

Kyogle Council



Infrastructure

‘Core’ Infrastructure Risk Management Plan



Version 1.2

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1. INTRODUCTION

1.1 Aim

The purpose of this core risk management plan is to document the results and recommendations resulting from periodic identification, assessment and treatment of risks associated with providing services to the community from infrastructure, using the fundamentals of International Standard ISO 31000:2009 *Risk management – Principles and guidelines*.

Risk Management is defined in ISO 31000:2009 as: “coordinated activities to direct and control an organisation with regard to risk”¹.

1.2 Objectives

The objectives of the plan are:

- to identify risks to the Kyogle Council that may impact of the delivery of services from infrastructure
- to select credible risks for detailed analysis,
- to analyse and evaluate risks in accordance with ISO 31000:2009,
- to prioritise risks,
- to identify risks requiring treatment by management action,
- to develop risk treatment plans identifying the tasks required to manage the risks, the person responsible for each task, the resources required and the due completion date.

1.3 Core Infrastructure Risk Management

This core risk management plan has been designed to be read as a supporting document to the infrastructure and asset management plan. It has been prepared using the fundamentals of International Standard ISO 31000:2009 *Risk management – Principles and guidelines*.

1.4 Scope

This plan considers risks associated with delivery of services from infrastructure.

1.5 The Risk Management Context

We have implemented many management practices and procedures to identify and manage risks

associated with providing services from infrastructure assets. These include:

- operating a reactive maintenance service for all assets and services,
- operating a planned maintenance system for key assets,
- monitoring condition and remaining service life of assets nearing the end of their service life,
- renewing and upgrading assets to maintain service delivery,
- closing and disposing of assets not providing the required service level, and
- acquiring or constructing new assets to provide new and improved services.

The asset categories that have been included in this risk plan are:

- Buildings and Community Facilities
- Transport
- Water Supply
- Sewerage Services
- Plant Equipment and Emergency Services
- Waste Management
- Stormwater and Flood Management
- Parks and Reserves

We have assigned responsibilities for managing risks associated with assets and service delivery to the relevant Director through the relevant Manager.

1.6 Risk Management Process

The risk management process used in this project is shown in Figure 1.6 below.

It is an analysis and problem solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the fundamentals of International Standard ISO 31000:2009.

¹ ISO 31000:2009, p 2.

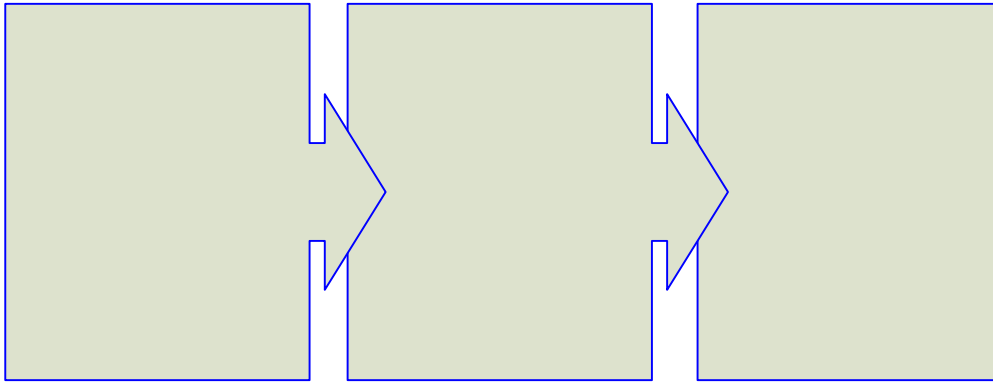


Fig 1.6: Risk Management Process – Abridged
 Source: Adapted from ISO 31000:2009, Figure 1, p vii

2. COMMUNICATION AND CONSULTATION

Risk communication and consultation is “continual and iterative processes that an organisation conducts to provide, share or obtain information and to engage in dialogue with stakeholders regarding the management of risk”².

‘Appropriate communication and consultation seeks to:

- Improve people’s understanding of risks and the risk management processes,
- Ensure that the varied views of stakeholders are considered, and
- Ensure that all participants are aware of their roles and responsibilities.’³

The development of this infrastructure risk management plan was undertaken using a consultative team approach to:-

- Identify stakeholders and specialist advisors who need to be involved in the risk management process,
- Discuss and take into account the views of stakeholder and specialist advisors, and
- Communicate the results of the risk management process to ensure that all stakeholders are aware of and understand their and roles and responsibilities in risk treatment plans.

Members of the team responsible for preparation of this risk management plan are:

- General Manager
- Director Technical Services

- Director Community and Corporate Services
- Director Planning and Environmental Services
- Manager Asset Services
- Manager Works
- JRA Consulting

3. RISK IDENTIFICATION

3.1 General

Potential risks associated with providing services from infrastructure were identified at meetings of the organisation’s infrastructure risk management team.

Team members were asked to identify “what can happen, where and when” to the organisation’s various services, at the network level and for critical assets at the asset level, then to identify possible “why and how can it happen” as causes for each potential event together with any existing risk management controls.

Each risk was then tested for credibility to ensure that available resources were applied to those risks that the team considered were necessary to proceed with detailed risk analysis

The assets at risk, what can happen, when, possible cause(s), existing controls and credibility are shown in Appendix A – Risk Register.

Credible risks are subjected to risk analysis in Section 4.4.5. Risks assessed as non-credible were not considered further and will be managed by routine procedures.

4. RISK ANALYSIS

² ISO 31000:2009, p 3

³ HB 436:2004, Sec 3.1, p 20

4.1 General

Credible risks which have been identified during the risk identification stage were analysed. This process takes into account the 'likelihood' and the 'consequences' of the event. The objective of the analysis is to separate the minor acceptable risks from the major risks and to provide data to assist in the assessment and management of risks.

The risk analysis process is applied to all credible risks to determine levels of risk. The process acts as a filter by applying a reasoned and consistent process. Minor risks can be eliminated from further consideration and dealt with within standard operating procedures.

The remaining risks will therefore be of such significance as to consider the development of risk treatment options and plans.

4.2 Likelihood

Likelihood is a qualitative description of chance of an event occurring. The process of determining likelihood involves combining information about estimated or calculated probability, history or

experience. Where possible it is based on past records, relevant experience, industry practice and experience, published literature or expert judgement.

4.3 Consequences

Consequences are a qualitative description of the outcome of an event affecting objectives. The process of determining consequences involved combining information about estimated or calculated effects, history and experience.

4.4 Method

The risk analysis method uses the risk rating chart shown in Section 4.4.3. This process uses a qualitative assessment of likelihood/probability and history/experience compared against a qualitative assessment of severity of consequences to derive a risk rating.

The qualitative descriptors for each assessment are shown in Tables 4.4.1 and 4.4.2.

Table 4.4.1: Likelihood Qualitative Descriptors

Likelihood	Descriptor	Probability of occurrence
Rare	May occur only in exceptional circumstances	More than 20 years
Unlikely	Could occur at some time	Within 10-20 years
Possible	Might occur at some time	Within 3-5 years
Likely	Will probably occur in most circumstances	Within 2 years
Almost certain	Expected to occur in most circumstances	Within 1 year

Table 4.4.2: Consequences Qualitative Descriptors

Consequence	Injury	Service Interruption	Environment	Finance	Reputation
Insignificant	Nil	< 4 hrs	Nil	< \$20k	Nil
Minor	First Aid	Up to 1 day	Minor short term	\$20k - \$100k	Minor media
Moderate	Medical treatment	1 day – 1 week	Wide short term	\$100k - \$500k	Moderate media
Major	Disability	1 week – 1 month	Wide long term	\$500k - \$1M	High media
Catastrophic	Fatality	Over 1 month	Irreversible long term	> \$1M	Censure/Inquiry

4.4.1 Risk Assessment

The risk assessment process compares the likelihood of a risk event occurring against the consequences of the event occurring. In the risk rating table below, a risk event with a likelihood of 'Possible' and a consequence of 'Major' has a risk rating of 'High'.

This rating is used to develop a typical risk treatment in Section 5.3.

Table 4.4.1: Risk Assessment Matrix

Risk Rating					
Likelihood	Consequences				
	Insignificant	Minor	Moderate	Major	Catastrophic
Rare	L	L	M	M	H
Unlikely	L	L	M	M	H
Possible	L	M	H	H	H
Likely	M	M	H	H	VH
Almost Certain	M	H	H	VH	VH

Ref: HB 436:2004, Risk Management Guidelines, Table 6.6, p 55.

4.4.2 Indicator of Risk Treatment

The risk rating is used to determine risk treatments. Risk treatments can range from immediate corrective action (such as stop work or prevent use of the asset) for 'Very High' risks to manage by routine procedures for 'Low' risks.

An event with a 'High Risk' rating will require 'Prioritised action'. This may include actions such as reducing the likelihood of the event occurring by physical methods (limiting usage to within the asset's capacity, increasing monitoring and maintenance practices, etc), reducing consequences (limiting speed of use, preparing response plans, etc) and/or sharing the risk with others (insuring the organisation against the risk).

Table 4.4.1: Risk Assessment Matrix

Risk Rating		Action Required and Timing
VH	Very High Risk	Immediate corrective action
H	High Risk	Prioritised action required
M	Medium Risk	Planned action required
L	Low Risk	Manage by routine procedures

4.4.3 Analysis of Risk

The team conducted an analysis of credible risks identified in section 3.1 using the method described above to determine a risk rating for each credible risk.

The credible risks and risk ratings are shown in Appendix A – Risk Register.

4.5 Risk Evaluation

The risk management team evaluated the need for risk treatment plans using an overall assessment of the evaluation criteria shown in Table 4.5 to answer the question "is the risk acceptable?"

Table 4.5: Risk Evaluation Criteria

Criterion	Risk Evaluation Notes
Operational	Risks that have the potential to reduce services for a period of time unacceptable to the community and/or adversely affect the council's public image.
Technical	Risks that cannot be treated by the organisation's existing and/or readily available technical resources.
Financial	Risks that cannot be treated within the organisation's normal maintenance budgets or by reallocation of an annual capital works program.
Legal	Risks that have the potential to generate unacceptable exposure to litigation.
Social	Risks that have the potential to: <ul style="list-style-type: none"> - cause personal injury or death and/or - cause significant social/political disruption in the community.
Environmental	Risks that have the potential to cause environmental harm.

The evaluation criteria are to provide guidance to evaluate whether the risks are acceptable to the council and its stakeholders in providing services to the community. Risks that do not meet the evaluation criteria above are deemed to be unacceptable and risk treatment plans are required to be developed and documented in this Infrastructure Risk Management Plan, for consideration by Council.

"Decisions on managing risk should take account of the wider context of the risk and include consideration of the tolerance of the risks borne by parties, other than the organisation that benefit from the risk. Decisions should be made in accordance with legal, regulatory and other requirements.

In some circumstances, the risk evaluation can lead to a decision to undertake further analysis. The risk evaluation can also lead to a decision not to treat the risk in any way other than maintaining existing controls. This decision will be influenced by the organisation's risk attitudes and the risk criteria that have been established."⁴

preparing risk treatment plans and implementing those plans. This includes reviewing existing guides for treating that particular risk, such as Australian and State legislation and regulations, International and Standards and Best Practice Guides.

Developing risk treatment options starts with understanding how risks arise, understanding the immediate causes and the underlying factors that influence whether the proposed treatment will be effective.

One treatment option is to remove the risk completely by discontinuing the provision of the service.

Risk treatment options can include:

- a) avoiding the risk by deciding not to start or continue with the activity that give rise to the risk,
- b) taking or increasing the risk in order to pursue an opportunity,
- c) removing the risk source,
- d) changing the likelihood,
- e) changing the consequences,
- f) sharing the risk with another party or parties (including contracts and risk financing),
- g) retaining the risk by informed decision.⁵

5. RISK TREATMENT PLANS

5.1 General

The treatment of risk involves identifying the range of options for treating risk, evaluating those options,

⁴ ISO 3100:2009, Sec 5.4.4, p 18.

⁵ ISO 3100:2009, Sec 5.5.1, p 19

5.2 Risk Treatment Options

The risk treatment options selection process comprises 5 steps.

Step 1. Review causes and controls

The risk identification process documented in Section 3 included identifying possible causes and documenting existing controls.

Step 2. Develop treatment options

Treatment options include those that eliminate risk, reduce the likelihood or the risk event occurring, reducing the consequences should the risk event occur, sharing of the risk with others and accepting the risk.

Step 3. Assess risk treatment options against costs and residual risk

The method of assessment of risk treatment options can range from an assessment by a local group of stakeholders and practitioners experienced in operation and management of the assets/service to detailed risk cost and risk reduction cost/benefit analysis involving assessment of the likelihood and consequences to determine the residual risk and analysis of the reduction in risk against the costs for each treatment option.

Step 4. Select optimum risk treatment

Step 5. Develop risk treatment plans

5.3 Risk Treatments

The risk treatments identified for non-acceptable risks are detailed in Appendix A – Risk Register.

5.4 Risk Treatment Plans

From each of the risk treatments identified in Appendix A – Risk Register, risk treatment plans were developed.

The risk treatment plans identify for each non-acceptable risk:-

1. Proposed action
2. Responsibility
3. Resource requirement/budget
4. Timing
5. Reporting and monitoring required

The risk treatment plan is shown in Appendix A – Risk Register.

6. MONITORING AND REVIEW

The program for monitoring and review of the infrastructure risk management plan is shown in Table 6.

Table 6: Monitoring and Review Program for Infrastructure Risk Management Plan

Activity	Review Process
Review of new risks and changes to existing risks	Annual review by team with stakeholders and report to council
Review of Risk Management Plan	3 yearly review and re-write by team and report to council
Performance review of Risk Treatment Plan	Action plan tasks incorporated in council staff performance criteria with regular performance reviews. Action plan tasks for other organisations reviewed at annual team review meeting

7. REFERENCES

- IPWEA, 2006, *International Infrastructure Management Manual*, 2006, Institute of Public Works Engineering Australia, Sydney, www.ipwea.org.au.
- IPWEA, 2011, *Asset Management for Small, Rural or Remote Communities Practice Note*, Institute of Public Works Engineering Australia, Sydney, www.ipwea.org.au/AM4SRRC.
- ISO, 2009, *ISO 31000:2009, Risk management – Principles and guidelines*, Standards Australia, Sydney.
- Standards Australia, 2004, *AS/NZS 4360:2004, Australian/New Zealand Standard, Risk Management*, Sydney (superseded by ISO 31000:2009).
- Standards Australia, 2004, *HB 436:2004, Risk Management Guidelines, Companion to AS/NZS 4360:2004*, Sydney.

APPENDIX A RISK REGISTER

Kyogle

Infrastructure Infrastructure Risk Register

RISK IDENTIFICATION							RISK ANALYSIS					RISK TREATMENT			RISK TREATMENT PLAN				
Risk No.	Asset at Risk	What can happen?	When can it occur?	Possible cause	Existing controls	Is risk credible?	Likelihood	Consequences	Risk rating	Action required	Is risk acceptable?	Treatment option(s)	Residual risk	Risk treatment plan	Actions	Responsibility	Resources	Budget	Date due
1	Building Maintenance	Maintenance costs increasing due to inadequate renewal program	Anytime in the future	Underfunding Inadequate information	Reactive maintenance works undertaken when identified	Yes	Unlikely	Moderate	Medium	Planned action required	No	Continue to improve data Maintenance is managed appropriately at an operational level Future planning improvements can be made by documented service level risks and utilisation of these in establishing future maintenance priorities	Remains but reduced	Continue to improve data Maintenance is managed appropriately at an operational level Future planning improvements can be made by documented service level risks and utilisation of these in establishing future maintenance priorities	Implementation of regular condition assessments and documented maintenance inspections	Manager	Staff	Nil	Jun-13
2	Building Renewal	Buildings deteriorate to a lesser service standard and higher risk situation	Anytime in the future	Underfunding Inadequate information	Renewal works undertaken when identified or listed for works budget	Yes	Unlikely	Moderate	Medium	Planned action required	No	Continue to improve data Future planning improvements can be made by further documented service level risks and utilisation of these in establishing future renewal priorities	Remains but reduced	Continue to improve data Future planning improvements can be made by further documented service level risks and utilisation of these in establishing future renewal priorities	Implementation of regular condition assessments and documented maintenance inspections	Manager	Staff	Nil	Jun-13
3	Reduced building utilisation	Buildings not fully utilised	Anytime now	Buildings not suiting the needs of service providers	Maintenance provided	Yes	Possible	Minor	Medium	Planned action required	No	Continue to monitor not only the condition of buildings, but how well they suit the needs of users	Remains but reduced	Continue to monitor not only the condition of buildings, but how well they suit the needs of users	Undertake functional and utilisation assessments of all structures	Manager	Staff	Nil	Jun-13
4	Building funding pressure	Increasing financial pressure to adequately maintain the building portfolio	Within 10 years	Growth in building portfolio due to provision of grants	Growth in portfolio managed	Yes	Possible	Minor	Medium	Planned action required	No	Consideration should be made to ensure sufficient ongoing operation and maintenance funds can be provided to support these additional assets	Remains but reduced	Consideration should be made to ensure sufficient ongoing operation and maintenance funds can be provided to support these additional assets	Undertake assessment of buildings portfolio with a view to identifying surplus assets for disposal	Manager	Staff	Nil	Jun-13
5	Road maintenance levels	Decreasing frequency of maintenance	Within 5 years	Maintenance costs increasing due to inadequate renewal program	Maintenance is managed appropriately at an operational level	Yes	Possible	Moderate	High	Prioritised action required	No	Follow documented service level risk rating processes and prioritisation for establishing future maintenance works	Remains but reduced	Follow documented service level risk rating processes and prioritisation for establishing future maintenance works	Follow documented service level risk rating processes and prioritisation for establishing future maintenance works	Manager	Staff	Nil	Jun-13

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Risk No.	Asset at Risk	What can happen?	When can it occur?	Possible cause	Existing controls	Is risk credible?	Likelihood	Consequences	Risk rating	Action required	Is risk acceptable?	Treatment option(s)	Residual risk	Risk treatment plan	Actions	Responsibility	Resources	Budget	Date due
6	Road condition	Roads deteriorate to a lesser service standard and higher risk situation	Within 5 years	Inadequate renewal program	Required renewal of road components is being achieved in the short to medium term	Yes	Likely	Major	High	Prioritised action required	No	Future planning improvements can be made by further documented service level risks and utilisation of these in establishing future renewal priorities	Remains but reduced	Future planning improvements can be made by further documented service level risks and utilisation of these in establishing future renewal priorities	Future planning improvements can be made by further documented service level risks and utilisation of these in establishing future renewal priorities	Manager	Staff	Nil	Jun-13
7	Roads storm and flood damage	Damage to roads as a result of major storm events	Anytime now	Extreme weather events	Natural disaster funding has enabled services to be maintained	Yes	Almost certain	Catastrophic	Very High	Immediate corrective action	No	Seek assistance from other tiers of government, which relies on Natural Disaster declarations	Remains but reduced	Seek assistance from other tiers of government, which relies on Natural Disaster declarations	Seek assistance from other tiers of government, which relies on Natural Disaster declarations	Manager	Staff	Nil	Jun-13
8	Transport asset renewals not funded when required	Conditions will deteriorate and funding shortfall grows due to higher cost renewal treatments being required	Within 10 years	Funding Insufficient	Gravel budget is approx \$200k per year. For a 15 year sheeting cycle a budget of \$1.2M is required. Seals budget is approx. \$112k per year. For a cycle of 15 years a budget of \$500k is required.	Yes	Almost certain	Major	Very High	Immediate corrective action	No	High reliance on funding from other tiers of government. Reduction in funding from these sources will lead to a reduction in service level. Sealed roads may revert to gravel roads and gravel roads may become formed earth roads	Remains but reduced	Limited funding available needs to be directed to highest priority areas, by utilising traffic counts, accident data, insurance claims, and industry transport and bus route assessments	Limited funding available needs to be directed to highest priority areas, by utilising traffic counts, accident data, insurance claims, and industry transport and bus route assessments	Manager	Staff	Nil	Jun-13
9	Bridges	Failure. Structural or functional.	Anytime now	Most timber bridges are at or past their useful life, larger timber bridges are not being replaced due to large capital cost per bridge	Focus on replacing smaller timber bridges Monitoring load limits Bridge condition inspections	Yes	Almost certain	Major	Very High	Immediate corrective action	No	Increase inspections, Impose weight limits, Closures where required, Identify non-critical structures for disposal	Service risk still remains, but physical risk is reduced	Increase inspections, Impose weight limits, Closures where required, Identify non-critical structures for disposal	Increase inspections, Impose weight limits, Closures where required, Identify non-critical structures for disposal	Manager	Staff	Nil	Jun-13
10	Stormwater Network	General deterioration of the network resulting in structural and capacity failures	Within 20 years	Renewals not undertaken when required	Assessment of condition	Yes	Likely	Moderate	High	Prioritised action required	No	Assess adequacy of inspections, particularly in aged network areas, undertake CCTV inspections of areas of highest risk. Keep data up to date so that renewals can be planned	Service risk still remains but long term financial risk is reduced	Assess adequacy of inspections, particularly in aged network areas. Keep data up to date so that renewals can be planned	Assess adequacy of inspections, particularly in aged network areas. Keep data up to date so that renewals can be planned	Manager	Staff	Nil	Jun-13

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Infrastructure Infrastructure Risk Register

RISK IDENTIFICATION							RISK ANALYSIS					RISK TREATMENT			RISK TREATMENT PLAN				
Risk No.	Asset at Risk	What can happen?	When can it occur?	Possible cause	Existing controls	Is risk credible?	Likelihood	Consequences	Risk rating	Action required	Is risk acceptable?	Treatment option(s)	Residual risk	Risk treatment plan	Actions	Responsibility	Resources	Budget	Date due
11	Stormwater Network	Surcharges onto private property causing damage and nuisance	Anytime now	Undersized or poorly constructed local stormwater drainage system	Stormwater maintenance program in place, insurances	Yes	Almost certain	Moderate	High	Prioritised action required	No	Capital upgrades to existing systems where surcharges occur most frequently and with the most adverse impact	Remains but reduced	Assess adequacy of capital works program, and prioritise improvements	Assess adequacy of capital works program, and prioritise improvements	Manager	Capital improvements required	Some limited funding available in the long term financial plan	Jun-13
12	Flood Managment System	Flooding caused by inadequate or lack of stormwater or flood management systems	Anytime now	Natural hazards	Kyogle Floodplain Risk Management Plan and emergency response	Yes	Likely	Major	High	Prioritised action required	No	Implement Flood Modification Works in Kyogle and associated development controls and voluntary purchases	Service risk still remains, but works can be programed with confidence based on corporate priorities	Investigate flood management options for other villages at risk	Investigate flood management options for other villages at risk	Manager	Staff	Nil	Jun-13
12	Private Property	Flooding caused by inadequate or lack of stormwater or flood management systems	Anytime now	Property in flood affected area	Kyogle Floodplain Risk Management Plan and emergency response	Yes	Likely	Major	High	Prioritised action required	No	Implement Flood Modification Works in Kyogle and associated development controls and voluntary purchases	Service risk still remains, but works can be programed with confidence based on corporate priorities	Implement Kyogle Floodplain Risk Management Plan	Implement Kyogle Floodplain Risk Management Plan	Manager	Capital improvements required	Funding in the long term financial plan	Jun-15
10	Deterioration of sewerage supply system	Blockages	Within 5 years	Tree root infiltration, soil movement, materials failures	CCTV inspections completed to identify extent of problems	Yes	Almost certain	Moderate	High	Prioritised action required	No	Required renewal of sewer system components is being achieved in the short to medium term Future planning improvements can be made by further documented service level risks and utilisation of these in establishing future renewal priorities	Remains but works can be prioritised	Continue to improve data by carrying out sample inspections on a regular basis Required renewal of sewer system components is being achieved in the short to medium term Future planning improvements can be made by further documented service level risks and utilisation of these in establishing future renewal priorities	Review sewer main renewal program	Manager	Staff	Within existing	Jun-13

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Infrastructure Infrastructure Risk Register

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Risk No.	Asset at Risk	What can happen?	When can it occur?	Possible cause	Existing controls	Is risk credible?	Likelihood	Consequences	Risk rating	Action required	Is risk acceptable?	Treatment option(s)	Residual risk	Risk treatment plan	Actions	Responsibility	Resources	Budget	Date due
11	Deterioration of sewerage supply system	Structural failures, increased maintenance	Within 10 years	Underfunding of renewals in the future can have a significant impact on increased costs, environmental impacts, and compliance	Inspections	Yes	Possible	Major	High	Prioritised action required	No	Continue to undertake CCTV inspections to assess the condition of the reticulation assets to identify sections of main at risk of failure	Remains but reduced	Additional analysis of data inventory, assessment of useful lives will be critical to ensure the long term financial planning for sewer systems is reliable	Undertake further CCTV inspections on oldest mains	Manager	Staff	Within existing	Jun-13
12	Deterioration of sewerage supply system asset components	Failures of transport and treatment systems	Within 10 years	mechanical and electrical failures	Inspections	Yes	Possible	Major	High	Prioritised action required	No	Implement inspection and preventative maintenance program for sewer pumping stations and treatment works and associated mechanical and electrical components	Remains but reduced	Continue to develop the inspection and maintenance programs	Implementation of risk treatments	Manager	Staff	Within existing	Jun-13
13	Sewer system not available	Public health or environmental issues	Within 5 years	System not provided	Works prioritised based on land use planning requirements	Yes	Likely	Moderate	High	Prioritised action required	No	Investigate un-sewered areas and assess sewerage system requirements and land use planning requirements so that future needs can be anticipated	Remains but reduced	Ensure appropriate Development Controls and Land use planning provisions and in place	Undertake feasibility studies for providing sewerage services to existing and proposed village areas	Manager	Staff	Within existing	Jun-13
14	Not meeting drinking water guidelines	Increase in taste and odour complaints, spread of illness and disease	Anytime now	Highly variable raw water can lead to poor final water quality	Regular testing and monitoring	Yes	Likely	Moderate	High	Prioritised action required	No	Develop a Drinking Water Quality Management Plan and complete the Kyogle Water Supply Augmentation	Remains but reduced	Develop a Drinking Water Quality Management Plan and complete the Kyogle Water Supply Augmentation	Develop a Drinking Water Quality Management Plan and complete the Kyogle Water Supply Augmentation	Manager	Staff	Within existing	Jun-13
15	Deterioration of water supply system	High numbers of main breaks leaving customers without water	Within 10 years	Deterioration of pipelines at a greater rate than expected	Reactive repairs and renewals program	Yes	Likely	Major	High	Prioritised action required	No	Improve records for water mains breakage locations and use data to prioritise water mains renewals	Remains but reduced	Improve records for water mains breakage locations and use data to prioritise water mains renewals	Improve records for water mains breakage locations and use data to prioritise water mains renewals	Manager	Staff	Within existing	Jun-13

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Risk No.	Asset at Risk	What can happen?	When can it occur?	Possible cause	Existing controls	Is risk credible?	Likelihood	Consequences	Risk rating	Action required	Is risk acceptable?	Treatment option(s)	Residual risk	Risk treatment plan	Actions	Responsibility	Resources	Budget	Date due
16	Deterioration of water supply system	Underfunding of renewals leading to frequent failures and higher operating and maintenance costs	Within 10 years	Caused by inadequate renewal funding	Works required are identified and included in works programs	Yes	Likely	Major	High	Prioritised action required	No	Ensure funding for renewals is provided in the medium and long term, and implement preventative maintenance programs for all mechanical and electrical components	Remains but reduced	Implement preventative maintenance programs for all mechanical and electrical components	Implement preventative maintenance programs for all mechanical and electrical components	Manager	Staff	Within existing	Jun-13
17	Drought Failure of a Water Supply	Failure of a water supply to a community	Within 10 years	Lack of available water sources to meet demand	Drought Management Plan, and use of water restrictions	Yes	Likely	Major	High	Prioritised action required	No	Continue to implement drought management plan and involvement in regional strategies	Remains but reduced	Continue to implement drought management plan and involvement in regional strategies	Continued involvement in regional water supply strategy	Manager	Staff	Within existing	Jun-13
18	Parks and Reserves not to standard	Accidents and injuries to users	Anytime in the future	Sub standard or poorly maintained components	Inspected and monitored	Yes	Likely	Moderate	High	Prioritised action required	No	Continue to inspect facilities so their standard is known. Monitor industry changes so that potential changes to regulatory standards can be anticipated	Remains but risk can be reduced by forward planning decisions	Establish procedures for assessing inspection results and prioritising maintenance and repairs	Establish procedures for assessing inspection results and prioritising maintenance and repairs	Manager	Staff	Within existing	Jun-13
19	Parks and Reserves do not meet user requirements	User levels decrease, wasted resources	Anytime in the future	Substandard or obsolete assets, aging population, change in sporting trends	None	Yes	Possible	Moderate	High	Prioritised action required	No	Monitor utilisation so that user requirements are anticipated	Remains but risk can be reduced by forward planning decisions	Monitor utilisation so that user requirements are anticipated	Monitor utilisation so that user requirements are anticipated	Manager	Staff	Within existing	Jun-13
20	Parks and Reserves deteriorate	Parks and Reserves not funded to meet requirements for maintenance and upkeep	Anytime in the future	Insufficient maintenance or renewal due to insufficient funds	None	Yes	Possible	Moderate	High	Prioritised action required	No	Continue to monitor costs Regularly review, update and improve the Parks and Reserves Asset Management Plan to monitor trends	Remains but risk can be reduced by forward planning decisions	Continue to monitor costs Regularly review, update and improve the Parks and Reserves Asset Management Plan to monitor trends	Continue to monitor costs Regularly review, update and improve the Parks and Reserves Asset Management Plan to monitor trends	Manager	Staff	Within existing	Jun-13

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Infrastructure Infrastructure Risk Register

RISK IDENTIFICATION							RISK ANALYSIS					RISK TREATMENT			RISK TREATMENT PLAN				
Risk No.	Asset at Risk	What can happen?	When can it occur?	Possible cause	Existing controls	Is risk credible?	Likelihood	Consequences	Risk rating	Action required	Is risk acceptable?	Treatment option(s)	Residual risk	Risk treatment plan	Actions	Responsibility	Resources	Budget	Date due
18	Aging plant and equipment Technical Obsolescence	High incidence of breakdowns Increased maintenance costs Increased down time Increased project costs and poor efficiency Works programs run behind schedule	Within 10 years	Caused by inadequate renewal funding	Plant requirements are identified and included in the plant replacement program	Yes	Possible	Moderate	High	Prioritised action required	No	Service in accordance with manufacturers requirements Investigate and replace equipment at optimise time to give the lowest lifecycle cost Regular condition assessment of key equipment to assist in predicting maintenance and renewal needs Maintenance is managed appropriately at an operational level	Remains but reduced	Service in accordance with manufacturers requirements Investigate and replace equipment at optimise time to give the lowest lifecycle cost Regular condition assessment of key equipment to assist in predicting maintenance and renewal needs Maintenance is managed appropriately at an operational level	Implementation of risk treatments	Manager	Staff	Nil	Jun-13
19	Plant and Equipment Reduced Safety	Underfunding of renewals in the future	Within 5 years	Caused by inadequate replacement and/or servicing	Plant requirements are identified and included in the plant replacement program	Yes	Possible	Moderate	High	Prioritised action required	No	Investigate and replace equipment at optimise time to give the lowest lifecycle cost and improved safety	Remains but reduced	Investigate and replace equipment at optimise time to give the lowest lifecycle cost and improved safety	Implementation of risk treatments	Manager	Staff	Nil	Jun-13
20	Decline in Plant and Equipment Efficiency	Increased costs, environmental impacts and low efficiency	Within 5 years	Underfunding of replacement and maintenance	Plant requirements are identified and included in the plant replacement program	Yes	Possible	Moderate	High	Prioritised action required	No	Continue to develop the detail of the costs to manage the major plant and equipment so that a strong case can be made for adequate funding	Remains but reduced	Continue to develop the detail of the costs to manage the major plant and equipment so that a strong case can be made for adequate funding	Implementation of risk treatments	Manager	Staff	Nil	Jun-13

Kyogle

Infrastructure Infrastructure Risk Register

RISK IDENTIFICATION							RISK ANALYSIS					RISK TREATMENT			RISK TREATMENT PLAN					
Risk No.	Asset at Risk	What can happen?	When can it occur?	Possible cause	Existing controls	Is risk credible?	Likelihood	Consequences	Risk rating	Action required	Is risk acceptable?	Treatment option(s)	Residual risk	Risk treatment plan	Actions	Responsibility	Resources	Budget	Date due	
22	Aging waste services plant and equipment Technical Obsolescence	High incidence of breakdowns Increased operational costs Increased down time	Within 10 years	Caused by inadequate renewal funding	Plant and equipment requirements are identified and included in the plant replacement program	Yes	Possible	Moderate	High	Prioritised action required	No	Service in accordance with manufacturers requirements Investigate and replace equipment at optimise time to give the lowest lifecycle cost Regular condition assessment of key equipment to assist in predicting maintenance and renewal needs Maintenance is managed appropriately at an operational level	Remains but reduced	Service in accordance with manufacturers requirements Investigate and replace equipment at optimise time to give the lowest lifecycle cost Regular condition assessment of key equipment to assist in predicting maintenance and renewal needs Maintenance is managed appropriately at an operational level	Service in accordance with manufacturers requirements Investigate and replace equipment at optimise time to give the lowest lifecycle cost Regular condition assessment of key equipment to assist in predicting maintenance and renewal needs Maintenance is managed appropriately at an operational level	Manager	Staff	Nil	Jun-13	
23	Waste Customer Safety Risks	Injury to member of the public using waste facilities	Anytime now	Poorly planned and constructed facilities	Requirements are identified and included in the waste services replacement program	Yes	Possible	Moderate	High	Prioritised action required	No	Audit of current facilities, and upgrade to facilities	Remains but reduced	Audit of current facilities, and upgrade to facilities	Audit of current facilities, and upgrade to facilities	Manager	Staff	Nil	Jun-13	
24	Decline in efficiency of waste services	Increased costs, environmental impacts and lower service levels	Within 5 years	Lack of forward planning for waste services	Requirements are identified on an ad hoc basis	Yes	Possible	Moderate	High	Prioritised action required	No	Undertake detailed financial assessment of waste operations area to establish the long term asset needs and service levels that can be delivered.	Remains but reduced	Undertake detailed financial assessment of waste operations area to establish the long term asset needs and service levels that can be delivered.	Undertake detailed financial assessment of waste operations area to establish the long term asset needs and service levels that can be delivered.	Manager	Staff	Nil	Jun-13	
25									#N/A	#N/A										
26									#N/A	#N/A										
27									#N/A	#N/A										
28									#N/A	#N/A										
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36									#N/A	#N/A										
37									#N/A	#N/A										
38									#N/A	#N/A										
39									#N/A	#N/A										
40									#N/A	#N/A										
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