Statement of

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Reference
JKC EMGR 07 2029 6139

QFCI

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I, **ROBIN LEWIS**, state:

Role and Position

Question 1 – Mr Lewis' role and position within Queensland Urban Utilities.

1. I am the Chief Operating Officer of Queensland Urban Utilities (**QUU**). I am responsible for all operational aspects of QUU including water and wastewater services, maintenance, asset planning and capital works program delivery. The operational division comprises several branches being service delivery, major projects and commercial services, maintenance and renewal planning, planning and source control.

2. This statement is in response to the Requirement to Provide Statement to Commission of Inquiry (**Requirement**) received by Blake Dawson Lawyers (solicitors for QUU) from the Queensland Floods Commission of Inquiry (**Commission**) dated 4 October 2011.

3. I have previously provided a statement to the Commission, such statement being dated 4 May 2011 (**my earlier statement**).

Land Use Planning Framework

Question 2 – The legal authority by which QUU provides or develops wastewater infrastructure.

4. The *Water Safety and Reliability Act 2008* (Qld) (**Water Supply Act**) provides a regulatory framework for providing water and wastewater services in Queensland, and specifies the functions and powers of service providers (including QUU).

5. QUU was, on and from 1 July 2010, appointed as the water and wastewater services provider for the geographic areas of its participating councils(Brisbane City Council, Ipswich City Council, Scenic Rim Regional Council, Lockyer Valley Regional Council and Somerset Regional Council) by virtue of section 53AA of the *South-East Queensland Water (Distribution and Retail Restructuring) Act 2009* (Qld) (**Restructuring Act**).

6. On and from 1 July 2010 QUU, by virtue of section 53AE of the Restructuring Act, was taken to be a registered grid participant in the grid customer and distribution service provider categories under the market rules under the *Water Act 2000* (Qld) (**Water Act**)

7. The provision of water and wastewater services in South East Queensland is highly regulated. The statutory framework includes:

   (a) Water Act;

   (b) Market Rules (made under the Water Act);

   (c) Restructuring Act; and

   (d) Water Supply Act.

8. The Water Supply Act requires water and wastewater service providers such as QUU to have an approved strategic asset management plan for ensuring continuity of supply of each of the service provider's registered services which states the following matters:

   (a) the registered services to which the plan applies;

   (b) the infrastructure for providing the services;

   (c) standards for appropriate levels of service, including customer service, and performance indicators for the service;

(d) an operation, maintenance and renewals strategy that demonstrates how each standard will be achieved.[1]

9. The strategic asset management plan must also:

(a) identify the methodology used by the service provider for developing the standards, including, for example, cost considerations in deciding appropriate levels of service;

(b) state the service provider's proposed arrangements for financing the implementation of the plan;

(c) have regard to the best industry standards for the registered services;

(d) demonstrate how the service provider will comply with the system operating plan applying to the service provider; and

(e) be prepared in accordance with the guidelines, if any, made by the regulator for preparing the plan.[2]

10. Until such time as a distributor-retailer such as QUU has a water netserv plan (described in paragraph 11 below) the existing strategic asset management plans for the registered services of a participating local government for the distributor-retailer are taken to be the distributor-retailer's approved strategic asset management plans under the Water Supply Act.[3] A distributor-retailer must have its water netserv plan in place by 1 July 2013.[4] QUU's water netserv plan has been prepared in draft and has been released for consultation.

11. A distributor-retailer's water netserv plan when developed must be consistent with the SEQ regional plan and the planning assumptions for the distributor-retailer's geographic area. The purposes of a distributor-retailer's water netserv plan for its geographic area are:

(a) to provide for strategic planning for the operation of the distributor-retailer's business;

(b) to provide planning for the delivery of infrastructure for supplying the distributor-retailer's water services and wastewater services for at least 20 years;

(c) to ensure the provision of safe, reliable and secure water services and wastewater services by the distributor-retailer;

(d) to integrate land use planning and planning for infrastructure for the distributor-retailer's water services and wastewater services; and

(e) to provide for the management of the distributor-retailer's water services and wastewater services in a way that seeks to achieve ecological sustainability.[5]

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[1] Water Supply Act section 71(2).

[2] Water Supply Act section 71(3).

[3] Restructuring Act section 53AM.

[4] Restructuring Act section 99BJ.

[5] Restructuring Act section 99BM.

Question 3 – The land use planning framework, including the applicable legislative and regulatory provisions governing the provision or development of wastewater infrastructure by QUU in its region of operations.

12. QUU is subject to a complex land planning and sustainability framework, the key legislative instruments being:

    (a) The Water Act – the Water Act provides for the sustainable management of water and other resources and for other purposes. Catchment based water resource planning is achieved through the development of water resource plans, and in certain catchments, resource operations plans;

    (b) The Water Supply Act provides for the safety and reliability of water supply and other particular water related purposes;

    (c) The *Sustainable Planning Act 2009* (Qld) (**SPA**) provides the planning framework for the development of water and wastewater infrastructure. If a distributor-retailer wishes to deliver new infrastructure or upgrade existing infrastructure it is subject to the Integrated Development Assessment System (**IDAS**) process specified in SPA. Much of the infrastructure delivered by QUU is assessable development and will be assessed by the relevant local authority. This includes developments that:

        (i) make a material change of use of premises for an environmentally relevant activity (subject to code assessment under SPA);

        (ii) operational work that involves taking or interfering with water from a watercourse, lake or spring; and

        (iii) operational work that is tidal works or within a coastal management district.

    (d) The Department of Environment and Resource Management (**DERM**) is frequently a referral agency for assessments of water and wastewater infrastructure.

    (e) The *Environment Protection Act 1994* (Qld) (**EPA**) and subordinate legislation, provides the framework for environmental regulation of water and wastewater infrastructure. QUU is bound by this legislation.

    (f) The Restructuring Act deals with the formation of distributor-retailers such as QUU and addresses various specific planning issues relevant to distributor-retailers. Distributor-retailers currently have limited powers under the Restructuring Act and SPA to impose conditions on the water and sewage infrastructure components of developments.

13. Additionally, in developing its planning assumptions QUU must have regard to the:

    (a) South East Queensland Regional Plan 2009-2031;

    (b) South East Queensland Water Strategy;

    (c) Regional Water Security Program; and

    (d) Planning schemes and total water cycle management plants of our participating councils.

14. Prior to the establishment of distributor-retailers on 1 July 2011, land use and infrastructure planning for water and wastewater businesses was carried out within local government. This is still the case for much of Queensland.

15. From 1 July 2011, distributor-retailers became responsible for water and wastewater services planning, infrastructure and other related functions. Councils retain responsibility for land use planning and stormwater services.

16. The Restructuring Act provides for the phased transfer of certain planning functions relating to water and wastewater services to distributor-retailers, from their participating councils, over a period of time.

17. In recognition of the impossibility of distributor-retailers establishing integrated water and wastewater infrastructure plans, development standards and supporting systems immediately, transitional arrangements have been put in place, relying on existing planning documents and council processes. These will form the basis of land use and infrastructure decision making processes undertaken on behalf of distributor-retailers during the period from 1 July 2011 until 1 July 2013.

18. From 1 July 2011, distributor-retailers were given concurrence agency functions under SPA in relation to water and wastewater infrastructure. This concurrence agency function is however subject to a statutory delegation back to the distributor-retailer's participating council for the relevant geographic area until 1 July 2013.

19. Until 30 June 2013, Councils will assess and determine development applications on behalf of distributor-retailers. From 1 July 2013, a new arrangement, which is yet to be determined by the Queensland government, will be put in place.

Question 4 – The factors that determine the location or site of wastewater plant and infrastructure (such as land use planning considerations and technical, demographic or commercial considerations).

20. Wastewater infrastructure networks make use of the natural land layout and gravity to minimise pumping costs and in particular power consumption (and in more recent times, to reduce carbon emissions). Wastewater networks are designed to drain to the lowest point of the natural land layout. As a consequence, wastewater treatment plants (**WWTPs**) are typically located on low lying land. Additionally, each WWTP requires a discharge point, which, in turn, requires positioning adjacent to waterways, including rivers and creeks.

21. Gravity systems are the most cost effective approach to service community needs for wastewater treatment and are used extensively worldwide.

22. WWTPs need to be located within a reasonable distance of the communities that they serve. This is because sewerage degrades when it travels over distances. In turn, this affects the treatability of the sewerage. The precise location of the infrastructure is constrained by the requirement to access for maintenance purposes and needs to consider the locations of other infrastructure such as underground power cables, gas services and stormwater systems.

23. The size of the infrastructure is governed by the population served which is based on a volumetric calculation for residential and industrial customers.

Question 5 - Where wastewater infrastructure is to be located on flood prone land, the considerations that inform measures to protect the proposed plant or infrastructure during:

(a) the planning stage (for example, any flood immunity standards or service delivery codes that have to be complied with); and

24. During the planning stage for delivery of wastewater infrastructure, consideration is given to:

(i) the relevant regulatory framework noted above;

(ii) acquisition of all regulatory permits, for example, those required under SPA;

(iii) the acquisition of suitable land;

(iv) provision of a buffer to residential areas around each WWTP;

(v) ensuring that the location adequately services community demand in growth;

(vi) the site history with respect to flooding (identification of flood levels using inundation maps);

(vii) hydrological site assessment including flood studies;

(viii) consideration of Q100 (or mitigation strategy) for electrical systems and well openings;

(ix) meteorological forecasting (wet season identification);

(x) resilience of planned infrastructure against damage caused by any wet season event;

(xi) engineering, in particular the ability to construct;

(xii) location of sensitive equipment, including electrical, mechanical and control systems;

(xiii) balancing the cost of prudent solutions against excessive design; and

(xiv) ensuring value for money for the community.

(b) the construction stage (for example, the minimum height of services, building materials, engineering standards or engineering solutions (such as physical barriers) that should be observed or employed.

25. Factors considered during planning are also monitored during construction to ensure achievement against the planned design. Further, where possible, construction projects at risk of wet season interference are scheduled for delivery during the dry season.

Question 6 – The sources of information that are used to determine whether land is flood prone.

26. In order to determine whether the land is flood prone, a variety of information sources are called upon including:

(a) Geospatial Information Systems (**GIS**);

(b) previous flood level information, as provided by the Bureau of Meteorology (**BOM**);

(c) flood level modelling;

(d) historical information; and

(e) staff and local knowledge.

Wastewater treatment operations

Question 7 – The general operation of the wastewater collection and treatment process including the components of the system and their respective functions (while identifying differences, if any, between water reclamation plants and wastewater treatment plants).

27. Water reclamation is a modern industry term for sewage treatment. Water reclamation or WWTPs (the terms are interchangeable) are facilities at which wastewater from homes and businesses is cleaned using biological and chemical treatment, so that the water can be on-sold as recycled water or, if necessary, be returned to the environment safely via waterways. For ease of reference, the term 'wastewater treatment plants or WWTPs' is used in this statement.

28. QUU's wastewater network is made up of service branch lines from individual homes, which are connected to larger reticulation mains. These mains in turn feed into pump stations and trunk sewers leading ultimately to WWTPs.

29. QUU has 28 WWTPs ranging from small scale package plants to advanced wastewater treatment plants.

30. When it reaches the wastewater treatment plant, raw sewage is treated to minimise potential impacts on the public and the environment.

31. Elements that are typical to most WWTPs include pre-treatment to remove large solid items that enter the wastewater system network (for example rags, nappies, plastic bags etc) followed by primary and secondary treatment stages before final clarification or settling and disinfection. Sludge generated as part of the treatment process is treated further prior to either disposal or beneficial re-use.

32. QQU's wastewater network provides redundancy, including:

    (a) generators to maintain operations in the event of power failure;

    (b) contingent storage in the network to allow for the network to store up to two thirds of its average dry weather volume prior to surcharge; and

    (c) includes overflow structures to control the point of discharge.

33. QUU's wastewater network is monitored by a sophisticated control system and is operated by a mix of remote and on-site operation by trained operators.

Restoration and protection of existing wastewater infrastructure

Question 8 – In relation to QUU's wastewater pumping stations:

(a) the number and location of wastewater pumping stations that were affected by the 2010/2011 floods, including the level of damage sustained in each case;

34. Wastewater pumping station is a modern industry term for a sewage pumping station. Both terms are used interchangeably in the water and wastewater industry and in my earlier statement.

35. Please refer to **Appendix A** for a list of the wastewater pump stations operated by QUU that were affected during the January 2011 flood events, including their location. The level of damage to each wastewater pumping station varied from inundation, electrical damage and silting.

(b) the "flood-proofing" features built into the design of this type of infrastructure;

36. QUU uses a standard design for its pump stations. A copy of a standard QUU pump station design is at **Appendix B**. The pumps and motors in the majority of cases are of a submersible type which would not be impacted by flood events. The electrical control panels are susceptible to flooding and where possible are elevated to minimise the risk of inundation.

(c) whether these features are included by virtue of any lawful requirement and, if so, the source of this requirement; and

All pump stations are designed and built to meet the appropriate Australian Standard. Pump stations are required to be built in compliance with licensing conditions under the EPA. Pump stations must also comply with the safety requirements in the *Electrical Safety Act 2002* (Qld).

(d) the operation of the in-built network overflow structures that prevent sewerage spillage onto land.

37. QUU's wastewater network provides contingency for abnormal operational events and, where required and/or practical, additional measures such as generators are installed to ensure system redundancy and compliance with regulations including the *Environmental Protection Regulation 2008* (Qld) **(EP Regulation)**.

38. The wastewater network has a number of overflow relief structures that discharge in emergency situations or extreme weather events to local watercourses. These structures are designed to operate preferentially to prevent localised wastewater discharge in residential and commercial areas. When river levels are high, relief structure outlets may become submerged because of excessive flows in the watercourse. When this occurs, manholes can lift due to water pressure and cause localised flooding. In some cases, manholes can be bolted down to prevent these occurrences, however, prior to such decision being made any impacts on customers that could cause potential backflow into ground floor facilities via shower grates and toilet pedestals must be carefully considered .

39. Backflow preventers to household sewerage systems can be installed to prevent internal discharge of sewerage into ground floor premises. The installation of these devices is the responsibility of the householder as the backflow preventers must be installed on the householder's private infrastructure. One issue with the use of such preventers is that this may preclude the use of toilets and showers during significant inundation events. Consequently householders are often reluctant to install these devices.

Question 9 – In relation to each of QUU's wastewater treatment plants at Fairfield, Oxley Creek, Bundamba, Karana Downs, Goodna Rosewood, Esk, Lowood and Fernvale:

(a) the level of floodwater inundation during the 2010/2011 floods and the consequences for sewerage treatment operations (including the disposal of any untreated sewerage);

40. Please refer to **Appendix C** for a list of the QUU WWTPs that were impacted in the January 2011 floods, including their location.

41. The civil infrastructure component (pipes and physical structure) of QUU's WWTPs and sewerage pumping stations were, apart from some minor impact damage from trees and other structures, not physically damaged during the 2011 flood events. This is because most of the civil infrastructure is located underground or is built to withstand wet conditions.

42. Inundation of affected WWTPs and waste water pumping stations during the 2011 January flood events caused damage to generators and switchboards and hence critical failures to treatment systems.

43. Physical inspections indicated that QUU's WWTPs at Oxley Creek, Bundamba, Karana Downs, Fairfield and Fernvale were completely inundated during the flood events. Other QUU WWTPs suffered varying degrees of inundation.

44. In an effort to ensure public health risks were mitigated, wastewater was transported away from people's homes through the wastewater system network, using diesel pumps in place of failed generators.

45. Untreated sewage which was not removed by tankers was discharged to waterways in accordance with existing licence conditions and emergency provisions as provided for under our licence conditions via outfalls/overflow infrastructure. All QUU wastewater infrastructure is constructed and is obliged to operate under licence conditions determined by the regulator at the time of development.

46. Where untreated wastewater was discharged to waterways, QUU erected signage informing the community to remain out of the waterways.

47. QUU met frequently with DERM and public health authorities, informing and involving them in proposed and performed actions during the flood event. After the flood event, QUU kept DERM formally appraised of the progress of the infrastructure recovery through formal weekly meetings

(b) what, if any, pre-existing design features were present to minimise or counter the effects of flooding;

48. Critical infrastructure (including electrical, mechanical and control systems) are located at elevated levels, where practical, to minimise the effects of flooding.

49. As noted at paragraph 20 above, WWTPs are by necessity located in low level areas.

(c) the restoration and/or upgrade works undertaken to date; and

50. All affected plant has been recovered to operate in accordance with compliance conditions agreed with DERM.

(d) whether these works include any measures designed to improve flood immunity and, if so, what these measures are and the degree by which flood immunity is expected to be improved.

51. QUU's flood recovery is being delivered in a phased approach, being:

(a) restoration of operations to mitigate environmental and public health risks;

(b) performance of a full review which includes an external flood resilience analysis; and

(c) site by site resilience improvement and risk mitigation.

52. QUU immediately acted to maintain services and restore operational infrastructure, generally with a 'like for like' design. Delaying restoration to consider improved design for flood mitigation would have had a significantly greater impact on the environment and potentially public health.

53. To place switchboards in WWTPs above Q100 level would have involved heavy design work and extensive site works. An individual design would need to have been prepared for each WWTP. New foundations would need to have been laid. This process would have significantly increased recovery times as an individual design would need to have been prepared for each site and a formal procurement process undertaken for the design work and any resulting civil works.

Question 10 – In relation to the proposed external assessment of the business resilience of QUU's wastewater treatment plants:

(a) the purpose of this exercise and the nature of its stated focus on the business resilience of these assets;

54. QUU has commissioned AECOM Australia Pty Ltd, consulting engineers (**AECOM**) to undertake a business resilience study of its affected infrastructure. The purpose of this exercise is to identify practical and achievable measures to mitigate impacts and improve recovery times where impacts are unavoidable. The overall aim of the study is to undertake a defensible risk assessment and prioritisation process, the end result of which will be a high level strategy on flood risk mitigation options and indicative costs for making key assets more flood resilient. It is anticipated that many of the prioritised assets will require a detailed feasibility and design project before final investment decisions are made.

(b) the current status of the external assessment; and

This external assessment is ongoing. The latest of several drafts of the report has been provided to QUU. However, the report is subject to the comment of a number of QUU

employees. The report is being reviewed for accuracy. It is subject to discussion and consultation before the report can be finalised. It is anticipated that the assessment will be concluded prior to the end of the calendar year.

(c) any recommendations that have been made in connection with the conduct of the external assessment.

None has been made to date as the assessment is not yet complete.

Question 11 – In relation to QUU's commissioning of Brisbane City Council City Design to undertake a reassessment of flood levels for the purpose of ascertaining the new level at which assets should be constructed:

(a) the current status of the reassessment by Brisbane City Council City Design; and

55. Please refer to my earlier statement at paragraph 98.

56. Brisbane City Council (**BCC**) City Design were unable to complete the reassessment due the volume of work. Therefore, QUU engaged alternative consultants to complete the reassessment, which is now complete. The recommendations have been incorporated into the design for the Lockyer and Fernvale treatment plant upgrades.

(b) if completed, the implications of the reassessment for QUU wastewater plant or infrastructure generally and the proposed upgrades of the Fernvale and Lockyer wastewater treatment plants, in particular.

57. BCC has adopted an interim flood standard to control habitable floor levels for new residential development. The interim flood standard is the higher of the 2011 flood level plus 500mm or the current Defined Flood Level plus 500mm.

58. To guide QUU decisions, the interim standard adopted by BCC will be used in project feasibility to develop practical flood resilience for existing flood prone assets and proposed assets in QUU's Capital Investment Plan.

59. QUU will also update its contingency, emergency management and disaster recovery plans to have regard to the interim flood standard adopted by the BCC.

60. A post flood reassessment of the Fernvale and Lockyer Valley (East) WWTP upgrades is currently underway.

61. The primary objective of each study is to determine whether the preferred approach, at preferred sites, will have an adverse effect on flood levels, potentially affecting residential homes in the vicinity of the site.

62. The studies will provide commentary on possible impacts of the proposed construction, namely raising the ground level of preferred sites using fill.

Sewerage overflow

Question 12 – QUU's Sewer Overflow Management Strategy.

63. QUU's sewer overflow management strategy is summarised in the table at **Appendix D.**

Question 13 - The nature of "sealed" and "pressure" wastewater systems, their mechanisms of operation, their significance in relation to reducing or eliminating the risk of sewerage overflow (particularly during times of peak wet weather flow) and the constraints, if any, on the implementation of such a system.

64. A sealed/pressure wastewater system is made up of a network of fully sealed pipes which are fed by pumping units located at each connected property. A pumping unit processes

household wastewater and transfers it to the pressure sewer located in the street by a small pipeline within the property.

65. The pressure sewer forms part of the overall pipe network which discharges to the trunk sewer system.

66. The system is fully sealed against storm, ground or flood water ingress, mitigating the risk of infiltration likely to cause system overloading.

67. Sealed and pressurised wastewater systems are dependent upon power to operate and are unable to take advantage of gravity. It would add significant capital and operating costs to the network if all wastewater systems were to be sealed and pressurised.

Stormwater management issues

Question 14 – The basis for QUU's belief that a significant source of stormwater infiltration into its wastewater system is from illegal stormwater connections to private sewers that are in turn connected to QUU's wastewater system.

68. This issue was largely addressed in my earlier statement at paragraphs 117 to 132.

69. QUU's belief is based on the significant increase of flow observed in its infrastructure during wet weather events.

Signed and solemnly, sincerely and truly affirmed and declared by Robin Lewis, of QUU
at Brisbane, Queensland, this 14th day of October 2011.

[redacted]

Witness Signature

[redacted]

Signature

[redacted]

Print name

APPENDIX A – AFFECTED WASTEWATER PUMP STATION LOCATIONS

Brisbane City Council area

Wastewater Pump Station ID		Location	
SP172	RUSHWORTH ST PUMP STATION	FEUERRIEGEL RD	BALD HILLS
SP211	BRACKEN RIDGE RD PUMP STATION	BRACKEN RIDGE RD	BALD HILLS
SP153	LOBE ST PUMP STATION	LOBE ST	BALD HILLS
SP300	SERPENTINE RD PUMP STATION	MAIN MYRTLETOWN RD	EAGLE FARM
SP10	VIOLET ST EAGLE FARM PUMP STATION	KINGSFORD SMITH DR	EAGLE FARM
SP131	MCBRIDE RD PUMP STATION	EAGLE FARM RD	PINKENBA
SP214	ANTON RD PUMP STATION	ANTON RD	HEMMANT
SP298	LYTTON RD NO 4 PUMP STATION	LYTTON RD	LYTTON
SP256	CONSTELLATION WAY PUMP STATION	CONSTELLATION WAY	WYNNUM
SP248	PORT DR PUMP STATION	WYNNUM NORTH RD	LYTTON
SP5	NA	HOLT ST	PINKENBA
SP270	LYTTON RD VACUUM PUMP STATION	LYTTON RD	HEMMANT
SP49	KIANAWAH RD PUMP STATION	KIANAWAH RD	WYNNUM WEST
SP16	GORDON ST PUMP STATION	SCOTT ST	HAWTHORNE
SP226	RUSSELL CL PUMP STATION	EMMETT ST	WYNNUM WEST
SP266	GREY ST PUMP STATION	GREY ST	SOUTH BRISBANE
SP103	HEROES AVE PUMP STATION	INDOOROOPILLY RD	TOOWONG
SP118	SANDFORD ST PUMP STATION	SANDFORD ST	ST LUCIA
SP119	MACQUARIE ST PUMP STATION	MACQUARIE ST	ST LUCIA
SP11	CASWELL ST PUMP STATION	STANLEY ST E	EAST BRISBANE
SP75	KILKIVAN AVE PUMP STATION	KILKIVAN AVE	KENMORE

SP192	FORTROSE ST PUMP STATION	FORTROSE ST	KENMORE
SP81	WITTON RD PUMP STATION	WITTON RD	INDOOROOPILLY
SP162	JILBA ST PUMP STATION	JERRANG ST	INDOOROOPILLY
SP113	KINLOCK ST PUMP STATION	KINLOCH ST	INDOOROOPILLY
SP100	MUSGRAVE RD PUMP STATION	MUSA ST	INDOOROOPILLY
SP127	HARTS RD PUMP STATION	BOUGAINVILLEA AVE	INDOOROOPILLY
SP129	IVY ST PUMP STATION	IVY ST	INDOOROOPILLY
SP98	RADNOR RD PUMP STATION	RADNOR ST	INDOOROOPILLY
SP109	REGATTA ST PUMP STATION	REGATTA ST	CHELMER
SP73	ARANUI ST PUMP STATION	CASSIA LANE	YERONGA
SP86	INDOOROOPILLY RD PUMP STATION	INDOOROOPILLY RD	TARINGA
SP71	DIANE ST PUMP STATION	ESPLANADE	YERONGA
SP194	FAIRFIELD WWTP PUMP STATION	BRISBANE CSO	YERONGA
SP122	ESPLANADE NO 2 PUMP STATION	THE ESPLANADE	ST LUCIA
SP72	ORMUZ RD PUMP STATION	ORMUZ RD	YERONGA
SP121	ESPLANADE NO 1 PUMP STATION	THE ESPLANADE	ST LUCIA
SP175	SIR WILLIAM MC GREGOR DRIVE PUMP STATION	UPLAND RD	ST LUCIA
SP40	SUNSET RD PUMP STATION	GEM RD	KENMORE
SP191	GEM RD PUMP STATION	GEM RD	KENMORE
SP197	SCENIC RD PUMP STATION	SCENIC RD	KENMORE
SP189	SPINKBRAE ST PUMP STATION	SPINKBRAE ST	FIG TREE POCKET
SP174	JESMOND RD PUMP STATION	JESMOND RD	FIG TREE POCKET
SP160	MANATON PARK VACUUM PUMP STATION	JESMOND RD	FIG TREE POCKET
SP108	JARROTT ST PUMP STATION	JARROTT ST	CHELMER
SP110	LONG ST WEST PUMP STATION	LONG ST W	GRACEVILLE
SP116	FERRY ST PUMP STATION	FERRY ST	SHERWOOD
SP111	GERLEE ST PUMP STATION	GERLEE ST	TENNYSON
SP64	ORTIVE ST PUMP STATION	ORTIVE ST	YERONGA

SP313	QLD TENNIS CENTRE PUMP STATION	KING ARTHUR TCE	TENNYSON
SP65	STEVENS.ST PUMP STATION	STEVENS ST	YERONGA
SP63	ASTOLAT ST PUMP STATION	PATHWAY	YERONGA
SP216	PINE MOUNTAIN RD PUMP STATION	PINE MOUNTAIN RD	HOLLAND PARK
SP287	NERRINA CT PUMP STATION	COLLEGE RD	KARANA DOWNS
SP288	NALYA CRES PUMP STATION	NALYA CRES	KARANA DOWNS
SP155	PENONG ST PUMP STATION	PENONG ST	WESTLAKE
SP50	MT OMMANEY DR PUMP STATION	MT OMMANEY DR	JINDALEE
SP178	OLDFIELD RD PUMP STATION	OLDFIELD RD	SVTN MILE ROCKS
SP19	CENTENARY HWAY PUMP STATION	CENTENARY HWY	JINDALEE
SP181	SINNAMON RD PUMP STATION	SINNAMON RD	SVTN MILE ROCKS
SP45	MACTIER ST PUMP STATION	FIG TREE POCKET RD	FIG TREE POCKET
SP115	TURNER ST PUMP STATION	TURNER ST	SHERWOOD
SP46	BOTTICELLI ST PUMP STATION	BOTTICELLI ST	FIG TREE POCKET
SP291	SOLANDER CT PUMP STATION	SOLANDER CT	KARANA DOWNS
SP286	ILLAWONG WAY PUMP STATION	ATKINSON DR	KARANA DOWNS
SP285	ARINGA CREST PUMP STATION	ARINGA CRES	KARANA DOWNS
SP292	WIRRIBOOT CT PUMP STATION	WIRRIBOOT CT	KARANA DOWNS
SP290	OMEO GROVE PUMP STATION	BOOLUNGAL WAY	KARANA DOWNS
SP278	LAGOON CRES PUMP STATION	LAGOON CRES	BELLBOWRIE
SP235	PIONEER CRES PUMP STATION	PIONEER CRES	BELLBOWRIE
SP168	DURANTA ST PUMP STATION	DURANTA ST	BELLBOWRIE
SP218	WESTLAKE DRIVE NO 1 PUMP STATION	BALATON ST	WESTLAKE
SP261	WENDOUREE CRES PUMP STATION	WENDOUREE CRES	WESTLAKE
SP255	CALLABONNA ST PUMP STATION	CALLABONNA ST	WESTLAKE
SP232	BEANLAND ST PUMP STATION	BEANLAND ST	JAMBOREE HTS
SP88	BLACKHEATH ST PUMP STATION	BLACKHEATH RD	CORINDA
SP148	DONALDSON RD PUMP STATION	DONALDSON RD	ROCKLEA
SP303	CHURCH RD PUMP STATION	GREYGUM PL	ANSTEAD

SP308	MATFIELD ST PUMP STATION	MATFIELD ST	MOGGILL
SP207	WEEKES RD PUMP STATION	WEEKES RD	MOGGILL
SP243	BIRKIN RD PUMP STATION	BIRKIN RD	BELLBOWRIE
SP263	BRUMBY CIRCUIT PUMP STATION	BRUMBY CRCT	SUMNER
SP213	SANANANDA ST PUMP STATION	SANANANDA ST	WACOL
SP182	KIMBERLEY ST PUMP STATION	KIMBERLEY ST	DARRA
SP254A	ARCHERFIELD AERODROME PUMP STATION	BEATTY RD	ARCHERFIELD
SP250	SINCLAIR DR PUMP STATION	WATERFORD RD	ELLEN GROVE
SP306	Coro Drive	CORONATION DR	TOOWONG

Ipswich City Council area

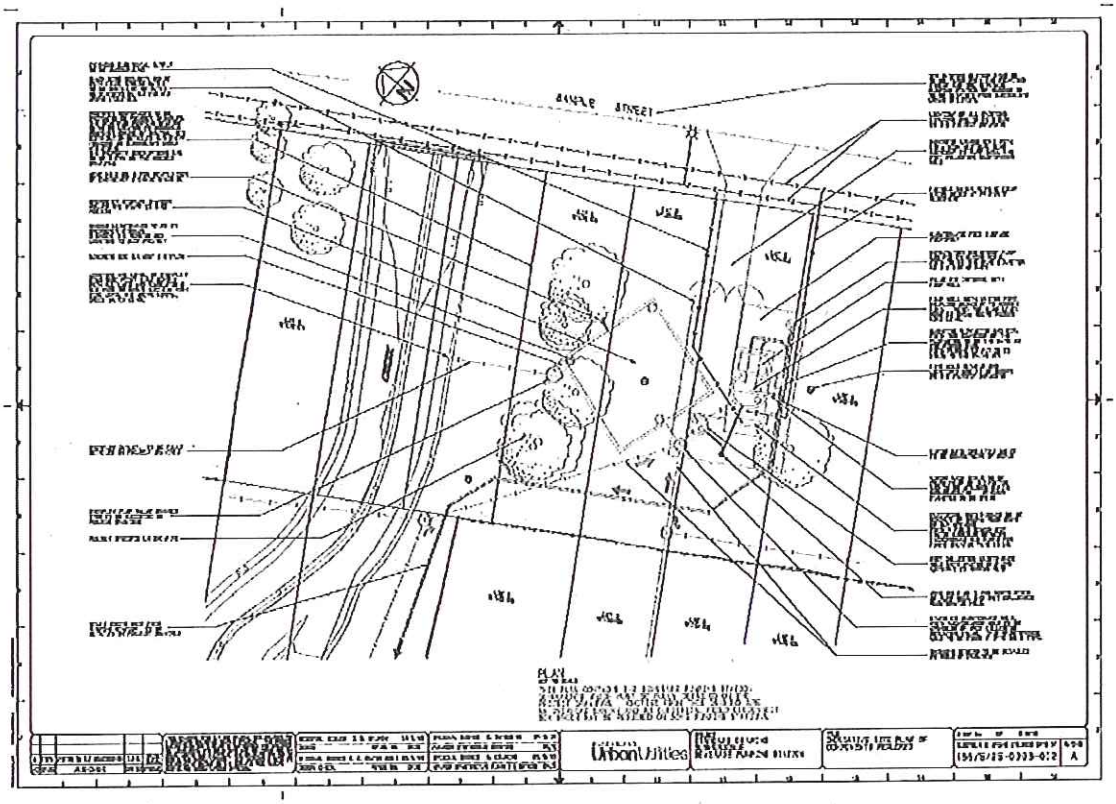
Wastewater Pump Station ID	Location	
SP073	Junction Road	Karalee
SP001	Old Toowoomba Road	Leichhardt
SP002	Berry Street	Yamanto
SP003	Hanlon Street	Bundamba
SP004	Videronist Road	Bundamba
SP005	Archer Street	Bundamba
SP008	Old Toowoomba Road	Amberley
SP011	Queen Street	Blackstone
SP013	Warwick Road	Yamanto
SP015	Samford Road	Leichhardt
SP016	Lobley Street	Ipswich
SP018	Ashburn Road	Bundamba
SP019	Riverview Road	Riverview
SP020	Sutton Street	Churchill
SP021	Lobb Street	Churchill
SP022	Avon Street	Leichhardt
SP056	Mt Crosby Road	Tivoli

SP060	Moores Pocket Road	Moores Pocket
SP063	Boundary Street	Moores Pocket
SP065	Woodend Road	Woodend
SP074	North Station Road	North Booval
SP028	Brisbane Terrace	Goodna
SP032	Moggill Ferry Road	Riverview
SP033	McAuliffe Street	Redbank
SP034	Brisbane Road	Redbank
SP036	Monash Road	Redbank
SP048	Roseberry Parade	Woodend
SP049	Tantivi/Kent Street	Tivoli
SP050	Chermside Road	East Ipswich
SP051	Tiger Street	West Ipswich
SP052	Boundary Street	Moores Pocket
SP053	Haig Street	Brassall
SP054	Blackall Street	East Ipswich
SP055	Mt Crosby Road	North Tivoli
G34	Lower Cross St	Goodna

Somerset Regional Council area

Wastewater Pump Station ID	Location	
SP467	Lowood SPS no 7	Lowood
SP397	Banks Creek Rd SPS1	Fernvale
SP390	Hope St SPS	Kilcoy
SP398	Banks Creek Rd	Fernvale
SP399	Schmidt Rd	Fernvale
SP468	Fernvale Rd, Lowood No 1	Lowood

APPENDIX B



APPENDIX C

Location of Affected Wastewater Treatment Plants

Affected Wastewater Treatment Plants	Location	Date first commissioned
Fairfield	206 Brisbane Corso, Yeronga	1966
Oxley Creek	240 Donaldson Road, Rocklea	1968
Karana Downs	Nayla Crescent, Karana Downs	1982
Bundamba	136 River Road, Bundamba	1982
Goodna	Lower Cross Street, Goodna	1971
Rosewood	Rosewood-Warrill View Road, Rosewood	1960
Esk	Francis Street, Esk	1977
Lowood	Forest Hill-Fernvale Road, Lowood	1974
Fernvale	Banks Creek Road, Fernvale	1992

APPENDIX D – SEWER OVERFLOW MITIGATION STRATEGY

Function	Key Strategy	Tactics	Deliverables	Timeline
Program Marketing and Communication	Education and Awareness	• WWOF info on QUU public newsletter • Direct mail to hot spot areas • Related industry and media campaigns • Public notification of overflows on QUU website • customer brochure to clarify owners responsibilities and QUU's responsibilities to ensure field crews all deliver the same message to customers • 1800 number reporting	• Informed customers • Customers understand maintenance of household sewers is their responsibility • Overflow reporting and information on QUU website	Concepts in August Publication and printing in September Pre-wet season distribution in October 200 properties and upstream catchments
Identification and tracking of sewage overflows	• Databases are developed and maintained of reported property overflows • Records of SPS failures are kept • KPI's are developed and reported for management to track progress	• QUU wide database developed and maintained on intranet	• Up to date information for all QUU functions including report to EWOQ (Energy and Water Ombudsman Queensland) • Via Ellipse std job = Wet weather overflow investigation	Updated spreadsheet of known customer complaints 31 August Ellipse WWOF investigation std job to record process 31 August
Identification of properties at risk	Historical overflows clean-up data reviewed to identify and target areas and properties at most risk	• Properties and areas with chronic overflows identified • Target properties with 5 or more clean-ups in the past 5 years	• Ranked list of properties for case management	Complete for SDE SDW info by 31 August 2011
Targeted operation and maintenance programs for priority areas	Existing system operated to maximum potential capacity	• Rolling program of inspection and maintenance in place for "hot spot" areas to include: – pre wet season inspection of overflow structures – MH inspection and rehab program	• A targeted operation and maintenance plan for hot spot areas • Rolling source control program of smoke testing, dye testing etc for 12,000 properties/yr	Source control program March 2012 MH Inspections 1 November 2011 Emergency Relief Overflow Structures Trunk cleaning 1 October 2011
Fit-for-purpose household sewers	Engage property owners to ensure their household sewers are fit for purpose	• Develop and market a subsidised voluntary household sewer inspection retrofit program • Program to be developed jointly with councils and Master Plumbers' Association of Queensland • Implementation by Master Plumbers at request of householders	Proactive retrofit program offered to customers impacted by sewer overflows	Scaled back to be installation of overflow relief caps only, inspection can come later with smoke testing as we have no powers of enforcement if defects are found, targeting properties within overland flow paths upstream of identified properties
Improved system performance in wet weather	Investigate and implement measures to improve key pump stations performance at Rosewood, Oxley and Wynnum	• Audit pump stations operation and recommend improvements	Pump Station Audit/Report	Oxley & Wynnum TOR developed, sent out to 3 nominated tenderers this week, consultant awarded end of august 12 week project Rosewood – Network only
Impact of sewer overflow on public health and the environment	Contribution to regional Healthy Waterways ecosystem health monitoring program	• Contribution to regional funding • Coordination and cooperation with Healthy Waterways to manage public perception and calls for greater controls	• Agreed protocol for partnership – how to deal with incidents • Regional partnering to manage overflow impacts	Delivery action plan by July 2011

Function	Key Strategy	Tactics	Deliverables	Timeline
Case management of prioritised properties at risk	• Operating procedures are in place to ensure prompt response to incidents • Overflow cause and mitigation options investigated for properties with chronic overflows • MH lids that are known to 'pop' on a frequent basis are made safe	• Short-term response measures - incident notification initiates standardised response procedures - routine clean-up at "hot spots" to manage customer expectation - incidents are investigated in wet to determine local drivers – stormwater overland flow paths, sewer system configuration, low dt's etc - records of SPS failures resulting in overflows are kept - records of access chamber overflows are maintained - crews are able to respond to chokes etc quickly at short notice - post overflow clean-up procedures/ contingency plans in place - staff receive ongoing training in response procedures - environmental monitoring / sampling / reporting in place • Long-term response developed - local asset operational improvement / maintenance - wider system operational improvements and capacity increase recommendations - last resort – make recommendations for property acquisition - Local hydraulic problems identified and options to mitigate recommended - Rosewood and Woolloongabba priority	• Customer interface managed • Local system issues and capacity constraints identified • Proactive maintenance and works recommended to mitigate overflows • Mitigation options to include - manhole raising/sealing - sewer / manhole spot repairs - fit for purpose on-property plumbing - increased local sewer cleaning of known trouble spots - Assist Master Plumbers in installing non return valves to prevent QUU sewer back-up	Drainers Contract 31 August 2011 MH lid safety Ongoing Retrospectively 1 April 2012