

Pollution Incident Response Management Plan Volume 2 - Planning

Sewerage Services

Updated 06-2022



NARRABRI SHIRE
DISCOVER THE POTENTIAL

POLLUTION INCIDENT RESPONSE MANAGEMENT PLAN

VOLUME 2 - PLANNING

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Revisions

Revision	Date	Checking	Author	Details
1 DRAFT	29/07/2016	MB in consultation with WOM, WSM	MB	Implementation copy – internal review 1
1.2 FINAL COPY	29/11/2016	MB in consultation with WOM, WSM, and NSC Env. Services representative	MB	Implementation copy for internet publishing
1.3 REVISION	15/11/2018	CHL	DR	Update details
1.4 REVISION	23/06/2020	Water Services Manager	BA	Update details
1.5 REVISION	10/06/2021	Water Performance Reporting Officer	TC	Update details
1.6 REVISION	05/06/2022	Water Performance Reporting Officer	SY	Update contact details and layout

Circulation¹

Revision	Format	Access Location
Treatment Plant Operators	Hardcopy	SNA.TP01
W&S Operations Manager (WOM)	pdf & hardcopy	ECM & Operations Depot
Water Services Manager (WSM)	pdf & hardcopy	ECM & NSC Administration
EPA (confidential reference copy)	pdf	Email

Abbreviations

PIRMP	Pollution Incident Response Plan
NA	Narrabri
NSC	Narrabri Shire Council
SNA	Narrabri Sewerage Scheme Service Class = S = Sewerage, Community = NA = Narrabri
STP	Sewage Treatment Plant
PDWF	Peak Dry Weather Flow
PWWF	Peak Wet Weather Flow
PoEO.Act	Protection of the Environment Operations Act 1997
PoEO.Reg	Protection of the Environment Operations (General) Regulation
P-I	Pollution Incident (definition below)

Key Definitions

Catchment(s)	Tract(s) of land related to sewage and/or stormwater flows upstream and downstream of a given point in the subject sewerage network.
Hazard(s)	set of substances that may be harmful to people or the environment and could result in a P-I
Material Harm ²	Environmental harm as defined in s147 of the PoEO Act. Material harm is notifiable pursuant to s148 of PoEO Act. Refer Appendix 1 – Key definitions from PoEO Act 1997. <i>Key words: potential/actual non-trivial harm; humans/ecosystems; aggregate potential/actual loss/property-damage and remedy exceeding \$10,000.00.</i>
Pollution Incident ²	(P-I) As defined in PoEO Act 1997. Refer Appendix 1 – Key definitions from PoEO Act 1997 . <i>Key words: substance (other than noise); leak/spill/escape/deposit/placement/disposal; pollution has-occurred/is-occurring/is-likely to occur.</i>

¹ Pursuant to PoEO Act s153D, and PoEO Reg s98D

² The legislative definition is included for convenience in of this PIMRP.

Part C – Overview for Volume 2

About Volume 2

This is PIRMP Volume 2 - the second of two volumes. This volume is intended to be read in conjunction with Volume 1.

Focus of Volume 2

PIRMP Volume 2 documents for the areas of operation below, NSC's pertinent *Incident Prevention Planning* including:

- The *hazards* and *hazardous events* which may lead to *pollution incidents*:
- **Risk** of environmental harm
- Relevant details of the subject **catchments**; and
- Training, testing, and update of the PIRMP

PIRMP Area of Operations

At present, PIRMP Volume 2 pertains³ to the following NSC scheme(s):

- **SNA** - Narrabri Sewerage Scheme.

Expansion of this document to include the townships of Boggabri and Wee Waa will be performed as resources permit.

Third Party Transported Waste in Transit is Not Included

This PIRMP does not cover the spillage of liquid waste or chemicals from the vehicles of third-party carriers outside NSC sewerage facilities. Such carriers are separately responsible under legislation for safe transport of these substances.

Implementation and Maintenance of the PIRMP

NSC's Water Services Manager is responsible for the implementation and maintenance of this plan. Such implementation and maintenance are done in accordance with legislation and the relevant guideline and will be relative to the management system processes.

In accordance with s153F of the PoEO Act, *if a pollution incident occurs in the course of an activity so that material harm is caused or threatened, the person carrying on the activity must immediately implement the PIRMP* i.e. NSC's PIRMP Volume 1.

³ Intent is to expand to include all Sewerage and Water Supply Schemes

Legislation

This PIRMP is pursuant to the following NSW legislation:

- PoEO Act⁴ 1997; and the
- PoEO (General) Regulation 2009.

This PIRMP has been prepared with reference to the PIRMP Guidelines⁵.

Training, Testing and Update or the PIRMP

These details are covered below in this Volume 2.

⁴ PoEO - Protection of the Environment Operations

⁵ From the 2012 Guidelines, the specific requirements for pollution incident response management plans are set out in Part 5.7A of the POEO Act and the Protection of the Environment Operations (General) Regulation 2009 (POEO(G) Regulation)⁵.

In short, this provision requires the following:

- All holders of environment protection licences **must prepare a PIRMP⁵** (section 153A, PoEO Act);
- The plan **must include the information** detailed in:
 - the PoEO Act (section 153C); and
 - be in the form required by the PoEO(G) Regulation (clause 98B);
- Licensees **must keep the plan at the premises** to which the environment protection licence relates or, in the case of trackable waste transporters and mobile plant, where the relevant activity takes place (section 153D, PoEO Act);
- Licensees **must test the plan** in accordance with the PoEO(G) Regulation (clause 98E).

Part D – Incident Prevention Planning

Pollution incident prevention planning focusses on the minimisation of the risk of hazardous events.

Hazards and Hazardous Events

In relation to this PIRMP, *hazards* will be taken as substances that may be harmful to people or the environment⁶. For this PIRMP, applicable *hazards* pertain mainly to raw sewage or partially treated sewage, and treatment chemicals. But also pertain to sewage gases. *Hazardous events* will be taken as events or conditions that would or could increase the likelihood of a such a hazard to people or the environment.

Pollution Incidents (P-Is) may occur as a consequence of *hazardous events* within seweraged catchments.

The hazardous events which could result in *P-Is* include:

Pollution Incident	Hazardous Event	Likelihood
Sewage overflow or spillage	<ul style="list-style-type: none"> Storms (lightning/heavy rainfall/wind) causing power failure or infrastructure damage Reticulation and treatment plant blockages Damage to reticulation (during legal/illegal excavations) Infrastructure failure due to age SCADA/Communications failure Excessive flows Mechanical break down Power outage Discharge of illegal trade waste or illegally dumped transported waste coinciding with one of the above events 	<ul style="list-style-type: none"> Likely during storm seasons Likely due to age of infrastructure Less likely but possible Possible for some infrastructure Possible Likely due to age of infrastructure Possible Possible Unlikely
Sewage gas release	<ul style="list-style-type: none"> Malodourous sewage gases can release from the sewer network via manholes, from sewage pump stations, and from the STP Explosive mixture of digester methane and oxygen from air (Coward diagram limits) – danger to operational staff in vicinity of digester 	<ul style="list-style-type: none"> Possible Possible during digester maintenance or failure of digester equipment
Accidental release of treatment chemicals	<ul style="list-style-type: none"> Tank/storage/bund failure Spillage/leakage during delivery Damage to chemical reticulation Vandalism Fire / lightning strike Inappropriate chemical use 	<ul style="list-style-type: none"> Possible Possible Possible Possible Possible Unlikely

Note: As stated above, this PIRMP does not cover the spillage outside of sewerage facilities of liquid waste or chemicals from the vehicles of licenced third-party carriers

⁶ Pursuant to PoEO (General) Reg Part 3A

Overflows from Sewerage Scheme Catchments

Council's sewerage networks and associated overflow potential is described generally in Volume 1 Appendix 3. Sewage overflows may occur in any location where a sewer network is located, but some locations have a higher likelihood and a higher impact than other locations, based on relative position within sub-**catchments**.

Municipal Conventional Gravity Sewer Network

Council's sewer networks may be considered largely as discrete sub-**catchments** with pump stations and the STP at the downstream outlet end where simultaneous loading is greatest, and hence overflow discharge is most likely occur with significant consequence. In some instances, one or more manholes may be the place where such discharges will occur as they are lower than the sub-**catchment** outlet.

Each of these locations is considered critical in that they have the highest risk (likelihood and consequence) of sewage overflow, and as such are the focus of incident prevention planning. These are listed in Table 1 below, and in relative figures in *Appendix 2 – Site Plans*.

Such sewer overflow risk is considered in network computer-simulation models and associated analysis and reporting performed for Council by *Hunter H2O for NSC's sewerage networks*.

Private Sanitary Plumbing and Drainage (AS3500)

Discharge can also occur at overflow-relief-gullies (ORGs) within customer premises within these sub-catchments that are dedicated for overflow sewage in blocked or overloaded networks. ORGs and owners' responsibilities are outlined in Volume 1 Appendix 3.

Municipal Conventional Gravity Sewer

SNA possesses one (1) sub-catchment comprising large-lot premises, serviced by pressure-sewerage system collecting sewage pumped from each premise: Downstream of the ORG(s) of each large-lot premise, a septic tank collects and treat sewage solids; The effluent water flowing from the septic tank is pumped by customer pumps into a pressurised pipe that is shared by multiple customers, which in turn discharges into a single receiving manhole in an adjacent downstream gravity sub-catchment.

Municipal Conventional Gravity Sewer

At the Narrabri township sewage treatment plant "*SNA.TP01*", excessive flow that exceeds the inlet works hydraulic capacity results in coarsely screened raw sewage being discharged to the STP Bypass Lagoon. The STP Bypass Lagoon and operational considerations are provided in Figure 2 in Appendix 2 – Site Plans. Potential overflow of partially treated wastewater can occur from unit-processes downstream of the inlet works should be assessed as part of a CCC⁷ style of inspection.

⁷ Compliance, capacity and condition audit.

Accidental Release of Chemicals

Municipal sewage treatment chemicals

Chemical spills may occur at specific locations where chemicals are stored and used for sewage treatment or during transport to these locations. The primary location where chemicals are stored and used is the sewage treatment plant (STP) as detailed below. Lime is stored and dosed into the sewage at the sewage pump stations.

Industrial trade waste

Chemicals have the potential to enter the sewer system via the service connection from industrial dischargers. Such trade waste discharge is controlled by way of regulation and policed by NSC's trade waste inspectors. The risk of illegal discharge of a high strength trade waste coinciding with an overflow event should be low where a trade waste policy is implemented, and routine inspections occur. However, it may also be diligent to assess the risk relative to the database of trade waste dischargers.

Illegal dumping of trade waste

It is possible that a person (e.g. a rogue trade-waste transporter discharger) may illegally dump domestic grease-trap waste or transported trade waste into the sewer network. The risk of illegal discharge of a high strength trade waste coinciding with an overflow event (on face value) is considered low and would be addressed by way of policing activities.

Sewerage Gases

Prolonged detention of sewage in networks beyond a few hours in pump station wet wells, rising mains leads to anaerobic conditions and the generation malodourous gases and methane which can be explosive where there is insufficient ventilation. Detention of sewage and its consequences considered by the analysis and reporting performed for Council by *Hunter H2O for NSC's sewage networks*.

At NSC's sewage treatment plants, odour can occur particularly at the inlet works, and from digesters, and from sedimentation tanks where desludge intervals are too infrequent. Precautions are essential with anaerobic digesters due to the potential of the generation of explosive mixtures of methane and oxygen. Dedicated safety zoning, safety valves and O&M procedures should be performed by specially trained persons. Care is essential during maintenance, and it is necessary to purge the subject digester of methane using nitrogen gas as a preventative measure.

Narrabri Sewerage Scheme (SNA) Sub-Catchments – Critical Outlets

SNA sub-catchments outlets consist of the critical sites listed in Table 1 and consist of:

- One (1) sewage treatment plant:
- Eleven (11) sewage pump stations:
- A number of critical manholes identified by way of computer network modelling

Table 1 – SNA Critical Sites (sub-catchment outlets)			
Site Code	Site Name and Address	Present overflow impact.	Inspection Point(s) (Ideally early warning)
SNA.TP01	"Narrabri STP" CNR SALEYARDS LA & NEWELL HWY	Controlled: refer Figure 2	1. STP Inlet o/flow weir. 2. STP Bypass lagoon 3. Digesters
SNA.PS01	"PS-2Masons" MARGARET STREET	Overland to lagoon – refer Figure 3	1. Pump station lids. 2. Land up to and including lagoon.
SNA.PS02	"PS2-Doctors Ck" SHORT STREET	Direct into creek – refer Figure 4	1. Pump station lids. 2. Land up to and including creek.
SNA.PS03	"PS3-Nobles" COOMA ROAD	Manholes upstream of pump station– refer Figure 5	1. Manhole lids. 2. Gully up to and including lagoon.
SNA.PS04	"PS4-Ugoa St" GENANAGIE STREET	Into adjacent table drain – refer Figure 6	1. Manhole lid. 2. Table drain.
SNA.PS05	"PS5-Cargills" 5 BARANBAR STREET	Into adjacent pondage/ gully – refer Figure 7	1. Manhole lid. 2. Gully.
SNA.PS06	"PS6-Regent Street" REGENT STREET	Onto Regent Street and into stormwater – refer Figure 8	1. Manhole lid. 2. Footpath and kerb.
SNA.PS07	"PS7-Hinds" HINDS STREET	Overland – refer Figure 9	Manhole lids and land surrounding.
SNA.PS08	"PS8-Golf Course" 123A GIBBONS STREET	Direct into creek – refer Figure 10	Pump station lids and land surrounding.
SNA.PS09	"PS9-Taylor St" 5A HILLAM AVENUE	Via railway table drain into gully – refer Figure 11	1. Pump station lids. 2. Table drains.
SNA.PS10	"PS10-Elizabeth St" THE ISLAND ROAD	Potentially into The Island Rd stormwater and/or pondage at rear of adjacent residential parcel – refer Figure 12.	Pump station lids and land surrounding.
SNA.PS11	"PS11-Zimmerman St" ZIMMERMAN STREET	Potentially onto Zimmerman St and into stormwater – refer Figure 13.	Pump station lids and land surrounding.

Note: The information in the above table and associated figures has been prepared relative to contour maps and interview of experienced Council personnel. This table is to be updated relative to findings of the Hunter Water report for Narrabri (also update to include Boggabri and Wee Waa) sewerage networks, and reports from overflow events should they occur in future.

Refer Appendix 2 – Site Plans for detailed maps pertaining above sites.

For each of the critical sites, hazardous substances (potential pollutants) are generally limited to raw sewage and lime powder, with the exception of process methane and oxygen-dosing at the STP. Table 2 is an inventory for all critical sites.

Table 2 – SNA Critical Sites – Hazardous Substance Inventory			
Site Code	Site Name and Address	Description of hazardous substance.	Estimated Volume⁸
SNA.TP01	"Narrabri STP" CNR SALEYARDS LA & NEWELL HWY	Raw Sewage – bypass pond Process methane – digesters Oxygen storage and dosing	
SNA.PS01	"PS-2Masons" MARGARET STREET	Raw Sewage Lime powder	
SNA.PS02	"PS2-Doctors Creek" SHORT STREET	Raw Sewage Lime powder	
SNA.PS03	"PS3-Nobles" COOMA ROAD	Raw Sewage (upstream MHs) Lime powder (at pump station)	
SNA.PS04	"PS4-Ugoa St" GENANAGIE STREET	Raw Sewage Lime powder	
SNA.PS05	"PS5-Cargills" 5 BARANBAR STREET	Raw Sewage Lime powder	
SNA.PS06	"PS6-Regent Street" REGENT STREET	Raw Sewage Lime powder	
SNA.PS07	"PS7-Hinds" HINDS STREET	Raw Sewage Lime powder	
SNA.PS08	"PS8-Golf Course" 123A GIBBONS STREET	Raw Sewage Lime powder	
SNA.PS09	"PS9-Taylor St" 5A HILLAM AVENUE	Raw Sewage Lime powder	
SNA.PS10	"PS10-Elizabeth St" THE ISLAND ROAD	Raw Sewage Lime powder	
SNA.PS11	"PS11-Zimmerman St" ZIMMERMAN STREET	Raw Sewage Lime powder	

Preventative Measures

There are numerous best-practice measures that NSC can and does use to prevent or minimise the risk and impact of hazardous events. These are achieved as part of day-to-day operational practices & maintenance and/or capital works projects and include:

- standard personnel personal protective equipment (PPE), and confined space practices;
- eliminate substances that can become potential pollutants;

⁸ To be populated as an action arising from Table 4 in Appendix 3 – Pollution Incidents and Prevention

For raw sewage, estimated PDWF & PWWF volumes in kL/h are shown. For gases such as digester gas and chlorine gas quote the storage mass in kg. For dry powder quote the dry mass in kg. For chemical solutions quote the strength and volume. Risk is addressed in Appendix 3 – Tables 3 and 4.

- establish physical barriers e.g. bypasses, bunds and spill drainage containment;
- establish controlled overflow points – refer Table 1 for NSC inspection/overflow points;
- establish alarm systems, fail-safes, SMS alerts for: high level events; communication failure; chemical bund alert; motor faults; no-flow/high-flow events;
- supervisory and control systems with appropriate cover scheduling;
- CCTV, jetting of sewers, repair, replacement, and relining of sewers
- use of nitrogen gas and personnel with appropriate training to purge digesters during maintenance and identification of explosive zones relative to Australian standards for process methane and oxygen-dosing
- quality assurance – integrated management system including the use of work process guidelines

Incident Prevention Planning – Risk Based Prioritisation

A risk-based approach is utilised by NSC to prioritise actions to minimise likelihood and impact of pollution incidents (P-Is), and aim to avoid material harm due to hazardous events. This approach is detailed in the table in Appendix 3 – Pollution Incidents and Prevention on page 38 of this PIRMP. Risk is calculated considering the likelihood and consequence of a given hazard leading to a P-I. Appropriate preventative measures are determined through employee experience and innovation, and relative to industry best practice, and are prioritised based on a risk score to be achieved through day-to-day operations and/or capital works projects.

Capital Works

Actions in Appendix 3 – Pollution Incidents and Prevention of this PIRMP. The proposed actions are assessed via the Best Practice Management processes prescribed by the NSW Office of Water. Selected priority works and thus included in NSC's Total Asset Management Plan and delivered relative to budget constraints to achieve the community's desired levels of service.

Operational Practices

Based on risk, operational practices occur at different frequencies and include daily checks (e.g. chemical quantities, check pump stations via telemetry, vandalism, bunds); monthly checks (e.g. valve exercising, inspection of controlled overflow/surcharge points); annual checks (e.g. RPZ testing, service pumps, electrical inspections of pump controls).

NSC's day to day operational practices and their frequency are set out in Appendix 4 – O&M Activities. These are performed in accordance with NSC's Work Process Guidelines (WPGs).

The following WPGs are key procedures to be followed in the event of a P-I:

Table 3 – Key Work Process Guidelines for P-Is	
WPG No	Process
3750-1	OPERATE SEWER MAINS - WATER BLASTING
3750-2	POLLUTION INCIDENT RESPONSE – SEWAGE OVERFLOWS AND LIME SPILLS ⁹
3755-1	OPERATE SEWER PUMP STATION
3780-1	OPERATE SEWER TREATMENT WORKS
3780-2	POLLUTION INCIDENT RESPONSE - SEWER TREATMENT WORKS
3329-3	HIGH RISK INSPECTIONS a) waterways.
3665-2	SAMPLING & TESTING - WATER QUALITY

The full set of sewerage procedures are available via NSC's Enterprise Content Management (ECM).

Contingency Measures

If preventative measures fail, the following contingency measures are deployed:

- backup generator outlets on switchboards and portable backup generators – refer Appendix 5 – Power Failure: Gen-Set Size and Priority for details of generator requirements and response times.
- portable bypass pumps and other containment options available:

Training

All staff required to implement this plan and associated documents must have training in its use and be inducted into it. This is to ensure they are aware of the content, processes and requirements of this plan and can competently implement it if necessary.

The objective of the training program is to ensure that Council Employees are knowledgeable of:

- their roles and responsibilities concerning this PIRMP
- the PIRMP's procedures to affect a safe and appropriate response to pollution incidents.

Council Employees will receive training in the PIRMP appropriate to the level of their expected involvement as listed in PIRMP Vol.1. The following is the general training program which is to be implemented in support of this PIRMP:

a) Training Frequency

Relevant Council staff will receive training during initial employment orientation / induction and refresher training at least annually. Additional training will be provided to employees whenever the PIRMP is changed.

b) Training Level

All Council Employees will receive training in the general PIRMP procedures and Standard Operating Procedures related to the PIRMP.

Training shall cover routine pre-emptive inspections, incident discovery and management, (standard operating procedures), notifications, incident response and best practice facility management.

c) Supervisor Training

Relevant supervisors and managers will receive additional training dealing with actions that are necessary to provide for the safety of employees, contractors, possible site visitors, the protection of facility assets and the management of pollution incidents generally.

d) Training Competencies¹⁰

- i) Call-centre staff: UTW NWS010 A; NWS030 A; NWS040 A or equivalents.

⁹ Under review and update

¹⁰ Competencies Source: https://training.gov.au/TrainingComponentFiles/NTIS/UTW98_1.pdf

- ii) On-call personnel: As per call-centre staff plus: UTW NWS360 A; NWS370 A; NWS620 A; NWS630 A or equivalents.
- iii) W&S Supervisors: As per on-call personnel plus: UTW NWS050 A; NWS060 A or equivalent.
- iv) WOM: As per W&S Supervisors plus: UTW NWS070 A; BSFXM1301A; 1302A; 1305A; 1306A; 1308A; 1310A or equivalent.
- v) WSM: Degree plus: UTW NWS080 A; UTW NWS090 A; NWS510 ANWS670 A or equivalent.

Testing and Update of the PIRMP

In the event of a significant incident, an investigation and debrief will be conducted, documentation updated (if required) and staff will be re-inducted.

Pursuant to s153E of the PoEO Act, this PIRMP shall be tested in accordance with s98C (1)(n) & (1)(p), and s98E of the PoEO Act.

s98E requires that the testing be carried out:

- every twelve (12) months, in such a manner as to ensure that the information included in the plan is accurate and up-to-date and the plan is capable of being implemented in a workable and effective manner; and
- within one (1) month of any pollution incident occurring in the course of an activity to which the licence relates. This is to assess in the light of that incident, whether the information included in the plan is accurate and up to date and the plan is still capable of being implemented in a workable and effective manner.

As part of the annual test, a *Legislative Compliance Check*¹¹ will be performed.

All testing and incidents are to be registered into NSC's TechOne ECM document management system, and training records are maintained by Human Resources. This will satisfy s98C (1)(n) & (1)(p).

¹¹ Refer 20150812_NSC.SNA.PIRMP.Test.Legislation_Rev1.docx prepared by LMB Aqua.

Part E - Appendices

Appendix 1 – Key Definitions from POEO Act 1997¹²

Definition for a *Pollution Incident*

pollution incident means an incident or set of circumstances during or as a consequence of which there is or is likely to be a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur. It includes an incident or set of circumstances in which a substance has been placed or disposed of on premises, but it does not include an incident or set of circumstances involving only the emission of any noise.

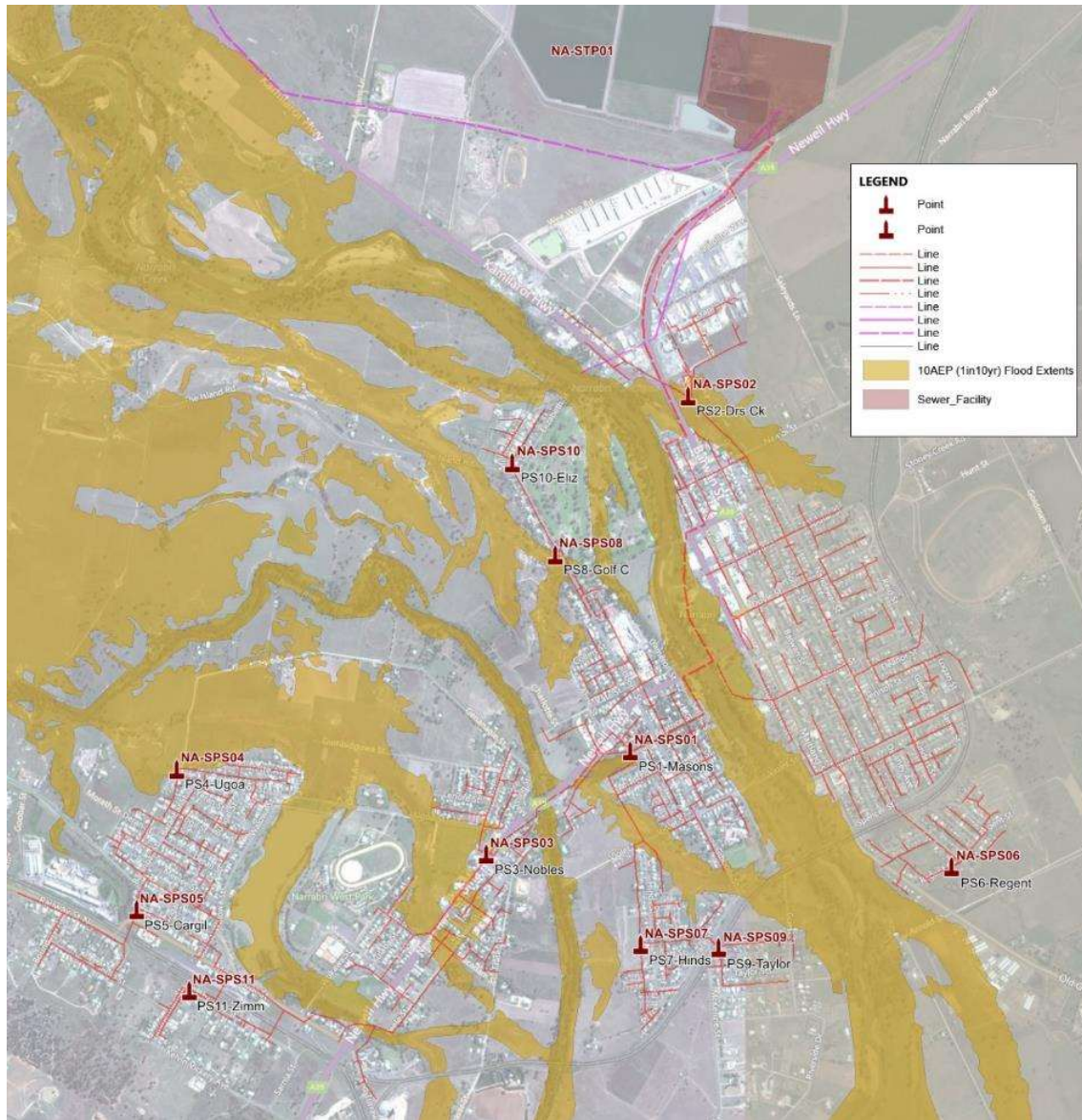
s147 – Meaning of *Material Harm to the Environment*

- (1) For the purposes of this Part (5.7 Duty to notify of pollution incidents):
 - (a) harm to the environment is material if:
 - (i) it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial,
or
 - (ii) it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (or such other amount as is prescribed by the regulations),
and
 - (b) loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment.
- (2) For the purposes of this Part (5.7 Duty to notify of pollution incidents), it does not matter that harm to the environment is caused only in the premises where the pollution incident occurs.

¹² Protection of the Environment Operations Act 1997

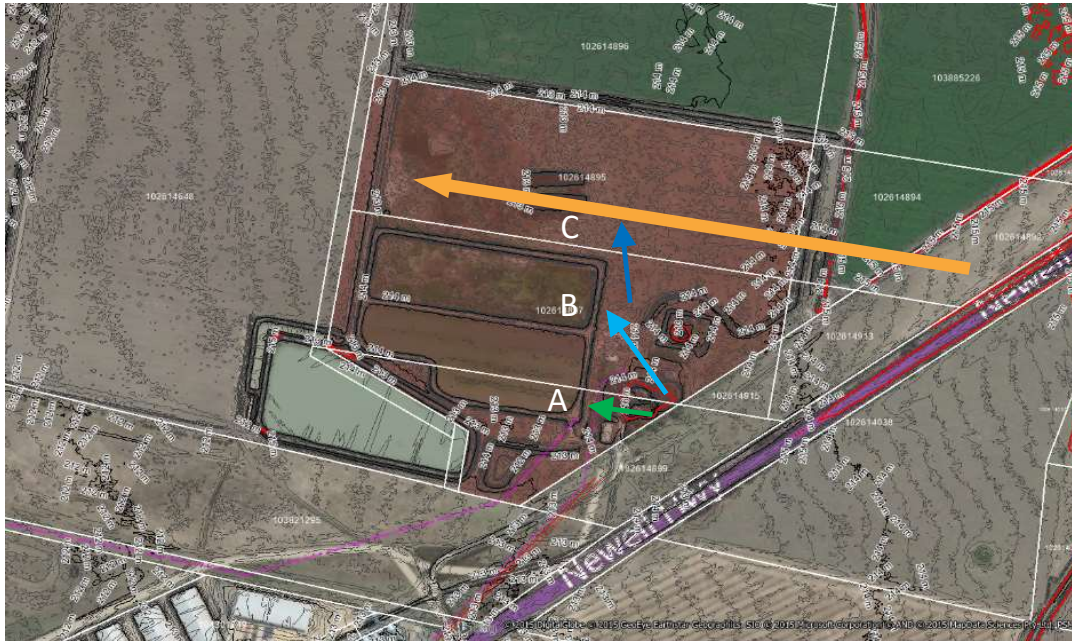
Appendix 2 – Site Plans¹³

Figure 1 – Scheme Extents: SNA. Narrabri Sewerage



¹³ Source: MapInfo workspace: 20140919_PIRMP.WOR

Figure 2 – SNA.TP01 - Narrabri Sewerage Treatment Plant



A. Treated Water Lagoon

- Receives treated water from STP (green arrow) and ensures sufficient contact time for disinfection prior to pumping to Federation Farm (FF).
- 100% is pumped to FF (refer Irrigation Mgt plan)
- Overflow is averted through wet-weather storage capacity at Federation Farm.
- Overflow RISK=LOW: (L=Rare x C=Minor)

B. STP Bypass Lagoon

- Receives sewage that is very highly diluted by stormwater (light blue arrow) from rainfall infiltration events into network which exceed the STP inlet works hydraulic capacity.
- The water passes through a vertical bar screen at the STP inlet chamber and gravitates to the lagoon. The bar screen is raked by the TPO.
- When bypass ceases, the lagoon water is pumped back via STP inlet at a maximum rate such that the combined bypass + STP inflow does not cause bypass.
- Overflow may occur to the overflow area "C." in very extreme weather events.
- Overflow RISK=MEDIUM: (L=Low x C=Moderate)

C. STP Limited Overflow Ponds

- Receives sewage that is very highly diluted by stormwater (dark blue arrow) from rainfall infiltration events into network which exceed both the STP inlet works hydraulic capacity and the Bypass Lagoon capacity. This is only in very extreme rain events.
- Water is pumped back using a trash pump and lay-flat pipe back to the Bypass Lagoons when overflow from "B." has ceased and the empty ponds are limed. Flood maps indicate the area is prone to flooding (overland flow brown arrow) where ARI >Q100 / AEP <1% i.e. very rare. Extremely diluted.
- Flood risk washing to neighbouring parcel 102610648: RISK=LOW: (L=Rare x C=Minor)

Mitigation of overflow risk by way of:

- periodic CCC review and timely completion of actions arising from the review
- Effective O&M by competent W&S personnel including very frequent cleaning of STP inlet works bar screen during overflow event, and 5-yearly cleaning of lagoons A & B.

- Recurrent training: this PIRMP; Irrigation Management Plan (TPO & FF manager)
- Flood-risk assessment and timely completion of actions arising
- Maintenance of bunds for lagoons A and B to ensure stable for wave action and PMF flood event

Figure 3 – SNA.PS01 – Masons Sewerage Pump Station



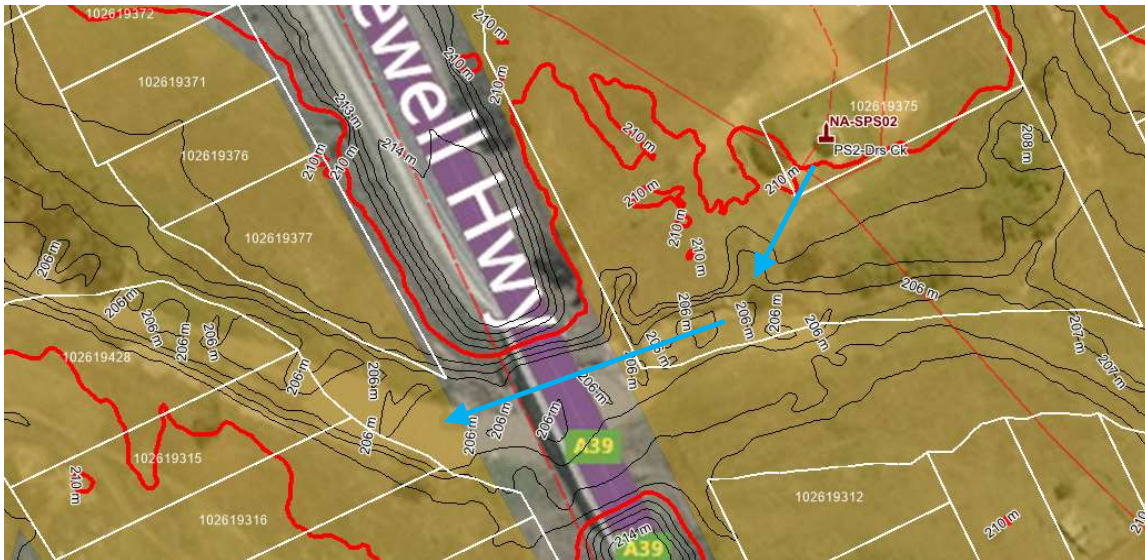
A. Pump Station Overflow

- In extreme INI events, the lagoon receives sewage that is very highly diluted by stormwater) from rainfall infiltration events via network which exceed the pump station hydraulic capacity.
- The water passes through gap under pumpwell lids and flows overland (blue arrow) to the lagoon.
- Notify owner of parcel 102619045 in such an event.
- When overflow event ceases, the lagoon water is cleaned of any solids and limed.
- Overflow RISK=MEDIUM: (L=Medium x C=Moderate)
- Pond inundated by Namoi River (10yr ARI / AEP 10%)

Mitigation of risk by way of:

- review of Hunter Water report and timely completion of actions arising to achieve sustained network capacity and reliability
- Flood-risk assessment for pump station and timely completion of actions arising
- implementation of a rolling INI strategy
- periodic pump station inspections and reports by specialist contractors and timely completion of actions arising
- effective O&M by competent W&S personnel in line with relevant WPG

Figure 4 – SNA.PS02 – Doctors Creek Sewerage Pump Station



A. Pump Station Overflow

- In extreme INI events, Doctors Creek receives sewage that is very highly diluted by stormwater (light blue arrow) from rainfall infiltration events via network which exceed the pump station hydraulic capacity.
- The water passes through gap under pump well lids and flows overland (blue arrow) across parcel 102619374 to the creek, but most likely concurrent with major stream flow in creek.
- Notify owner of parcel 102619374 in such an event.
- When overflow event ceases, the adjacent land is cleaned of any solids and limed.
- Overflow RISK=MEDIUM: (L=Medium x C=Moderate)
- Pump station site is inundated by Namoi River (10yr ARI / AEP 10%)

Mitigation of risk by way of:

- review of Hunter Water report and timely completion of actions arising to achieve sustained network capacity and reliability
- Flood-risk assessment for pump station and timely completion of actions arising
- implementation of a rolling INI strategy
- periodic pump station inspections and reports by specialist contractors and timely completion of actions arising
- effective O&M by competent W&S personnel in line with relevant WPG

Figure 5 – SNA.PS03 – Nobles Sewerage Pump Station



A. Manhole Overflow

- In extreme INI events, overflow is expected occur at manholes A17 and A18. Overflow as occurred at A21 and a lockable lid has thus been installed. The overflow is sewage very highly diluted by stormwater (blue arrows) from rainfall infiltration events via network which exceed the pump station hydraulic capacity.
- The water lifts the manhole lids and passes flows overland (blue arrows) to the gully across parcels 103924355 "Public recreation reserve" and 104573649 "Gately Field" both owned and managed by Council, and most likely concurrent with stream flow in gully.
- There is limited public impact of the discharge from A17 and A18, but the water passes into the town lagoon with minimal environmental impact.
- When overflow event ceases, the adjacent land is cleaned of any solids and limed. The lagoon is inspected and cleared of any floating debris, and the need for further cleaning is assessed and actioned as necessary.
- Overflow RISK=MEDIUM: (L=Medium x C=Moderate)

B. Pump Station Flooding

- Pump station site is inundated by Namoi River (20yr ARI / AEP 5%)

Mitigation of risk by way of:

- review of Hunter Water report and timely completion of actions arising to achieve sustained network capacity and reliability
- Flood-risk assessment for pump station and timely completion of actions arising
- implementation of a rolling INI strategy
- periodic pump station inspections and reports by specialist contractors and timely completion of actions arising
- effective O&M by competent W&S personnel in line with relevant WPG

Figure 6 – SNA.PS04 – Ugoa Street Sewerage Pump Station



A. Manhole Overflow

- In extreme INI events, overflow is expected occur at manhole AN1 into the vee drain beside Genanagie St. The overflow is sewage very highly diluted by stormwater from rainfall infiltration events via network which exceed the pump station hydraulic capacity.
- The water lifts the manhole lid and passes flows overland (blue arrow) along the vee drain.
- There is limited public impact of the discharge from AN1 with minimal environmental impact.
- When overflow event ceases, the effected land is cleaned of any solids and limed.
- Overflow RISK=MEDIUM: (L=Medium x C=Moderate)

B. Pump Station Flooding

- Pump station site is inundated by Namoi River (10yr ARI / AEP 10%)

Mitigation of risk by way of:

- review of Hunter Water report and timely completion of actions arising to achieve sustained network capacity and reliability
- Flood-risk assessment for pump station and timely completion of actions arising
- implementation of a rolling INI strategy
- periodic pump station inspections and reports by specialist contractors and timely completion of actions arising
- effective O&M by competent W&S personnel in line with relevant WPG

Figure 7 – SNA.PS05 – Cargills Sewerage Pump Station



A. Manhole Overflow

- In extreme INI events, overflow is expected occur at overflow¹⁴ manhole at rear of parcel 102616992 into the gully on parcel 102616991. The overflow (light blue arrow) is sewage very highly diluted by stormwater from rainfall infiltration events via network which exceed the pump station hydraulic capacity.
- The water lifts the manhole lid and passes flows overland (blue arrow) to the gully.
- There is limited public impact of the discharge from A17 and A18, but the water can pass into the downstream lagoon with minimal environmental impact.
- When overflow event ceases, the effected land is cleaned of any solids and limed.
- Overflow RISK=MEDIUM: (L=Medium x C=Moderate)

B. Pump Station Flooding

- Pump station site is inundated by Namoi River (20yr ARI / AEP 5%)

Mitigation of risk by way of:

- review of Hunter Water report and timely completion of actions arising to achieve sustained network capacity and reliability
- Flood-risk assessment for pump station and timely completion of actions arising
- implementation of a rolling INI strategy
- periodic pump station inspections and reports by specialist contractors and timely completion of actions arising
- effective O&M by competent W&S personnel in line with relevant WPG

¹⁴ To be validated in the field

Figure 8 – SNA.PS06 – Regent Street Sewerage Pump Station



A. Manhole Overflow

- In extreme INI events, overflow is expected occur at manhole DP1 across the footpath and into the kerb drain beside Regent St, and then likely into a stormwater pit. The overflow is sewage very highly diluted by stormwater from rainfall infiltration events via network which exceed the pump station hydraulic capacity.
- The water lifts the manhole lid and passes flows overland (blue arrow) along the kerb into the stormwater pit.
- There is limited public impact of the discharge from DP1 with minimal environmental impact.
- When overflow event ceases, the land, kerb and drain is cleaned of any solids and limed.
- Overflow RISK=MEDIUM: (L=Medium x C=Moderate)

B. Pump Station Flooding

- Pump station site is inundated by Namoi River floodwater (20yr ARI / AEP 5%)

Mitigation of risk by way of:

- review of Hunter Water report and timely completion of actions arising to achieve sustained network capacity and reliability
- Flood-risk assessment for pump station and timely completion of actions arising
- implementation of a rolling INI strategy
- periodic pump station inspections and reports by specialist contractors and timely completion of actions arising
- effective O&M by competent W&S personnel in line with relevant WPG

Figure 9 – SNA.PS07 – Hinds Street Sewerage Pump Station



C. Manhole Overflow

- In extreme INI events, overflow is expected occur from the manholes as shown in the figure above. The overflow is sewage very highly diluted by stormwater from rainfall infiltration events via network which exceed the pump station hydraulic capacity.
- The water lifts the manhole lid and flows overland in the directions shown (blue arrow).
- There is limited public impact of the discharge with minimal environmental impact.
- Landowners 102616648, 102616705, 103964115, 102616635, 102616646 are therefore to be notified when effected.
- When overflow event ceases, the effected land is cleaned of any solids and limed.
- Overflow RISK=MEDIUM: (L=Medium x C=Moderate)

D. Pump Station Flooding

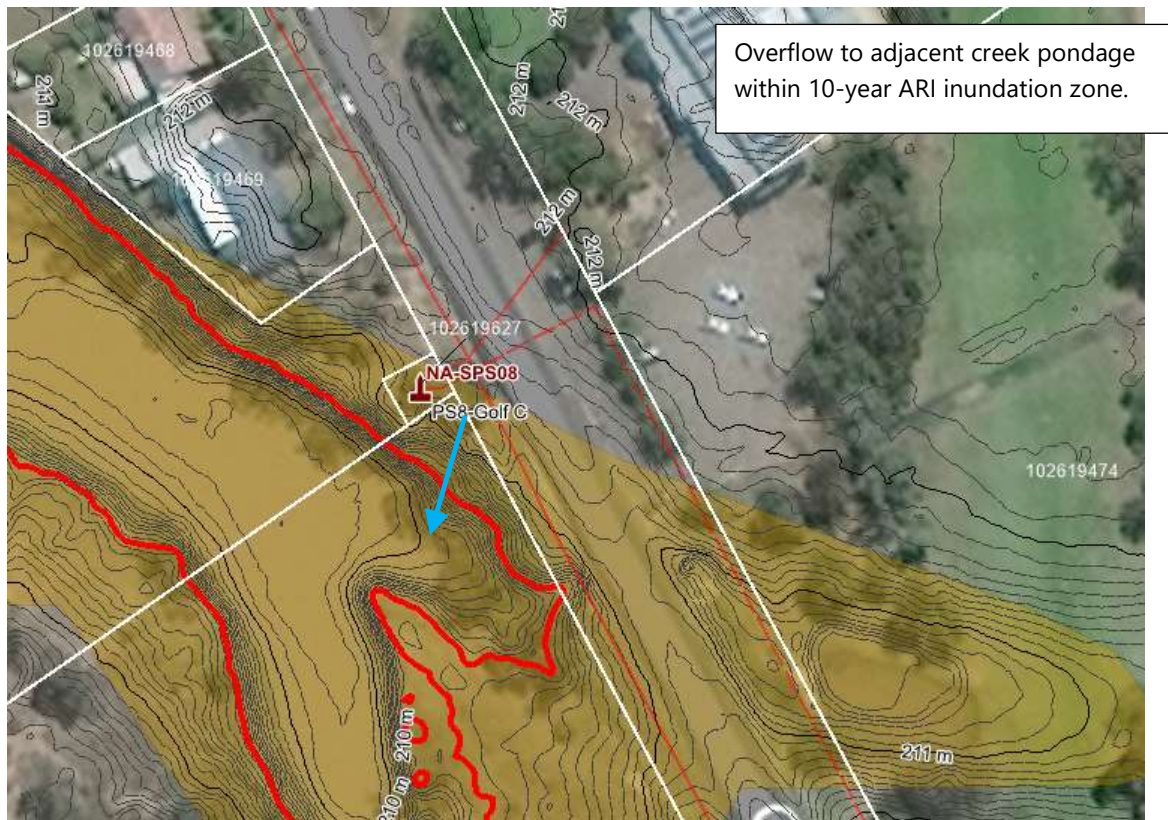
- Pump station site is inundated by Namoi River floodwater (20yr ARI / AEP 5%)

Mitigation of risk by way of:

- review of Hunter Water report and timely completion of actions arising to achieve sustained network capacity and reliability
- Flood-risk assessment for pump station and timely completion of actions arising
- implementation of a rolling INI strategy

- periodic pump station inspections and reports by specialist contractors and timely completion of actions arising
- effective O&M by competent W&S personnel in line with relevant WPG

Figure 10 – SNA.PS08 – Golf Course Sewerage Pump Station



A. Pump Station Overflow

- In extreme INI events, the adjacent billabong on parcels 159407445 and 104175033 receive sewage that is very highly diluted by stormwater (light blue arrow) from rainfall infiltration events via network which exceed the pump station hydraulic capacity.
- The water passes through gap under pumpwell lids and flows overland (blue arrow) across to the billabong, but most likely concurrent with major stream flow in creek.
- Notify owner of these parcels in such an event.
- When overflow event ceases, the effected land is cleaned of any solids and limed.
- Overflow RISK=MEDIUM: (L=Medium x C=Moderate)
- Pump station site and billabong is inundated by Namoi River (10yr ARI / AEP 10%)

Mitigation of risk by way of:

- review of Hunter Water report and timely completion of actions arising to achieve sustained network capacity and reliability
- Flood-risk assessment for pump station and timely completion of actions arising
- implementation of a rolling INI strategy
- periodic pump station inspections and reports by specialist contractors and timely completion of actions arising
- effective O&M by competent W&S personnel in line with relevant WPG

Figure 11 – SNAPS09 – Taylor Street Sewerage Pump Station



A. Manhole Overflow

- In extreme INI events, overflow is expected occur at manhole J1 into the vee drain beside the railway embankment in the reserve that also contains Grace St. The overflow is sewage very highly diluted by stormwater from rainfall infiltration events via network which exceed the pump station hydraulic capacity.
- The water lifts the manhole lid and passes flows overland (blue arrow) NE along the vee drain.
- There is limited public impact of the discharge from AN1 with minimal environmental impact.
- When overflow event ceases, the effected land is cleaned of any solids and limed.
- Overflow RISK=MEDIUM: (L=Medium x C=Moderate)

B. Pump Station Flooding

- Pump station site is inundated by Namoi River (10yr ARI / AEP 10%)

Mitigation of risk by way of:

- review of Hunter Water report and timely completion of actions arising to achieve sustained network capacity and reliability
- Flood-risk assessment for pump station and timely completion of actions arising
- implementation of a rolling INI strategy
- periodic pump station inspections and reports by specialist contractors and timely completion of actions arising
- effective O&M by competent W&S personnel in line with relevant WPG

Figure 12 – SNA.PS10 – Elizabeth Street Sewerage Pump Station



A. Pump Station Overflow

- In extreme INI events, i.e. highly diluted by stormwater from rainfall infiltration events via network which exceed the pump station hydraulic capacity could overflow the pump station and is expected to traverse the path as shown (light blue arrow)
- Install footpath signage in such an event, check extent of overflow, monitor and sandbag as necessary so as to direct flow as shown.
- When overflow event ceases, the effected land is cleaned of any solids and limed.
- Overflow =LOW (L=Low x C=Minor)
- Pump station site and billabong is inundated by Namoi River (10yr ARI / AEP 10%)

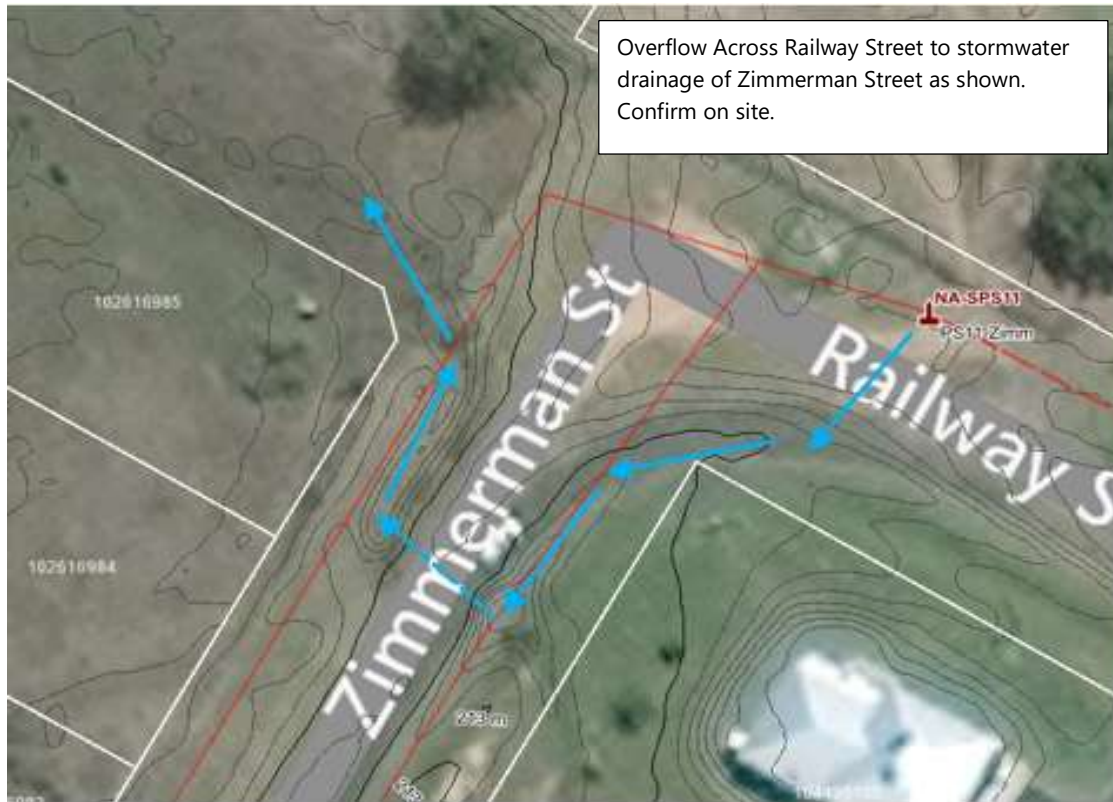
B. Pump Station Flooding

- Pump station site is inundated by Namoi River (50yr ARI / AEP 2%)

Mitigation of risk by way of:

- review of Hunter Water report and timely completion of actions arising to achieve sustained network capacity and reliability
- Flood-risk assessment for pump station and timely completion of actions arising
- implementation of a rolling INI strategy
- periodic pump station inspections and reports by specialist contractors and timely completion of actions arising
- effective O&M by competent W&S personnel in line with relevant WPG

Figure 13 – SNA.PS11 – Zimmerman Street Sewerage Pump Station



C. Pump Station Overflow

- In extreme INI events, i.e. highly diluted by stormwater from rainfall infiltration events via network which exceed the pump station hydraulic capacity could overflow the pump station and is expected to traverse the path as shown (light blue arrow)
- Install footpath signage in such an event, check extent of overflow, monitor and sandbag as necessary so as to direct flow as shown.
- When overflow event ceases, the effected land is cleaned of any solids and limed.
- Overflow =LOW (L=Low x C=Minor)
- Pump station site and billabong is inundated by Namoi River (10yr ARI / AEP 10%)

D. Pump Station Flooding

- Pump station site is inundated by Namoi River (50yr ARI / AEP 2%)

Mitigation of risk by way of:

- review of Hunter Water report and timely completion of actions arising to achieve sustained network capacity and reliability
- Flood-risk assessment for pump station and timely completion of actions arising
- implementation of a rolling INI strategy
- periodic pump station inspections and reports by specialist contractors and timely completion of actions arising
- effective O&M by competent W&S personnel in line with relevant WPG

Appendix 3 – Pollution Incidents and Prevention

Table 4 – Common Hazardous Events, Typical Preventative Measures, Proposed Actions

ID	Hazardous event	Risk ¹⁵	Typical Preventative Measure	Actions ¹⁶
Sewage Overflow				
HS1	Pipe collapse due to age	Calculated in Error! Reference source not found.	Network planned maintenance Network planned rehabilitation ¹⁷	Mains programmed clean/CCTV/remove chokes/repair Mains clean/CCTV/reline - CCTV program and capital works
HS2	Blockages (Network/STP)		As per HS1, plus STP Bypass systems & raw sewage overflow storage	As per HS1, plus STP CCC audit and planning ¹⁷ , and any necessary CAPEX
HS3	Infiltration/inflow/rainfall		As per HS1, plus Pipe size & slope, and pumpwell capacity Site earthworks to store/direct overflow	As per HS1 including smoke testing, plus Network modelling and planning ¹⁷ , and any necessary CAPEX Complete Error! Reference source not found. & review above, plan earthworks and any necessary CAPEX.
HS4	SCADA/Communications failure		SCADA planned maintenance CMF alert of SCADA failure	Routine switchboards inspection and audit Electrical and control systems planning ¹⁷ & CAPEX
HS5	Power failure		As per HS4, lightning protection, backup generators. Portable pumps	As per HS4, plus Implement gen-set strategy ¹⁷ , & assoc. pumps & pipes CAPEX
HS6	Storm damage		Same as for N3, plus Vegetation to prevent damage to infrastructure	Refer N3, plus Vegetation strategy ^{18 17} , & any necessary CAPEX
HS7	Third-party damage e.g. excavation		Accurate buried-asset location information Appropriate education & supervision of contractors	Completion of GPS survey project. Regular contractor inductions & easy-access DBYD information.
HS8	Mechanical breakdown		As per HS1 and HS4, plus	As per HS1 and HS4, plus

¹⁵ Pollute land and possibly also gully/waterway – impact varies by site ... LxC = Likelihood, C=Consequence

¹⁶ For inclusion in NSC corporate business planning processes – e.g. TAMP, Operational Plan, 4-year Delivery Plan

¹⁷ As part of Total Asset Management Planning (TAMP) process

¹⁸ planting and maintenance of appropriately sized screening vegetation with suitable root systems that avert root intrusion

ID	Hazardous event	Risk ¹⁵	Typical Preventative Measure	Actions ¹⁶
			Equipment redundancy and CAPEX	Redundancy planning ¹⁷ & CAPEX
HS9	Vandalism		As per HS1, plus site security fences	As per HS1, plus Site security planning ¹⁷ & CAPEX
Accidental Release of Chemicals				
HC1	Tank/storage/bund failure	Calculated in Error! Reference source not found.	Bundling, alarms, routine bund & tank inspection & test as per statutes.	Ensure routine inspections and urgent repair/replacement as necessary.
HC2	Spillage during delivery		As per HC1 WPG & SWMS & PPE	As per HC1 Ensure WPG exists and is used for chemical handling
HC3	Chemical reticulation pipework damage		As per HC2 and HS7 Emergency stop valves	As per HC2 and HS7 Ensure routine inspections and urgent repair/replacement as necessary.
HC5	Trunk spillage outside bund		Use of licenced carriers, NSC safety inductions, signage.	Initiate and routinely check.
HC6	Vandalism		As per HS9 and Signage.	As per HS9 and Initiate and routinely check.
Sewage Gases				
HG1	Malodourous gas - network - STP			- Continue lime dosing. Minimise detention times by way of Hunter H2O report recommendations. - Effective operation of STPs by competent TPOs to minimise odour and gas formation.
HG2	Explosive gas - Network - STP			- O&M of PStns to avoid methane formation. Benching improvements may be necessary. - Digester gas O&M training, including the use of nitrogen gas. Assessment of digesters by specialist inspectors. - Liquid Oxygen routine inspection by competent industry inspector.

Table 5 – Risk of Pollution Incident for Given Hazardous Events - SNA

ID	Hazardous event	Risk-Rating (LC=Rating) for specific SNA location ¹⁹														
		PS01	PS02	PS03	PS04	PS05	PS06	PS07	PS08	PS09	PS10	PS11	TP01	MHx	Sewers	ORGs
Sewage Overflow																
HS1	Pipe collapse due to age	L2=M	L2=M	L2=M	L2=M	L3=M	L3=M	L3=M	L3=M	L3=M	L3=M	L4=M	L2=M	L3=M	M3=M	L4=L
HS2	Blockages (Network/STP)	M2=M	M2=H	M2=H	M2=H	M3=M	M3=M	M3=M	M3=M	M3=M	M3=M	M3=M	M2=H	M3=M	M4=M	M4=M
HS3	Infiltration/inflow/rainfall	M2=H	M2=H	M2=H	M2=H	M3=M	M3=M	M4=M	M4=M	M4=M	M4=M	M4=M	M2=H	M4=M	M4=M	M4=M
HS4	SCADA/Comms failure	M2=H	M2=H	M2=H	M2=H	M3=M	M3=M	M3=M	M3=M	M3=M	M3=M	M3=M	M2=H	M3=M	N/A	N/A
HS5	Power failure	M2=H	M2=H	M2=H	M2=H	M3=M	M3=M	M4=M	M4=M	M4=M	M4=M	M4=M	M2=H	M4=M	N/A	M4=M
HS6	Storm damage	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	M2=M	N/A	R4=L
HS7	Third-party damage e.g. excavation	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	M2=M	M2=M	M3=M	M4=M
HS8	Mechanical breakdown ²⁰	M2=H	M2=H	M2=H	M2=H	M3=M	M3=M	M3=M	M3=M	M3=M	M3=M	M4=M	M3=M	N/A	N/A	N/A
HS9	Vandalism	L2=M	L2=M	L2=M	L2=M	L3=M	L3=M	L3=M	L3=M	L3=M	L3=M	L4=M	L3=M	L3=M	L3=M	L4=L
Accidental Release of Chemicals																
HC1	Tank/storage failure	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	M1=E	N/A	N/A
HC2	Spillage during delivery	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	R3=L	M2=H	R3=L		R3=L
HC3	Chemical pipework failure	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	M2=H	N/A		N/A
HC4	Bund failure	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	L3=M	N/A		N/A
HC5	Truck spillage outside bunded area	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	L3=M	N/A		N/A
HC6	Vandalism	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	L2=M	N/A		N/A
Sewage Gases																
HG1	Malodourous gas generation	M3=M	R3=L	M3=M	R3=L	R3=L	M3=M	M3=M	R3=L	R3=L	L3=M	R3=L	M3=M	R1=L		R1=L
HG2	Gas explosion	L1=M	L1=M	L1=M	L1=M	L1=M	L1=M	L1=M	L1=M	L1=M	L1=M	R1=L	M1=E	R1=L		R1=L

Priority for actions:

E Action immediately	H Action next budget	M Action 4yr Delivery plan	L Monitor only
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¹⁹ Calculated from NSC risk matrix - overleaf

²⁰ Duty-assist pumping is an existing mitigation measure reducing the consequence through sound maintenance management.

Narrabri Shire Council Risk Definitions

Decision Escalation Protocol	
Risk Rating	Action Required
Extreme 1-3	ACT IMMEDIATELY. Bring to attention of Council and the GM for immediate management and treatment to reduce the risk to an acceptable level.
High 4-12	ATTENTION NEEDED. Bring to attention of Director if the matter affects one Directorate or to MANEX if the matter affects multiple Directorates to manage planning, allocation & implementation of responsibilities, resources & regular monitoring of progress. Regular reporting to Departmental risk committee.
Medium 13-19	MONITOR AND REVIEW. Management responsibility, monitor & review response action as necessary. Oversight & monitoring of treatment by the Section/Team
Low 21-25	DEAL WITH THROUGH BUSINESS AS USUAL. Manage through existing processes and procedures.

		CONSEQUENCE DEFINITIONS				
		Insignificant	Minor	Moderate	Major	Catastrophic
RISK CATEGORIES	Strategic	Insignificant negative event with no impact on Council/Business Unit objectives	Minor negative impact on strategic objectives	Moderate adjustment to resource allocation and service required to achieve strategy	Major impact cannot be managed within existing framework	Significant impact on Council's ability to achieve strategic objectives
	Service Delivery / Operational	Incident or loss with no impact on Council/Business Unit operations	Minor negligible impact on Council operations	Moderate disruption to Council business	Major disruption to Council business	Critical loss of infrastructure or critical objectives cannot be achieved
	Financial	<\$25,000 or <1% of project budget	<\$250,000 or 2% of project budget	<\$1,000,000 or 10% of project budget	<\$2,500,000 or 25% of project budget	>\$2,500,000 or 25% of project budget
	Environmental	Insignificant transient environmental release, no environmental harm	Minor transient environmental harm	Moderate short term environmental harm	Significant long term environmental harm	Catastrophic long term environmental harm
	Compliance (Legal, Regulatory, Contractual)	Insignificant regulatory breach no warning, no penalty	Minor regulatory breach and warning issued	Regulatory breach and moderate fines	Serious breach with fines and public exposure	Significant breach resulting in GM or Council dismissal
	Regulation	Unsubstantiated negative publicity with no impact on Council reputation	Minor negative publicity/ limited media exposure	Local negative publicity/ short term effect	Negative publicity having long term effect on public confidence in Council	Sustained national negative publicity and public confidence in Council lost
Health & Safety (WHS & Public)	No injuries	First aid required	Medical treatment and (if WHS) lost time	Long term illness or serious injury	Death or permanent disability/illness	

Probability	Frequency
> 50% chance	multiple times in a year
25% - 50%	once in 1 or 2 years
10% - 25%	at least once in 2 – 10 years
5% - 10%	less than once in 15 years
< 5%	less than once in 20 years

		Consequence				
		Insignificant	Minor	Moderate	Major	Catastrophic
Likelihood	Almost Certain	15	10	6	3	1
	Likely	19	14	9	5	2
	Possible	22	18	12	8	4
	Unlikely	24	21	17	13	7
	Rare	25	23	20	16	11

Appendix 4 – O&M Activities

Activity	Frequency
Sewage Treatment Plant	
Operate the STP as per operation and maintenance procedures	Daily
Pumping Stations	
Check pump station operations via telemetry system	Daily
Check pump stations not connected to telemetry	Daily
Visual check of pumping operations	Weekly
Clean pump stations	Monthly
Service and specialist pump inspections	Annually (minimum)
Electrical inspections of pump controls	Annually
Pump refurbishments	Determined by service reports
Pump replacements/upgrades	Determined by service reports
Reticulation	
Inspection of controlled overflow/surcharge points	Monthly
CCTV inspections of mains	As per program
Mains rehabilitations	As per program
Location of manholes and boundary shafts	3-year program

Note: These frequencies are nominal and are to be updated based on the updated risk-based asset renewal and maintenance scheduling process being developed for NSC's Water Services Section.

Appendix 5 – Power Failure: GEN-SET Size and Priority

Table 6 – SPS Response Time Ranking Scale²¹

Ranking	Response Time (Dry Weather)	Response Time (Wet Weather)
1	<3hrs	<1hr
2	<4hrs	<2hrs
3	<6hrs	<3hrs
4	<10hrs	<4hrs
5	<12hrs	<5hrs

Table 7 – SNA.PS Generator Requirements²²

Site Code	Site Name and Address	Pumps Size kW	Generator Required ²² kVA	Response Time Ranking
SNA.PS01	"PS-2Masons" MARGARET STREET	75	240	1
SNA.PS02	"PS2-Doctors Creek" SHORT STREET	60	180	1
SNA.PS03	"PS3-Nobles" COOMA ROAD	60	180	1
SNA.PS04	"PS4-Ugoa St" GENANAGIE STREET	30	100	1
SNA.PS05	"PS5-Cargills" 5 BARANBAR STREET	10	30	1
SNA.PS06	"PS6-Regent Street" REGENT STREET	6.7	30	1
SNA.PS07	"PS7-Hinds" HINDS STREET	4	30	1
SNA.PS08	"PS8-Golf Course" 123A GIBBONS STREET	3.1	30	1
SNA.PS09	"PS9-Taylor St" 5A HILLAM AVENUE	2	30	1
SNA.PS10	"PS10-Elizabeth St" THE ISLAND ROAD	4	30	1
SNA.PS11	"PS11-Zimmerman St" ZIMMERMAN STREET	2	30	1

²¹ To be reviewed relative to raw sewage volumes in Table 2 and pump asset size information

²² Assumes approximately three (3) times the pump kW for two-pump operation. [kW x 2/.8/.85], and standard gen-set sizes of 30, 60, 100, 180 and 240 kVA (Ref: <http://au.power.powerlinkworld.com/product/liebiao.aspx?id=12>] To be confirmed by qualified electrical engineer at time of procurement.



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