

**ATTACHMENT 3**  
**Site Based Stormwater Management Report**

**STORMWATER MANAGEMENT PLAN  
LOTS 2 & 3 BILAMBIL ROAD BILAMBIL  
PROPOSED SUBDIVISIONAL DEVELOPMENT**

REVISION C  
OUR REF: O8418

<b>REVISION</b>	<b>DATE</b>	<b>AMENDMENTS</b>
A	4/08/08	-
B	15/03/09	Revised Subdivision Layout
C	20/05/09	Revised Council Requirements

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## 1. Introduction

The Stormwater Management Plan has been prepared in order to address the requirements of Tweed Shire Council's Stormwater Quantity and Quality objectives, in association with the application for Subdivisional Approval.

There are two objectives for this Stormwater Management Plan.

The first is to ensure that the peak flows from the site during localised design storms will not result in any material adverse impact on the adjacent properties, both upstream and downstream. Thus the proposal is to demonstrate that the required works will not cause ponding on the upstream properties, nor will they result in an increase in peak flow rates. This objective is to be achieved for all rainfall events up to and including the Q100.

The second is to ensure that all runoff from the proposed site will comply with the Water Quality Objectives of Council, through proposing methodologies whereby stormwater runoff from the site may be treated to achieve those water quality objectives.

## 2. Site Information

The site is located at the corner of Hogans Road, Bilambil Road and Urliup Road in Bilambil (Lots 2 & 3 on DP244652). The site is approximately 4.6Ha in area.

The site is to be developed as a residential subdivision comprising 57 allotments. Details of the proposed development are contained on CLA Drawing Nos 08418 - 002.

It will be noted that the site can be generally divided in to 3 separate catchments. The earthworks associated with the development will generally maintain this division, however the construction of the internal street will significantly alter the relative sizes of the original catchments.

### Legal Point of Discharge

Tweed Shire Council requires that stormwater runoff be discharged to a legal point of discharge, defined as a point on or adjacent to the development site, and (amongst other definitions) "a natural watercourse or waterway to which the site naturally drains". Accordingly, Bilambil Creek is nominated as the appropriate legal point of discharge. This has been confirmed by Council.

## 3. Stormwater Quantity

tweed Shire Council has advised that there are no apparent issues related to the conveyance capacity of Bilambil Creek. Accordingly, it is not required to attenuate post development flow rates.

#### **4. Stormwater Quality**

Tweed Shire Council has advised that the development does not trigger requirements for water quality improvement devices, in that the development does not have more than 50 allotments in a contributing catchment.

##### **4.1 Construction Phase**

During the course of the construction, the following processes are expected:

- Bulk earthworks
- Detailed trim to final levels
- Haulage of fill to the site
- Underground Services construction

Management of stormwater runoff from the exposed earthwork surfaces will be based on containment, diversion and retention. At all stages of construction, current standards of building practices will be adhered to. These include:

- Placement of sediment fences where appropriate
- Vehicle shakedown to prevent suspended solids being exported from site and consequently into surrounding stormwater infrastructure
- Construction of temporary sediment ponds as required.

It will be the responsibility of the contractor to ensure that these and any other sedimentation and erosion controls are carried out in accordance with the TSC approved Sediment & Erosion Control Plan. This plan is included in Figures (see 08418-008).

#### **5. Conclusion**

This report set out to propose measures through which the requirements of the Tweed Shire Council could be met in terms of Stormwater Quality and Quantity.

The installation of on site stormwater detention would mitigate any increase in peak flows generated as a result of the proposed development.

Through addressing stormwater quality at both the construction and operational phases of the development, deemed to comply water quality objectives will be met.

**6. References**

- Tweed Shire Council Development Design Specifications D5 – Stormwater Drainage Design v1.2
- Tweed Shire Council Development Design Specifications D7 – Stormwater Quality v1.3
- “Design Guidelines for Stormwater Quality Improvement Devices”, Final Draft, BCC 4 November 1999
- “Guideline on Identifying and Applying Water Quality Objectives in Brisbane City”, Version 1, BCC March 2000
- “Guidelines for Pollutant Export Modelling in Brisbane”, Version 7 – Draft, BCC Oct 2003
- Bureau of Meteorology Website, [www.bom.gov.au](http://www.bom.gov.au)
- “Subdivision & Development Guidelines, 2000” Brisbane City Council
- Brisbane City Council Stormwater Outlets, Parks and Waterways Guidelines (Version 2, 2003)
- Brisbane City Council Natural Channel Design Guidelines (November 2003);
- Water Sensitive Urban Design – Melbourne Water

## **Figures**

**CLA Consultants Drawing 08418 - 002**

**CLA Consultants Drawing 08418 - 008**



SEWER RETICULATION  
 STORMWATER DRAINAGE  
 ROOFWATER DRAINAGE  
 PROPOSED ALLOTMENTS  
 ROAD PAVEMENTS  
 ROAD VERGE  
 PUBLIC OPEN SPACE  
 SEWAGE PUMP STATION

STORMWATER FLOW RATES  
 Q5 - 0.165M3/S  
 Q100 - 0.357M3/S

LOTS 1 TO 11 SEWERED  
 VIA E-ONE SYSTEM OR  
 MONO PSS ECO 1-60 OR  
 SIMILAR TO LOW  
 PRESSURE MAIN IN ROAD

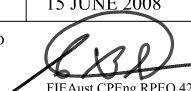
SISD - 80M AT DESIGN  
 SPEED 50KM/H

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CLIENT  
**JACKSON INTERNATIONAL  
 PTY LTD**

PROJECT  
**LOTS 2 & 3  
 BILAMBIL ROAD  
 BILAMBIL**

ASSOCIATED CONSULTANTS  
 -

PROPERTY DESCRIPTION	LOTS 2 & 3 DP244652		
UBD REF.			
DESIGNED	CBL		
DRAWN	ACAD		
REVIEWED	CBL		
DATE	15 JUNE 2008		
APPROVED	 FIEAust CPEng RPEQ 4293		

REV.	DESCRIPTION	BY	DATE	APPRD
E	TSC REQ'S	CBL	20/05/09	CBL
D	REV LAYOUT	CBL	15/03/09	CBL
C	GEN REV	CBL	4/12/08	CBL
B	DA SUBMISSION	CBL	4/08/08	CBL
A	DA PROPOSAL	CBL	14/06/08	CBL

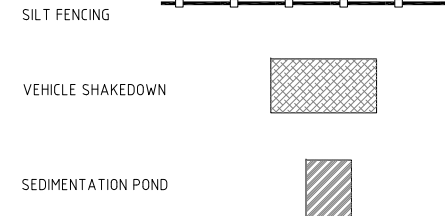
NAME  
**GENERAL ARRANGEMENT**

PROJECT REF.	DRAWING NO.	REVISION
08418	002	E

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**LEGEND**



- Sedimentation and Erosion Control**
- Sedimentation and erosion control implementation and maintenance shall be in accordance with Byron Shire Council's Development Manual as read in conjunction with the document titled "Environmental Best Management Practices". The Contractor shall make himself aware of the prevailing weather conditions and shall take all necessary precautions to secure the site at the completion of each day's work, and whenever else is considered necessary.
  - Sediment and erosion control measures shall be provided as required to prevent the movement of dust and/or silt from the site.
  - Sediment and erosion control measures shall be installed downstream of any work area prior to the commencement of work in that area.
  - Erosion and sedimentation control measures shall be installed prior to the disturbance of the site and as required during the course of the works.
  - Topsoil shall be stripped in accordance with the specification and stockpiles at locations as agreed by the superintendent and Council's designated representative.
  - All disturbed areas shall be stabilised with the provision of 75mm minimum topsoil and grass seeded, mulched, re-vegetated etc within 7 days of the completion of final allotment earthworks.
  - All sediment control measures and devices shall be inspected for structural damage after each rainfall event and at the completion of each days work. All trapped sediment shall be removed to an approved location on site for re-use on site or for subsequent removal from the site. Site disposal will only be approved when it can be established that no additional erosion can occur.
  - Sediment and erosion control measures around stockpiles shall include but not necessarily be limited to-
    - Provision of a silt fence below the stockpile, as indicated by the natural slopes of the land,
    - Provision of grass cover if stockpile is to remain in place for more than 30 days,
    - Provision of a surface emulsion or approved equivalent to prevent wind erosion.
    - Diversion of runoff around stockpiles.
  - Place 600mm width turf at both top and toes of retaining walls and tops of new kerb.
  - Water areas of construction regularly as required to obviate potential for dust nuisance to adjoining properties and the site generally.
  - Contractor to be responsible for removal of silt that is washed onto Council or private property, from subject site.
  - Contractor to make provision for containment of waste materials on site including waste oils etc from machinery servicing.
  - Contractor to be responsible for the control of dust at all times including weekends and holidays.

**Construction Traffic Shakedown**  
Provide construction traffic shake down device at all relevant site exit points. Clean out and maintain shake down device regularly to ensure efficient operation.

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PROJECT  
**LOTS 2 & 3  
BILAMBIL ROAD  
BILAMBIL**

ASSOCIATED CONSULTANTS  
-

PROPERTY DESCRIPTION  
**LOTS 2 & 3 DP244652**

UBD REF.

DESIGNED  
**CBL**

DRAWN  
**ACAD**

REVIEWED  
**CBL**

DATE  
**15 JUNE 2008**

APPROVED  
*[Signature]*  
FIEAust CPEng RPEQ 4293


D	TSC REQ'S	CBL	20/05/09	CBL
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C	REV LAYOUT	CBL	15/03/09	CBL
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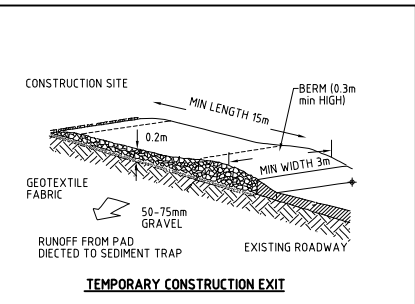
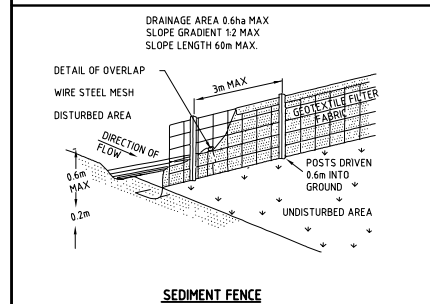
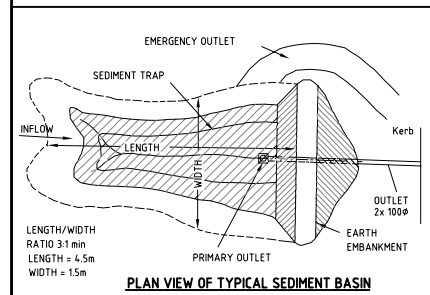
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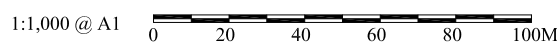
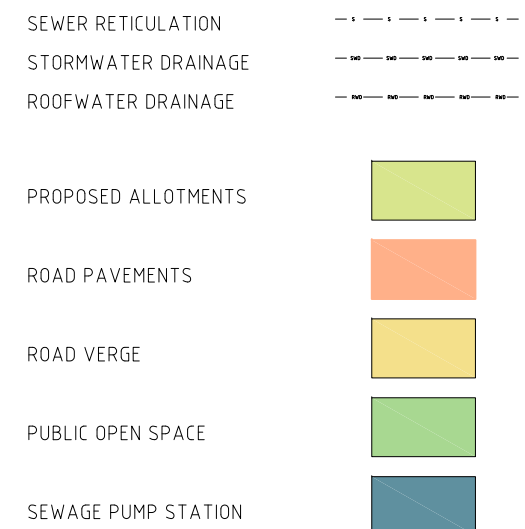
REV.	DESCRIPTION	BY	DATE	APPRD

NAME  
**WATER QUALITY  
MANAGEMENT  
CONSTRUCTION PHASE**

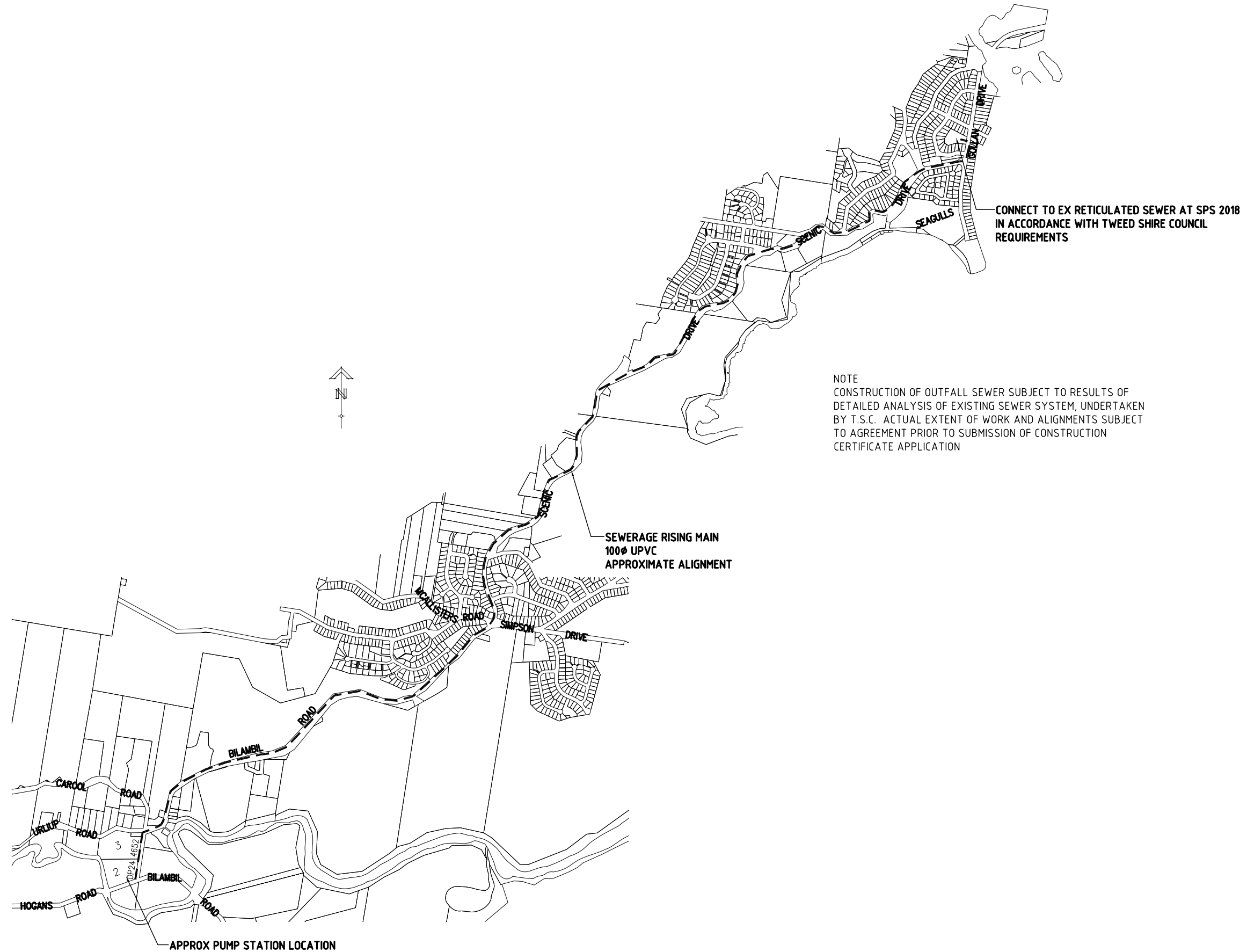
PROJECT REF.	DRAWING NO.	REVISION
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<p><b>Prior to the Commencement of Works</b></p> <p>a Submission of a copy of the Contractor's Program for the Works. Submit program for the implementation and monitoring (inspection type) of the specified sedimentation control measures for approval.</p> <p>b Approve submitted program</p> <p><b>During Construction</b></p> <p>a Install sedimentation and control measures (measures) b Approval of the Measures as constructed c Periodic inspection of the measures</p> <p>d Rectification of issues identified by periodic inspection e Inspection of adjacent roads and drains</p> <p><b>On Maintenance</b></p> <p>a Submit program for the continued maintenance of the works during the "On Maintenance" period. b Approve submitted program c Install/maintain sedimentation and erosion control measures Installation</p> <p><b>Off Maintenance</b></p> <p>d Approval of Measures as implemented e Routine inspection of implemented measures (including adjacent road network)</p> <p>f Rectification/Reinstatement of sediment and erosion control measures Off Maintenance</p> <p>g Removal of Erosion and sedimentation Control Measures</p>	<p>Contractor</p> <p>Contractor Superintendent /Council</p> <p>Contractor Superintendent Contractor Superintendent Contractor</p> <p>Contractor Superintendent in conjunction with Council</p> <p>Contractor Contractor Superintendent in conjunction with Council Contractor Superintendent Contractor</p> <p>Contractor</p>	<p>Prior to the Pre-Start Meeting</p> <p>Prior to the Pre-Start Meeting Pre-Start Meeting</p> <p>Prior to the commencement of works necessitating the measures Prior to the commencement of works necessitating the measures Daily and after rainfall event At least weekly and/or in conjunction with other required inspections Immediately Daily and after rainfall event</p> <p>Prior to On Maintenance inspection. Prior to On Maintenance inspection.</p> <p>Prior to On Maintenance inspection. During On Maintenance Period At On Maintenance Inspection Weekly, and after each rainfall event As requested by the Contractor As soon as practicably possible (24 hours max)</p> <p>As directed by the Superintendent</p>
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**ATTACHMENT 4**  
**Rising Main Alignment**




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ASSOCIATED CONSULTANTS  
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REV.	DESCRIPTION	BY	DATE	APPR'D
D	TSC REQ'S	CBL	20/05/08	CBL
C	SPS AMDD	CBL	19/09/08	CBL
B	DA SUBMISSION	CBL	4/08/08	CBL
A	DA PROPOSAL	CBL	14/06/08	CBL

NAME  
EXTERNAL SEWER  
RISING MAIN ALIGNMENT

PROJECT REF.	DRAWING NO.	REVISION
08418	010	C

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**ATTACHMENT 5**  
**Outfall Sewer**  
**Draft Statement of Commitment**

**MAJOR PROJECT APPLICATION NO. 08-0034 – PROPOSED 62 LOT SUBDIVISION  
AT BILAMBIL VILLAGE**

**DRAFT STATEMENT OF COMMITMENTS**

1. The developer will construct a sewer pump station on the development site to the satisfaction of the Director of Community Services and Natural Resources.
2. The developer will construct a Sewer Rising Main (SRM) from the new pump station to Sewer Pump Station (SPS) 2018 at Gollan Drive, including necessary odour control and septicity control facilities.
3. In the event that the Sewer Network Analysis currently being undertaken by Tweed Shire Council determines that a connection point south west of Sewer Pump Station 2018 (closer to the development site) is feasible, the sewer rising main shall be connected to that point, to the satisfaction of the Director of Community Services and Natural Resources.
4. On completion of the Sewer Network Analysis, and the subsequent identification of the appropriate connection point, the Developer shall provide to Tweed Shire Council for approval the proposed route for the construction of the required pipework. The alignment of the sewer rising main shall be located either in the road reserve or in easements on adjacent private land along the Bilambil Road section. The rising main may only be located in sections of the road reserve if the Director of Engineering and Operations determines that such location will not adversely impact on the stability, functionality and operation of the road. The Developer shall address such issues to the satisfaction of the Tweed Shire Council in association with the application for the issue of a Construction Certificate. The remaining sections to Gollan Drive SPS 2018 will not be via Scenic Drive but rather through a route to be agreed with Tweed Shire Council prior to the issue of a Construction Certificate to Councils SPS 2038 at the north eastern end of Peninsula Drive. Then via the foreshore of Terranora Broadwater parallel to Council's existing 300mm SRM to the northern end of Scenic Drive. Then finally to Gollan Drive SPS 2018 via road reserve to the satisfaction of the Director of Engineering and Operations.
5. Detailed plans shall be provided with the Construction Certificate Application addressing slope stability within Bilambil Road and other areas as may be necessary, together with a Detailed Traffic Management Plan and the alignment of other future services in relation to construction of the sewer rising main.
6. The developer will provide detailed plans as part of the Construction Certificate which will incorporate Reduced Inflow / Infiltration Gravity Sewers (RIGS) to Councils requirements.

**ATTACHMENT 6**  
**Mono PSS Eco 1-60**  
**Low Pressure Sewer System**



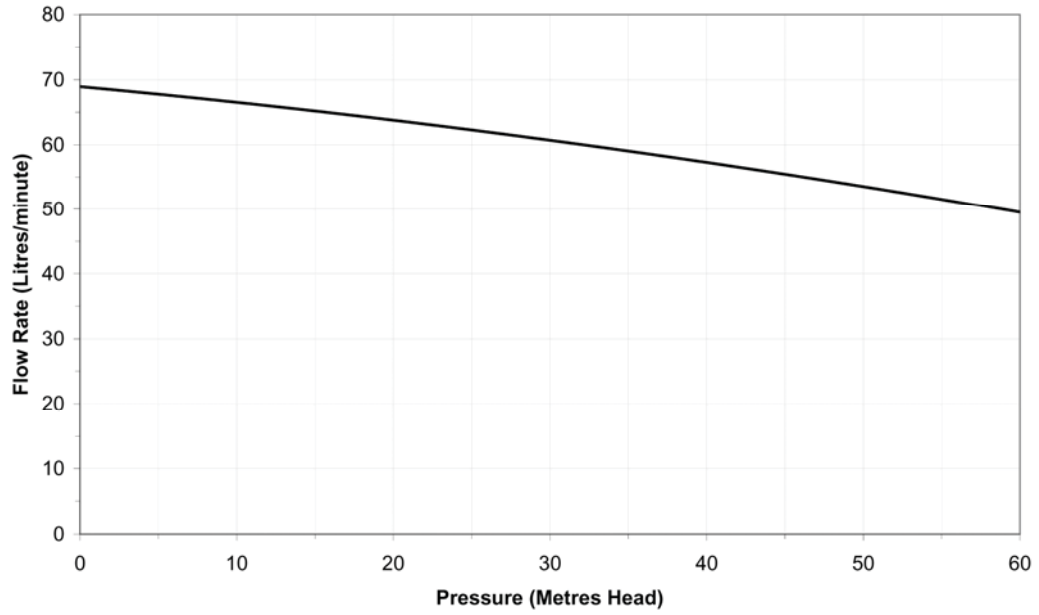
# Mono Pumps PSS Eco 1-60

## Pump Unit Specification

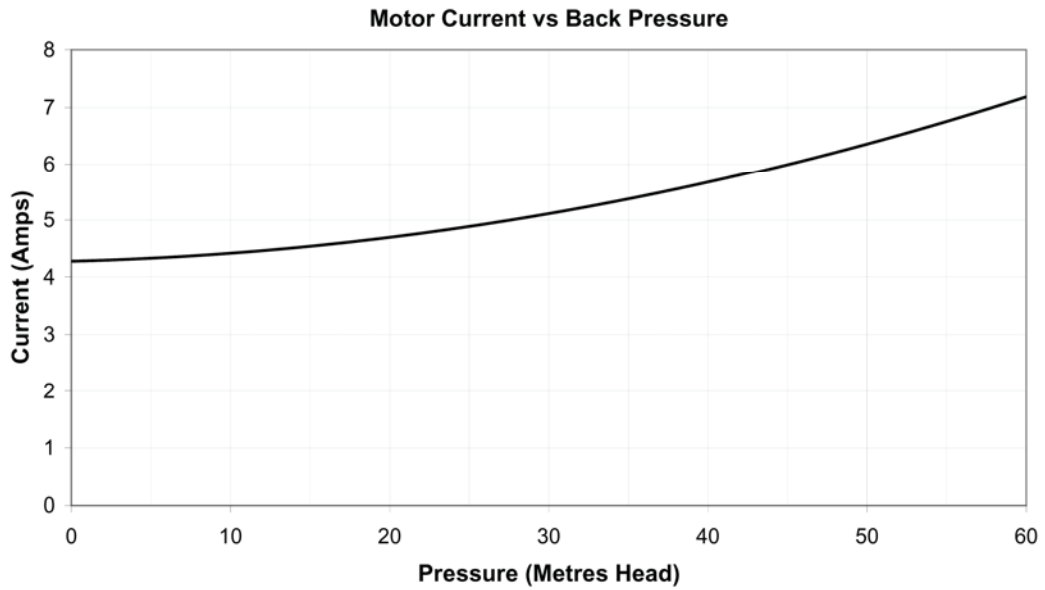
### *G60 Grifter (grinder pump) Specification*

<b>Specification Topic</b>	<b>Specification</b>
<b>Manufacturer</b>	Mono Pumps (Australia) Pty. Ltd.
<b>Model</b>	G60
<b>Nominal flow rate</b>	1 litre per second
<b>Maximum Head capability</b>	60 metres (continuous operation)
<b>Flow at Max. Head</b>	0.83 litres per second
<b>Slip at 60m discharge</b>	27%
<b>Type</b>	Progressive Cavity – Helical Rotor
<b>Inlet</b>	80mm DWV
<b>Outlet</b>	32mm (pump discharge, not tank discharge – refer to tank specification detail)
<b>Materials of construction</b>	
Pump Body	Cast Iron
Motor Shaft	316 Stainless steel
Helical Rotor	316 Stainless steel, Hard Chrome Plated
Stator	Nitrile Synthetic Rubber
Macerating Cutter	Hardened tool steel
Cutting Ring	Hardened tool steel
Hardware	316 Stainless steel
Oil Bath (mechanical seal)	Shell Tellus Oil 100 Anti Wear hydraulic oil
Mechanical Seal	Carbon Vs. Ceramic faces, 316 SS spring & body, nitrile elastomer
<b>Unit Weight*</b>	32 Kg

\*There are design projects in place that will further improve on this specification and reduce unit weight. Details quoted are as available today.



***PSS Eco 1-60 Hydraulic Performance Curve***



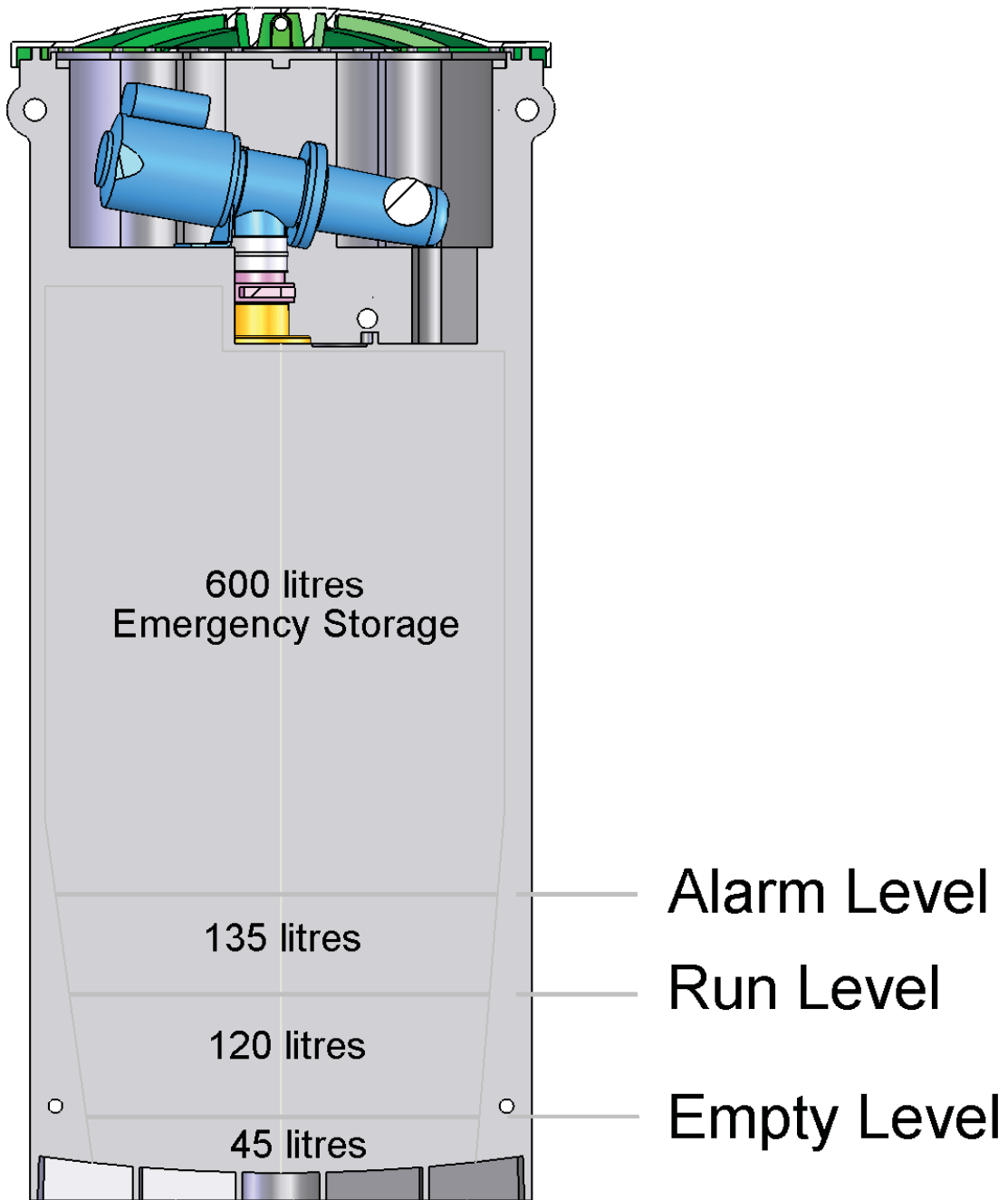
**PSS Eco 1-60 Power Curve**

### ***AC Motor Specification***

<b>Specification Topic</b>	<b>Specification Topic</b>
<b>Power</b>	0.93 kW
<b>Voltage / Phase / Frequency</b>	240 / 1 / 50
<b>Full Load Current</b>	8 Amps
<b>Locked Rotor Current</b>	31.3 Amps
<b>Motor Duty</b>	S2 – 30 minutes
<b>Maximum Starts per Hour</b>	10
<b>Thermal Overload</b>	Automatic reset
<b>Motor Speed</b>	1450 RPM
<b>Humidity Rating</b>	95 %
<b>Rating</b>	IP55
<b>Cable Included</b>	15m of 15 Amp 3 core flex 15m of 3 core control cable
<b>Relevant Standards</b>	C-tick AS/NZ CISPR 14.1

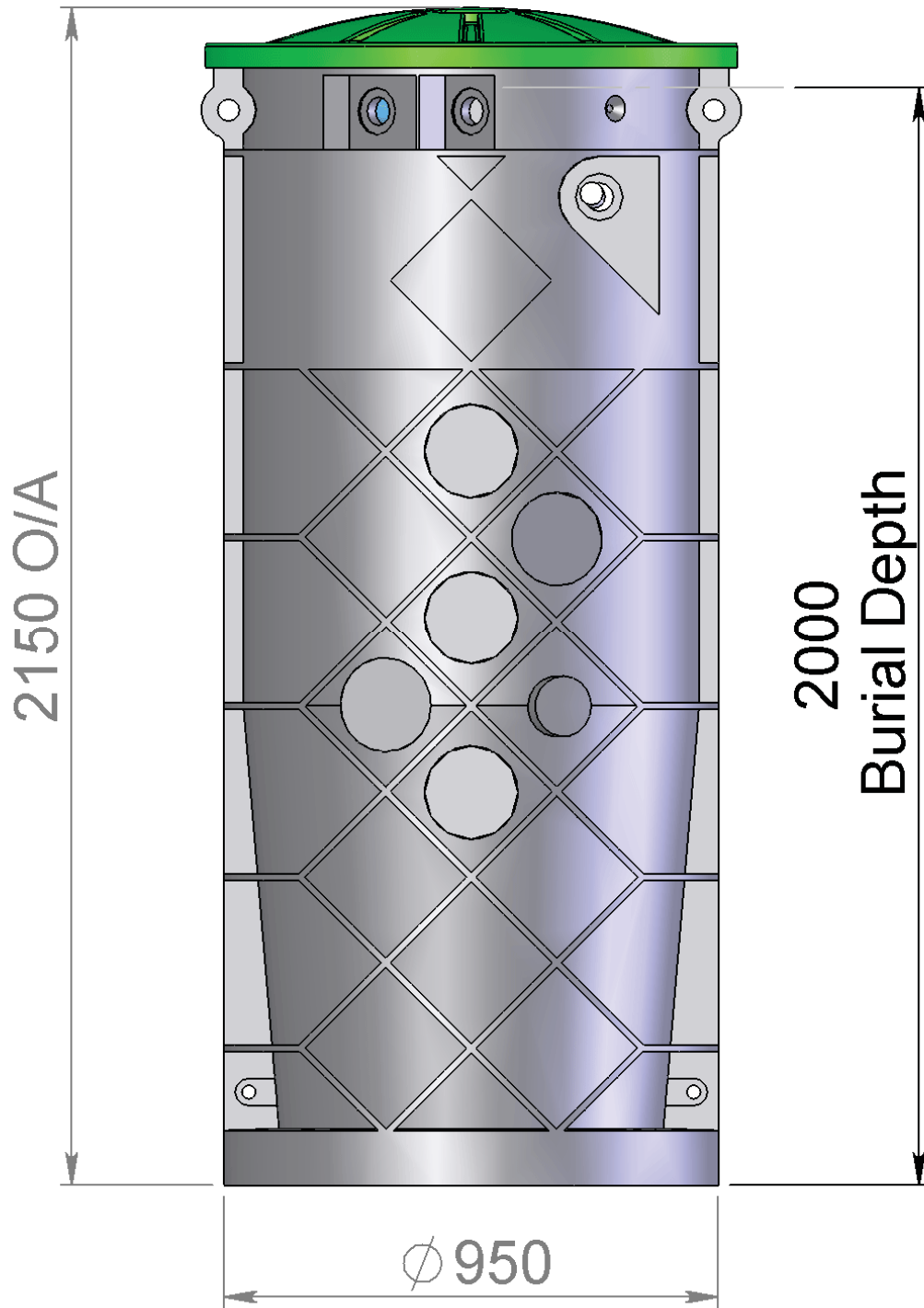
### Collection Well (Tank) Specification

Specification Topic	Specification
Well and Lid Material	Heavy Duty Polyethylene, UV Stabilised
Manufacturer	Linpac Rotational Mouldings Pty. Ltd. Tooling owned by Mono Pumps
Type	Rotationally Moulded – one piece tank
Format	Circular, single piece tank Pump mounted in “Dry Well” recess Sealed sewerage collection well
Lid Rating (Hydraulic)	Dry well flood proof to 1 metre above lid
Lid Loading (Max. Static load)	500 kg
Lid Security	Tamper-proof fasteners in lid or pad-lockable lid
Well Volume – Total	900 litres
Active Storage Volume – Pump on to pump off (litres)	120 litres standard Customised settings available on request
Well Volume – Above High Level	600 litres
Retained Storage Volume – volume remaining when pump turned off (litres)	45 litres standard Customised settings available on request
Other Storage Volume options (litres)	Fully customised options available
Tank Inlet	100mm Uniseal
Minimum and Maximum depths of inlet connection below cover level	750mm to 1300mm below ground level
Tank Outlet	32mm BSP PVC fitting standard Optional Electrofusion HDPE ‘Plasson’ fitting
Relevant Standards	AS/NZ 1546.1



**PSS Eco 1-60 Tank Levels\***

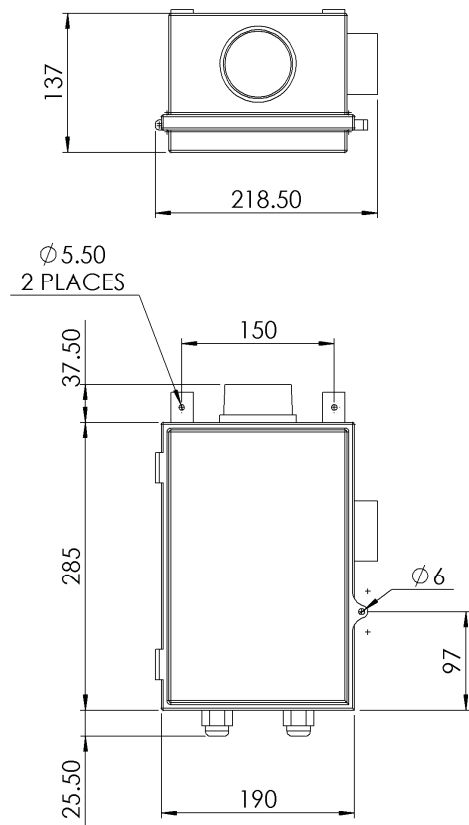
\*Tank levels indicated are standard however these can be adjusted at the time of manufacture if necessary.



**PSS Eco 1-60 Tank Overall Dimensions**

**Controller Specification**

<b>Specification Topic</b>	<b>Specification</b>
<b>Input Voltage</b>	240 +6% /-10% VAC
<b>Max. Continuous Current</b>	8 Amps
<b>Max. Current – Motor Start</b>	20 Amps (peak)
<b>Circuit Breaker</b>	15 Amps
<b>Control Circuit fuse</b>	0.5 Amps
<b>Max. Output (motor)</b>	1 kW max
<b>Motor Over current protection</b>	8 Amps
<b>Brownout Protection</b>	Automatic electronic sensing
<b>Level Control Methodology</b>	Pressure sensor mounted in the 'dry-well' connected to tube partially immersed in the sewerage monitor sewerage level and control pump operation.
<b>Alarm Level Methodology</b>	Alarm tube inlet is set above the normal operating level to remain clear and free of blockages during regular operation.
<b>Rating of Enclosure</b>	IP66 – Lockable enclosure
<b>Default Protection Settings</b>	
Pump motor current trip (over pressure)	8 Amps
Pump reset time from trip	5 minutes
Number of current trips per hour till alarm activates	10
Maximum continuous pump run time	20 minutes
Maximum pump starts per hour	10
Pump cool down time	10 minutes
<b>Relevant Standards</b>	AS3100 C-tick AS/NZ CISPR 14.1



**PSS Eco 1-60 Controller Dimensions**



**PSS Eco 1-60 Controller (shown connected to Hand Held Display / Diagnostics Unit)**

## Controller Alarms

Alarm	Detail
<b>Over Pressure or Over Current</b>	Trips when pressure / current exceeds programmed maximum current level
<b>Maximum Pressure/Current Trips</b>	Trips when number of pressure trips exceed programmed value
<b>Exceed maximum run time</b>	Trips when pump/motor has continuously run greater than the programmed maximum time
<b>Exceed maximum Starts per Hour</b>	Trips when maximum starts per hour have been exceeded
<b>High Level</b>	Trips when high level probe is active

All alarms are fully programmable and alarm trip points can be tailored to meet specific requirements. This can be done either at the time of manufacture, or via telemetry at a later date.

Limits with respect to motor run time, maximum starts per hour and maximum motor current are all set per the recommendations of the motor manufacturer.

### Standard Alarm Outputs

- 1. External Strobe**
- 2. Internal Siren**
- 3. Communication Port / Telemetry Interface**

All alarm outputs are fully programmable and can be tailored to meet specific requirements or time delays. For example, on-site outputs can be de-activated or delayed in order to provide a 'head start' or system check via the telemetry system.

All alarm outputs are accessible through the telemetry system and the controller can be programmed to 'dial-out' via telemetry to a dedicated monitoring system to alert network supervisors of any alarms.

Alarm outputs are also accessible through the standard 'Handheld Display Unit' which can be used in the field to diagnose and troubleshoot system alarms.

**Telemetry Data**

<b>Specification Topic</b>	<b>Specification</b>
<b>Remote Monitoring Capability</b>	Via RS232 modem interface
<b>Communications Protocols</b>	SCADA Modbus & ASCII as standard
<b>UHF Data Radio</b>	GME Electrophone TX 3600D (or equivalent)
<b>GSM Modem</b>	'AT' Command Set compatible
<b>Alarm Initiated and Polled Messaging</b>	Yes

### **Controller Logged Data**

<b>Data Log</b>	<b>Detail</b>
<b>Number of Starts</b>	Number of motor starts since installation
<b>Hours Run</b>	Number of hours run since installation
<b>Number of Resets</b>	Number of times the mains power has been disconnected
<b>Number of Pressure / Current trips</b>	Number of pressure/motor current trips since installation
<b>Motor Current</b>	Current motor running current
<b>Starts per Hour</b>	Number of starts in the last hour
<b>High level trips</b>	Number of high level trips
<b>Serial and DOM</b>	Serial Number and date of manufacture
<b>Unit Type</b>	Unit type and software level
<b>Last Fault</b>	Last fault condition and last running current
<b>Last Motor Current</b>	Logged value of the last motor current
<b>Current System State</b>	Detail of present operating state of the unit. On / Off / High level alarm / etc.

All logged data is stored in controller memory. Logged data can be accessed on demand via 'dial-in' telemetry and can be used to remotely monitor system performance and if necessary, troubleshooting without going to site. Logged data can also be accessed while on-site via the standard 'Handheld Display Unit'.



## Mono Eco 1-60 PSS – Frequently Asked Questions

- 1. What happens when solid objects get into the tank?**  
The unique elutriation pipe design of the Mono Eco 1-60 system ensures that objects such as cutlery, solid plastics and metal items fall to the bottom of the tank and will not be drawn into the grinder and pump mechanism.  
All pressure sewer grinder pumps have been designed to grind and transfer a wide variety of items that can be found in domestic sewage. The Mono Eco 1-60 has undergone extensive testing and will efficiently grind and transfer items such as condoms, disposable nappies, plastic bags, tampons and sanitary pads.  
As with any sewage system; septic tank, modified gravity or vacuum, users of pressure sewer systems need to be aware that the toilet is not for disposal of general household waste.
- 2. What is a brownout?**  
A “brownout” is when the supply voltage falls more than 10% below the standard single-phase voltage of 240V.
- 3. What will happen to the Mono Eco 1-60 PSS system in a brownout?**  
As the voltage to the motor decreases, motor run current will increase and may exceed the maximum rated current and overheat the motor. To protect against this, the motor controller is programmed to shut the motor down if the supply voltage falls to 190V. Once the voltage returns to normal, the motor will start again.
- 4. Will the Mono Eco 1-60 PSS system over-pressurise a 600 kPA (60m) pipe?**  
No. The controller features over-pressure protection and will shut down the motor before the backpressure reaches 600Kpa.
- 5. Will the life of the G60 grinder pump be compromised operating at full discharge pressure?**  
No. The Mono G60 grinder pump has undergone extensive testing and has clocked up over 5000 hours of both continuous and intermittent operation at the maximum discharge pressure of 600KPa (60m) without any significant loss of performance or efficiency.
- 6. How does the over-pressure protection work?**  
The Controller continually monitors the motor current. As the Mono Eco 1-60 pump is a Progressive Cavity pump, motor current is directly proportional to the backpressure of the system. When the motor run current exceeds 8 amps this indicates a pressure of over 60m, the pump will shut down and then try to start again after 5 minutes.
- 7. How big is the Mono Eco 1-60 tank?**  
The standard\* Eco 1-60 tank is 950mm in diameter and 2m deep.  
The dry well is sized to accommodate the pump, pressure control box and fittings. This dictates the footprint of its visible component, the tank lid  
The 900 litre capacity wet well is sized as follows\*\*:

  - 45 litres will always remain in the bottom of the tank.
  - The operating level between pump start and pump stop is set at 120 litres or 2 minutes of run time.
  - Above the pump on level there is an additional 135 litres capacity before activation of the high level alarm.
  - The remaining 600 litres ensures there is at least a day’s emergency storage should there be a power failure.

\* Non-standard tanks are available, please contact Mono to discuss requirements

\*\* On / off and alarm levels can be adjusted at time of manufacture if required

**8. What is the loading of the Eco 1-60 lid?**

500kgs.

**9. How is a Mono Eco 1-60 PSS tank installed?**

A 3 tonne mini-excavator with bucket and teeth is adequate to excavate the hole and lift the tank into position. The small excavator is able to enter and operate in tight, difficult locations with minimal damage to the existing landscape. Mono can arrange installation and commissioning. Alternatively a larger excavator with a suitable auger attachment (Ø1m) can be used.

**10. What depth of hole is required for the install?**

2000mm.

**11. Why the need for a boundary kit? What is in it?**

A boundary kit allows isolation of the on-site Mono Eco 1-60 PSS tank and discharge line from a Pressure Sewer System. When the pressure sewer system is in place before the block is built on, a kit is installed on the property's boundary. On development, the Eco 1-60 PSS unit is installed and connected to the boundary kit and the pressure sewer main.

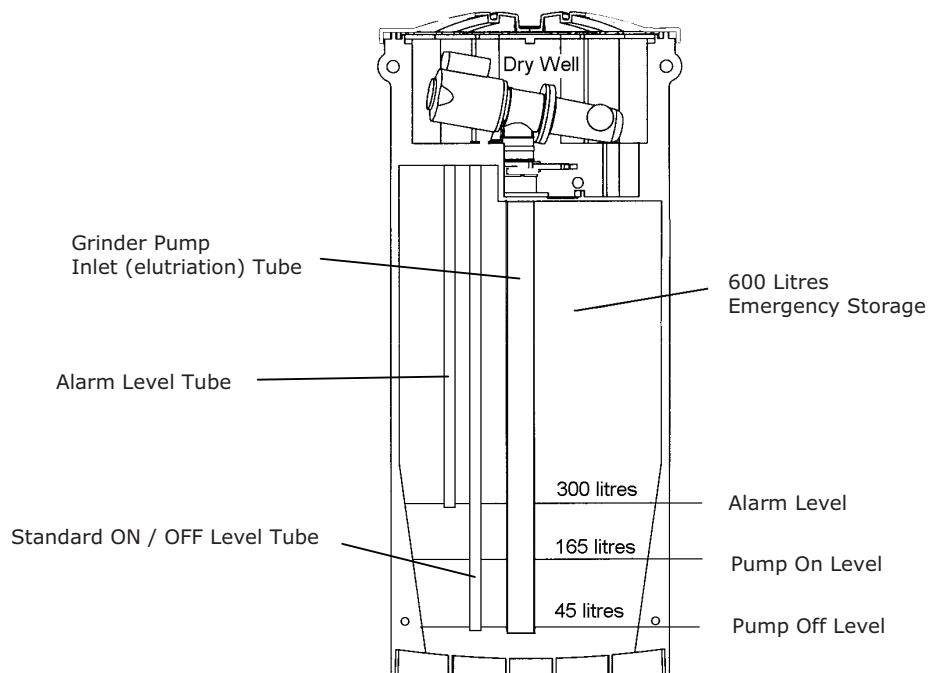
The standard\* kit consists of:

- LDPE box and lid
- 1 ¼ inch BSP fittings
- 32mm 316 stainless steel lockable ball valve
- 316 stainless steel check valve
- 316 stainless steel hex nipple.

\* Fully customised boundary kits are available on request

**12. How does Mono's system monitor sewage levels in the tank?**

As the sewage rises in the tank it rises up the two level tubes and increases the air pressure within the tube, the increasing or decreasing air pressure acts against pressure switches located in the dry well level control box. The pressure switches turn on or off and signal the Controller to perform the appropriate action.



- 13. What advantages does the dry well offer over conventional submersibles?**  
The dry well ensures that the Mono Eco 1-60 pump, pipes and fittings are situated close to the surface and not immersed in sewage. Easy and safe one-man access is achieved and there is minimal sewage contamination of the environment, tools or the service vehicle.
- 14. Being a 'Dry Well' pump, is any priming ever required?**  
No. Being a high quality progressive cavity pump, the Mono G60 has been designed to self prime. In normal operation; when the pump stops, the pump inlet tube will remain full of sewage. If the pump remains off for a significant period of time the inlet tube will drain however upon re-starting the pump will self-prime without any user intervention.  
Extensive testing conducted by Mono on the G60, in conjunction with over 70 years of experience in progressive cavity pump design ensures that once installed, no regular user intervention will be required.
- 15. Why are there 2 tubes for the level probes?**  
The longer tube located is the normal operating tube. At the high level (165 litres) it starts the pump and stops it at the low level (45 litres). If the sewage continues to rise it enters a second tube and at the 300 litre level the high level visual and audible alarms will operate. If the pump has failed to start on the low-level tube, it will now start and operate on the alarm tube, thus a level of redundancy has been built into the design.
- 16. What happens if the operating tube blocks?**  
If the operating tube is blocked and the pump does not start, the sewage will rise up the second tube and trigger the high-level alarms-warning lamp on front panel, strobe light on top of panel and audible siren alarm. At that point the controller will recognise that the pump is not operating and will start it. It will then stop when the sewage level clears this tube.  
If the strobe continues flashing after 30 minutes, the householder should contact the service authority to remove and unblock the two tubes. This is a relatively simple task and does not require removal of the pump from the system.
- 17. What can be done if the tank fills with product that cannot be pumped out?**  
There is a 110mm port in the top of the tank external to the dry well that can be quickly accessed via unscrewing a lockable cap to accommodate up to a 100mm hose as would be found on a vacuum sucker truck.
- 18. What can be done if water pools in the bottom of the dry well during installation?**  
There is a 80mm drain plug in the bottom of the dry well.
- 19. What will happen when the pump fails or stops for a period of time such as a power outage?**  
If the pump stops, the 600 litres of emergency storage in the tank is usually more than sufficient to accommodate inflowing sewage for at least 24 hours.  
If the power outage continues and the tank fills up, the sewage will back up and escape through the overflow that we recommend be installed in the gravity feed line and through the breather that is incorporated into the removable 100mm cap. Sewage will spill onto the ground but it is preferable to it backing up the inlet line and entering the premises.
- 20. How would a network of Mono Eco 1-60 units recover from an extended power outage?**  
After an extended power outage, pressure sewer networks need to operate at their peak capacity to clear the retained sewage. Upon power being re-established, all units within the network will attempt to start however due to the pressure cut-out system employed by Mono, only the units closest to the network discharge point that see the lowest friction losses will operate. By utilising the electronic over-pressure protection, you can be assured that the rising main pressure will not exceed the design limits which can lead to rising main failure. All units that failed to start on the first attempt, we automatically re-attempt a second start after a pre-set five minute delay, because some

of the first units would have now finished their run cycle, the friction loss in the rising main will be reduced and the second series of pumps will operate. This process will continue until the network fully recovers. Utilising this technique of network recovery, the network will recover as fast as possible within the design constraints of the rising main design.

If there were specific units that were identified as requiring a higher priority to start on the first attempt - such as nursing homes and hotels due to their relatively smaller storage capacities - the network can be biased to ensure that these units take priority and clear first.

**21. Is there a breather? Why?**

There is a Millipore vent breather in the lid of dry well, this allows air to pass however it is impervious to water and water vapour. It is necessary to equalize the pressure in the dry well to that outside to ensure better sealing as well as ensuring atmospheric pressure is applied to the level sensors.

**22. Is odour an issue? How are odour problems prevented?**

Sewage will emit an odour when it becomes septic after about 24 hours. In occupied premises, sewage will not be retained in the tank long enough for this to occur. If the premises are being vacated for longer than about 3 days, a small amount of fresh or grey water should be sent to the tank rather than toilet waste, until the pump starts. When the pump stops at the low level, only 45 litres of fresh or grey water will be retained rather than raw sewage which would go septic and create an odour.

The Mono Eco 1-60 PSS tank is completely sealed so if raw sewage is allowed to go septic in the tank, foul air will be displaced through the breather as fresh sewage enters. However, after one cycle it will be eliminated and no odour will remain.

**23. Is there recommended maintenance? What and when?**

There is no recommended periodic maintenance schedule.

**24. How does the controller work and what does it do?**

The Mono pressure sewer system controller has been developed as an integral part of the Eco range of pressure sewer products and has been designed to provide a variety of features to protect and control both the grinder pump and the wider reticulation network.

Functions performed by the Mono PSS Controller include:

- Monitoring the standard sewage level in the tank via air pressure in level tube and control pump operation
- Monitoring the high level sewage level in the tank via air pressure in level tube and control visual and audible alarms
- Regulate grinder pump operating times to limits within motor manufacturers recommendations
- Regulate the maximum discharge pressure delivered by the pumps via motor current
- Protect the grinder pump from events such as rising-main blockages and 'brown-outs'
- Provide data storage of key events such as total number of starts and hours run
- Provide an interface to enable accurate data to be used for troubleshooting
- Provide a platform for telemetry options

**25. What telemetry options are available?**

Telemetry allows data on the pump operation to be easily collected for data-logging, detailed analysis or network manipulation. The standard communication options available are low power radio or GSM mobile connection.

All data is transferred according to standard SCADA ASCII protocols.

There are further customised telemetry options that can be discussed with Mono.

**26. What are the basic principles of network design?**

The basic principles involve:

- Determining the path of the sewage
- Determining the length and elevation change within each section.
- Predicting how many units will be operating at any one time.
- Sizing of the pipe diameters in each branch to keep the pressure in the system below the maximum allowable.
- Keeping sewage velocity high enough to enable scouring of the pipes.

**27. What is the maximum and minimum operating times of the system per day or per cycle?**

The pump motor is rated for maximum continuous running of 20 minutes and 10 starts per hour. The controller will stop the pump after 20 minutes continuous running or after 10 starts in the one hour. The motor will be allowed to cool for 10 minutes and then be started again. Under full loading, the Eco 1-60 can transfer 1200 litres every half hour however utilising the 600 litre emergency storage capacity could handle a single 1800 litre event without overflow.

**28. How far from the house can you install the unit?**

The unit should be as close to the house as possible but in an area where there is good drainage away from the lid, the inlet pipe can be laid at a minimum of 1:1.6 grade to enter the tank in the designated area. Identification of a suitable tank location is a process requiring a balance of land owner expectations and hydraulic requirements and as such forms a key step in the detailed design and homeowner consultation process.

**29. How is the system electrically connected to the household power supply?**

Power to the controller must come from a dedicated circuit from the meter / fuse box with its own 20-amp type D circuit breaker. It is important to consider that in some cases, household electrical audits and circuit upgrades may be necessary prior to commissioning of the pressure sewer equipment.

**30. What happens when the householder goes on holidays?**

If the householder goes away for a period of the time, they should ensure that the sewage is totally pumped out so it does not go septic and only 45 litres of fresh or grey water is retained in it. Allowing fresh or grey water to enter a basin until the pump turns on will achieve this.

**31. What happens when there is a need for a duplex or larger unit?**

The Mono Eco 1-60 PSS unit can continuously transfer nominally 2400 litres / hour so compared to competitive units the need for a multiplex system is reduced. For larger flows and head, custom designed Mono pumping stations can be offered using either multiple G60 Grinder pumps in duty / standby configuration, conventional PC pumps and macerators or submersible grinder pumps.

**32. What do you recommend to prevent the tank popping out the ground in water charged areas?**

The Mono Eco 1-60 PSS O&M specifies that 700kgs of concrete needs to be installed around the base of the tank, assuming the worst ground conditions. Steel reinforcing bar can also be inserted through holes under the tank.

**33. Is the Mono Eco 1-60 noisy?**

Measurements taken 1 metre above then tank lid during pump operation recorded a noise level of 55 dBA.

**34. What sort of installation times and costs are typical, broken down by trade (eg labourer, electrician)?**

Typically, using a mini excavator, the hole for the tank can be dug, tank lowered into position and hole filled in less than 2 hours. Allow another hour for plumber to connect external pipe work and 1 hour or less for electrician to position and wire up control box.

**35. What is the electrical power consumption per cubic metre of sewage pumped?**

The G60 Grifter uses a 0.93kW 240 volt electric motor. The motor has a full load current rating of 6.6 amps. The flow of the pump is 0.833 litres per second at the maximum head of 60 metres. The theoretical power maximum consumption at this duty would be about 0.528kW per cubic metre, this will be proportionally less if the discharge head is reduced.

**36. Why doesn't the Mono Eco 1-60 PSS package have an anti-siphon device similar to others?**

Due to the high quality of the rotor / stator combination in the Mono G60, the use of an anti-siphon device is not necessary. This feature is not desirable as each time the pump stops air is introduced into the system pipe work, once into the reticulation network, the entrapped air will negatively impact the overall system efficiency. This is often used where pumps are not able to start when subjected to system back-pressure. The Mono pump has been endurance tested starting against full system pressure (6 bar) without any problems.

**37. What happens to the liquid in the suction pipe when the pump stops? If it empties how can the pump work when it starts up again?**

The liquid stays in the pipe. However this is not a concern as even if the pipe drained the pump is designed for, and capable of self priming. Tests have been carried out continuously stopping and starting the pumps on the test rigs for an equivalent of 25 years of normal operation without any problems.

**38. Can Mono Pumps provide a complete system design?**

Yes. Mono can assist with complete pressure sewer network design and project delivery; we are firmly committed to making the entire process of selecting, designing and operating a pressure sewer system as easy and successful as possible.



# Mono Pumps (Australia) Pty Ltd Eco 1-60 Pressure Sewer Unit

Product Appraisal – PA 07/02

January 2008

**Note 1**

This appraisal applies to the product(s) as submitted. Any changes to the product(s) either minor or major shall void this appraisal.

To maintain the recommendations of this appraisal any such changes shall be detailed and notified to the Product Appraisal Manager for consideration and review of the appraisal report and appropriate action. Appraisals and their recommendations will be the subject of continuous review dependent upon the satisfactory performance of products.

WSAA reserves the right to undertake random audits of product manufacture and installation. Where products fail to maintain appraised performance requirements the appraisal and its recommendations may be modified and reissued. Appraisal reports will be reviewed and reissued at regular intervals not exceeding five (5) years.

**Note 2 Disclaimer**

The Disclaimer on page 10 explains a number of very important limits on your ability to rely on the information in this Product Appraisal Report.

Please read it carefully and take it into account when considering the contents of this Product Appraisal Report.

The report was peer reviewed by Russell Jennings, Michael Hordern and Bruce Douglas.  
Any technical inquiries regarding this report should be directed to the Appraisal Project Manager,  
Grant Leslie, Phone: 02 9290 3655 - E-mail [grant.leslie@wsaa.asn.au](mailto:grant.leslie@wsaa.asn.au)

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## **1. Executive Summary**

This Product Appraisal Report (PA07/02) covers the Mono Pumps Eco 1-60 Pressure Sewer Unit. The product is designed for collecting and transporting black water to a pressure sewerage system.

The Eco 1-60 is available in a nominal 900lt capacity with 3 models, the standard unit, with telemetry enabled control panel and a standard unit with telemetry and an auto reversing motor. All products have a boundary kit as an optional accessory.

Mono Pumps (Australia) Pty Ltd is quality assured to ISO 9001:2000 by Lloyd's Register Quality Assurance Ltd for both its manufacturing plant and business operations. The tank is supplied by Linpac Rotational Mouldings Pty Ltd which is StandardsMark licenced to AS/NZS 1546.1 – On-Site domestic waste water treatment units – Septic Tanks.

Assessment and review of this information using guidance set by the WSAA infrastructure products and materials network has concluded that the quality assurance requirements have been satisfied for the purpose of this appraisal.

### **1.1. Recommendation**

It is recommended that WSAA Members and Associates accept/authorise the Mono Pumps Eco 1-60 Pressure Sewer Unit product range as listed in the Product Schedule (Table 1) that are relevant to pressure sewerage pipeline design, installation, acceptance testing and commissioning and are in accordance with applicable WSAA Codes and the manufacturer's requirements where specified.

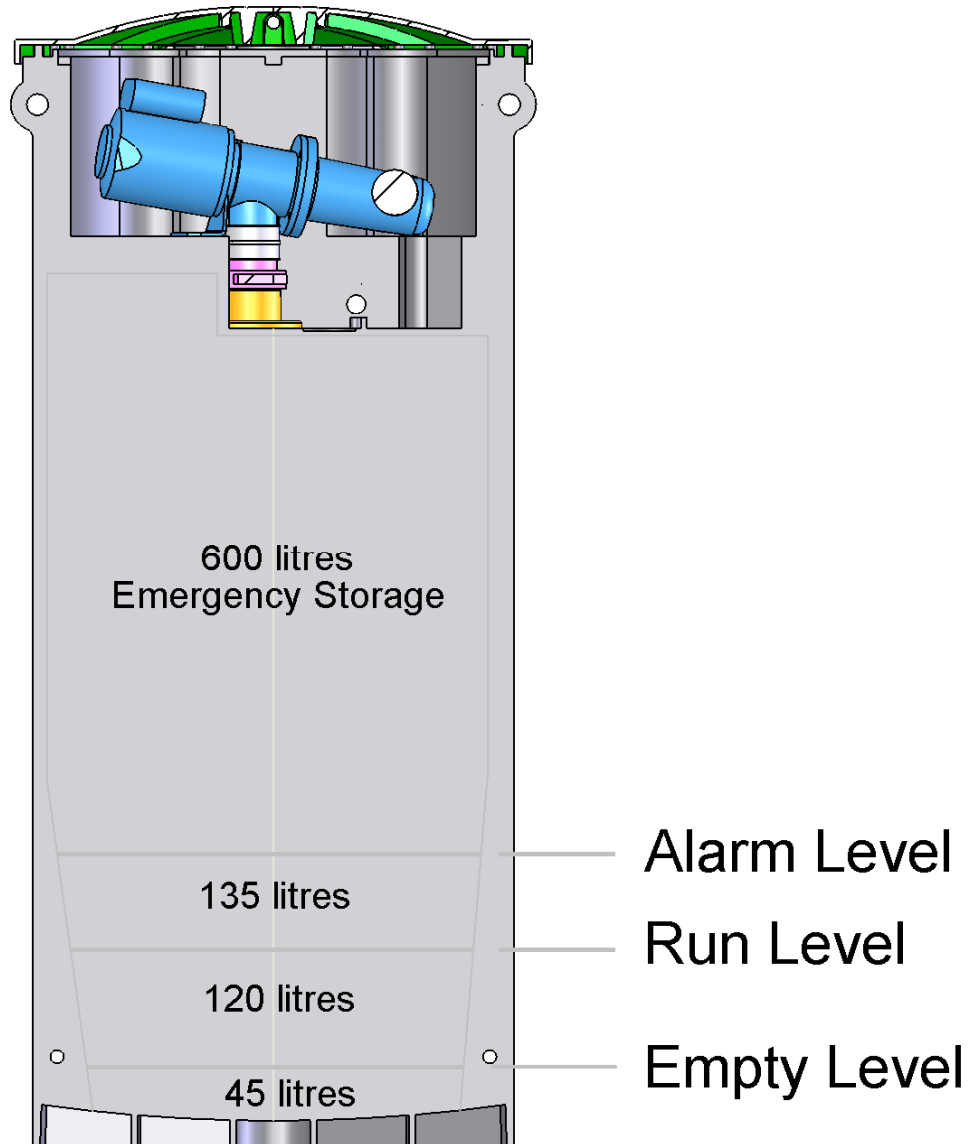
## **2. The Company**

Mono Pumps (Australia) Pty Ltd is part of a world wide network of companies with offices located in New Zealand, China, England, and the USA. The company has specialisation in pumping systems for Mining, Waste Water and Agricultural markets.

### 3. The Product

The Mono Pumps Eco 1-60 Pressure Sewer Unit comprises of a Collection vessel, Grinder pump, AC Motor, Control Panel and a Boundary Kit as an optional extra in the standard design. The boundary kit has been excluded from this appraisal.

The total well volume is 900lt with 600lt of that capacity designated as emergency storage. 45lt is retained storage, an active storage volume of 120lt (pump on to pump off) and 135lt to alarm level. The tank has a burial depth of 2m allowing 150mm above ground



Mono provides a comprehensive set of Installation, Operation and Maintenance instructions with each unit sold and also provides a householders guide for the unit.

The product is assembled mechanically and hydraulically tested at the companies Mordialloc site in Victoria.

#### 4. Scope of the Appraisal

This Product Appraisal Report covers the Eco1-60 and its derivative products as listed in the product schedule below:

**Table 1 – Product Schedule**

Items	Part Numbers	Size / Capacity	Packaging	Shipping Volume
Eco 1-60	PSS-Eco160	900lt	Individual	1.53 cubic meters
Eco 1-60-RTST	PSS-Eco160-RTST	900lt	Individual	1.53 cubic meters
Eco 1-60-RTRV	PSS-Eco160-RTRV	900lt	Individual	1.53 cubic meters
Boundary Kit	PSS-BK2		Carton	
Control Panel	PSS Control	219x323x190mm	Carton	0.02 cubic meters
Control Panel - RTST	PSS-CONT-RTST	219x323x190mm	Carton	0.02 cubic meters
Control Panel - RTRV	PSS-CONT-RTRV	219x323x190mm	Carton	0.02 cubic meters
Hand Held Controller	PSS DISP UNIT	180x100x25mm	Carton	0.01 cubic meters

#### 5. Appraisal Criteria

##### 5.1 Quality Assurance Requirements

The WSAA product appraisal network accepts system (ISO 9001) and product certification by a Certification Body at the manufacturing site of strategic products to appropriate Australian or internationally recognised standards. The Certification Body shall have relevant accreditation by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ) or by an equivalent international accreditation system recognised by JAS-ANZ.

##### 5.2 Performance Requirements

The Eco1-60 Pressure Sewer Unit has been appraised for manufacturing and performance compliance with AS/NZS 1546.1 – On-Site domestic waste water treatment units – Septic Tanks and relevant WSAA Codes.

A number of internal test results were supplied, supporting the application.

#### 6 Compliance with Appraisal Criteria

##### 6.1 Compliance with Quality Requirements

Mono Pumps (Australia) Pty Ltd is quality assured to ISO 9001:2000 by Lloyd's Register Quality Assurance Ltd for both its manufacturing plant and business operations.

The tank is supplied by Linpac Rotational Mouldings Pty Ltd which is StandardsMark licenced to AS/NZS 1546.1 – On-Site domestic waste water treatment units – Septic Tanks.

Assessment and review of this information using guidance set by the WSAA Infrastructure Products and Materials Network has concluded that the quality assurance requirements have been satisfied for the purpose of this appraisal.

## **6.2 Compliance with Appraisal Requirements**

Assessment and review of the information provided using guidance set by the WSAA Infrastructure Products and Materials Network has concluded that the appraisal requirements have been satisfied for the purpose of this report.

## **7 WSAA Agency Network Requests**

The WSAA Infrastructure and Materials Network questions were deemed to be 'commercial in confidence' and have not been included in this report, but will be made available upon request to WSAA members.

## **8 Fitting Instructions, Training and Installation**

No specific training is offered by Mono. However Installation, Operation and Maintenance Instructions, and a Home Owners Guide have been provided.

## **9. Product Marking**

The product does not carry any quality system markings

## **10. Traceability**

The supplier of the tank is compliant with AS/NZS 1546.1 – On-Site domestic waste water treatment units – Septic Tanks.

Mono Pumps (Australia) Pty Ltd is fully certified to ISO 9001:2001 by Lloyd's Register Quality Assurance Limited.

These certifications are noted and it is assumed that as long as these certifications remain current then the traceability of batch numbers, test reports, transport, etc, will be acceptable.

## **11. Packaging and Delivery**

The Eco 1-60 products are individually packed or supplied in cartons as described in Table 1.

## **12. WATER AGENCIES EXPERIENCE/FIELD REPORT**

Water agencies have experience with the product range. A number of utilities have individually approved the products for use in their jurisdictions.

## **13. PRODUCT WARRANTY**

No product warranties were supplied with the Application.

#### **14. DISCUSSION**

The Eco1-60 range of pressure sewer units comply with the appraisal quality requirements by providing evidence of their Lloyd's Register Quality Assurance Limited quality systems certification for and ISO9001:2001, and WaterMark certification of the tanks to AS/NZ 1546.1. A number of internal test reports were supplied supporting the accreditation.

WSAA Infrastructure and Materials Network questions have been answered satisfactorily.

A number of WSAA members have individually approved the product range for use in their jurisdiction.

#### **15. SUMMARY**

Examination of all of the submitted documented material provides an expectation that the Eco1-60 range of pressure sewer units products are 'fit for purpose' in pressure sewerage pipeline networks.

#### **16. LIFE EXPECTANCY RATING**

The Eco1-60 range of pressure sewer units has the following life expectancies which are based on domestic sewage applications where the system has been installed in accordance with Mono Pumps recommendations;

- a) Collection vessel, 50 years
- b) G60 Grinder Pump, 25 years
- c) Control Panel, 25 years
- d) Boundary Kit, 25 years
- e) Hand Held Controller, 25 years

#### **17. FUTURE WORK**

No future works items have been identified. However an agency has suggested that it would be useful for Mono to self assess the product against the WSAA pressure Sewerage Code and report to the Product Appraisal Manager.

#### **18. RECOMMENDATION**

It is recommended that WSAA Members and Associates accept/authorise The Eco1-60 range of pressure sewer units product range as listed in the Product Schedule (Table 1) that are relevant to pressure sewerage pipeline design, installation, acceptance testing and commissioning and are in accordance with applicable WSAA Codes and the manufacturer's requirements where specified.

## **19. Disclaimer**

### **19.1. Issue of Report**

This Product Appraisal Report (Report) has been published and/or prepared by the Water Services Association of Australia, Inc and nominated Project Manager and peer group of technical specialists (the Publishers).

The Report has been prepared for use within Australia only by technical specialists that have expertise in the function of products such as those appraised in the Report (the Recipients).

By accepting this Report, the Recipient acknowledges and represents to the Publisher[s] and each person involved in the preparation of the Report that the Recipient has understood and accepted the terms of this Disclaimer.

## **19 Limits on Reliance on Information and Recommendations**

### **19.2.1 Disclaimer of liability**

Neither the Publisher[s] nor any person involved in the preparation of the Report accept[s] any liability for any loss or damage suffered by any person however caused (including negligence or the omission by any person to do any thing) relating in any way to the Report or the product appraisal criteria underlying it. This includes (without limitation) any liability for any recommendation or information in the Report or any errors or omissions.

### **19.2.2 Need for independent assessment**

The information and any recommendation contained (expressly or by implication) in this Report are provided in good faith. However, you should treat the information as indicative only. You should not rely on that information or any such recommendation except to the extent that you reach an agreement to the contrary with the Publisher[s].

This Report does not contain all information that a person might require for the purposes of assessing any product discussed or appraised within it (Product). The product appraisal criteria used in preparing this Report may not address all relevant aspects of the Product.

Recipients should seek independent evidence of any matter which is material to their decisions in connection with an assessment of the Product and consult their own advisers for any technical information required. Any decision to use the Product should take into account the reliability of that independent evidence obtained by the Recipient regarding the Product.

Recipients should also independently verify and assess the appropriateness of any recommendation in the Report, especially given that any recommendation will not take into account a Recipient's particular needs or circumstances.

### **19.2.3 No updating**

Neither the Publisher[s] nor any person involved in the preparation of this Report [has][have] any obligation to notify you of any change in the information contained in this Report or of any new information concerning the Publisher[s] or the Product or any other matter.

### **19.2.4 No warranty**

The Publisher[s] do[es] not, in any way, warrant that steps have been taken to verify or audit the accuracy or completeness of the information in this Report, or the accuracy, completeness or reasonableness of any recommendation in this Report.

**APPENDIX A**

Q A CERTIFICATES

Contains:

Mono Pumps (Australia) Pty Ltd

Lloyd's Register Quality Assurance Limited certificate MEL 0924555 for AS/NZS ISO 9001:2000, Quality Management System

Linpac Rotational Mouldings Pty Ltd

StandardsMark Licence SMKB20051 for AS/ANZS 1546.1 – On-site domestic wastewater treatment units – Septic tanks.



**CERTIFICATE OF APPROVAL**

This is to certify that the Quality Management System of:

**Mono Pumps (Australia) Pty Ltd  
Mordialloc, Victoria  
Australia**

has been approved by Lloyd's Register Quality Assurance Limited  
to the following Quality Management System Standards:

**AS/NZS ISO 9001: 2000**

The Quality Management System is applicable to:

**Design, development, manufacture, assembly, repair and service of  
progressive cavity positive displacement pumps and spare parts. Design  
and supply of integrated drive arrangements and ancillary plant.  
Stockholding of pumps, spare parts, selected alternative pump types,  
disintegration and screening equipment.**

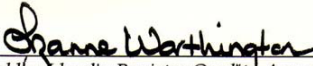
This certificate is valid only in association with the certificate schedule bearing the same  
number on which the locations applicable to this approval are listed.

Approval  
Certificate No: MEL 0924555

Original Approval: 5 October 1993

Current Certificate: 1 March 2006

Certificate Expiry: 28 February 2009

  
Issued by: Lloyd's Register Quality Assurance Limited



001

This document is subject to the provision on the reverse

71 Fenchurch Street, London EC3M 4BS, United Kingdom. Registration number 1879370

This approval is carried out in accordance with the LRQA assessment and certification procedures and monitored by LRQA.

The use of the UKAS Accreditation Mark indicates Accreditation in respect of those activities covered by the Accreditation Certificate Number 001

AS/NZS ISO 9001:2000

LLOYD'S REGISTER QUALITY ASSURANCE



**CERTIFICATE SCHEDULE**

**Mono Pumps (Australia) Pty Ltd  
Mordialloc, Victoria  
Australia**

**Locations**

**Activities**

Mordialloc,  
Victoria

*Design, development, manufacture, assembly, repair and service of progressive cavity positive displacement pumps and spare parts. Design and supply of integrated drive arrangements and ancillary plant. Stockholding, hire and service of pumps, spare parts, selected alternative pump types, disintegration and screening equipment.*

Rural Products  
Mordialloc,  
Victoria

*Sales, stockholding and assembly.*

Sydney,  
New South Wales

*Sales, stockholding, hire, assembly, repair and service.*

Brisbane,  
Queensland

*Sales, stockholding, hire, assembly, repair and service.*

Approval  
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Page 1 of 2



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71 Fenchurch Street, London EC3M 4BS, United Kingdom. Registration number 1879370  
This approval is carried out in accordance with the LRQA assessment and certification procedures and monitored by LRQA.  
The use of the UKAS Accreditation Mark indicates Accreditation in respect of these activities covered by the Accreditation Certificate Number 001*

LLOYD'S REGISTER QUALITY ASSURANCE



**CERTIFICATE SCHEDULE**

**Mono Pumps (Australia) Pty Ltd  
Mordialloc, Victoria  
Australia**

Locations

Activities

Perth,  
Western Australia

Sales, stockholding, hire, assembly, repair and service.

Darwin,  
Northern Territory

Sales, hire and stockholding.

Claremont,  
Tasmania

Sales and stockholding.

Adelaide,  
South Australia

Sales, hire and stockholding.

Kalgoorlie,  
Western Australia

Sales, stockholding, hire, assembly, repair and service.

Approval  
Certificate No: MEL 0924555

Original Approval: 5 October 1993

Current Certificate: 1 March 2006

Certificate Expiry: 28 February 2009

Page 2 of 2



*This document is subject to the provision on the reverse*  
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LLOYD'S REGISTER QUALITY ASSURANCE



# STANDARDSMARK LICENCE

*SAI Global hereby grants to:*

## Linpac Rotational Mouldings Pty Ltd

ABN 19 067 462 337

**81 Frankston Gardens Drive, CARRUM DOWNS 3201, VIC AUSTRALIA**

*"the Licensee" the right to use the STANDARDSMARK as shown above only in respect of the goods described and detailed in the Schedule which are produced by the Licensee and which comply with the appropriate Standard referred to below as from time to time amended. The Licence is granted subject to the rules governing the use of the STANDARDSMARK and the Terms and Conditions for certification and licence. The Licensee covenants to comply with all the Rules and Terms and Conditions.*

*Manufactured to:*

**AS/NZS 1546.1 - On-site domestic wastewater treatment units - Septic tanks**

The STANDARDSMARK is a registered certification trademark of SAI Global Limited (A.C.N. 050 644 642) and is issued under licence by SAI Global Certification Services Pty Limited (ACN 108 716 669) ("SAI Global"). This certificate remains the property of SAI Global and must be returned to SAI Global upon its request. Refer to the Schedule for the list of product models.

Licence No.: SMKB20051  
Issue Date: 20 October 2004

Certified Date: 12 May 2003  
Expiry Date: 11 May 2008

Alex Ezrakhovich - General Manager Certification  
For and on behalf of SAI Global

Authorised Local Signatory, SAI Global



A division of SAI Global Limited  
ABN 67 050 611 642



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