Gauge	Replace Telemetry Gauge	7,065
A00524247	Cashs Crossing AL Telemetry Gauge	Cashs Crossing AL	Telemetry Gauge	Replace Telemetry Gauge	7,065
A00524021	Lawnton AL Telemetry Gauge	Lawnton AL	Telemetry Gauge	Replace Telemetry Gauge	21,340
A00524215	Samford Village AL Telemetry Gauge	Samford Village AL	Telemetry Gauge	Replace Telemetry Gauge	23,942
A00524249	John Bray Park AL Telemetry Gauge	John Bray Park AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
A00524019	John Bray Park AL Telemetry Gauge	John Bray Park AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524195	Upper Caboolture AL Telemetry Gauge	Upper Caboolture AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
				Total for FY2028:	215,539
Potential Capi	tal Works for FY2029				
A00524198	Youngs Crossing AL Telemetry Gauge	Youngs Crossing AL	Telemetry Gauge	Replace Telemetry Gauge	7,065
A00524169	Beachmere AL Telemetry Gauge	Beachmere AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
A00524160	Woody Point AL Telemetry Gauge	Woody Point AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
				Total for FY2029:	56,565
Potential Capi	tal Works for FY2030				
A00524209	Narangba (Oakey Flat Rd) AL Telemetry Gauge	Narangba (Oakey Flat Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524248	Cedar Creek Rd AL Telemetry Gauge	Cedar Creek Rd AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
A00524250	Lawnton AL Telemetry Gauge	Lawnton AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
A00523637	Strathpine (Gympie Rd) AL Telemetry Gauge	Strathpine (Gympie Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
A00523638	Lipscombe Rd AL Telemetry Gauge	Lipscombe Rd AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
A00523639	Elimbah (Rose Creek Rd) AL Telemetry Gauge	Elimbah (Rose Creek Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
A00523640	Lawnton (Todds Rd) AL Telemetry Gauge	Lawnton (Todds Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	21,000

17 March 2021

### ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Asset	Location	Description	Make	Treatment	Total Cost
A00524004	Caboolture (Pruse Hww) Al Telemetry Gauge	Caboolture (Bruce Hway) Al	Tolomotry Gauge	Ronlace Telemetry Gauge	21.000
A00524004	Roachmara Al Talamatry Gauge	Roschmoro Al	Telemetry Gauge	Replace Telemetry Gauge	21,000
A00524008	Codar Crook Rd Al Tolomotry Caugo	Codar Crook Pd Al	Telemetry Gauge	Replace Telemetry Gauge	20,500
AUU524U15	Ceudi Creek KU AL Teleffietry Gauge	Ceudi Creek KU AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524129	Deception Bay (Creek Rd) AL Telemetry Gauge	Deception Bay (Creek Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
AUU524143	Burpengary (Watnew Cr) AL Telemetry Gauge	Burpengary (Matnew Cr) AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
A00524151	Norrowska (Oplaw Flat Rd) AL Telemetry Gauge		Telemetry Gauge	Replace Telemetry Gauge	21,000
A00524175	Narangba (Oakey Flat Rd) AL Telemetry Gauge	Narangba (Oakey Flat Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
Detential Card				Total for FY2030:	316,500
Potential Capit	tal Works for FY2031	- (			
A00523989	Burpengary (Mathew Cr) AL Telemetry Gauge	Burpengary (Mathew Cr) AL	Telemetry Gauge	Replace Telemetry Gauge	38,627
A00524192	Wamuran (McClure Rd) AL Telemetry Gauge	Wamuran (McClure Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	13,116
A00523999	Ocean View AL Telemetry Gauge	Ocean View AL	Telemetry Gauge	Replace Telemetry Gauge	13,116
A00524147	Toorbul (Donnybrook Rd) AL Telemetry Gauge	Toorbul (Donnybrook Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	39,102
A00524141	Deception Bay (Creek Rd) AL Telemetry Gauge	Deception Bay (Creek Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	38,627
				Total for FY2031:	142,590
Potential Capit	tal Works for FY2032				
A00815211	Wamuran (Eureka Ct) TM Telemetry Gauge	Wamuran (Eureka Ct) TM	Telemetry Gauge	Replace Telemetry Gauge	18,100
A00815210	Wamuran (Eureka Ct) TM Telemetry Gauge	Wamuran (Eureka Ct) TM	Telemetry Gauge	Replace Telemetry Gauge	18,100
A00815208	Eatons Hill TM Telemetry Gauge	Eatons Hill TM	Telemetry Gauge	Replace Telemetry Gauge	18,100
A00815207	Eatons Hill TM Telemetry Gauge	Eatons Hill TM	Telemetry Gauge	Replace Telemetry Gauge	18,100
A00607316	Wamuran (McClintock Rd) AL Telemetry Gauge	Wamuran (McClintock Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	10,515
A00607313	Morayfield (Williamson Rd) AL Telemetry Gauge	Morayfield (Williamson Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	10,515
A00607312	Elimbah (Eaton Rd) AL Telemetry Gauge	Elimbah (Eaton Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	10,515
A00607315	Kallangur AL Telemetry Gauge	Kallangur AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00607325	Kallangur AL Telemetry Gauge	Kallangur AL	Telemetry Gauge	Replace Telemetry Gauge	10,515
A00607318	Kobble Creek (Ladies Rd) AL Telemetry Gauge	Kobble Creek (Ladies Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	10,515
A00607320	Caboolture (Short St) AL Telemetry Gauge	Caboolture (Short St) AL	Telemetry Gauge	Replace Telemetry Gauge	21,205
A00607324	Caboolture (Short St) AL Telemetry Gauge	Caboolture (Short St) AL	Telemetry Gauge	Replace Telemetry Gauge	15,355
A00607319	Rothwell (Anzac Ave) AL Telemetry Gauge	Rothwell (Anzac Ave) AL	Telemetry Gauge	Replace Telemetry Gauge	21,205
A00607311	Delaneys Creek AL Telemetry Gauge	Delaneys Creek AL	Telemetry Gauge	Replace Telemetry Gauge	38,835
A00524148	Dayboro (Mt Mee Rd) AL Telemetry Gauge	Dayboro (Mt Mee Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	36,627
A00607314	Warner AL Telemetry Gauge	Warner AL	Telemetry Gauge	Replace Telemetry Gauge	10,515
A00607317	Highvale AL Telemetry Gauge	Highvale AL	Telemetry Gauge	Replace Telemetry Gauge	13,851
				Total for FY2032:	311,067
Potential Capit	tal Works for FY2033				
A00890163	Kurwongbah (Mumford Rd) FRWS Flooded Road	Kurwongbah (Mumford Rd) FRWS	Flooded Road Warning	Replace Flooded Road Warning	25,680
	Warning System		System	System	

17 March 2021

### ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Asset	Location	Description	Make	Treatment	Total Cost
Number					
A00890161	Kobble Creek (Kobble Creek Rd) FRWS Flooded	Kobble Creek (Kobble Creek Rd) FRWS	Flooded Road Warning	Replace Flooded Road Warning	27,130
	Road Warning System		System	System	
A00890167	Petrie (Youngs Crossing Rd) FRWS Flooded Road	Petrie (Youngs Crossing Rd) FRWS	Flooded Road Warning	Replace Flooded Road Warning	25,680
	Warning System		System	System	
A00890158	Deception Bay (Lipscombe Rd) FRWS Flooded	Deception Bay (Lipscombe Rd) FRWS	Flooded Road Warning	Replace Flooded Road Warning	25,680
	Road Warning System		System	System	
A00890153	Cedar Creek (Cedar Creek Rd) FRWS Flooded Road	Cedar Creek (Cedar Creek Rd) FRWS	Flooded Road Warning	Replace Flooded Road Warning	25,680
	Warning System		System	System	
A00890157	Dayboro (Lees Crossing Rd) FRWS Flooded Road	Dayboro (Lees Crossing Rd) FRWS	Flooded Road Warning	Replace Flooded Road Warning	27,130
	Warning System		System	System	
				Total for FY2033:	156,980
Potential Capi	tal Works for FY2034				
A00524024	Elimbah (Rose Creek Rd) AL Telemetry Gauge	Elimbah (Rose Creek Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	61,148
A00524159	Moodlu (Williams Rd) AL Telemetry Gauge	Moodlu (Williams Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	48,654
A00524023	Beachmere (Riversleigh Rd) AL Telemetry Gauge	Beachmere (Riversleigh Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	46,086
A00524156	Lawnton (Todds Rd) AL Telemetry Gauge	Lawnton (Todds Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	39,722
A00524213	Caboolture (Pumicestone Rd) AL Telemetry Gauge	Caboolture (Pumicestone Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
A00524214	Beachmere (Riversleigh Rd) AL Telemetry Gauge	Beachmere (Riversleigh Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
A00524216	Sheep Station Creek AL Telemetry Gauge	Sheep Station Creek AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
A00524191	Caboolture (Bribie Island Rd) AL Telemetry Gauge	Caboolture (Bribie Island Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524197	Moodlu (Williams Rd) AL Telemetry Gauge	Moodlu (Williams Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
				Total for FY2034:	308,111
Potential Capi	tal Works for FY2035				
A00648565	Beachmere (St Smith Rd) AL Telemetry Gauge	Beachmere (St Smith Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	23,628
A00648564	Beachmere (St Smith Rd) AL Telemetry Gauge	Beachmere (St Smith Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	23,628
A00648563	Deception Bay (Major St) AL Telemetry Gauge	Deception Bay (Major St) AL	Telemetry Gauge	Replace Telemetry Gauge	23,628
A00648562	Deception Bay (Major St) AL Telemetry Gauge	Deception Bay (Major St) AL	Telemetry Gauge	Replace Telemetry Gauge	23,628
A00632064	Caboolture (Machinery Pde) AL Telemetry Gauge	Caboolture (Machinery Pde) AL	Telemetry Gauge	Replace Telemetry Gauge	19,909
A00634317	Caboolture (Machinery Pde) AL Telemetry Gauge	Caboolture (Machinery Pde) AL	Telemetry Gauge	Replace Telemetry Gauge	14,417
A00634316	Samford Valley AL Telemetry Gauge	Samford Valley AL	Telemetry Gauge	Replace Telemetry Gauge	13,440
		<u> </u>	· · · ·	Total for FY2035:	142,278
Potential Capi	tal Works for FY2036			· · · · · · · · · · · · · · · · · · ·	
A00632065	Banksia Beach AL Telemetry Gauge	Banksia Beach AL	Telemetry Gauge	Replace Telemetry Gauge	11,457
A00607326	Rothwell (Anzac Ave) AL Telemetry Gauge	Rothwell (Anzac Ave) AL	Telemetry Gauge	Replace Telemetry Gauge	15,355
A00524152	Kippa Ring AL Telemetry Gauge	Kippa Ring AL	Telemetry Gauge	Replace Telemetry Gauge	13,617
A00524050	Strathpine (Gympie Rd) AL Telemetry Gauge	Strathpine (Gympie Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	41,802
A00524052	Caboolture (Bribie Island Rd) AL Telemetry Gauge	Caboolture (Bribie Island Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	50,000
A00523996	Caboolture (Bruce Hwy) AL Telemetry Gauge	Caboolture (Bruce Hwy) AL	Telemetry Gauge	Replace Telemetry Gauge	45,627

17 March 2021

#### ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Asset	Location	Description	Make	Treatment	Total Cost
A00524051	Beerburrum-Woodford Rd AL Telemetry Gauge	Beerburrum-Woodford Rd Al	Telemetry Gauge	Replace Telemetry Gauge	14 865
A00524210	Caboolture (Pumicestone Rd) AL Telemetry Gauge	Caboolture (Pumicestone Bd) Al	Telemetry Gauge	Replace Telemetry Gauge	50,651
A00524155	Sheep Station Creek AL Telemetry Gauge	Sheep Station Creek AL	Telemetry Gauge	Replace Telemetry Gauge	62.733
				Total for FY2036:	306.108
Potential Capit	al Works for FY2037				000,200
A00815215	Caboolture (Machinery Pde) MHG Maximum	Caboolture (Machinery Pde) MHG	Maximum Height	Replace Maximum Height Gauge	20,000
	Height Gauge		Gauge		
A00815216	Caboolture (Pumicestone Rd) MHG Maximum	Caboolture (Pumicestone Rd) MHG	Maximum Height	Replace Maximum Height Gauge	20,000
	Height Gauge		Gauge		
A00815217	Caboolture (Short St) MHG Maximum Height	Caboolture (Short St) MHG	Maximum Height	Replace Maximum Height Gauge	20,000
	Gauge		Gauge		
A00815218	Caboolture WTP MHG Maximum Height Gauge	Caboolture WTP MHG	Maximum Height	Replace Maximum Height Gauge	20,000
			Gauge		
A00815219	Rothwell (Anzac Ave) MHG Maximum Height	Rothwell (Anzac Ave) MHG	Maximum Height	Replace Maximum Height Gauge	20,000
	Gauge		Gauge		
A00815220	Burpengary (Mathew Cr) MHG Maximum Height	Burpengary (Mathew Cr) MHG	Maximum Height	Replace Maximum Height Gauge	20,000
	Gauge		Gauge		
A00817431	Short Street	Short Street	Maximum Height	Replace Maximum Height Gauge	20,000
			Gauge		
Detential Canit	al Marke for EV2020			Total for FY2037:	140,000
	al WORKS IOF F12038			Deplese Fleeded Deed Werning	25,000
A00890169	Strathpine (Mott St) FRWS Flooded Road Warning	Strathpine (Mott St) FRWS	Flooded Road Warning	Replace Flooded Road Warning	25,680
A008001CF	System Margufield (Undernass Dd) EDM/S Elected Deed	Margufield (Undernass Dd) FDN/S	System	System	25 680
A00890165	Worning System	Moraylield (Onderpass Rd) FRWS	Suctom		25,080
100800164	Marayfield (Grogan Pd) EPW/S Elected Poad	Moraufield (Grogan Pd) EPW/S	Eloodod Road Warping	Poplace Flooded Road Warning	25 680
A00890104	Warning System	worayneid (Grogan Ku) r Kws	System	System	25,080
A00890162	Kurwongbab (Moore Rd) FRW/S Flooded Road	Kurwonghah (Moore Rd) FRWS	Elooded Road Warning	Replace Flooded Road Warning	25 680
A00030102	Warning System		System	System	23,000
A00632063	Samford Valley AI Telemetry Gauge	Samford Valley Al	Telemetry Gauge	Replace Telemetry Gauge	18 559
A00815212	Wamuran (Fureka Ct) MHG Maximum Height	Wamuran (Eureka Ct) MHG	Maximum Height	Replace Maximum Height Gauge	20,000
//00013212	Gauge		Gauge	Replace Maximum Height Budge	20,000
A00815213	Burpengary (Dale St) MHG Maximum Height	Burpengary (Dale St) MHG	Maximum Height	Replace Maximum Height Gauge	20.000
	Gauge		Gauge		-,
A00815214	Deception Bay (Creek Rd) MHG Maximum Height	Deception Bay (Creek Rd) MHG	Maximum Height	Replace Maximum Height Gauge	20,000
	Gauge	. , , , -	Gauge		
A00815209	Eatons Hill MHG Maximum Height Gauge	Eatons Hill MHG	Maximum Height	Replace Maximum Height Gauge	20,000
	- •		Gauge	- •	

17 March 2021

## ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Asset	Location	Description	Make	Treatment	Total Cost
Number					
New	Caboolture - Bribie Island Road	Flood Monitoring Camera		Replace	20,000
New	Caboolture - Bruce Highway	Flood Monitoring Camera		Replace	15,000
New	Burpengary - Dale Street	Flood Monitoring Camera		Replace	20,000
New	Deception Bay - Old Bay Road	Flooded Road Warning System		Replace	35,000
				Total for FY2038:	291,279
Potential Capi	tal Works for FY2039				
New	Deception Bay - Blue Pacific Road	Flooded Road Warning System		Replace	35,000
New	Everton Hills - Camelia Avenue	Flood Monitoring Station Installation		Replace	60,000
New	Moodlu - Williams Road	Flooded Road Warning System with		Replace	50,000
		Monitoring Camera			
				Total for FY2039:	145,000
Potential Capi	tal Works for FY2040				
New	Rocksberg - Old North Road	Flooded Road Warning System		Replace	35,000
New	Woodford - Neurum Road	Flooded Road Warning System		Replace	35,000
A00524010	Browns Creek Rd AL Telemetry Gauge	Browns Creek Rd AL	Telemetry Gauge	Replace Telemetry Gauge	20,042
A00524020	Laceys Creek AL Telemetry Gauge	Laceys Creek AL	Telemetry Gauge	Replace Telemetry Gauge	20,042
A00524011	Burpengary (Dale St) AL Telemetry Gauge	Burpengary (Dale St) AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524012	Burpengary (Rowley Rd) AL Telemetry Gauge	Burpengary (Rowley Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524013	Caboolture WTP AL Telemetry Gauge	Caboolture WTP AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524019	John Bray Park AL Telemetry Gauge	John Bray Park AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524025	Round Mt Reservoir AL Telemetry Gauge	Round Mt Reservoir AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524170	Burpengary (Dale St) AL Telemetry Gauge	Burpengary (Dale St) AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
A00524196	Wamuran AL Telemetry Gauge	Wamuran AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
	·			Total for FY2040:	294,585
Potential Capi	tal Works for FY2041				
New	Donnybrook - Pumicestone Passage	Tide Monitoring Gauge Installation		Replace	20,000
New	Narangba - Narangba Road	Rain Gauge		Replace	15,000
A00524017	Dayboro AL Telemetry Gauge	Dayboro AL	Telemetry Gauge	Replace Telemetry Gauge	20,042
A00524016	Clear Mountain AL Telemetry Gauge	Clear Mountain AL	Telemetry Gauge	Replace Telemetry Gauge	20,042
A00524204	Moorina AL Telemetry Gauge	Moorina AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524206	Mt Samson Rd AL Telemetry Gauge	Mt Samson Rd AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
				Total for FY2041:	132,085
Potential Capi	tal Works for FY2042				
New	Various	Various		Replace	160,000
New	Various	Various		Replace	160,000
				Total for FY2042:	320,000
Potential Capi	tal Works for FY2043				

17 March 2021

### ITEM 2.1 - FLOOD MANAGEMENT DEVICES PORTFOLIO ASSET MANAGEMENT PLAN - 61712125 (Cont.)

Asset Number	Location	Description	Make	Treatment	Total Cost
A00524171	Burpengary (Rowley Rd) AL Telemetry Gauge	Burpengary (Rowley Rd) AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
A00524172	Caboolture WTP AL Telemetry Gauge	Caboolture WTP AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
A00524157	Upper Caboolture AL Telemetry Gauge	Upper Caboolture AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524158	Wamuran AL Telemetry Gauge	Wamuran AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524195	Upper Caboolture AL Telemetry Gauge	Upper Caboolture AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
				Total for FY2043:	120,000
Potential Capi	tal Works for FY2044				
New	Various	Various		Replace	160,000
New	Various	Various		Replace	160,000
			· · · · · · · · · · · · · · · · · · ·	Total for FY2044:	320,000
Potential Capi	tal Works for FY2045				
A00524198	Youngs Crossing AL Telemetry Gauge	Youngs Crossing AL	Telemetry Gauge	Replace Telemetry Gauge	7,065
A00314828	Seepage Monitoring Station - Halpine Lakes	Halpine Lakes Reserve - WQMS	Water Seepage	Replace Seepage Monitoring Station	11,956
	Reserve		Monitoring Station		
A00524021	Lawnton AL Telemetry Gauge	Lawnton AL	Telemetry Gauge	Replace Telemetry Gauge	21,340
A00524205	Morayfield AL Telemetry Gauge	Morayfield AL	Telemetry Gauge	Replace Telemetry Gauge	6,420
A00524018	Deception Bay AL Telemetry Gauge	Deception Bay AL	Telemetry Gauge	Replace Telemetry Gauge	7,169
A00524009	Bribie Island AL Telemetry Gauge	Bribie Island AL	Telemetry Gauge	Replace Telemetry Gauge	7,169
A00524248	Cedar Creek Rd AL Telemetry Gauge	Cedar Creek Rd AL	Telemetry Gauge	Replace Telemetry Gauge	21,000
A00524015	Cedar Creek Rd AL Telemetry Gauge	Cedar Creek Rd AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
A00524022	Lipscombe Rd AL Telemetry Gauge	Lipscombe Rd AL	Telemetry Gauge	Replace Telemetry Gauge	28,500
				Total for FY2045:	139,118