



North West Queensland Regional Waste Management Plan



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ACRONYMS

APC	APC Waste Consultants
ASC	Aboriginal Shire Council
Burke SC	Burke Shire Council
Carpentaria SC	Carpentaria Shire Council
COEX	container exchange
C&I	commercial and industrial
C&D	construction and demolition
CFL	compact fluorescent lamps
CRP	container refund point
CRS	container refund scheme
DES	Department of Environment and Science
Doomadgee ASC	Doomadgee Aboriginal Shire Council
EOL	end of life
ESD	ecologically sustainable development
EPA	Environment Protection Authority
EPS	expanded polystyrene
Etheridge SC	Etheridge Shire Council
Flinders SC	Flinders Shire Council
FNQROC	Far North Queensland Regional Organisation of Councils
FOGO	food organics and garden organics
ILM	investment logic map
ILUA	Indigenous Land Use Agreement
LGA	Local Government area
McKinlay SC	McKinlay Shire Council
Mount Isa CC	Mount Isa City Council
MRF	material recovery facility
MSW	municipal solid waste
NRM	Natural Resource Management
NSW	New South Wales
NWQROC	Northwest Queensland Regional Organisation of Councils Inc.
PIN	penalty infringement notices
RAPAD	Remote Area Planning and Development Board
Richmond SC	Richmond Shire Council
RORO	roll-on roll-off
RWMP	Regional Waste Management Plan
SDG	sustainable development goals
SUP	single-use plastic
TMR	Transport and Main Roads
TS	transfer station
ULAB	used lead-acid batteries
UN	United Nations
WAC	Waste Advisory Committee
WMRR	Waste Management and Resource Recovery Strategy

Acknowledgement

The APC and Aurecon project team wish to acknowledge the enormous support and co-operation afforded us by council staff and elected representatives. In addition, we acknowledge staff from agencies of the Queensland Government, neighbouring local councils and other stakeholders that gave freely of their time and shared expertise. It greatly assisted in the preparation of this RWMP.

EXECUTIVE SUMMARY

This Northwest Queensland Regional Waste Management Plan (Plan) identifies the issues and opportunities specific to the Northwest Queensland Region of Councils (NWQROC) and its ten local government areas (LGAs):

- Burke SC
- Carpentaria SC
- Cloncurry SC
- Croydon SC
- Doomadgee ASC
- Etheridge SC
- Flinders SC
- McKinlay SC
- Mount Isa CC
- Richmond SC.



While Doomadgee ASC is a member of NWQROC, the council is also a participant in the development of the First Nations Southern Gulf Regional Waste Management Plan, along with Mornington Island SC and Kowanyama ASC, addressing the priorities and indicators documented in the First Nations Respecting Country Waste Strategy. Agreement has been reached with Doomadgee ASC for the inclusion of common issues into the NWQROC Plan which will ensure maximum alignment between the two (2) plans avoiding duplication of effort and supporting Doomadgee ASC in implementing all identified actions. This Plan should be read with these inclusions in mind.

In June 2023 Croydon SC became a member of the NWQROC. Prior to joining, the Council's waste management issues had been identified and included in the Far North Queensland Regional Resource Recovery Plan. Preliminary analysis shows they are consistent with the other nine (9) NWQROC member Councils and following consultation, Council has agreed to the incorporation of its needs into this Plan. This will support Croydon SC in implementing all identified actions and will involve the adjustment of implementation cost estimates and the inclusion of additional information in this Plan. This, and adjustments required in relation to Doomadgee ASC, will be undertaken when the Regional Support Resource is in place.

The region faces immense challenges, with just 31,000 people in 22 discrete communities in an area of 350,000 km² or 20% of the Queensland landmass. However, transformative actions taken toward future management of waste in the region will assist in meeting the state government's ambitious targets by 2050 to:

- reduce household waste by 25%
- achieve 75% recovery across all waste streams
- 90% of all waste is recovered and not landfilled.

In researching and developing this Plan, site visits and interviews were undertaken with officers of member Councils. This was followed by series of workshops with both senior council managers and elected members of the NWQROC to initially define current issues and challenges, then identified opportunities, refine and select preferred options, and to identify a pathway for implementation.

The outcome of the Plan is summarised here and in Tables EX2 and EX3 and detailed in the body of this Plan, indicating an implementation roadmap and a total estimated capital and operational funding identified to FY30-31 of \$59 million.

Issues

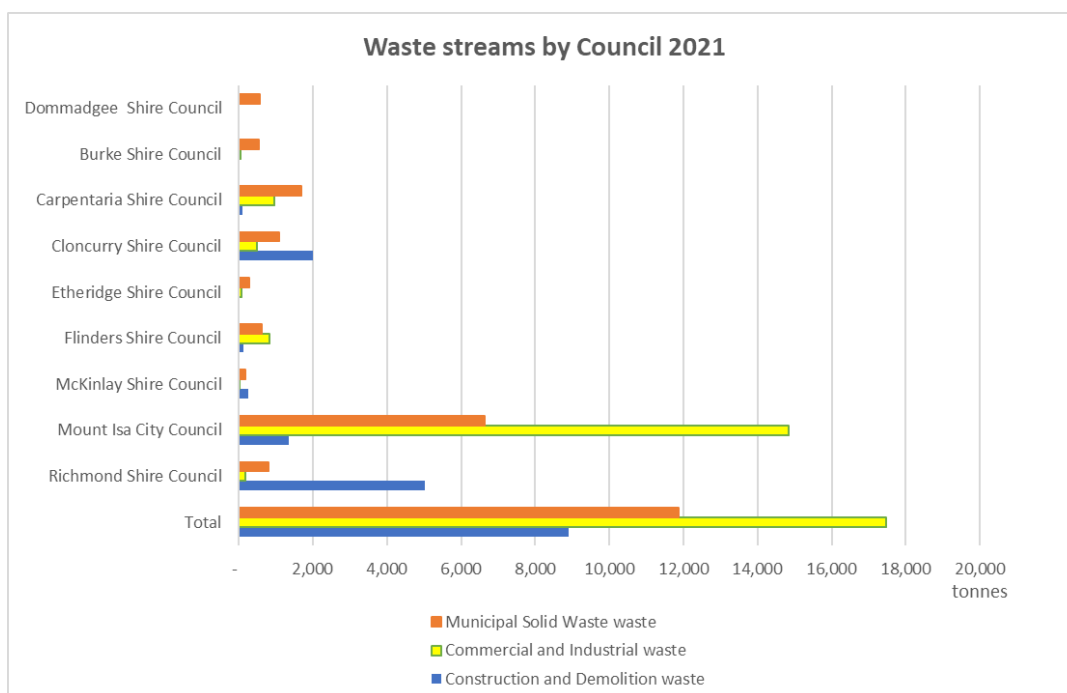
Across the region, each council has particular issues and constraints. Common regional themes include geographic isolation, significant seasonal weather impacts, constrained council budgets, transient staff and management, declining populations, diverse waste streams, poor economies of scale, expensive freight by road or rail and tyranny of distance to end markets.

The key issues identified for the region include depleting landfill capacity, litter and illegal dumping especially abandoned vehicles and other items, accumulated legacy waste at landfills (especially tyres, concrete, scrap metal white goods, and vegetation), lack of regional processing capacity, lack of reliable data to inform business case development, and minimal current diversion from landfill.

There are currently 27 waste disposal facilities throughout the region comprising 25 landfills and two (2) transfer stations. All councils operate their own waste management facilities by day labour, apart from Carpentaria and Richmond councils, where operations are outsourced to a private contractor. All councils also undertake their own waste collection by day labour except for Mount Isa and Cloncurry, where kerbside waste collection has been contracted out.

In 2021, an estimated 43,870 tonnes of waste were reported as generated throughout the region, excluding Croydon Council, of which 38,000 tonnes was sent to landfill. Figure EX1 summarises waste generation by council and waste stream. These figures exclude mining operations, which self-manage waste arisings with only limited data visibility available from reported activities directly to Department of Environment and Science (DES). Currently, Mount Isa City Council generates approximately 60% of the region’s waste arisings from 60% of the region’s population.

Figure EX1: Waste generation by council and stream (2021)



NB: This data is subject to updating to include Croydon Council

The 2021 regional diversion of waste from disposal performance is 13%, however this is achieved by substantial stockpiles of legacy waste especially unprocessed concrete, tyres, garden, timber, scrap metals and e-waste.

Challenges to improving the current situation as alluded to above have been acknowledged by the Queensland Waste and Resource Recovery Infrastructure Report (2021) which identifies future infrastructure needs and opportunities. For remote Queensland, the report notes: *'whilst opportunities to improve the recovery of most streams exist, there are also significant practical and financial challenges in doing so' ... 'that such efforts are likely to be less ambitious than other regions, given the significant challenges.'*

Litter and Illegal Dumping

Litter and dumping of household waste and abandoned motor vehicles are a blight on the landscape and can present a hazard to both domestic animals and wildlife. It is estimated over 220 abandoned vehicles are located within the region. Many councils have dumping 'hot spots' and areas out of sight where dumped materials have accumulated over decades and are now beyond the councils' capacity to manage with individual council clean-up costs exceeding \$300,000 for a single but extensive site. Mapping of both vehicles and 'hot spots' is required to provide a baseline for remedial action.

Once current dumping is removed, measures to reduce a recurrence including video surveillance, earth barriers to roads frequently used and community messaging should be developed. A range of stakeholders who are familiar with the issues including but not limited to council, police, rangers, TMR and Southern Gulf NRM should be invited to participate in an ongoing working group to manage these issues and prevent a recurrence. Support of regional media including television, radio and newsprint can assist in spreading messages around impact of littering and dumping and penalties.

The total indicative capital cost for activities associated with litter and illegal dumping clean-up is **\$1.1 million** to the FY 30-31. Ongoing education campaign with video surveillance at hot spots is also recommended.

Legacy waste

All councils have accumulated large quantities of tyres, garden waste and timber, concrete and scrap metal at waste facilities, to the extent that these are now considered 'legacy waste' owing to the scale and management of the stockpiles and are now beyond the financial capacity of individual councils to address. These stockpiles potentially present significant fire risks.

To manage these legacy waste issues, a regional processing contract for organics and concrete for local reuse and for metals and tyres for freighting to end markets has been identified. To inform this initiative a volumetric assessment is required to provide an accurate estimate of the quantities and mapping of all sites.

The total indicative capital cost for activities associated with legacy waste clean-up of stockpiles at waste facilities is **\$4.9 million** to the FY 30-31. Once these stockpiles are addressed, ongoing regular routine processing is required to prevent a recurrence. [Note: FNQROC operates a regional model, overseeing the collection of scrap-metal for the region on behalf of its council members. Subject to quantities generated, each council is serviced annually or bi-annually, with income-sharing between the processors and the councils.

Recycling

Enshrining the principles of circular economy into day-to-day waste operations has challenges, particularly given the geographic isolation, small quantities and disproportionate freight costs for the region. Currently, the only recycling opportunities for used packaging in the region is through the COEX Containers for Change program.

The region has only three permanent redemption sites (Cloncurry SC, Normanton SC and Mount Isa CC) and mobile services to some communities in Burke SC, Croydon SC and Etheridge SC. With the State Government announcement to include wine and spirit containers in the Container Refund Scheme, equity of access is important, particularly when four councils have no access to COEX sites nor are any kerbside services offered. Some commercial premises in Mount Isa CC are provided with cardboard services, although collections are currently landfilled.

Mount Isa CC has approved the establishment of a Material Recovery Facility (MRF) to support the introduction of a kerbside recycling service to its residents, and potentially neighbouring Cloncurry SC, at an indicative cost of \$13million for site infrastructure plus an additional \$1million for household bins and an education campaign.

Efforts to source-separate some materials at landfills include garden, green waste and timber, concrete, scrap metal, white goods, vehicles and tyres. Other separation includes: e-waste, used motor/cooking oils, used lead-acid batteries (ULABs) with some sites also collecting paint, gas bottles and fire extinguishers. Future waste streams requiring management during the life of this Plan will include e-waste. Currently, Carpentaria SC and Mount Isa CC are separating e-waste but with no destination confirmed for recovery.

Dialogue with Mount Isa's Glencore Mines indicates it is conducting a series of trials to determine if e-waste and tyres can be added to the furnace as an alternate fuel source. The trials are still underway and outcomes unknown. The mine seeks and encourages ongoing dialogue with councils, who may control future usable waste fuel sources for the mine and provide mutually beneficial outcomes to all parties.

Spent photovoltaic solar panels and wind turbines are also an emerging waste streams. This is an emerging issue for the region with several large solar and wind farms either already established or planned for the region. A plan for these future waste streams is needed as the end-of-life management cannot be borne by councils. End of life waste disposal must be considered at the planning approval stage and applications appropriately conditioned, so the proponent bears the cost and responsibility. An ongoing advocacy role to both State and Commonwealth government will be required to ensure that these developments do not create new legacy waste items in the region.

The total indicative capital cost for activities associated with recycling and resource recovery is **\$13.1 million** to the FY 30-31. A budget of \$65,000 would allow advocacy projects to be undertaken to assist the region develop recycling capability in the region.

Organics management

While much focus is on used packaging waste, which requires transport to end markets in either coastal or capital cities, organic waste such as vegetation, timber and food-waste recovery can be processed and used locally. Organic waste is a high-priority material to mitigate greenhouse gas generation and increased landfill volumes, as governments seek to transition to zero emissions. A

consistent theme across all tiers of government is the need to reduce organics through policy instruments including the National Food Waste Strategy (2017), National Waste Policy (2019) and Action Plan (2020), which seek to halve organic waste to landfill by 2030. The Queensland Organic Strategy (2022–32) seeks to halve the amount of food waste generated by 50% by 2030, to divert 80% of organic waste from landfill and achieve a minimum recycling rate of 70%.

Organics can be processed and used locally, from chipping of garden waste, vegetation and timber for mulch to composting programs with vegetation, timber and food waste. Operations can be scaled to the volumes requiring processing and to meet end market specifications. A composting program in the region has been identified as the cornerstone of the drive for waste diversion given a recent waste audit at Mount Isa CC found 44% of the general waste bin contents are organic garden and food waste, and an additional 18% are other organic materials including 13% cardboard.

All State governments are encouraging councils to tackle organic waste to reduce climate-change impacts. For this region, small councils can encourage and support home and or community composting with community education, while larger councils such as Mount Isa CC and Cloncurry SC can consider offering a food organics and garden organics (FOGO) kerbside service.

The total indicative capital cost for activities associated with organics management including to establish a processing facility with industrial shredder, kerbside service to Mount Isa CC and Cloncurry SC and a home composting and community education program is **\$5.2 million** to the FY 30-31. To support local home and business organics management with home composting and worm farming an annual provision of \$500,000 is required for bins, training and outreach activities.

Residual waste management

The absence of reliable data is apparent throughout the region due to the lack of weighbridges at waste facilities (except for Mount Isa CC). Without reliable data to inform funding decisions, this RWMP has relied on annual Department of Environment and Science (DES) waste survey data filed by each council. Enhanced data recording provides opportunities to implement fees and charges more fairly, particularly on government contractors, utility service providers, State Agencies, and construction companies. Introduction of public fees and charges needs to be carefully undertaken however fees on commercial operators could be undertaken as an annual charge.

The majority of the larger centres within the region have sufficient capacity in their existing landfills for the next 10 years at least, with a reported 40 years available at Mount Isa CC. Many of the region's smaller landfills however are near, at or beyond capacity. With the increasing compliance obligations, limited budget reserves and unknown closure and post-closure liabilities for landfills, transitioning sites to transfer stations is considered the best alternative to reduce compliance and operational challenges for smaller councils.

A key initiative of this first Plan is to transform waste disposal by reducing 24 landfills to 9, building 15 new transfer stations, and upgrading all sites, including unmanned sites, with remote access, which has been successfully implemented in other council jurisdictions. All sites require improved customer-facing signage and bunded storage facilities for regulated wastes.

Burke SC's Burketown landfill has an imperative to be closed and rehabilitated by 2026. Urgent attention is required to identify and secure a waste disposal solution given the lengthy timeframes to have a solution in place. No indicative cost for a new landfill is known given no alternative site has been identified. If waste transfer is part of the solution, an estimated figure of \$1.4 Million has been

identified for waste transfer stations at Burketown and Gregory landfills and an indicative transport cost for both Burketown and Gregory waste transfer to an intra-regional landfill could be in the vicinity of \$150,000 per annum plus notional gate fees to be negotiated.

Mount Isa CC and Cloncurry SC recently entered into a kerbside collection contract with the private sector for general waste collections. Given the absolute reliance on collection equipment to perform kerbside services, McKinlay, Richmond and Flinders councils currently provide ad hoc support to each other as and when required. The collection fleet is replicated and not fully utilised in any council. Richmond's proximity to its neighbouring councils (115–150 kilometres) affords opportunities for waste collection consolidation with resource sharing, or regional service provision.

Richmond SC's strategic location in the centre of the three councils provides future landfill consolidation especially if resource sharing of waste collection vehicles occurs and domestic waste is transported to the Richmond landfill instead of local landfills. The landfills at Hughenden and Julia Creek could be transitioned to transfer stations in the second 5-year Plan.

The total indicative capital cost for activities associated with waste disposal is **\$22.4 million** to the FY 30-31. In addition, ongoing financial support will be required to offset the transport costs, not all of which can be currently identified, and ongoing operational costs for both the short-term needs and long-term solutions.

Education

The role of education and community engagement cannot be underestimated. However, any education and community engagement program must be multi-faceted in order to reach all community members. The region could engage with local radio, newsprint and television as part of their community service obligation to run several campaigns focused on litter and dumping, reduce reuse and recycle materials and organics management.

The initial budget of **\$340,000** has been allocated to develop an education campaign and a further **\$1.2 million** to deliver the first education campaign. An estimated annual ongoing budget of **\$350,000** has been identified.

Resources

There is limited regional co-ordination and collaboration with councils operating independent waste collection, processing, disposal operations, and community education, which in turn leads to replication of services and duplication of effort. However, there are several opportunities for member councils to work together for regional solutions, given their common issues in relation to regional contracting for the management of legacy and recurrent bulky waste, waste collection, waste disposal, processing kerbside recycling and community education.

Access to regional facilitation/co-ordination support is essential for implementation of this Plan by councils. Implementation at the regional scale will also require funding to co-ordinate, liaise and advocate for better waste outcomes in the region with the State Government as is funding support to develop supporting documentation for funding applications.

Support is required around the development of business plans and forecasting suitable for approval by the Queensland Government, particularly for infrastructure such as new or improved transfer facilities, new waste collections, processing infrastructure and community education. Funding for

capital expenditure such as small or even large-scale long-term infrastructure improvements may also be facilitated by government, pending specific business case development. A recurrent annual budget of **\$275,000** is required.

Other operational items identified include a further **\$500,000** annually estimated to be required to facilitate ongoing the identified activity home and community composting, and transportation subsidies of **\$250,000** annually should the Burketown landfill close and waste transport becomes imperative have also been identified. Capacity building within the region and advocacy on behalf of the region has been considered and annual provisional amount of **\$100,000** included to cover costs and provide opportunity to engage external experts and technical support as required.

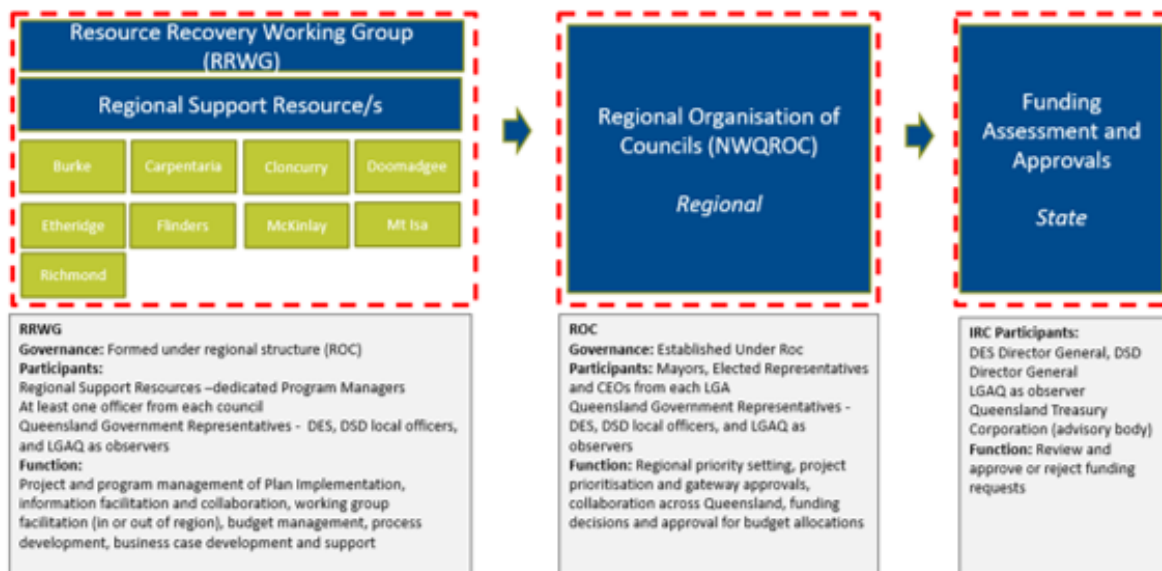
Implementing the Plan

Costs for implementation of this Plan as summarised in the following Table EX1, are estimated at **\$59.1 million (2023)** over the period to FY30–31, with the assumption that changes to residual waste management come into effect beyond this period.

Regional collaboration and responsibilities

Under the existing NWQROC, the region has a collaborative approach to strategy development and implementation and will continue to collaborate on the Plan’s implementation. Responsibility for decision making for the implementation of interventions under this Plan will sit with individual councils facilitated by the NWQROC to co-ordinate funding requests required to the Queensland Government for approval under the following structure:

Figure EX2: Governance arrangements



Review and monitoring

Implementation of the Plan will be the responsibility of the NWQROC. Initial actions will be measured against progress, but longer-term review should be against metrics including delivery of specific services identified in the RWMP. The Plan should be reviewed and updated every five years.

The budget (2023) required to implement the plan allocated to the five key pillars is summarised in Table Ex1.

Table EX1: Budget to FY30-31

Activity	Budget
Capital	
Litter and Illegal Dumping	
Abandoned vehicle mapping and tender	\$100,000
Removal of abandoned vehicles and illegal dumping to local disposal sites	\$1,000,000
Recycling and Resource Recovery	
MRF – Mount Isa (infrastructure and equipment)	\$13,100,000
Organics Management	
Business Plan for establishing an organics processing facility (Mount Isa CC)	\$100,000
Compost facility and shredder (Mount Isa CC)	\$1,800,000
FOGO implementation x 8,000 households (Mount Isa CC)	\$2,000,000
FOGO implementation x 1500 households (Cloncurry SC)	\$375,000
Home composting program and education	\$960,000
Residual Waste	
New transfer station Burketown (including capping old landfill)	\$1,100,000
Cap and close 14 landfills, design and construct 14 new transfer stations	\$8,400,000
Skip Bins for new Transfer Stations	\$1,200,000
New landfill (Cloncurry)	\$8,000,000
Remote access system to all unmanned sites	\$1,650,000
Weighbridges for all remaining supervised landfills	\$950,000
Upgrade to all remaining sites (signage, fencing etc)	\$450,000
Hook truck to be shared between Councils	\$350,000
Rectification works to large transfer station (Mount Isa CC)	\$200,000
Landfill masterplan and airspace assessment for Normanton (Carpentaria SC)	\$100,000
Legacy Waste	
Determine legacy stockpiles quantities	\$150,000
Tender for tyre legacy shred and transport to end processor	\$2,000,000
Tender for concrete crushing of legacy waste for local reuse	\$900,000
Tender for garden and wood waste legacy chipping	\$900,000
Tender for scrap metal legacy clean-up	\$900,000
Education	
Initial education campaign	\$1,540,000
Sub-total	\$48,785,000
Operational (per annum)	
Resources	
Regional Support Resource to support Regional Resource Recovery Working Group	\$275,000
Home / community composting support program	\$500,000
Capacity building and Advocacy Role as identified and required including technical financial support re sustainable waste management fees and charges	\$100,000
Education	
Yearly community education	\$350,000
Transport and Operational Support	
Transport subsidies and waste disposal fee for Burketown (Burke SC)	\$250,000
Sub-total (per annum)	\$1,475,000
Total Operation over 7 years	\$10,325,000
Total	\$59,110,000

Implementation roadmap

An implementation roadmap has been developed, identifying timing and activities to deliver this Plan. Within each priority area is a list of actions; some are interrelated while others are stand-alone. Actions are based on short term, 5 years (high priority) and long term, (5 – 10 years) in Tables EX2 and EX3.

Table EX2: Implementation Roadmap – high priority issues – within 5 years

Activity	
Operational implementation of RWMP	
1	Establish RWMP Resource Recovery Working Group for member councils to guide implementation
2	Engage a Regional Support Resource to oversee implementation
3	Advocate for Mount Isa CC to be excluded from waste levy zone given no interstate or mining waste is deposited at landfill and the funds are needed to support the economics of recycling and local reuse
4	Adopt advocacy role with collaboration and co-operation engaging mining sector and state regulatory framework
5	Advocate that new wind or solar farms must take responsibility for EOL management of all waste streams and not burden local council or community waste facilities
6	Maintain contact with Glencore Mines in relation to fuel source trials
7	Provide capacity building on issues / matters as identified by member councils and engage experts to assist as required
8	Review and facilitate inclusion of updated information in the Plan and alignment of actions for Doomadgee ASC and Croydon SC with related Plans
Litter and illegal dumping	
9	Identify and map the location of illegal dumping and abandoned vehicles
10	Co-ordinate regional-collection tender to collect and transport abandoned cars to nearest landfill
11	Develop and implement community education campaign around litter, illegal dumping and abandoned motor vehicles
Recycling and resource recovery	
12	Seek DES support to have COEX redemption services in all councils
13	Support Mount Isa and Cloncurry to introduce a kerbside recycling service
14	Assist with the development of a sub-regional processing facility for kerbside recycling
15	Develop and implement a community education campaign based on reduce, reuse and recycle
Legacy waste	
16	Estimate all legacy stockpiles at all waste disposal facilities
17	Prepare regional scrap-metal tender (Ref: FNQROC model) or as an annexe to the next FNQROC tender, subject to timing and support from FNQROC
18	Prepare regional/sub-regional concrete-crushing tender
19	Prepare regional/sub-regional garden and wood waste chipping service
20	Prepare regional/sub-regional tyre-shredding tender
Organics management	
21	Develop a region-wide campaign to support organic waste recycling with subsidised compost bins/worm farms
22	Develop business plan for Mount Isa CC organics processing facility
23	Subject to above outcome, introduce FOGO service at Mount Isa CC and Cloncurry (optional)
Residual waste	
24	Assist Burke SC to design / construct new Transfer Stations or identify landfill opportunities; cap, close and rehabilitate existing landfill
25	Co-ordinate the design and construction of new transfer stations with remote access
26	Co-ordinate the cap and close of landfills

27	Upgrade ongoing landfills with improved signage and bunding
28	Assist Mount Isa CC regarding waste transfer station upgrades
29	Consider fees / charges to Ergon, TMR and their contractors as fee for service to use waste facilities
30	Design and construct remaining new waste transfer stations with remote access to all unmanned sites
31	Cap and close remaining landfills
32	Assist Cloncurry landfill/TS design and construction
33	Engage with the commercial users regarding fees for waste disposal within each council

Table EX3: Implementation Roadmap – long term 5–10 years

	Activity
1	Review RWMP re achievements, context of new issues, opportunities and regulatory framework
2	Investigate sub-regional waste collection contracting opportunities and rationalisation
3	Review impact of regional education campaigns and consider appropriate interventions
4	Review fit for purpose options for organic waste management
5	Investigate regional collaboration for collection and disposal seeking to increase sub-regional facilities
6	Continue to play an advocacy role re new opportunities and impacts for the region

Whilst the Plan provides the primary vehicle for accessing available funding from the Recycling and Jobs Fund, there may also be opportunities for initiatives to be funded that are outside the Plan, for example, a pilot at a local level to ‘test’ the suitability of a model or infrastructure for the region (or sub-region). It is recognised that the Plan needs to be a living document and that not all potential initiatives will have been identified in the Plan.

However, it is expected that the bulk of the funding will come through the projects identified in the Plan with a more streamlined pathway for funding approvals as they have already been identified in the Plan. In the first instance any projects identified that are outside the Plan would likely be discussed with the Resource Recovery Working Group and the NWQROC and the proposed regional support resource position that will be funded to support implementation of the Plan, to assess suitability for funding under the Plan or whether this would be considered under a separate funding process.

Councils, participating in the development of this RWMP and subsequent endorsement of or support for its finalisation and publication, can do so in the knowledge that this of itself does not obligate individual Councils to any funding commitment. Subsequent business cases developed as part of implementing the Plan would include funding arrangements for their consideration and decision making at that time.

1. INTRODUCTION

While much progress has been made in many areas of regional Australia, waste management often significantly lags behind other essential services such as power, water and sewerage. There are significant public health and environmental ramifications if solid waste is not adequately managed. Hot tropical climates amplify these challenges, with waste piles providing breeding grounds for disease, vectors, and vermin.

All local government authorities are required to plan, operate and maintain waste management infrastructure and services for their communities in accordance with state legislation, relevant strategies and policies.

The Queensland Waste Management and Resource Recovery Strategy (WMRR) aims to transition Queensland to a new paradigm of circular economy in which materials are retained and circulated in the economy at the highest values for as long as possible. The Strategy includes actions for state and local governments, business and industry to collaborate in developing coherent plans for waste management.

As a framework for this planning, the Department of Environment and Science (DES) are facilitating all regions to prepare a Regional Waste Management Plan with the following objectives.

- Maximise the value of waste including but not limited to problematic waste streams;
- Deliver a financially sustainable and fit-for-purpose pathway to leverage government co-funding arrangements, and industry investment or co-investment;
- Provide Local Governments with the data and options analysis required for them to make informed decisions about policy, infrastructure and non-infrastructure options;
- Support improved waste management, resource recovery and recycling practices towards the achievement of agreed targets;
- Encourage and support job creation and economic and market development opportunities and embed circular economy principles into BAU practices;
- Improve environmental outcomes for the community;
- Identify non-infrastructure and social and community benefits, including investment in social capital and place-based opportunities;
- Establish and maintain collaborative relationships with key stakeholders.

Each RWMP is to provide:

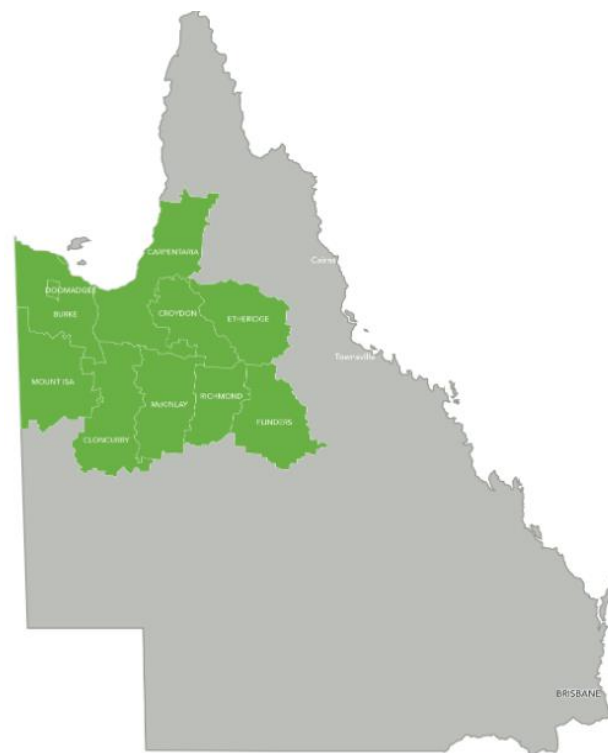
- a detailed snapshot of waste flows and existing infrastructure for each council
- identification of actions and data collection exercises to inform investment decisions and innovative solutions for waste management and resource recovery
- analyses of constraints and opportunities
- identification of potential solutions across the region
- an action plan based on priority and an accompanying budget
- clear priorities for future funding and investment over the short, medium, and long term
- detailed recommendations for sustainable waste management and resource recovery.

The guiding principles are the waste hierarchy and the circular economy, but this RWMP also seeks to identify and support local and regional economic opportunities, to encourage capacity building and environmental sustainability, with greater equity of access to services common to other councils and regions throughout Queensland.

1.1 The region

This RWMP covers the Northwest Queensland Regional Organisation of Councils (NWQROC) and its ten local government council members:

- Burke SC
- Carpentaria SC
- Cloncurry SC
- Croydon SC
- Doomadgee ASC
- Etheridge SC
- Flinders SC
- McKinlay SC
- Mount Isa CC, and
- Richmond SC.



While Doomadgee ASC is a member of NWQROC, the council is also a participant in the development of the *First Nations Southern Gulf Regional Waste Management Plan*, along with Mornington Island SC and Kowanyama ASC, addressing the priorities and indicators documented in the *First Nations Respecting Country Waste Strategy*. Doomadgee ASC was consulted during the development of this Plan and agreement reached on the incorporation of common issues and actions in the First Nations Plan into the NWQROC Plan. This will ensure maximum alignment between the two (2) plans avoiding duplication of effort and supporting Doomadgee ASC in implementing all identified actions. This Plan should be read with these inclusions in mind.

In June 2023 Croydon SC became a member of the NWQROC. Prior to joining, the Council's waste management issues had been identified and included in the Far North Queensland Regional Resource Recovery Plan. Preliminary analysis shows they are consistent with this Plan for the original nine (9) NWQROC member Councils and following consultation, Council has agreed to the incorporation of its needs into this Plan. This will support Croydon SC in implementing all identified actions and will involve the adjustment of implementation cost estimates and the inclusion of additional information in this Plan. This will be undertaken when the Regional Support Resource is in place, along with adjustments relating to Doomadgee ASC.

NWQROC spans an area of 380,000 km² or more than 20% of the Queensland landmass. The region borders the Northern Territory to the west, and the Gulf of Carpentaria and Cape York Peninsula to the north.

The member councils service a population of around 30,000 residents and 23 communities (as per ABS data). With small rate bases of just approximately 12,200 dwellings and 2,700 commercial premises across the entire region, generating sufficient income for councils to deliver all services is a constant challenge. Councils rely heavily on contestable, short-term grants, for example, grants and recurrent funding support 65% of Burke Shire's annual budget.

The region's population has a median age of 34 years, and a quarter of residents identify as First Nations people. Based on the 2021 ABS census the population is declining at an average annual rate of -2.6%, ranging from -1.1% at Richmond to -8.8% at Burke and range from 419 persons in Burke Shire to 18,727 persons in Mount Isa or measured as rateable properties, from 185 to 7,842 properties. Refer to Appendix A for population and housing by council.

The key employment generators in the region are mining (25%), agriculture, forestry and fishing (10%), healthcare and social services (10%), public administration and safety (9%), construction (5%) and manufacturing (2%). The region is resource-rich, with several new and expanding mining operations mostly relying on a fly-in fly-out (FIFO) workforce residing in camps on the mining leases, with limited direct impact on waste arisings in host councils.

It is recognised that there are many common themes faced by councils in the region in relation to waste and resource recovery, including the tyranny of distance, high freight costs, constrained council budgets, transient staff and management, poor economies of scale and diverse waste streams. The road distances are vast, with the distance between Mount Isa and Townsville at 900 kilometres, Mount Isa and Normanton at 500 kilometres and Burketown and Cairns at 800 kilometres.

Given these distances within the region, the concept of three sub-regions has been created for the purpose of this RWMP. Grouping councils based on geography and other synergies, such as transport nodes and freight routes, enables members to harness opportunities.

However, there are also many differing needs, challenges and opportunities that this RWMP seeks to explore and address.

1.2 Regional Waste Management Plan policy context

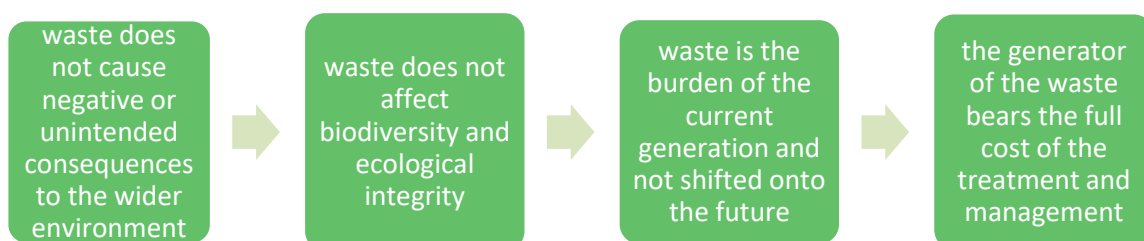
Different communities have different motivators and issues, and often require different waste solutions. The overarching principles of any waste plan should be founded in the principles of Ecologically Sustainable Development (ESD) and the waste hierarchy. The international, national, state and regional context should also be considered, while recognising the need for local, fit-for-purpose solutions.

In making the recommendations contained in this report we are mindful of the following principles:

1.2.1 Ecologically Sustainable Development (ESD)

The effects of decisions that we make today have far-reaching impacts on future generations and the environment. Waste management decisions should be based on responsible management of materials and resources to retain and conserve their value for secondary uses. This results in the conservation of natural resources for current and future generations.

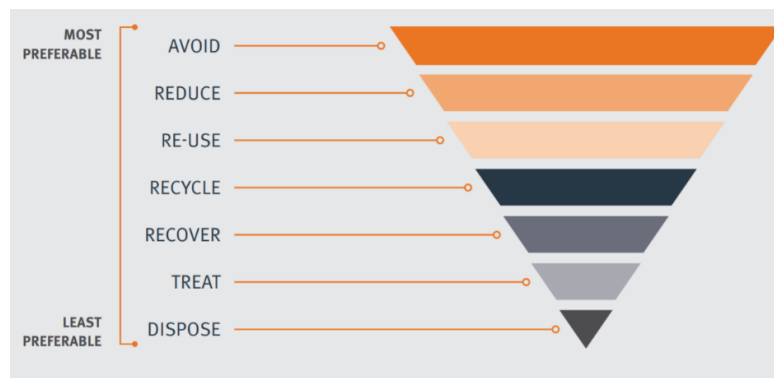
These four principles aim to govern waste management by ensuring that:



1.2.2 Compliance with the waste management hierarchy

The waste management hierarchy is a nationally and internationally accepted philosophy for prioritising and guiding efforts to manage waste. The waste hierarchy sets out the most-to-least preferred methods for waste management globally. The hierarchy has evolved over the past four decades and now includes seven steps as summarised in the following figure.

Figure 3: Waste Hierarchy



1.2.3 National Policy

The National Waste Policy (NWP) 2018: links Australia’s commitment to the United Nations (UN) 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDG) and our obligations under the UN Framework Convention on Climate Change in reducing greenhouse gas emissions primarily through the diversion of food waste from landfill. The policy commits circular economy principles to a whole-of-waste-management system. Targets of halving organic waste to landfill by the 2030 stated target will not be met on the current trajectory.

The National Food Waste Strategy, 2017: The strategy focuses activities to reduce Australia’s food waste by 50% by 2030 by establishing four priority areas, which are: policy, market development, business improvement and behaviour change.

National Soil Strategy (2021): Australia's first national policy on soil sets out how Australia will value, manage and improve its soil for the next 20 years. This includes Goal 2d – increase and maintain soil organic carbon.

1.2.4 Queensland Policy

Environmental Protection Act 1994 (EP Act) and Regulation (2019): prescribes waste management activities with environmentally relevant activities. ERA 60 – operation of waste disposal facilities (> 50 tonnes p.a.) by local authorities. For this RWMP, all councils have current approvals for their waste management facilities however they may operate under a variety of conditions, inherited from previous licensing regimes. Any new landfill facility would be required to conform to model operating conditions (MOCs). ERA 62 ‘Waste transfer and resource recovery facility’ excludes council-operated facilities accepting < 2,500 tonnes or 2,500 m³ per annum.

Queensland Waste Reduction and Recycling Act 2011 (WRR Act) and Regulation 2011: state-wide measures to reduce waste generation, landfill disposal. Encourages recycling based on the waste

management hierarchy and the waste management principles of polluter pays + user-pays + proximity + product stewardship.

Waste Management and Resource Recovery Strategy, July 2019: a vision for a zero-waste society and strives for a circular economy with targets and three strategic priorities:

- Reducing the impact of waste on the environment and communities
- Transitioning to a circular economy
- Building economic opportunity.

Action plans required for three sectors: state government, local governments and the waste industry.

Figure 4: Waste strategy 2050 targets



Queensland Climate Transition Strategy: includes achieving zero net emissions by 2050, reducing emissions by at least 30% below 2005 levels by 2030 (interim target).

Waste disposal levy: commenced 1 July 2019 and applies in 39 local government areas, including Mount Isa. The levy rate varies depending on the nature of the waste and is set by regulation, with different amounts for metropolitan and regional areas. For this financial year (2023), the rates are \$88 per tonne for Mount Isa. Waste liable for this levy is waste disposed of in the levy zone or waste that originates in the levy zone or interstate in the non-levy zone. *'The two levy zones attract different rates and increase at different rates to reflect the differences between South East Queensland and regional areas in terms of waste volumes and opportunities for recycling and resource recovery.'*¹

Keeping Queensland Clean – Litter and Illegal Dumping Plan 2021: sets a clear direction and provides actions for sustainable, long-term change using a combination of compliance, enforcement, community engagement, education, partnership-building and program development to reduce litter and illegal dumping in Queensland.

Other waste-related public policies and bans

- 1 July 2018 – plastic bags ban
- 1 November 2018 – Container Refund Scheme (CRS) for eligible used beverage containers
- 1 September 2021 – single-use plastic (SUP) ban
- From 1 September 2023 – cotton buds (plastic stems), EPS loose packaging, heavy-weight plastic shopping bags
- From 1 November 2023 – CRS extended to include wine and spirit containers in glass.

1.2.5 Regional Policy

The Queensland Waste and Resource Recovery Infrastructure Report (2021) identifies future infrastructure needs and opportunities across the 32 LGAs in remote Queensland. The report notes: *'whilst opportunities to improve the recovery of most streams exist, there are also significant practical*

¹<https://www.qld.gov.au/environment/management/waste/recovery/disposal-levy/about/levy-rates>

and financial challenges in doing so' and 'that such efforts are likely to be less ambitious than other regions, given the significant challenges.'

The report recommends the following:

- Focus on improving the environmental management of rural landfills
- Maximise the recovery of beverage containers through the CRS and leverage the subsidised logistics networks to potentially support other recycling initiatives
- For other recycling, focus on high-value materials, efficient methods of collecting and transport by investment in equipment such as balers and compactors
- In the towns, consider development of community composting projects attached to community gardens or schools, or on-farm composting schemes
- In areas where there are potential back-loading opportunities, work with mining companies to explore the potential to bale recyclables and transport them to a regional hub.

NWQROC has close alliances with the Remote Area Planning and Development Board (RAPAD) and Far North Queensland Regional Organisation of Councils (FNQROC). Given the number of common matters to be addressed it is recommended that these two organisations and NWQROC work together to enable the most efficient use of resources and budgets.

1.2.6 Local Policy

To date only one council has developed a local waste management plan. In 2022, Burke Shire developed a Waste Reduction and Recycling Action Plan 2022–2030² aligned with state and regional policy objectives. The strategic vision is noted as *'Burke Shire Council to become the "model" shire in terms of effective waste and recycling management in a remote setting.'*

Three strategic objectives are identified:

1. 20% reduction in annual waste volume by 2030
2. Waste and resource-recovery facilities operate in a compliant, environmentally responsible and commercially viable manner
3. Waste collection and recycling services are undertaken in a compliant, environmentally responsible and commercially viable manner.

2. CURRENT WASTE PROFILE

2.1 Current baseline conditions

The significant barriers to greater resource recovery include the tyranny of distance, the low quantities of a diverse waste stream providing poor economies of scale, the dispersed waste volumes over a large geographic area, high freight costs and poor backloading. Despite these challenges, the region is diverting 12% of all waste arisings (or 5,050 tonnes) from landfill as reported in 2021 and shown in the Table 4. It should be noted that garden waste, concrete, scrap metal and tyres are currently stockpiled, awaiting processing.

Table 4: Total reported waste recovered or recycled (2021)

Waste activity	Total tonnes
Total waste disposed	38,817

² <https://www.burke.qld.gov.au/downloads/file/524/burke-shire-council-waste-reduction-and-recycling-plan>

Total materials recovered	5,054
Total waste arisings	43,871
Diversion rate	12%

Source: Department of Environment and Science Survey 2021 this data excludes Croydon Council

There are efforts to source-separate some materials at landfills (breakdown provided in Table 5). Waste oils and ULABs are collected periodically for recovery as they have an economic value. Some councils have received scrap metal through collections and the removing of stockpiles on an ad-hoc and opportunistic basis.

Table 5: Materials diverted from landfill (2021)

Materials	Total (tonnes)	Materials	Total tonnes
Green waste and timber	2,048	Oils	50
Concrete	1,523	E-waste	0
Scrap metal/white goods/cars	1,157	Used lead-acid batteries	0
Tyres	276	Total	5,054

Source: Department of Environment and Science Survey 2021 excludes Croydon Council

Recycling is limited to used eligible beverage containers through the Containers for Change program operated by COEX. Only three operators currently provide permanent sites in Cloncurry, Normanton and Mount Isa, while communities in Burke and some in Etheridge are provided with mobile services. The remaining communities have no access to the scheme.

Some commercial premises in Mount Isa are provided with cardboard bins for source separation. We understand the contents of these bins are landfilled.

2.2 Current waste generation

Based on DES annual waste survey responses, the NWQROC region generates 43,500 tonnes or 0.04% of the state's waste generation.³ In 2021, of the 43,500 tonnes generated, 38,817 tonnes were landfilled.⁴ Refer the below table for a breakdown by waste stream. These tonnages exclude Croydon SC, mining waste, which is managed on mining leases and waste from primary production disposed of on farm.

Table 6: Total reported waste to landfill (tonnes) in 2021 and 2020

Waste fast facts	2021	2020	Proportion
Total municipal solid waste (MSW)	12,249	11,455	31%
Total commercial and industrial (C&I)	17,458	13,575	46%
Total construction and demolition (C&D)	8,899	9,375	23%
Total landfilled	38,817	34,597	100%

NB: This data is subject to updating to include Croydon Council

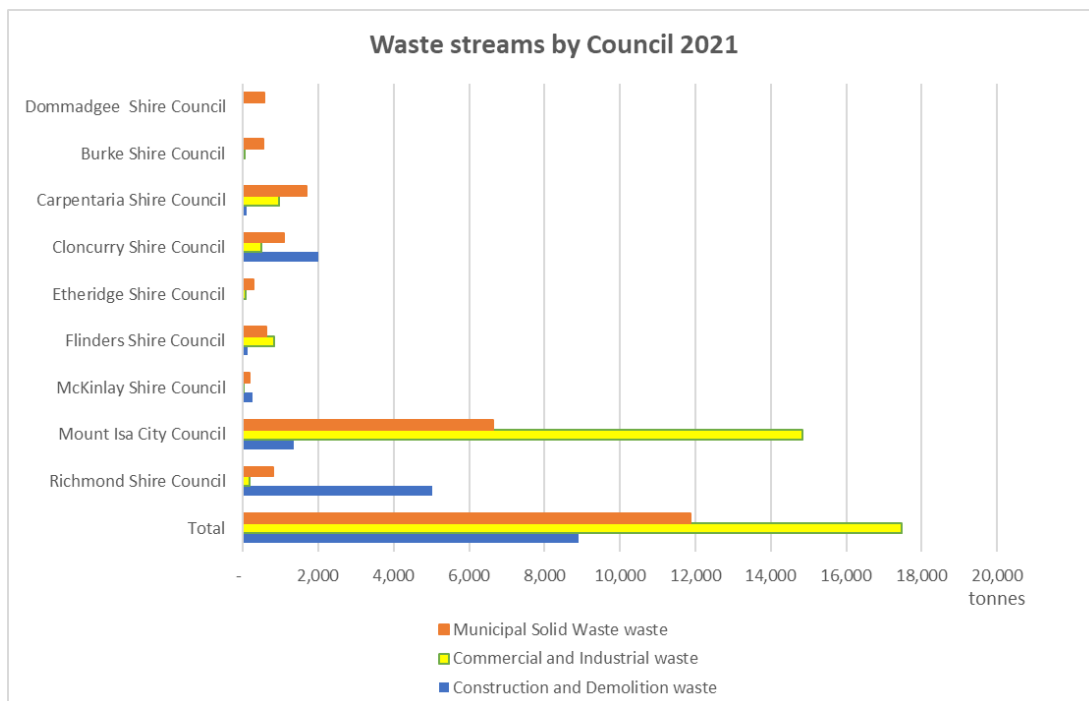
Waste generation by council and sector is provided in Appendix A and detailed in Figure 5 below. Mount Isa CC contributes 60% of the region's waste and hosts 60% of the region's population, and is the only council with a weighbridge. Therefore, data reliability for the remaining councils is limited

³ <https://www.qld.gov.au/environment/management/waste/recovery/data-reports/recycling-waste#section-localgovernments>

⁴ Collated by APC from DES Annual Waste Surveys 2020 and 2021.

however, there is some confidence in the data as the waste generation is proportional to the population.

Figure 5: Waste to landfill by council and region, by waste stream



NB: This data is subject to updating to include Croydon Council

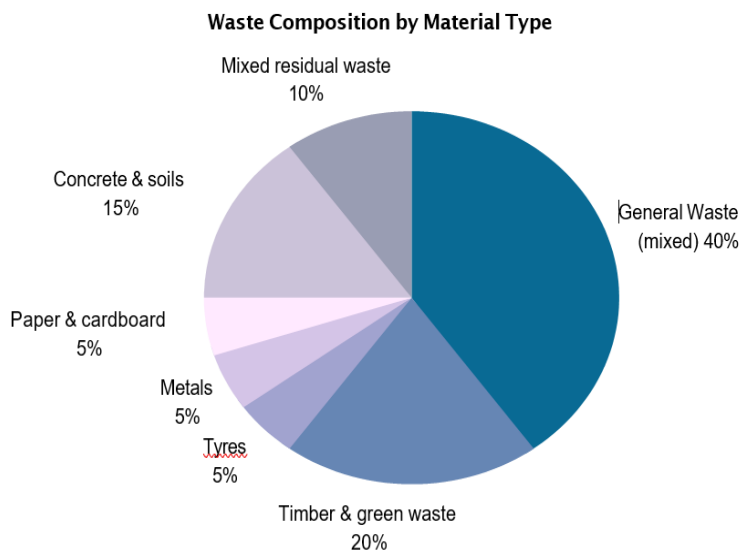
The only available data on household residual waste composition in the region is from a waste audit conducted for Mount Isa CC in 2020, where 2.2 tonnes of domestic waste was sampled and sorted, as shown in Table 7.

Table 7: Domestic waste composition for Mount Isa (2020)

Material Category	Proportion
Recyclable Paper	21.46%
Recyclable Glass	4.15%
Recyclable Plastic	3.57%
Recyclable Metal	1.59%
Non-Recyclable Paper	4.29%
Non-Recyclable Glass	0.03%
Non-Recyclable Plastic	11.03%
Non-Recyclable Metal	6.59%
Household Hazardous	1.48%
Others	2.72%
Organic Other	14.53%
Food / Kitchen	11.60%
Food / Kitchen - Containerised	14.39%
Other Putrescible	0.36%
Garden	0.76%
Other Fine Material <12.5mm	1.44%
Total	100.00%

Source: EnviroCom Mount Isa CC Waste Assessment, 2020

Burke SC has indicated the following breakdown of waste delivered to its facility for disposal in its *Waste Reduction and Recycling Action Plan 2022–2030*.

Figure 6: Burke Shire Council waste composition at landfill

2.3 Material flows

There is currently no flow of waste between councils nor between councils and mining sector (this sector manages its waste arisings within its mining leases). No other private waste disposal facilities exist within the region.

2.4 Current infrastructure

Waste infrastructure is limited across the region. There are 27 waste disposal facilities, of which 25 are landfills and two are transfer stations, as shown below in Table 8. No dedicated materials-recovery facilities, reprocessing facilities or residual waste processing are operating within the region.

Table 8: Regional disposal facilities

Council	Landfills	Transfer stations
Burke	2	
Carpentaria	1	1
Cloncurry	6	
Croydon	1	
Etheridge	4	
Flinders	4	
McKinlay	4	
Mount Isa	1	1
Richmond	2	
Sub Total	25	2
Total	27	

2.5 Current and future infrastructure capacity and gaps

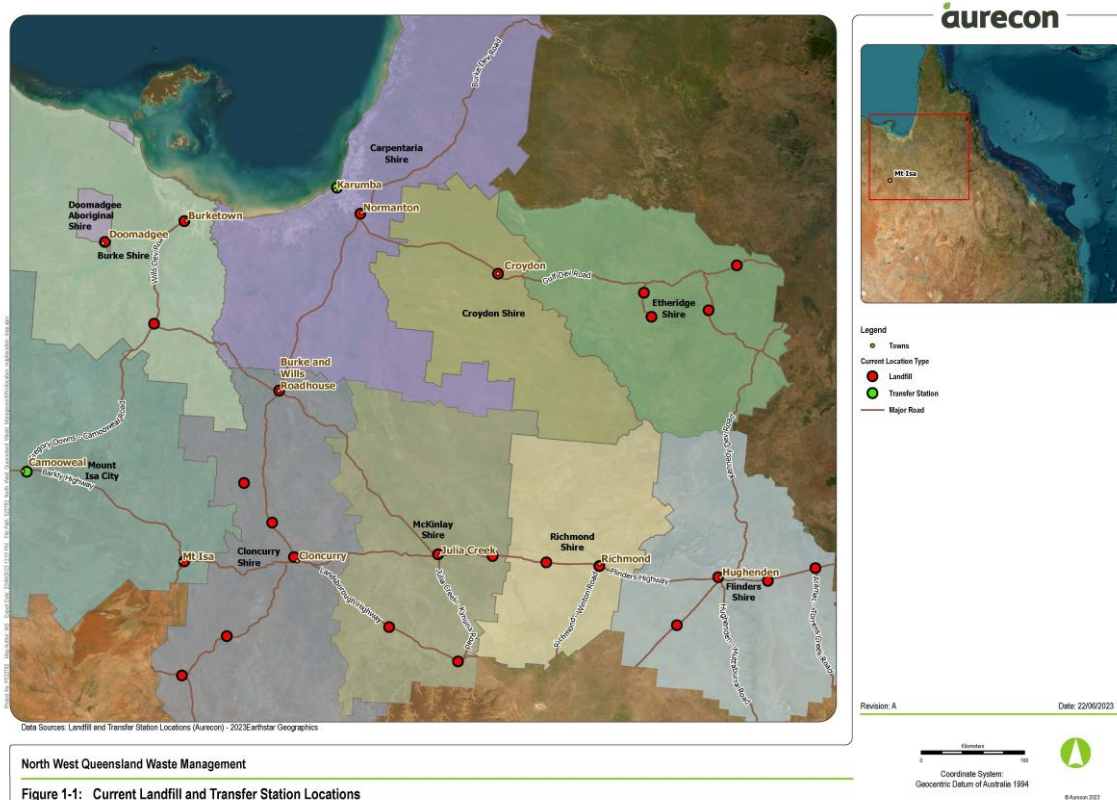
Table 9 and Figure 7 outline the current location, licensed amount, access, life expectancy and EA of all regional landfills and transfer stations.

Table 9: Landfill status

Council area	Landfill name/location	Licensed capacity (tonnes p.a.)	Access arrangements	Landfill remaining life	EA No.
Burke	Burketown Landfill	2,000 T	Unrestricted	At capacity	EPPR00542713
	Gregory Landfill	<50 T		Unknown	Not required
Carpentaria	Normanton Landfill	2,000–5,000 T	Apply	Significant	EPPR00239813
	Karumba Landfill	2,000–5,000 T		Transfer station only	EPPR00239813
Cloncurry	Cloncurry Regulated Waste Facility	2,000–5,000 T	Apply	Has operational issues – adjacent airport	EPPR00789613
	Cloncurry Landfill	2,000–5,000 T	Apply		EPPR00789613
	Kajabbi Landfill	2,000–5,000 T	Unrestricted	Small trench-style landfill	EPPR00789613
	Quamby Landfill	50–2000 T			EPPR00789613
	Dajarra Landfill	50–2000 T			EPPR00789613
	Duchess Landfill	50–2000 T			EPPR00789613
	Burke and Wills Roadhouse	0	Private operation	Limited details available	Unlicensed #
Croydon	Croydon Landfill	50–2000 T	Unrestricted	Small trench-style landfill	EPPR00568813
Etheridge	Forsayth Landfill	50–2,000 T	Unrestricted	Small trench style landfill	EPPR00239313
	Mount Surprise Landfill	50–2,000 T			EPPR00239313
	Georgetown Landfill, or Mount Sullivan	50–2,000 T		Capacity – 10 years	EPPR00239313
	Einasleigh Landfill	<50 T		Small trench-style	Not required
Flinders	Hughenden Landfill	< 50,000 tonnes	Access controls apply	Significant capacity remaining	EPPR00813313
	Prairie Landfill	2,000–5,000 T	Unrestricted	Small trench-style landfill	EPPR00813313
	Torrens Creek Landfill	2,000–5,000 T			EPPR00813313
	Stamford Landfill	2,000–5,000 T			EPPR00813313
McKinlay	McKinlay Landfill	< 2,000 T	Unrestricted	Small trench-style landfill	EPPR00835713
	Nelia Landfill	< 2,000 T			EPPR00835713
	Kynuna Landfill	< 2,000 T			EPPR00835713
	Julia Creek Landfill	< 2,000 T		Unknown	EPPR00835713
Mount Isa	Camooweal Transfer Station	50–2,000 T	Unrestricted	Transfer station only	EPPR00788713
	Mount Isa General & Regulated Waste Facility	100,000–200,000 T	Access controls apply	Significant capacity remaining	EPPR00788713
Richmond	Richmond Landfill	< 50,000 T tonnes	Unrestricted	Significant capacity remaining	EPPR00918213
	Maxwelton Landfill	50–2,000 T		Small trench-style landfill	EPPR00918213

Operates as a private facility for the roadhouse only

Figure 7: Current waste disposal facilities



The majority of councils operate and manage their waste facilities and would benefit from improved operational practices at landfills. Carpentaria SC and Richmond SC currently outsource waste facility management to a contractor which has improved overall day-to-day site management. Carpentaria SC appointed a third party to manage the Normanton Landfill, Karumba Waste Transfer Station and transport waste between sites. Richmond SC uses a small independent contractor to operate the landfill at Richmond, however this is likely to revert to Council’s operation soon.

Landfills at Mount Isa, Cloncurry, Hughenden and Burketown have controls on access with dedicated staff and opening hours. The remaining 20 landfills and transfer stations across the region have unrestricted 24-hour access. Many of the smaller landfills within the region are operated as trench-style landfills and do not appear to be lined or have a leachate collection system.

With the exception of Mount Isa, there are no weighbridges or other data-capture mechanisms at any of the landfills or transfer stations. This makes future planning for waste requirements difficult and also makes it impossible to implement gate fees. It is recommended that the installation of weighbridges (or weigh cells) be considered at all remaining landfills and transfer stations.

DES Environmental Services and Regulation section indicate its key common concern centre around tyre stockpiles and the risk of fires. Fires in general and windblown litter are also key concerns.

While all sites suffer from a lack of daily cover, efforts have been made to encourage source separation, including garden/green waste and timber, concrete, scrap metal/white goods/cars, tyres, e-waste, used motor and cooking oils, and used lead-acid batteries (ULABs). Some sites also collect paint, gas bottles and fire extinguishers. All sites require bunded storage facilities for chemicals, paint, oil and ULABs, except Karumba Waste Transfer Station, which already has suitable facilities.

All disposal sites, except Karumba Waste Transfer Station and Julia Creek Landfill, would benefit from improved standard customer-facing signage to clearly differentiate waste separation areas for ease of public use.

2.6 Current and future capacity

The majority of the larger centres within the region have sufficient capacity in their existing landfills for the next 10 years at least, with a reported 40 years available at Mount Isa CC. Burke SC however has a critical landfill-capacity issue as Council will need to vacate the current Burketown landfill site within the next three years. This is further discussed in section 4.5.

With increasing compliance obligations, limited budget reserves and unknown closure and post-closure liabilities, transitioning some smaller landfills to transfer stations is considered the best alternative. Sub-regional collaboration between councils will reduce compliance and operational challenges for smaller councils and will provide environmental benefits, especially given the vast distances involved. Transfer stations should be of consistent design across the region as this will reduce the design and construction costs, ensure signage and layout standardisation and allow for redundancy across the system for items such as skip bins and transfer vehicles. The recommendations for each current waste facility are outlined in the following table.

Table 10: Waste Infrastructure opportunities

Council area	Name/location	Recommendations
Burke	Burketown Landfill	Close and cap existing landfill. Build new transfer station
	Gregory landfill	Convert to transfer station
Carpentaria	Normanton Landfill	Contracted operations to Wanless – continue as is
	Karumba Landfill	Operates as Transfer Station. A model for the region Continue as is
Cloncurry	Cloncurry General and Regulated Waste Facility	Identify location for new landfill/ regulated waste facility / transfer station. Co-locate. Construct new landfill / Reg facility. Close and cap existing landfill
	Kajabbi Landfill	Convert to transfer station, close and cap existing landfill
	Quamby Landfill	Convert to transfer station, close and cap existing landfill
	Dajarra Landfill	Continue as is, improve operational measures
	Duchess Landfill	Convert to transfer station, close and cap existing landfill
	Burke and Wills Roadhouse	Investigate current waste management practices, seeking improved outcomes
Croydon	Croydon Landfill	Continue as is, improve operational measures
Etheridge	Forsayth Landfill	Convert to transfer station, close and cap existing landfill
	Mount Surprise Landfill	Convert to transfer station, close and cap existing landfill
	Georgetown Landfill	(known as Mount Sullivan) Continue as is, improve operational measures
	Einasleigh Landfill	Convert to transfer station, close and cap existing landfill
Flinders	Hughenden Landfill	Continue as is, improve operational measures
	Prairie Landfill	Convert to transfer station, close and cap existing landfill
	Torrens Creek Landfill	Convert to transfer station, close and cap existing landfill
	Stamford Landfill	Convert to transfer station, close and cap existing landfill
McKinlay	McKinlay Landfill	Convert to transfer station, close and cap existing landfill
	Nelia Landfill	Convert to transfer station, close and cap existing landfill
	Kynuna Landfill	Convert to transfer station, close and cap existing landfill
	Julia Creek Landfill	Continue as is, improve operational measures
Mount Isa	Camooweal Transfer Station	Continue as is, improve operational measures
	Mount Isa General & Regulated Waste Facility	Continue as is, improve operational measures. Introduce organics processing area, improve general transfer station and rectify commercial transfer station
Richmond	Richmond Landfill	Continue as is, improve operational measures
	Maxwelton Landfill	Convert to transfer station, close and cap existing landfill

2.7 Assessment of current individual and joint waste-handling commitments

Due to the large distances between each council area, there are limited joint waste-handling operations undertaken. Each council is responsible for their own waste collection and disposal and the use of contractors or private operators is limited.

A recent initiative between Mount Isa CC and Cloncurry SC has resulted in a joint waste collection contract, to undertake the kerbside collection in both Mount Isa CC and Cloncurry SC, providing a cost benefit and maximum utilisation of collection vehicles. The service is currently restricted to the general waste collection, however a kerbside recycling service could be introduced and added to the contract in the future.

While there is no formal agreement between McKinlay, Flinders and Richmond councils, they share resources if required. For example, if plant or equipment becomes unserviceable, councils may share resources until such time as the plant or equipment is operational again. A summary of the current waste-handling mechanisms for each council is shown in the following table.

Table 11: Current waste arrangements per council

Council	Household waste collection	Landfill operations
Burke	Council	Council
Carpentaria	Council	Council
Cloncurry	Contractor	Council
Croydon	Council	Council
Etheridge	Council	Council
Flinders	Council	Contractor
Mount Isa	Contractor	Council
McKinlay	Council	Council
Richmond	Council	Contractor

2.8 Legacy Waste

Legacy waste is one of the most significant issues facing all councils. It includes tyres, metal, timber, used vehicles and organics, and is generally stockpiled at landfill sites across the region. While the stockpiling of these materials is pronounced when compared with the general waste volume at each landfill, the overall volume is very low when considering commercially viable options for removal. On previous occasions, some councils have arranged contractors to remove the legacy waste stockpiles, however this does not appear to have occurred for some time. Generally, removal has been undertaken by a single council with limited consideration for a joint engagement of the contractor.

Partnerships through the NWQROC are pivotal in gaining access to regional services for the collection, transport and reprocessing of materials. If councils continue to operate individually, they are duplicating efforts, making it difficult to attract the interest of the private sector, especially given the low, dispersed volumes of the materials involved. Councils are also paying a premium for recovery and recycling endeavours as the private sector must make a profit and cover its risks, which are in turn exacerbated by rising fuel costs and poor road conditions in remote areas.

2.9 Littering and Illegal Dumping

Litter and dumping of household waste and abandoned motor vehicles are a blight on the landscape and can present a hazard to both domestic animals and wildlife. It is estimated over 220 abandoned

vehicles are located within the region. Many councils have dumping 'hot spots' and areas out of sight where dumped materials have accumulated and are now beyond the councils' capacity to manage with individual council clean-up costs exceeding \$300,000. Mapping of both vehicles and 'hot spots' is required to provide a baseline for remedial action.

Once current dumping is removed, measures to reduce a recurrence including video surveillance, earth barriers to roads frequently used and community messaging should be developed. A range of stakeholders who are familiar with the issues including but not limited to council, police, rangers, TMR and Southern Gulf NRM should be invited to participate in an ongoing working group to manage these issues and prevent a recurrence. Support of regional media including television, radio and newsprint can assist in spreading messages around impact of littering and dumping and penalties.

2.10 Geographic and sub-regional blockages and opportunities

The NWQROC's unique size, geography, climate, population and economic drivers present a number of challenges for the region. This gives rise to opportunities and blockages in the waste arena that are specific to the area.

2.10.1 Blockages

Key blockages for waste management within the region include:

- Small population – 30,000 for the entire region
- All councils (with the exception of Mount Isa CC) have a small rate base and heavy reliance on contestable government grants to maintain service delivery
- Large distances between population centres – the region covers 20% of the state landmass
- Diverse waste streams but relatively small volumes of waste
- Large distances to end processing and disposal options for recovery
- Climatic conditions, including the wet season, isolating a number of communities for many weeks at a time
- Fluctuations in population due to the influx of travellers during the dry season
- Small waste facilities wear the burden of construction waste from large infrastructure projects
- Limited collaboration between councils in relation to resource sharing for waste management
- Duplication of equipment that is not fully utilised
- Poor data on waste arisings
- Lack of weighbridges to quantify waste deliveries
- Economic conditions inhibit the ability to charge the true cost of waste management
- Lack of manned waste disposal facilities
- High freight costs to end markets at coast or capital cities – Brisbane or Darwin
- Mining companies can legally dispose of their own waste onsite and therefore do not contribute financially to community waste management
- Mount Isa is within the landfill levy zone, increasing waste disposal fees when no waste from outside the council is delivered
- Private sector reluctance to embrace new business opportunities, for example Containers for Change.

2.10.2 Opportunities

A number of opportunities exist in the region. These include:

- An environmentally engaged community that wants to recycle

- Potential for consolidation of landfills with new transfer facilities
- Potential for councils to work collaboratively to tackle legacy wastes – concrete, tyres, scrap metal, garden and timber
- Potential for Councils to work in collaboration to provide ongoing regular processing services to prevent accumulation/stockpiles of concrete, tyres, scrap metal, garden and timber
- Potential to develop a uniquely Northwest Queensland waste education campaign
- Opportunity to connect with larger mines, for end-of-life option for high-value wastes (metals, e-waste, tyres)
- Potential expansion of Containers for Change program across the whole region
- Potential to establish a recycling hub for solar, wind and battery components as renewable energy continues to expand in the Northwest.

2.11 Emerging wastes and materials

As consumer habits change, so too does the composition of the waste produced. Therefore, a waste plan must consider future waste streams, which are becoming increasingly complex and composite in structure. There are already trends and signals indicating a significant shift in wastes owing to the rise of technology and the increasing move into the renewable energy sector. Outlined below are the key products currently being used and consumed that have not yet become a waste burden in Northwest Queensland. It is expected these waste streams will appear in waste disposal facilities within the period of this and the next Plan.

2.11.1 Solar panels

Australians are estimated to generate one million tonnes of solar panel waste by the 2040s. In Queensland, more than 722,000 homes already have solar panels, accounting for 3.5 gigawatts of capacity. These home solar panels have a life expectancy of 10 to 15 years and will likely be disposed of by individuals.

At present, solar recycling is in the early stages in Australia with limited options nationally for recovery at this time. Panel recycling requires a separation of the materials – a complex, usually manual or mechanical process. The landfilling of solar photovoltaic modules as a form of disposal has been banned in Victoria, South Australia and the ACT, while Queensland and Western Australia have stated their intent to follow suit.

Given the region has several large solar farms already established and others being planned for the region it is recommended that the Northwest adopts a uniform strategy on how solar panels will be managed as a future waste stream as the end-of-life (EOL) management cannot be borne by councils. End of life management must be considered at the planning approval stage and applications appropriately conditioned, so the proponent bears the cost and responsibility. An ongoing advocacy role to both state and commonwealth government will be required to ensure that these developments do not create new legacy waste items in the region. Solar panels from large commercial solar farms are not expected to reach the EOL for at least another 10 years, at which point a market for industrial solar panel recycling is likely to exist.

2.11.2 Wind turbines

Wind turbines are expected to have a lifespan of at least 20 years. The oldest wind turbines within the region are 2 to 3 years and are therefore not expected to enter the waste stream until at least 2040.

While disposal options for wind turbines in Australia are currently limited, the industry expects that reuse and recycling of the key components such as the nacelle and blades will be commercially viable over the next few years. It is recommended that this waste type be reviewed by NWQROC in 2030 and that advocacy starts now with both state and commonwealth government to ensure that these developments do not create new legacy waste streams in the region.

2.11.3 Batteries

Currently, most councils collect used lead-acid batteries (ULABs) at their landfill sites. Due to a mature recycling system achieving more than 99% recovery, a contractor regularly removes the ULABs from waste facilities and council depots and sells the recycled battery for a profit.

The next generation of technologies, such as electric vehicles, generally contain lithium-ion batteries. Lithium-ion battery waste is growing by 20% each year in Australia and the recycling rate is currently less than 10%. However, similar to the solar PV module recycling industry, the recovery and recycling of lithium-ion battery cells is at an inflection point where the demand for a reliable recycling system is expected to increase dramatically over the next decade. Tesla, a leading supplier of utility-scale batteries and electric vehicles, has stated it will accept batteries that have reached EOL at its nominated facilities.

Much like the existing ULAB battery-collecting system, councils need to provide designated collection areas at transfer stations and landfills for storage of lithium-ion batteries (household quantities) and then rely on contractors or manufacturers to remove them. Where large-scale volumes of batteries are coming to EOL, as will be the case in 10 to 15 years from the current development of renewable energy projects, councils will need to consider the commercial consequences of accepting batteries at their facilities or whether they should instead require commercial operators to transport batteries direct to recycling facilities.

Small lithium-ion batteries are also known to cause fires in garbage trucks and recycling facilities, which is an increasing and vexing issue. The insurance premiums at recycling waste depots reflects the increase in claims attributed to battery fires.

2.11.4 Electric vehicles

In terms of waste generation, the key difference between electric vehicles and current internal combustion engine (ICE) vehicles is the battery system. Once the battery is removed from the electric vehicle, the remainder of the vehicle can be processed as per a standard ICE vehicle. (Batteries are discussed in section 2.11.3.)

2.11.5 Other emerging wastes

New products are beginning to filter through to the waste management system and many have the potential to affect current waste management practices. At this stage, it is recommended that a wait-and-see approach is taken in the Northwest in this regard. Key products to watch include increasing volumes of electronics and e-waste and an increase in composite materials, which are more difficult to separate and recycle.

3. OVERVIEW OF INTERVENTIONS AVAILABLE

3.1 Situation analysis

As a result of sites visits and the engagement with councils and stakeholders, the following table is a summary of the specific issues identified for each council.

Table 12: Key Issues by council and topic

Issue	Burke	Carpentaria	Cloncurry	Etheridge	Flinders	McKinlay	Mount Isa	Richmond
Landfill capacity	✓ x 1			✓ x 3				
Transfer station	✓ x 2			✓ x 3				
Landfill operational issues	✓		✓ x 2	✓				
Lack of data	✓	✓	✓	✓	✓	✓		✓
Tyre stockpiles	✓	✓	✓	✓	✓	✓	✓	✓
Scrap-metal stockpiles	✓	✓	✓	✓	✓	✓	✓	✓
Concrete stockpile	✓	✓		✓	✓	✓	✓	✓
Garden-waste stockpile	✓		✓		✓	✓	✓	✓
No kerbside recycling	✓	✓	✓	✓	✓	✓	✓	✓
No FOGO service	✓	✓	✓	✓	✓	✓	✓	✓
No food waste recovery		✓	✓	✓	✓	✓	✓	✓
No permanent COEX	✓			✓	✓	✓		✓
No mobile COEX service					✓	✓		✓
Litter and dumping		✓		✓			✓	
Abandoned cars	✓ x 12	✓ x 30	✓ x 12			✓ x 12	✓ x 100	
Lack of community education	✓	✓	✓	✓	✓	✓	✓	✓

Note: Croydon Council is not included.

3.2 Investment Logic Mapping

An investment logic map (ILM) process was also undertaken to assist in the development of this Plan. An ILM is an early-stage technique that assists in developing and documenting the logic that underpins a potential investment decision, before specific solutions are identified and before a decision is made. The ILM process is also a required part of the Business Case Development Framework for Queensland Government-funded projects.

The output from the ILM defines the problem or opportunity and logically maps the response to the benefits of the proposal. The output results from the ILM are outlined in **Appendix C**.

Issues identified and discussed in the discovery processes generally fall into the following categories:

- Litter and illegal dumping,
- Legacy waste management,
- Recycling and resource recovery,
- Organics management, and

- Residual waste management.

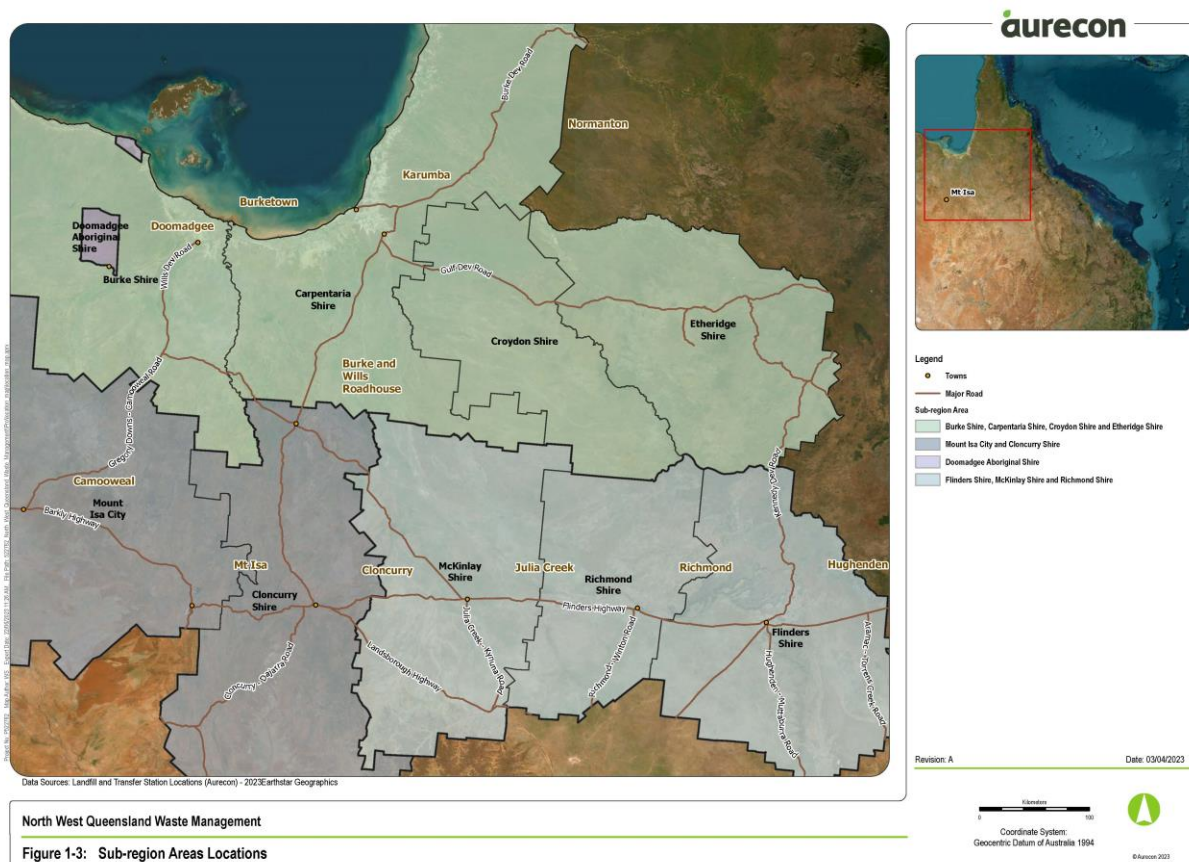
Each of these categories are addressed in section 4.

3.3 Regional collaboration

Given the distances within the region, the concept of three sub-regions has been created for the purpose of this Plan. Grouping councils based on geography and other synergies, such as transport nodes and freight routes, enables members to harness opportunities.

1. North sub-region – Burke SC, Doomadgee ASC, Carpentaria SC, Croydon SC and Etheridge SC
2. South west sub-region– Mount Isa CC and Cloncurry SC
3. South east sub-region- Flinders SC, McKinlay SC and Richmond SC

Figure 8: Sub-regional collaboration opportunities



4. MAJOR OPTIONS CONSIDERED AND EVALUATED

For remote areas of Queensland, the Queensland Waste and Resource Recovery Infrastructure Report correctly acknowledges that while ‘opportunities to improve the recovery of most streams exist, there are also significant practical and financial challenges in doing so’ and ‘that such efforts are likely to be less ambitious than other regions, given the significant challenges.’

The report suggests councils should focus on:

- maximising the uptake of the CRS for beverage containers
- developing systems to collect, clean and separate streams of high-value materials
- investigate establishing drop-off points for higher value materials

- investing in compaction and baling equipment to allow more cost-effective transport to a processing hub
- potentially using backloading options or rail.

This Plan and its outcomes must be grounded in reality given the vast distances, low volumes, low population, high freight costs and constrained council operating budgets. To reach end markets, which are typically coastal, many materials cannot be considered (for example, Cairns or Townsville is 900 kilometres from the collection points; capital-city-based end markets are 1,600 to 2,200 kilometres away). Although Mount Isa has a population of 18,000, it is 1,700 kilometres to either Darwin or Brisbane. The next largest council is Cloncurry, with a population 3,500, Carpentaria with 2,000 and 4 councils with less than 1,000 people each. Based on this, the following options were considered as practical, achievable and fit-for-purpose sustainable solutions.

4.1 Litter and Illegal dumping

Litter is generally well controlled. Carpentaria SC has been proactive in erecting large metal signs at litter hotspots to remind users to 'let's keep it clean', with advice on how to report littering via a website (www.qld.gov.au/litter).

Image 1: Roadside sign in Carpentaria Council LGA



Some councils report small amounts of illegal dumping at hot spots at the edge of town areas and along some road verges. Dumped rubbish breeds vectors, vermin and snakes.

Only Mount Isa CC indicated they had proactively issued penalty infringement notices (PINs) under the *Waste Reduction and Recycling Act* in response to illegal dumping activities. Council considered the increased dumping could have coincided with the introduction of disposal fees, but records were not kept previously. Between 2011 and 2019, 26 PINs were issued, and 110 tonnes of waste has been removed from dumping activities, excluding riverbed issues. In 2017, a total of 39 illegal dumping cases were investigated and by 2019 only one PIN was issued.

A significant amount of illegal dumping has occurred at Karumba over a long period, coincidentally on Dump Road. A quotation of \$300,000 would be required to mobilise heavy plant and equipment to remove the accumulated cars, boats, white goods, scrap metal and household wastes.

Image 2: Illegal dumping over a long period at Karumba

Southern Gulf NRM informed the study of approximately 200 abandoned and derelict motor vehicles which require removal from public lands. The majority of the vehicles (more than 100) are located within Mount Isa LGA, with approximately 30 in Carpentaria SC, 12 in Burke SC and 25 combined in Flinders and Cloncurry councils. All known abandoned vehicles are required to be mapped and a regional contract let for their removal and transport to the nearest waste disposal facility for storage. This assumes they are beyond scrapping for parts and of no interest to a wrecker and therefore have no commercial value. The following table provides a summary of items identified to date.

Table 13: Abandoned vehicles by LGA as advised by Southern Gulf NRM

Council	Abandoned cars
Burke	12
Carpentaria	30
Cloncurry	25
Flinders	25
Mount Isa	>100
Total	192

NB: This data is subject to updating to include Croydon Council

The Southern Gulf NRM and Aboriginal Rangers Group have been contracted to remove up to 50 vehicles in the past, however the number, diverse locations and scale of the region is beyond the current NRMs resources.

4.2 Legacy waste stockpiles

Most landfills offer designated areas for source separation of key materials, including scrap metal, garden waste, timber, tyres, concrete and rubble. Many of these materials have accumulated into large stockpiles over many years and are now referred to as legacy wastes.

These legacy wastes remain due to a lack of council equipment to process, little commercial interest in processing relatively small volumes in geographically dispersed locations, or lack of council funds to pay for processing (or a combination of these).

Tyres, scrap metal, concrete and garden waste are consistent across the region. Richmond SC has significant issues with concrete and Carpentaria SC has more than 7,000 tyres.

Image 3: Normanton landfill with a reported 7,000 tyres awaiting processing



Processing of stockpiles has been ad hoc or part of a FNQROC regional tender that Carpentaria and Ethridge Councils have joined or gained benefit from. There are no regional contracts negotiated in NWQROC at this time.

FNQROC provides a regional model as it currently manages a tendering process of behalf of its member councils to remove scrap metals. This contract has been in place for some years and re-tendered several times. A dedicated project manager at FNQROC oversees the tender and implementation process. A revenue stream is provided to each council based on commodity value at the time and the amount of scrap removed on an income-sharing arrangement between the processor and the councils. Under this arrangement it is understood that large councils may be serviced annually and smaller councils bi-annually.

This approach may be useful to NWQROC seeking to deal with both the once-off legacy wastes and ongoing maintenance to prevent a recurrence via a regional processing contract. FNQROC has indicated a willingness to share information with NWQROC.

Reviewing the 2020 and 2021 DES Annual Waste Survey data, it is unclear if all councils are reporting by units, tonnes or count, or a combination of methods. To inform the development of such a tender, a detailed volumetric audit by a quantity surveyor is required to provide an accurate estimate of the quantities and a mapping of all stockpiles at all sites. Separate contractors may be required to undertake processing of different streams given the equipment required, however co-ordinating the tender for all materials combined and separable could provide substantial economies, noting scrap-metal processing is usually undertaken by scrap-metal merchants who remove fuel, oil, gas bottles and batteries from motor vehicles prior to crushing. Scrap-metal merchants also process gas cylinders and fire extinguishers.

Concrete and organics waste can be stored for local reuse. The processing costs and quantities to be processed are unknown, however, and require a volumetric survey to enable a tender to be prepared. Scrap-metal contractors arrange transport to ports for overseas markets – in this case, probably Darwin for export to Asia. The amount and costs are also unknown without a volumetric survey.

Tyres can be shredded and either stored in RORO or bulk bags for ease and flexibility in transport or processed again through a hammermill to separate the steel from the rubber. A quotation to process 7,000-plus tyres at Normanton Landfill at the rate of 15 tonnes per day and freight to Townsville where a new tyre-recycling facility is proposed is in the order of \$450,000. This new facility may come to site to guarantee access to feedstock, prepare the materials in a preferred manner and arrange transport to the processing facility. The expected budget to shred and freight tyres for reprocessing at Townsville for the region could be in the order of \$1.5 to \$2 million.

Ongoing processing will be required and once the large stockpiles are removed, the smaller amount of material may be much less attractive to commercial enterprises, including more substantial fees on a per tonne, cubic metre or item basis. We consider it preferable to engage a specialised operator than for councils to resource-share large, complex machinery that requires skilled operators and maintenance.

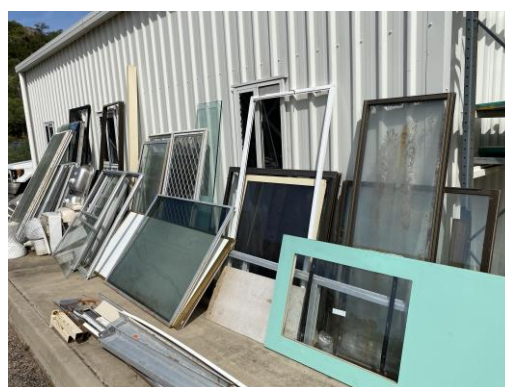
4.3 Recycling

4.3.1 Tip shops or reuse areas

Some informal scavenging takes place at most waste sites, however the risks and liability presented to councils for this activity are potentially significant. These risks can be eliminated by establishing a 'reuse area' or 'tip shop' – a concept ideally suited to remote communities given the delay and cost of buying new or replacement items. Useable and functional goods that are no longer needed can be made available to other members of the community or used as replacement parts.

Typically, tip shops or reuse areas are located near the entry to the actual waste site where patrons can off-load items of potential value. It is imperative the area be undercover to protect and preserve items of furniture and materials, and ideally has shelving or a raking system to both store and display items until they are removed. These facilities can divert a considerable amount of material from disposal if adequately supported by the community, who both donate and reuse items. Some sites are supported by men's sheds, other volunteer groups or by onsite staff.

Image 4: Tip shops support reuse within the community



4.3.2 Household hazardous materials

Many households and properties have hazardous, and problem wastes which can have a potentially detrimental impact on the environment and present risks in terms of fire, public and worker safety if not properly disposed of. Most waste disposal sites had ad-hoc infrastructure to receive or store these materials. A dedicated area is needed where the community can safely dispose of selected common household problem wastes. The interface should allow for easy and convenient use with correct receptacles and signage.

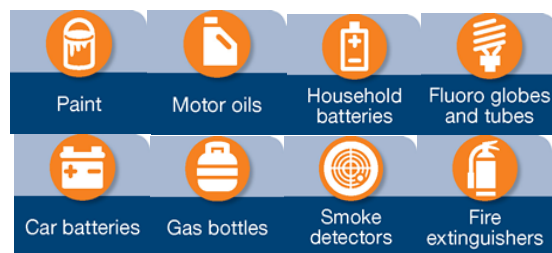
Household hazardous separation items can include:

- Paint – decanted into drums or IBCs on banded pallets or small quantities placed in banded area for evaporation
- Fluorescent and CFL light bulbs – stockpiled for export in one-way shipping containers
- E-waste/TVs – stockpiled in shipping container
- Smoke detectors

- Chemicals – stored in an approved cabinet to prevent unauthorised access at an appropriate distance from all ignition sources, including smoking areas
- Gas bottles and fire extinguishers – stored and processed by scrap-metal processor
- Waste oil – decanted into receptacle for pump out.

Standard signage, stillages and banded pallets could significantly improve the customer interface as indicated in the following example.

Figure 9: Example of standard signage



The following management methods are recommended for a range of problematic materials:

4.3.3 Unwanted rural chemicals

ChemClear is a national program for collection and disposal of unwanted rural chemicals. An inventory is required (but it is not onerous to compile) and is sent to ChemClear for scheduling. Chemicals are classified in two groups:

- Group One – chemicals that are currently registered. Rural chemicals manufactured by participating members are collected free of charge
- Group Two – chemicals that are de-registered, schedules are unknown, out-of-date chemicals or chemical products of non-participating manufacturers. These attract a fee ranging from 10 cents to 80 cents per litre, subject to the nature of the material.

4.3.4 Fluorescent bulbs and tubes

Mercury-containing lamps, including fluorescents and compact fluorescent lamps (CFLs), contain small amounts of mercury and are the largest single consumer product generating mercury waste in landfill in Australia. FluoroCycle is a voluntary partnership between government and industry to increase the recycling of mercury-containing lamps. There are options to both store and transport used lighting in purpose-built and designed cardboard or corflute boxes, weighing approximately 20 kilograms. The disposal rate includes a fee per box plus a recycling fee. Companies specialising in this type of recycling include Chemsal and CMA Ecocycle.

4.3.5 E-waste

Televisions, computers and printers are part of a national TV and computer recycling scheme, where industry is required to pay for the recovery of items at the end of their useful life. Suitable storage facilities are required, usually in shipping containers or bulk bins. Many councils have operated an e-waste clean-up to attract large quantities over a short time frame.

4.3.6 Toner cartridge recycling

The Cartridges 4 Planet Ark program was established to stop printer cartridges from ending up in landfill in partnership with Australia Post that provides cartridge collection points. Any site can register (1800 24 24 73) to receive collection box.

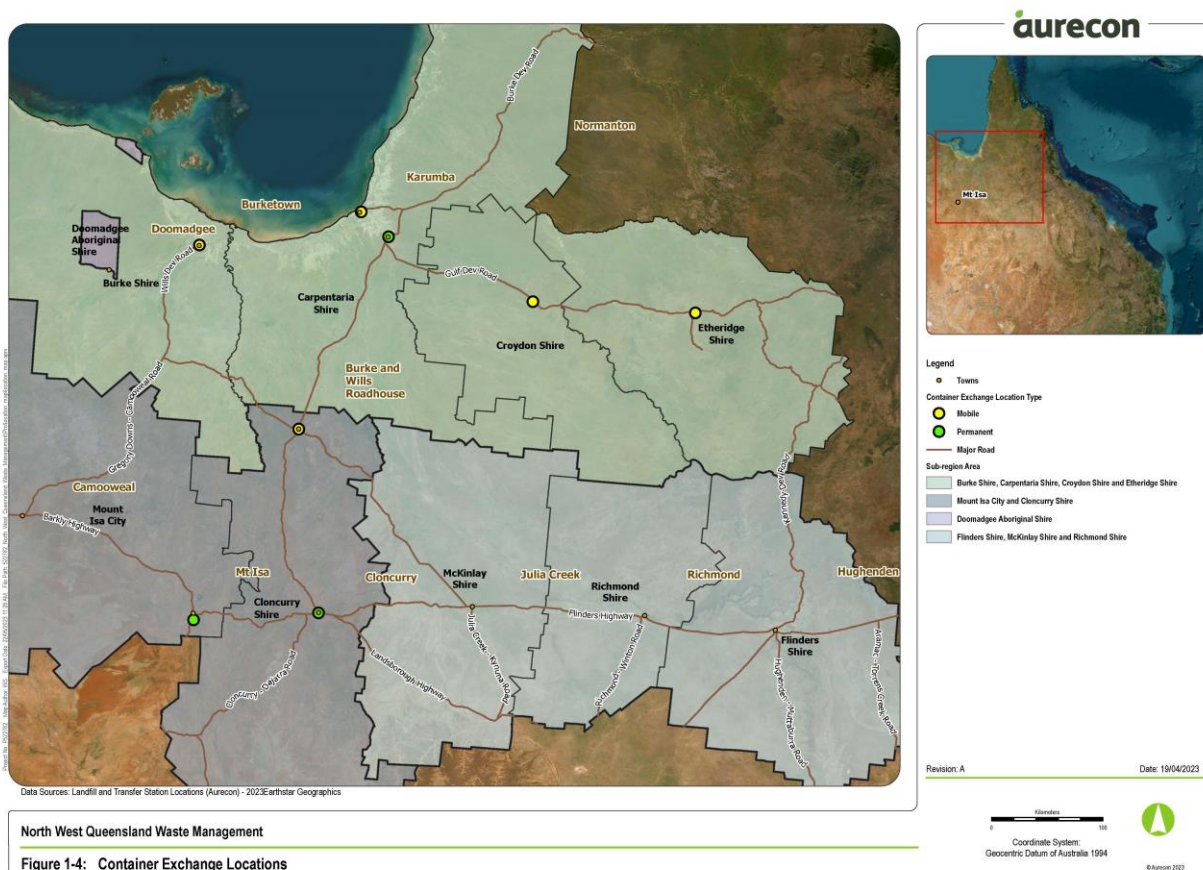
4.3.7 Batteries

The Australian Battery Recycling Initiative (ABRI) has set up Battery Back Australia to collect and recycle used alkaline lithium and reusable batteries containing toxic materials that should not go to landfill nor be burned. Old, discarded batteries can be placed in containers provided at the point of sale for new batteries and at council offices.

4.3.8 Containers for Exchange

The Containers for Change (COEX) scheme enables regional areas without kerbside recycling collections to provide recycling opportunities for their community. The program should be available to every council across the state, with either a fixed or mobile service where the public can redeem containers for 10 cents per container. From 1 November 2023, glass wine and spirit containers will be included in the scheme. Of the 10 councils within the region, excluding Croydon, 6 are serviced through a combination of fixed location and mobile collection services as shown in the following figure.

Figure 10: Current Container for Change operations



Currently, just three operators cover six councils and seven communities in the region servicing:

1. Normanton, Karumba, Burketown, Croydon and Georgetown
2. Mount Isa, and
3. Cloncurry

Three councils – Flinders, McKinlay and Richmond – have no local operator or access to the program. It is recommended that COEX be encouraged to assist in identifying service providers to support the scheme as we understand that a contractual obligation exists compelling COEX to have a service provider and redemption point in each LGA.

4.3.9 Kerbside recycling

Given the issues of low population, large distances across the region and to markets implementation of conventional kerbside commingled recycling systems will continue to be financially challenging in this region. The proposed Mount Isa CC MRF design has a 6,000 tonnes capacity or two-and-a-half times the tonnage expected, with likely processing throughput of 2,300 tonnes with current projected cost of a new MRF at Mount Isa is around \$20 million for both infrastructure and equipment excluding operational cost.

Cloncurry SC, located 120 kilometres to the east, with a resident population of 3,000, may join the kerbside recycling program subject to gate fees to be applied and increase in collection costs. There is limited further scope to increase the catchment to increase throughput as it will not be financially viable or efficient for other councils given the small volumes and distance and likely high levels of contamination experienced at public drop off facilities.

MICC have secured a commonwealth government grant of approximately \$6 million to offset the equipment costs. Other infrastructure costs re outlined in Table 14 below.

Table 14 Infrastructure costs of Mount Isa CC proposed MRF

Activity	Cost (2023)
MRF Civil works	\$12,299,094
Other Civil works to site (weighbridge relocation, road works, traffic management, contingency)	\$800,000
Supply of yellow top bins (\$80 per bin x 7000 assessments – includes freight)	\$560,000
Kerbside recycling change management (includes waste education materials & resourcing, systems changes, etc)	\$300,000
Minor equipment (forklift, other minor equipment, etc)	\$80,000
Total	\$14,039,094

4.4 Organics management

Organics represent close to 50% of the household waste bin across the region and double the amount of used packaging. Organics processing and composting should be the focus for household waste diversion as end markets are local and available. Reducing organics from the general bin has the potential to significantly impact both the volumes of waste going to landfill and the generation of methane gas as organics breakdown in landfill.

The Burke SC Waste Reduction and Recycling Action Plan 2022–2030 identified the need to reduce the amount of food and garden waste being sent to landfill as a high priority, requiring the following actions:

- Complete the program to provide compost bins to residents and businesses
- Provide educational material to support residents on how to use the compost bins
- Liaise with businesses to ascertain the preferred option of segregating food waste – food waste only bin for commercial-scale composting

- Actively promote the compost program at Burketown State School providing educational material which is available from the State Government and Container Exchange (COEX).

A budget estimate of \$140,000 has been allocated for each Council to supply home composting material and another \$120,000 per Council to support an initial general education campaign.

A food and garden organics (FOGO) service using a mobile garbage bin collected weekly could be a substitute for the planned kerbside recycling service if Council does not proceed with the MRF. Many councils are providing weekly FOGO bins and kitchen caddies with compostable bin liners to target the recovery of food, meat and fish scraps along with garden clippings, weeds, flowers and leaves, twigs and small branches.

The collection will require a processing system to compost both the collected materials and the self-hauled garden waste and untreated timber. Composting is a manufacturing process that follows a recipe with a specific carbon-to-nitrogen ratio. If the recipe is out of balance, odour and liquid can be generated and therefore staff training is imperative. A number of potential organics-processing options and variations within each type are available and discussed below.

Three options have been considered (from least to highest cost). These are windrowing, forced aeration and in-vessel and each is described below.

Windrow compost systems – typically carried out in the open and can occupy a large surface-area-to-volume ratio making them more prone to drying out in hot weather and becoming flooded during rain. Both these factors can significantly affect process control (which subsequently affects product quality, odour potential, re-work and production costs). The addition of food waste can create odour issues. The process takes 14 to 16 weeks and the piles require frequent turning and addition of water. This system requires the least capital.

Forced aeration or aerated-floor composting systems – these systems use either the aerated static piles or windrow methods where oxygen is pumped into the composting process through pipes embedded or on top of a hard stand, typically to manage potential odours. The system is common in many rural and regional areas across Australia to enable food waste to be processed with garden waste without odour issues. It is a proven technology and approach which significantly reduces both the footprint and the production time to deliver a composted product.

A hardstand area is recommended and these costs vary greatly depending on the location, nature of the material used and size of operation. A solid, impermeable base allows capture of any runoff and stormwater. Operational savings include reduced frequency of turning, lower labour costs, fuel (energy) savings and lower maintenance costs.

The end product is usually screened to remove contaminants and can produce a range of sizes suitable to the end markets. The investment required in sorting and screening will be dependent upon the contamination levels and the end market. A power supply is required as fans are used to force air through the pile to accelerate the decomposition process and are typically water-based on about 1,000 litres for each 1 m³ of finished product. The process takes 6 to 8 weeks.

In-vessel systems – these systems enable the processing of food and garden waste with effective odour and pathogen management to produce a compost product with no risk of odours. Systems include modified shipping containers and smaller modified bulk bins, which can process any type of food waste. Some systems are batch and other continuous flow with rotating drums both mixing and aerating.

Aeration is further enhanced by periodic air injection. Temperature probes record temperatures so the mix can be modified by changing air, water or temperature requirements. All air extracted is processed through a biofilter of organic material to remove and trap odour. Material is placed in the container by a bin lifter, front end-loader or auger and extracted by auger, front-end loader or tippler bin, subject to size and type. BiobiNs are suitable for small-scale composting and can be built to any size, subject to the capacity of plant to lift, move and empty. Typical bins are 4.5 m³ and are used in many commercial applications where food waste, shredded cardboard and chipped garden waste are layered. The energy cost is very low and the system has the advantage of a small footprint.

Image 5: Example of forced aeration system



Image 6: HotRot and BiobiN in-vessel systems



A simple, forced-aeration system may be the most suitable for processing garden and food waste given the volume to be processed. Some states are banning fibre (cardboard and paper) from kitchen composting bins; however, this is yet to occur in Queensland. It is recommended that Mount Isa Council consider the installation of an organics processing infrastructure. The indicative budget for installation is \$800,000.

In addition, council would need a multi-purpose shredder to prepare the garden waste as well as several other materials, including concrete, tyres and mattresses.

To support the roll out each household would require kitchen caddies and green waste bins. This is estimated \$2,000,000 for Mount Isa CC and \$375,000 for Cloncurry SC.

4.5 Residual Waste management

4.5.1 Landfill operation and consolidation

Maintaining landfills to acceptable environmental standards is expensive and technically difficult for small remote councils, particularly with issues of limited human resources, equipment and budgets.

In addition, at least a third of the member councils have either capacity issues requiring an immediate need for a replacement site or are operationally constrained.

Recognising this, six councils are seeking to close a total of 15 landfills. In some cases, this will involve councils seeking to engage another council to act as a host sub-regional waste facility. While this comes at a cost, it relieves councils of the day-to-day challenges and the responsibility of managing and maintaining their own landfill with limited skills, resources, equipment and oversight. One council is considering constructing a new landfill at a new site, which will improve operational efficiencies.

With increasing compliance obligations, limited budget reserves and unknown closure and post-closure liabilities, transitioning some smaller landfills to transfer stations is considered the best alternative as it will reduce compliance and operational challenges for smaller councils and provide environmental benefits.

Figure 12 and Table 15 show the existing and proposed waste disposal infrastructure facilities.

Figure 11: Proposed landfill post consolidation

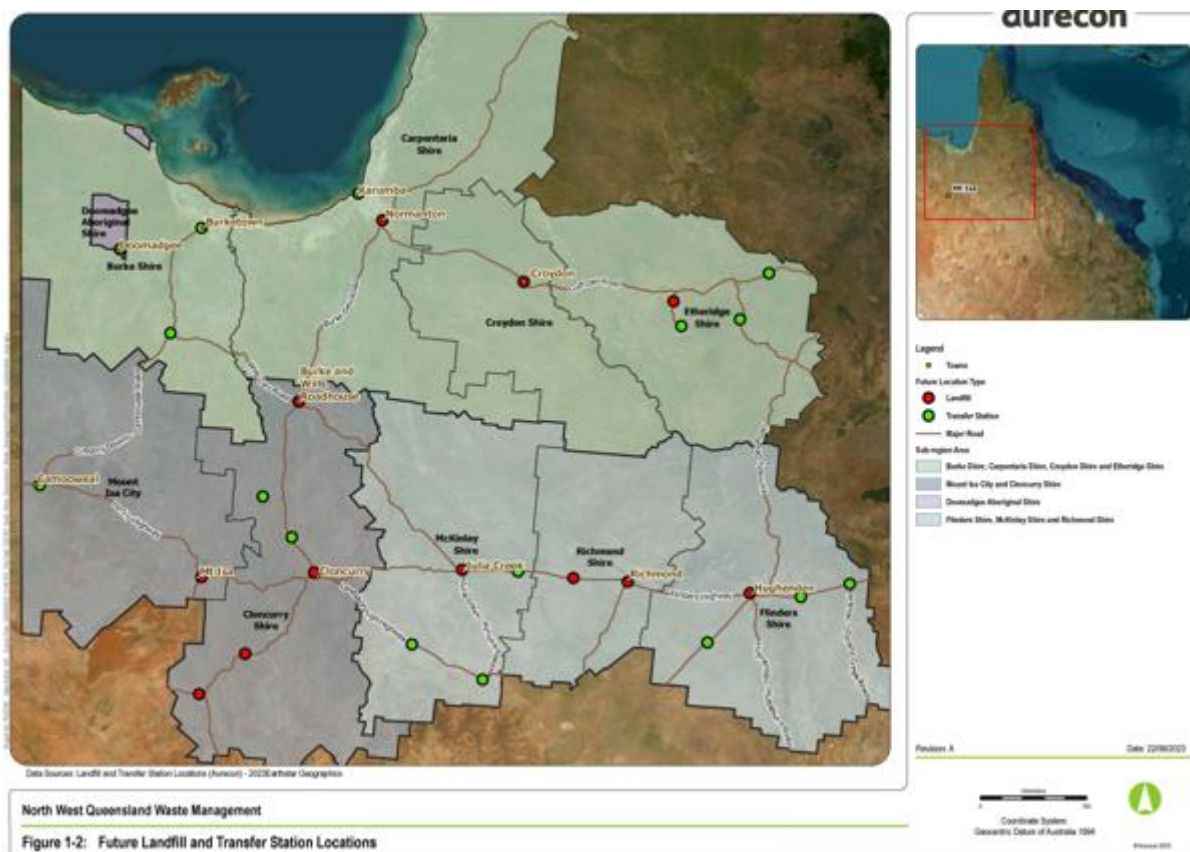


Table 15: Existing and proposed waste disposal infrastructure facilities

Council	Current		Proposed	
	Landfills	Transfer stations	Landfills	Transfer stations
Burke	2	0	0	2
Carpentaria	1	1	1	1
Cloncurry	5	0	2	3
Croydon	1	0	1	0
Etheridge	4	0	1	3
Flinders	4	0	1	3
McKinlay	4	0	1	3
Mount Isa	1	1	1	1
Richmond	2	0	1	1
Sub Total	24	2	9	17
Total	26		26	

Waste Transfer stations should be of consistent design across the region, as this will reduce the design and construction costs, will standardise signage and layout while also allowing for redundancy across the system for items such skip bins and transfer vehicles.

Image 7: Karumba Waste Transfer Station with three bays provided**Image 8: Karumba Waste Transfer Station with dedicated drop-off for steel and e-waste**

Burke SC has a significant deadline, whereby Burketown landfill has an imperative to be closed and rehabilitated by 2026 under the terms of an ILUA being finalised with the traditional owners of the site, the Carpentaria Land Council Aboriginal Corporation. Action for Burke SC will be to close and rehabilitate the site, and the landfill operation moved.

It will take considerably longer than 2026 to gain the necessary approvals and commission a new landfill site and therefore waste disposal solutions for Burke SC are recognised as high priority. No indicative cost for a new landfill is available given site details are unknown.

In place of a new landfill, an estimated figure of \$1.7 Million has been identified to construct new transfer stations at Burketown and Gregory and to cap, close and rehabilitate the existing landfills. As a destination landfill would need to be identified for this option, an indicative transport cost for both Burketown and Gregory waste transfer to an intra-regional landfill could be in the vicinity of \$150,000 per annum, plus notional gate fees to be negotiated. New 25–30 m³ bulk bins to service both sites, are estimated at \$150,000.

Burketown is also affected by wet season flooding and can be landlocked for weeks, or in the case of 2023, for longer. Additional skips would be needed to capture and store waste during prolonged periods of inaccessibility.

Given waste collection and disposal are essential services, the low rate base of Burke SC and the ongoing transport and disposal arrangement at a host regional landfill, the Council would need to secure annual operational support in the form of a waste freight subsidy to offset those costs if a transfer station solution is preferred. Alternatively additional capital funding would be required if it chose a new landfill solution.

Mount Isa CC has identified issues with the design of its new waste transfer station which requires rectification to be operational. Both waste transfer stations require the provision of a hook-lift truck and bulk bins to enable a more efficient operation.

Costs identified to enable changes identified to all waste management facilities, excluding Croydon SC, are summarised in the below table.

Table 16: Waste Management Infrastructure Upgrades

Council / Description	Rate	Amount (2023)
Burke		\$ 2,000,000.00
New transfer station at Burketown (new site required)	\$ 800,000.00	
Cap and close existing landfill at Burketown	\$ 300,000.00	
New transfer station at Gregory (cap old landfill)	\$ 600,000.00	
Remote access	\$ 150,000.00	
Skip bins	\$ 150,000.00	
Carpentaria		\$ 450,000.00
New Weighbridge, signage fencing and general upgrade	\$ 200,000.00	
Remote access	\$ 150,000.00	
Landfill ,masterplan and airspace assessment	\$ 100,000.00	
Cloncurry		\$ 10,050,000.00
New landfill at Cloncurry for general and regulated waste	\$ 8,000,000.00	
New transfer station at Kajabbi (cap old landfill)	\$ 600,000.00	
New transfer station at Quamby (cap old landfill)	\$ 600,000.00	
Upgrades to Dajarra and Duchess landfills	\$ 200,000.00	
Upgrades to Burke and Wills waste management practices	\$ 50,000.00	
Remote access	\$ 300,000.00	
New weighbridge for Cloncurry	\$ 150,000.00	

Skips bins	\$ 150,000.00	
Etheridge		\$ 3,200,000.00
New transfer station at Forsath (cap old landfill)	\$ 600,000.00	
New transfer station at Mt Surprise (cap old landfill)	\$ 600,000.00	
New transfer station at Mt Sullivan (cap old landfill)	\$ 600,000.00	
New transfer station at Einasleigh (cap old landfill)	\$ 600,000.00	
New weighbridge Georgetown	\$ 150,000.00	
Remote access	\$ 300,000.00	
General landfill upgrade, signage, fencing	\$ 50,000.00	
Skips bins	\$ 300,000.00	
Flinders		\$ 2,475,000.00
New transfer station at Prairie (cap old landfill)	\$ 600,000.00	
New transfer station at Torrens Creek (cap old landfill)	\$ 600,000.00	
New transfer station at Stamford (cap old landfill)	\$ 600,000.00	
New weighbridge at Hughenden	\$ 150,000.00	
Remote access	\$ 225,000.00	
General landfill upgrade, signage, fencing	\$ 50,000.00	
Skips bins	\$ 250,000.00	
McKinlay Shire		\$ 2,475,000.00
New transfer station at Nelia (cap old landfill)	\$ 600,000.00	
New transfer station at Kynuna (cap old landfill)	\$ 600,000.00	
New transfer station at McKinlay (cap old landfill)	\$ 600,000.00	
New weighbridge at Julia Creek	\$ 150,000.00	
Remote access	\$ 225,000.00	
General landfill upgrade, signage, fencing	\$ 50,000.00	
Skips bins	\$ 250,000.00	
Mt Isa		\$16,350,000.00
Rectification works to large transfer station	\$ 200,000.00	
Organics processing system (forced aeration)	\$ 1,900,000.00	
New Materials Recovery Facility	\$ 13,100,000.00	
Shredder for all materials	\$ 1,000,000.00	
Remote access (Camooweal)	\$ 150,000.00	
Richmond		\$ 1,050,000.00
New transfer station at Maxwellton (cap old landfill)	\$ 600,000.00	
Remote access	\$ 150,000.00	
General landfill upgrade, signage, fencing	\$ 50,000.00	
New weighbridge at Richmond	\$ 150,000.00	
Skip bins	\$ 100,000.00	
Shared Resources		\$ 350,000.00
Hook Truck	\$ 350,000.00	
Total		\$38,400,000.00

* Crocydon SC requirements are under investigation

4.5.2 Remote controlled entry to waste facilities

Councils have expressed interest in remote-controlled entry for unstaffed transfer stations and a number of technology providers have developed an auditable, controlled entry to unattended sites using a unique ID pin assigned to every household or business with / without number plate recognition and 360-degree cameras to monitor movements and deliveries. A pin entry is also required to exit the site. This allows controlled use to unmanned facilities as well as reporting tools to analyse collected data. The system tracks behaviour by household, street and township for targeted education. Councils need to provide a fenced site, electric gate, civil works, cabling, power (can be solar), 3G/4G connection and 360-degrees CCTV cameras. This technology has been implemented at other centres in Queensland and interstate, with similar issues with remote unmanned transfer stations. Contact with these respective councils will provide feedback on issues.

For a standard technology implementation, indicative costings are:

- hardware: \$28,000 (2 RAC boxes and 1 image capture camera)
- service: \$30,000 (data set-up, tenancy creation, installation of hardware, project management and training)
- annual subscription (subject to CPI): \$18,000 for 1 site, \$5,000 for each additional site in the same council.

4.5.3 Data and commercial charges

Weighbridges provide a definitive measurement from which fees and charges can be set. Currently, only Mount Isa CC has any cost recovery from deliveries. Except for Mount Isa, there are no weighbridges or other data-capture mechanisms at any of the landfills or transfer stations. This makes it difficult to plan for future waste requirements and makes it impossible to implement gate fees.

In-ground weighbridges are expensive relative to the low volumes involved, with costs ranging from \$80,000 to \$150,000 for the hardware and the installation may also require additional upgrades to roads and drainage. A weighbridge will also require operational staff and annual calibration if used for charging purposes. Given the size of the communities and tonnes delivered, only councils with large amounts of C&D warrant an investment of this magnitude. Based on tonnage received, only Cloncurry and Richmond councils exceed 2,000 tonnes of C&D and both these sites have onsite staff to oversee operations. Weighing is optional at Flinders and Carpentaria councils, with almost 1,000 tonnes of C&I.

Alternative approaches could include set annual waste fees for commercial customers, as recommended by Burke SC in its local waste management Plan. This could include builders and large commercial enterprises using the disposal sites regularly. Customers such as Ergon and TMR contractors, who use the landfills occasionally and whose waste streams are clearly identifiable, could be charged retrospectively post-deliveries on a user-pays basis.

Where large scale new developments such as wind and solar farms are proposed, early contact with proponents is necessary to ensure local facilities are able to take and manage the anticipated waste arisings for a fee or that the proponent is made aware that alternative disposal arrangements at larger centres is required.

4.6 Community education

The role of education and community engagement cannot be underestimated. However, any education and community engagement program must be multi-faceted in order to reach all community members.

Engaging radio, newsprint and television as part of their community service obligation to run a combined litter and dumping community education campaign could assist in maintaining a clean environment, which also reduces risks to wildlife, domestic animals and residents.

It is essential that any waste system is easy to understand – complicated systems lose participants. People incorrectly interact with waste systems due to apathy, arrogance or ignorance. Implementing an education campaign produces good results initially but sustained behaviour change is required. Ongoing actions and activities are needed to maintain the focus of the community.

In any kerbside service, contamination levels or the amount of separation of materials is a reflection of the success or failure of an education program. A waste education officer is imperative to engage, educate and motivate all sections of the community in the quest to improve waste management. Other councils have used a ‘train the trainer’ workshops to extend community outreach, particularly around composting.

The basic tools for effective waste education include:

- Branding
- Clear messaging based on the principle of ‘Less is More’.
- Clear, simple text, generic, consistent, appropriate images
- Website – a dedicated waste page with links to other sites
- Social media engagement
- Broader media exposure.

Suggested broad campaigns could feature:

- Litter and illegal dumping aimed to reduce risks to wildlife, domestic animals and residents,
- Reduce, reuse and recycle promoting designated disposal pathways at waste facilities, point of sale return, redemption centres or other charitable community facilities for identified materials,
- Organics management – at home and workplaces to reduce carbon impacts and improve soil health.

4.7 Collaboration with the mining sector

Under current legislation, mining operations are permitted to dispose of their own waste within their mining area. It is understood that most mines do this. The existing approvals are unlikely to extend, allowing external waste to be disposed of on the mining site. There would seem to be little benefit to a mine to transport its general waste to a council facility (particularly if it was to be charged a gate fee). Despite the difficulty in co-ordinating waste-disposal options between the councils and mines, there are likely to be many synergies that could be explored in terms of legacy waste, such as tyres and metals, and for activities relating to education and community engagement. The following table outlines some of the known mines in the region. It would be worthwhile approaching management when particular education and engagement activities are better defined.

Table 17: Mining activity in region

Mine and Locality	Details
Burke	
Century Mines	Produces zinc, lead and silver at the Lawn Hill mine 250km north of Mount Isa.
Cloncurry	
Chinova Resources Osborne	Produces 40,000 tonnes of copper-gold concentrate a year and employs 300 people. Located 150 km south of Cloncurry
Southern Cross Fertilisers	A division of Incitec Pivot, located at Phosphate Hill 150km south of Cloncurry, it is the largest fertiliser production site in the southern hemisphere
Ernest Henry Mining – Evolution Mining	Gold and copper mine, with 6 million tonnes of ore mined each year. Located 38 km northeast of Cloncurry
Malaco Leichhardt – Mount Cuthbert Group	Copper mine, aiming to produce 9,500 tonnes of copper each year. Located 100 km northeast of Mount Isa
Round Oak Minerals – now True North Copper	Copper, gold and cobalt mine, still under development. Located 140 km north of Mount Isa
McKinlay	
South 32 – Cannington	Silver and lead mine, previously owned by BHP. More than 500 employees and located near the township of McKinlay
AIC Copper – Eloise Copper Mine	Copper mine. Located 60 km south east of Cloncurry
Mount Isa	
Glencore Copper	Produces 6 million tonnes of copper ore and the hub of copper and zinc operations in Queensland. Located within Mount Isa Council

4.8 Other considerations

The following options were considered but were found to be unfeasible for the NWQROC at this time. They are discussed below for completeness.

4.8.1 Waste incineration

The option to incinerate waste at existing landfills was raised during the consultation sessions. As this is not an acceptable method of waste disposal under the current legislation and is specifically excluded in the Environmental Authority conditions for most of the sites, this option was not further explored.

4.8.2 Waste-to-energy

While waste incineration is not an acceptable practice, the option of a waste-to-energy (WtE) facility for heat or electricity production was also considered. There are a number of types of waste-to-energy facilities, ranging from anaerobic digestion-producing heat, through to more sophisticated gasification and pyrolysis plants.

The *Queensland Waste to Energy Policy* and the *Waste to Energy Guidelines* outline the significant requirements to construct and operate a WtE facility in Queensland. Only residual waste can be used in a WtE plant, which means that all material diverted from landfill, such as organics and recyclables, must not be used as feedstock for the WtE plant. Materials that are dangerous or hazardous also cannot be used in the plant. Once these materials are excluded, the volume of feedstock in the entire region is extremely small and would not be considered viable to operate.

5. IMPLEMENTATION

This Plan provides a framework for improved waste management. Key observations identified have been based on desktop research, scoping visits, stakeholder and industry engagement and community consultation, coupled with industry knowledge.

5.1 Key Actions

The key actions as detailed in the Implementation Roadmap have been grouped into five key pillars or themes as follows:

- Litter and illegal dumping
- Legacy waste management,
- Recycling and resource recovery,
- Organics management,
- Residual waste management,

5.2 Timeframe and Sequence

The extent of the implementation and the timing of actions will depend upon the availability of capital and recurrent funding. The key overarching actions have been divided into timeframes to provide a forward plan for councils, for the NWQROC, and for government funding agencies, having due respect for councils limited financial and human resources.

Actions identified in the below tables are prioritised based on priority rankings and the following timeframe.

- Short term (High priority) – within 5 years
- Long term – 5–10 years

Table 18: Roadmap to implementation – high-priority issues – within 5 years

Activity	
Operational implementation of RWMP	
1	Establish RWMP Resource Recovery Working Group for member councils to guide implementation
2	Engage a Regional Support Resource to oversee implementation
3	Advocate for Mount Isa CC to be excluded from waste levy zone given no interstate or mining waste is deposited at landfill and the funds are needed to support the economics of recycling and local reuse
4	Adopt advocacy role with collaboration and co-operation engaging mining sector and state regulatory framework
5	Advocate that new wind or solar farms must take responsibility for EOL management of all waste streams and not burden local council or community waste facilities and planning approvals must be conditioned with bonds as appropriate
6	Maintain contact with Glencore Mines in relation to fuel source trials
7	Provide capacity building on issues and matters as identified by member councils and engage experts to assist as required
8	Review and facilitate inclusion of updated information in the Plan and alignment of actions for Doomadgee ASC and Croydon SC with related Plans
Litter and illegal dumping	
9	Identify and map the location of illegal dumping and abandoned vehicles
10	Co-ordinate regional-collection tender or council-specific tender to collect and transport abandoned vehicles to nearest landfill
11	Develop and implement community education campaign around litter, illegal dumping and abandoned vehicles

Recycling and resource recovery	
12	Seek DES support to have COEX redemption services in all councils
13	Support Mount Isa and Cloncurry to introduce a kerbside recycling service
14	Assist with the development of a sub-regional processing facility for kerbside recycling
15	Develop and implement a community education campaign based on reduce, reuse and recycle
Legacy waste	
16	Estimate all legacy stockpiles at all waste disposal facilities
17	Prepare regional scrap-metal tender (Ref: FNQROC model) or as an annexe to the next FNQROC tender, subject to timing and support from FNQROC
18	Prepare regional/sub-regional concrete-crushing tender
19	Prepare regional/sub-regional garden and wood waste chipping service
20	Prepare regional/sub-regional tyre-shredding tender
Organics management	
21	Develop a region-wide campaign on the impacts of organic waste recycling with subsidised compost bins/worm farms
22	Develop business plan for Mount Isa CC organics processing facility
23	Subject to above outcome, introduce FOGO service at Mount Isa CC and Cloncurry (optional)
Residual waste	
24	Assist Burke SC to design / construct new Transfer Stations or identify landfill opportunities; cap, close and rehabilitate existing landfill
25	Co-ordinate the design and construction of new transfer stations with remote access
26	Co-ordinate the cap and close of landfills
27	Upgrade ongoing landfills with improved signage and bunding
28	Assist Mount Isa City Council regarding TS upgrades
29	Consider fees / charges to Ergon, TMR and their contractors as fee for service to use waste facilities
30	Design and construct remaining new transfer stations with remote access to all unmanned sites
31	Cap and close remaining landfills
32	Assist Cloncurry landfill/TS design and construction
33	Engage with the commercial users regarding fees for waste disposal within each council

Table 19: Implementation Roadmap – medium term (5–10 years)

	Activity
1	Review RWMP re achievements, context of new issues, opportunities and regulatory framework
2	Investigate sub-regional waste collection contracting opportunities and rationalisation
3	Review impact of regional education campaigns and consider appropriate interventions
4	Review fit for purpose options for organic waste management
5	Investigate regional collaboration for collection and disposal seeking to increase sub-regional facilities
6	Continue to play an advocacy role re new opportunities and impacts for the region

Whilst the Plan provides the primary vehicle for accessing available funding from the Recycling and Jobs Fund, there may also be opportunities for initiatives to be funded that are outside the Plan, for example, a pilot at a local level to ‘test’ the suitability of a model or infrastructure for the region (or sub-region). It is recognised that the Plan needs to be a living document and that not all potential initiatives will have been identified in the Plan.

However, it is expected that the bulk of the funding will come through the projects identified in the Plan with a more streamlined pathway for funding approvals as they have already been identified in the Plan.

In the first instance any projects identified that are outside the Plan would likely be discussed with the Resource Recovery Working Group and the NWQROC and the proposed regional support resource position that will be funded to support implementation of the Plan, to assess suitability for funding under the Plan or whether this would be considered under a separate funding process.

Councils, participating in the development of this Plan and subsequent endorsement of or support for its finalisation and publication, can do so in the knowledge that this of itself does not obligate individual Councils to any funding commitment. Subsequent business cases developed as part of implementing the Plan would include funding arrangements for their consideration and decision making at that time.

6. FUNDING REQUIRED

While it is acknowledged that current waste management is operated on very low budgets, any improvement in standards will require a commitment from government for both capital and in some cases operational funds to support this Plan which provides a framework for moving forward. It should also be acknowledged there are significant gaps due to lack of information about a range of issues, including the amount of legacy waste to be processed and the costs which will only be known when a detailed proposal is developed. Some costs to upgrade to new technology are also subject to supply and demand and availability of resources, equipment and commercial environment.

More precise costs will be available when the timing of the implementation and actions are agreed. A more detailed budget will be required prior to proceeding with each component. The indicative costs for implementation to FY30-31, summarised in the following tables, are around \$48.6 million with an annual opex budget of \$1.475 million.

Table 20: Budget - Capex for Infrastructure to FY 30-31

Activity	Budget
Capital	
Litter and Illegal dumping	
Abandoned vehicle mapping and tender	\$100,000
Removal to abandoned vehicles and illegal dumping to local disposal sites	\$1,000,000
Recycling and resource recovery	
MRF – Infrastructure and equipment (Mount Isa CC)	\$13,100,000
Organics Management	
Business Plan for establishing an organics processing facility (Mount Isa CC)	\$100,000
Compost facility and shredder (Mount Isa CC)	\$1,800,000
FOGO implementation x 8,000 households (Mount Isa CC)	\$2,000,000
FOGO implementation x 1500 households (Cloncurry SC)	\$375,000
Home composting program and education	\$960,000
Residual waste	
New transfer station Burketown (including capping old landfill) (Burke SC)	\$1,100,000
Cap and close 14 landfills, design and construct 14 new transfer stations	\$8,400,000

Skip Bins for New Transfer Stations	\$1,200,000
New landfill (Cloncurry SC)	\$8,000,000
Remote access system to all unmanned sites	\$1,650,000
Weighbridges for all remaining supervised landfills	\$950,000
Upgrade to all remaining sites (signage, fencing etc)	\$450,000
Hook truck to be shared between Councils	\$350,000
Rectification works to large transfer station (Mount Isa CC)	\$200,000
Landfill masterplan and airspace assessment for Normanton landfill (Carpentaria SC)	\$100,000
Legacy waste	
Determine legacy stockpiles quantities	\$150,000
Tender for tyre legacy shred and transport to end processor	\$2,000,000
Tender for concrete crushing of legacy waste for local reuse	\$900,000
Tender for garden and wood waste legacy chipping	\$900,000
Tender for regional scrap metal legacy clean-up	\$900,000
Education	
Initial education campaign	\$1,540,000
Sub-total	\$48,785,000

Table 21: Operational budget – annual

Activity	Budget
Operational (per annum)	
Resources	
Regional Support Resource to support Regional Resource Recovery Working Group	\$275,000
Home / community composting support program	\$500,000
Capacity building and Advocacy Role as identified and required including technical financial support re sustainable waste management fees and charges	\$100,000
Education	
Community education	\$350,000
Transport and operational support	
Transport subsidies and waste disposal fee for Burketown landfill (Burke SC)	\$250,000
Sub-total (per annum)	\$1,475,000
Total Operation over 7 years	\$10,325,000

Table 22: Combined budget to FY30-31

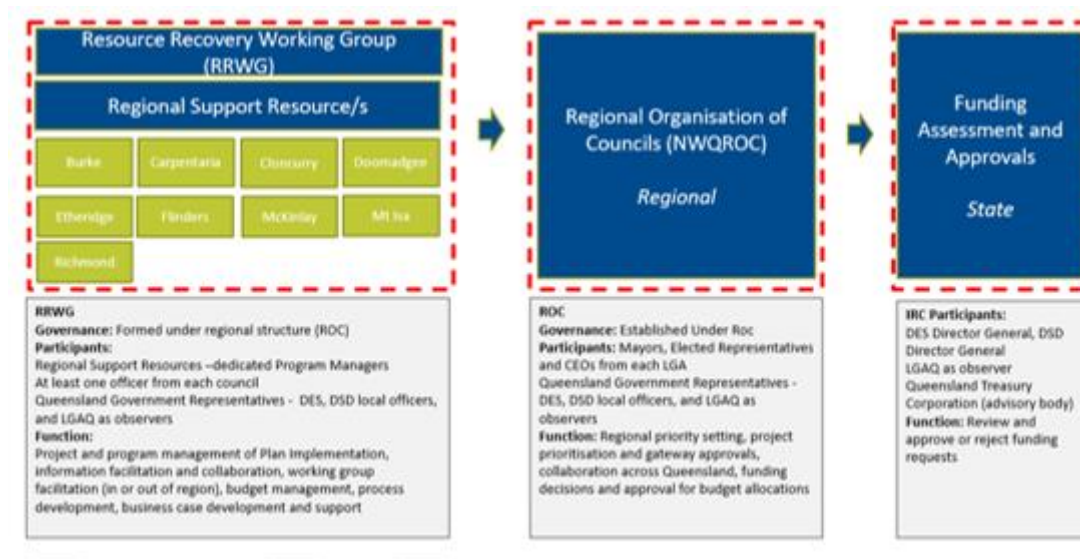
Activity	Budget
Capital	\$48,785,000
Operational	\$10,325,000
Total	\$59,110,000

7. GOVERNANCE, ROLES AND RESPONSIBILITY

The Plan will be delivered by the region via the NWQROC Resource Recovery Working Group established under the NWQROC. The structure of a working group and its functionality has been endorsed by member councils.

The following figure provides a schematic of the proposed governance structure and function.

Figure 12: Proposed governance arrangements



7.1 Regional Working Group

Implementation of the Plan requires ownership by member councils. Beyond the completion of the RWMP, there is a need to establish a governance approach for the region. This is required to allow for implementation of the Plan, which includes activities that should be progressed at a regional scale, or where there are benefits from information-sharing and awareness-raising across the region.

The Queensland Government has clearly stated the need for ongoing regional collaboration to support access to prospective grant funding in order to support implementation of the Plan. The region is required to establish a formal working group structure to continue to develop the outcomes of the region in resource recovery and recycling, for review, consideration and endorsement of the NWQROC, including the following activities:

- Enable NWQROC ownership, monitoring and review of the Plan
- Support identification and priorities (as per the Plan) as they flow up into the NWQROC and a Queensland Government decision-making body
- Access support for administration, funding, and development of supporting documentation and access to shared information
- This group would also facilitate regional collaboration on:
 - Education and behavioural change, including a regional education strategy
 - Data harmonisation, management, and reporting
 - Capacity-building and education for resource-recovery staff
 - Establishment of circular economy community initiatives, such as repair cafes or hubs, community composting, tool libraries

- Development of feasibility studies, business cases and other research activities relating to the progressing of regional solutions (for example regional problematic waste solutions).

Membership of the group will consist of key officers from member Councils and additionally may include representatives from the Queensland Government, notably the Department of Environment and Science (DES) and the Department of State Development, Infrastructure, Local Government and Planning (DSDILGP) as well as the Local Government Association of Queensland.

Terms of reference including reporting obligations to the NWQROC will need to be developed alongside a specific purpose for the group, and the identification of an administrator/co-ordinator to support the Group (this could be from an existing role within a member council, the NWQROC or the Regional Support Resources).

The Queensland Government would be required to fund a Regional Support Resource Co-ordinator for the group and the NWQROC to manage collaboration, progress against the Plan and generally be a champion for collaborative actions across the region. One full-time equivalent has been included in the RWMP at an estimated cost of \$275,000 per year to co-ordinate the Plan response and act as secretariat to the group. The establishment of the group will be an action of the Plan.

Capacity building within the region and advocacy on behalf of the region has been considered and provisional amount of \$100,000 included to cover costs and provide opportunity to engage external experts and technical support as required.

7.2 Regional procurement

Where the working group progresses actions (once established) that requires the contracting (of more than one council) of a service provider, consideration should be given to setting up a separate regional procurement entity. This entity could be set up as a special-purpose vehicle for delivery of one or more procurement activity for councils, or commonly one council takes the lead and runs the procurement. The actions that potentially require this approach are:

- Procurement of technical or commercial advisory services relating to research and development
- Regional-scale contracts for waste collection, audits, surveys and software
- Regional-scale contracts to purchase mobile plant and equipment to benefit the region (for example, vehicles and shredders)
- Development of a long-term regional residual waste solution (for example, regional landfill).

It is expected that the entity would need to have authorisation from the Australian Consumer and Competition Commission (ACCC) to collectively procure some elements of regional-scale procurement (notably long-term contracts for collection or post-collections services).

It was also noted that there may be opportunities for information-sharing regarding procurement, even if procurement is ultimately managed individually by councils.

7.3 Support for delivery

To support the execution of the RWMP, and the development of detailed business cases, procurement and contract development activities support will be required. It is proposed to use the regional support resource identified in this RWMP. This function will support:

- Governance and management system development for implementation of projects
- Project management and scheduling associated with development of key initiatives
- Non-technical support to development of business cases and funding plans for key initiatives
- Support with preparation of information to support funding applications specific to the gateway processes set up by the Queensland or Commonwealth governments.

7.4 Managing change

It is expected that the economic, environmental and technical assumptions this Plan is based on will change over the next 10 years, as documented in the individual stream sections. It is important that in implementing the Plan, the working group and the NWQROC is aware of and able to respond or react to disruptions caused by policy change, industry or technology. The biggest potential disruptors are:

- Changes to the levy
- Policy changes imposed by the Queensland or Commonwealth governments that have a direct impact on the services provided by councils
- Changes to the composition of waste within households and other streams due to action taken by the Commonwealth Government on imported materials
- The change in packaging materials, particularly an increase in the type of packaging used to favour a greater proportion of recyclable packaging
- The development of new technologies or the establishment in small scale for fit for purpose solutions including small-scale energy-from-waste (EfW) technologies or anaerobic digestion).

7.5 Monitoring and review

Responsibility for monitoring of this RWMP will reside with member councils under the overall leadership of the NWQROC. It is expected that Plan implementation will reside with the Working Group under the NWQROC. Key metrics to be monitored are shown in Table 23 below.

Table 23: Monitoring and Review

Key Metric	Review Mechanism	Responsibility
Increased diversion of waste from landfill	Yearly	NWQROC/Councils
Accurate data collection	Yearly	NWQROC/Councils
Access to CoEX to all Councils	Yearly	Councils/DES
Improved operations at all waste facilities	Yearly	Councils/DES
Reduction in illegal dumping/ abandoned cars	Yearly review	NWQROC
Removal of legacy stockpiles	After the first 2 years	NWQROC/Councils
Potential closure of Burketown landfill and implementation of new waste disposal solution	After the first 2 years	NWQROC/Burke Shire Council
Closure of nominated landfills and installation of transfer stations	After the first 2 years	NWQROC/Councils
Access to organics recycling (home composting and / or FOGO service)	After the first 2 years	NWQROC/Councils
Implementation of education campaign	After the first 2 years	NWQROC/Councils

APPENDIX A – POPULATION BY COUNCIL AREA AND PROPORTION

Table 24: Population by council area and percentage of region

Council	Population	Percentage	Houses
Burke	419	1.4%	185
Carpentaria	2,090	6.8%	895
Cloncurry	3,644	11.9%	1356
Croydon	266	0.9%	213
Etheridge	714	2.3%	282
Flinders	1,500	4.8%	744
McKinlay	836	2.7%	323
Mount Isa	18,727	61.1%	7842
Richmond	761	2.5%	331
Total	28,957	100%	12,171

APPENDIX B - WASTE GENERATION

Table 25: Waste generation by council and sector

Council	MSW	C&I	C&D	Total
Burke Shire Council [#]	335 [#]	50	10	395
Carpentaria Shire Council	1,689	960	104	2,753
Cloncurry Shire Council	1,084	500	2,000	3,584
Etheridge Shire Council	296	70	20	386
Flinders Shire Council	627	842	135	1,603
McKinlay Shire Council	192	10	250	452
Mount Isa City Council	6,644	14,841	1,360	22,845
Richmond Shire Council	798	185	5,020	6,003
Total	11,665	17,458	8,899	38,021

NB: No Croydon data, # Burke 2020 data

APPENDIX C - INVESTMENT LOGIC MAPPING

