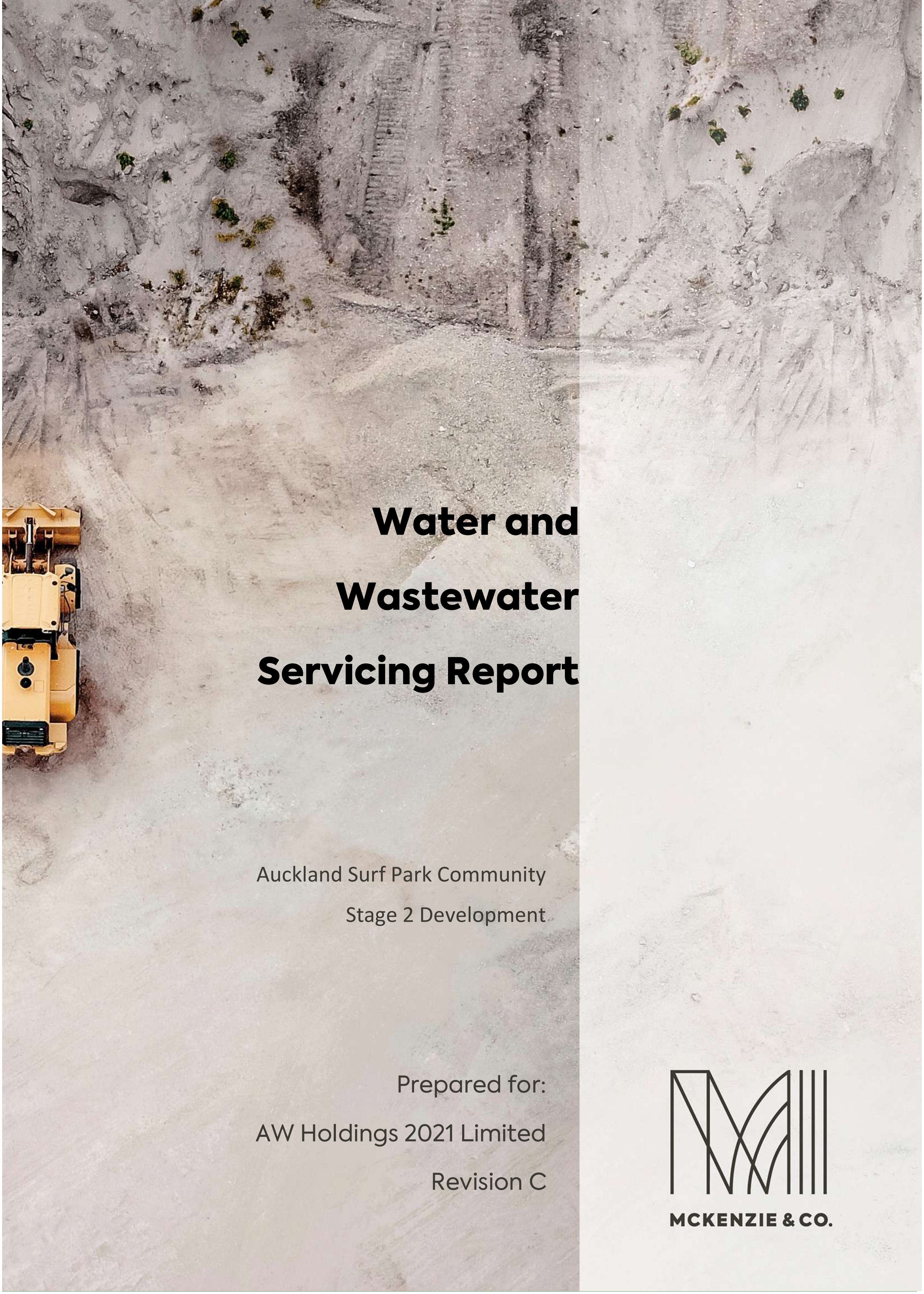

Water and Wastewater Servicing Report

Auckland Surf Park Community
Stage 2 Development

Prepared for:
AW Holdings 2021 Limited
Revision C

MCKENZIE & CO.

DOCUMENT CONTROL RECORD

PROJECT:	Auckland Surf Park Community
CLIENT:	AW Holdings 2021 Limited Partnership
PROJECT LOCATION:	1320 & 1350 Dairy Flat Highway; 89 & 105 Lascelles Drive; 253 & 237 Postman Road, Auckland

Revision	Date	Originator	Checker	Approver	Description
A	12/09/25	SMB	SL	SL	DRAFT
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C	07/11/25	SMB	SL	SL	Resource Consent
D	15/04/26	SL	SL	SL	Calculations Updated
E	09/06/26	SL	SL	SL	Stage 5A Vacant Subdivision

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APPENDIX B – WASTEWATER CALCULATIONS

APPENDIX C – WATER CALCULATIONS

1 STATEMENT OF QUALIFICATIONS AND EXPERIENCE

James Kitchen

I am a Director of McKenzie & Co and a Chartered Professional Engineer (CPEng, MIPENZ). I hold a Bachelor of Engineering (Hons) from the University of Canterbury and have worked in civil engineering for more than 20 years across New Zealand, Australia, and the United Kingdom. My experience includes director oversight, senior design and project management roles for land development, infrastructure, and contract administration, with work spanning residential subdivisions, industrial developments, and transport projects.

I have led civil engineering inputs on a wide range of subdivision and infrastructure projects throughout Auckland. My role involves guiding concept design, detailed engineering, procurement, and construction delivery, supported by a strong understanding of local planning and regulatory frameworks. I bring a practical approach to design and project coordination, ensuring that technical decisions are grounded in local conditions and achievable construction practice.

I confirm that, in my capacity as reviewer of the substantive application, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

Scott Lamason

I am a Senior Civil Engineer and Design Lead at McKenzie & Co, with a Bachelor of Engineering from Unitec and more than 20 years of experience in land development and subdivision engineering. My background includes senior roles in both consultancy and local government, where I have led multidisciplinary teams and provided direction on complex development projects across Auckland. My work covers detailed design, regulatory strategy, and project governance from concept through to approval.

My previous experience as Development Engineering Team Leader at Auckland Council has given me a clear understanding of local authority processes and engineering requirements. I have since managed civil inputs for residential, mixed-use, and infrastructure projects, supporting technical design, stakeholder engagement, and coordinated delivery. I bring structured judgement and practical insight to engineering assessment for the Auckland Surf Park project.

I confirm that, in my capacity as author and reviewer of parts of the substantive application, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

Zhongxin Wang

I am a Senior Civil Engineer at McKenzie & Co and a Chartered Professional Engineer (CPEng, CMEngNZ). I hold a Bachelor of Engineering and a Master of Engineering from the University of Auckland. My experience covers civil design, earthworks, infrastructure planning, and flood assessment for land development projects across Auckland. I have worked in both greenfield and brownfield settings, developing practical solutions supported by strong analytical skills and proficiency in 12d modelling.

Before joining McKenzie & Co, I held engineering roles with Woods, Everest/Hollier Greig, and M8 Group, where I contributed to the planning, design, and construction phases of subdivision and infrastructure projects. I focus on clear communication and coordinated delivery, supporting efficient progression of technical work and constructive engagement with clients, contractors, and council officers.

I confirm that, in my capacity as author of parts of the substantive application, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

Romeo Dela Cruz

I am a Senior Engineer at McKenzie & Co and a Chartered Professional Engineer (CPEng, CMEngNZ, IntPE(NZ)). I hold degrees in Civil Engineering and Geodetic Engineering from Feati University. I have extensive experience across land development and infrastructure engineering, with work covering detailed civil design, geometric road layout, three waters infrastructure, erosion and sediment control, and construction support.

Since joining McKenzie & Co in 2019, I have contributed to the delivery of subdivision projects throughout Auckland, providing engineering review and practical guidance on site-based matters. My background enables me to make sound design decisions and support effective coordination during construction, ensuring that engineering requirements are met consistently and efficiently.

I confirm that, in my capacity as author and reviewer of parts of the substantive application, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

2 INTRODUCTION

This report is prepared in support of the Auckland Surf Park Community (ASPC) and addresses the key water and wastewater engineering infrastructure matters relevant to this proposal. It covers all engineering works for the proposed onsite water and wastewater treatment system and the indicative long term servicing solution for the development.

This report should be read in conjunction with the consent application plan drawings and other supporting documents referred to in this report, along with the technical reports that support this development. Other engineering matters relevant to this development is discussed in engineering plans and reports attached separately.

Stage 5a Vacant Lot Subdivision

Stage 5a is proposed as a vacant lot subdivision only. No buildings, operational activities, or end-use development are proposed as part of the current application. The works sought under this consent are limited to the creation of development lots and the installation of supporting infrastructure required to service future development within the precinct. This includes bulk earthworks, stormwater infrastructure, wastewater and water reticulation, utility services, access roads, and a jointly owned access lot (JOAL), together with associated ancillary infrastructure.

For the purposes of infrastructure design and environmental assessment, a maximum probable development scenario has been adopted for Stage 5a. The water, wastewater servicing, and supporting infrastructure outlined within this report have been sized and assessed based on this anticipated ultimate development outcome. Accordingly, the infrastructure proposed under this application provides sufficient capacity to accommodate the forecast water and wastewater generation associated with future development of the precinct. This approach ensures that the bulk infrastructure network can be established in a coordinated manner and avoids the need for significant upgrades as development proceeds.

Future development within the Stage 5a will be required to undertake its own detailed engineering and environmental assessments to confirm the actual servicing demands and effects associated with the proposed activities. Where those assessments identify infrastructure requirements that differ from, or exceed, the assumptions adopted within this report, the future developer will be responsible for designing and implementing any necessary amendments, upgrades, or extensions to the infrastructure network as part of the subsequent development approval and detailed design process.

3 EXISTING WASTEWATER FACILITIES & FUTURE WASTEWATER NETWORK

The site is currently not within the Watercare service area for Auckland. However, there are plans for future expansion of the Watercare wastewater network which includes the proposed development area. An indicative concept plan of the expansion is shown in Figure 1. As of present, there is no set timeline for when this expansion will be implemented by Watercare.

The proposal includes an onsite wastewater treatment and disposal system for the development. The network will service the proposed surf park and its supporting buildings and facilities, while providing capacity for wastewater flows from the proposed data centre and vacant lot subdivision located east of the site.

Consent is sought for the onsite disposal of the treated wastewater generated by the proposed development. The proposed consent will be required to be in place until the system can be discharged into the Watercare wastewater network. The proposed network will run on a low-pressure system (LPS). Refer to the layout shown in 3335-02-5000 drawing and the specific design will be completed by Apex Water NZ during detailed design stage.

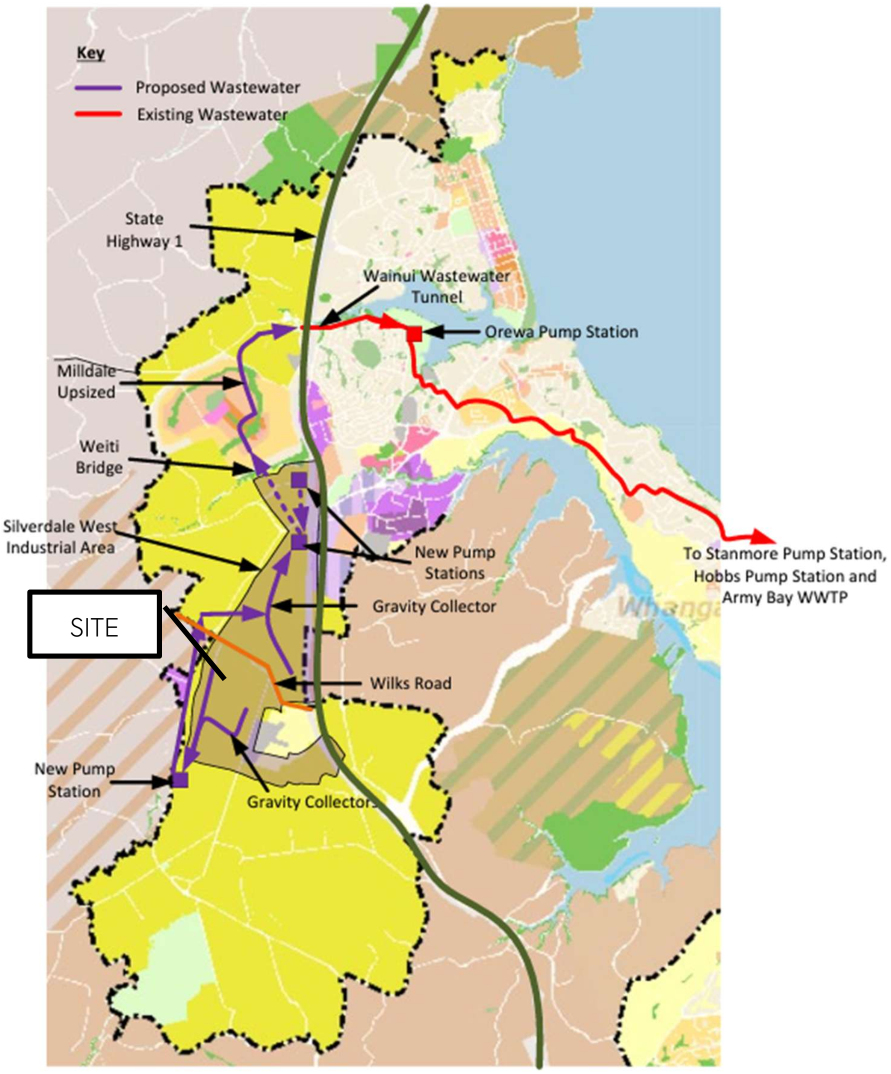


Figure 1 - Future Watercare Wastewater Network Extension

4 ONSITE WASTEWATER TREATMENT & DISPOSAL

The proposed wastewater generated from the development has been estimated based on typical wastewater flows from the various development areas, occupancy types, and loading rates, as outlined in the wastewater demand calculations included in Appendix B. Given the rural location of the site, there is currently no public wastewater network available for connection. As a result, the development will be serviced by a dedicated onsite wastewater treatment plant (WWTP), designed to treat effluent to a high standard suitable for land-based disposal. Apex Water NZ is undertaking the detailed design of the treatment plant and confirming the proposed discharge split across disposal systems.

The proposed treatment system has been designed to operate independently in perpetuity; however, it may be possible to switch over to a public system should public services be provided for in the future. To enable this option the proposed water and wastewater treatment infrastructure will be designed and constructed in accordance with current public Watercare standards as much as is practical. This will reduce the requirement for upgrade works should a public service connection become available, noting that the public service delivery time frame has not yet been confirmed and maybe some away and public service requirements may change.

The peak wastewater design flow for the development is approximately 669 m^3/day as per the wastewater demand. Approximately 70% of this flow is proposed to be discharged through a dedicated land dispersal trench system adjacent to the stream corridor. Ecological effects associated with wastewater disposal adjacent to the stream corridor, including riparian mitigation and protection of aquatic values, are addressed in the Ecological Impact Assessment prepared by Viridis (2 December 2025).

The trench will be approximately 200m in length, constructed with rock riprap to manage flow dispersal and provide bank protection. The landscape design will include planting within the riprap to soften visual impact and integrate the system into the natural environment. It is noted that the size and location of the dispersal trench is subject to future changes during the detailed design phase

This discharge will comply with all of the proposed conditions and will be treated to a standard that ensures no adverse effects on the receiving environment. The design will incorporate appropriate outfall structures and diffusers to ensure efficient mixing and dispersion within the stream. The treated wastewater effluent discharged to this trench will be to a high quality due to the high-performance treatment plant, including a reverse osmosis filter. A raingarden-based system was considered; however, the required treatment and discharge capacity makes this approach impractical as a primary disposal method.

Due to the Reverse Osmosis treatment process, approximately 30% of the treatment flow will not be suitable for disposal to the trench and will require disposal to conventional land disposal systems underneath the solar farm. The remaining 30% of the treated wastewater flow will be managed via surface drip irrigation in the landscape areas. Subsurface disposal options were considered but deemed unsuitable due to soil limitations. Initia Geotechnical specialists have confirmed Category 6 soils in accordance with GD06; refer to their report attached separately for further detail. Aquifer discharge was also assessed and discussed early in the design process. The GD06 PCDI method forms the basis of the surface irrigation system design.

Category 6 soils allow a maximum loading rate of 3 mm/day. An additional allowance of 1 mm/day has been applied for winter evapotranspiration, giving a total design irrigation rate (DIR) of 4 mm/day. Based on disposing approximately 200 m^3/day (30% of total flow), Equation 2 from GD06 applies:

$$A = \frac{Q}{DIR}$$

Where:

A = required irrigation area (m^2)

Q = design flow (L/day)

DIR = design irrigation rate (mm/day)

Parameter	Value

Q (Design Flow)	200,700 L/day (30% of 669 m^3/day)
DIR	4 mm/day
Calculated Area	A = Q / DIR = 50,325 m^2

Minimum required irrigation area: 50,175 m^2 ≈ 5.0175 ha

The site is subject to a designation to provide for a future Rapid Transport Network (RTN). In August 2024 AW Holdings obtained s178 approval from the New Zealand Transport Agency to undertake Stage 1 works within the designation including the construction and operation of wastewater disposal field underneath the solar farm. The approval noted that works on the RTN were not expected to occur before 2050. A condition of the approval was that the solar farm and wastewater disposal field must be removed before construction of the RTN commenced or before 2050 (whichever was sooner).

A similar strategy is proposed via a farm irrigation style disposal of the treated wastewater underneath the solar farm within the designation. The above ground irrigation pipe work can be attached to the solar farm array, and easily removed should the RTN be constructed. The designation area allows the disposal field to easily be extended as the development stages are completed and scales easily to the size of the current loading requirements.

Once construction of the RTN is underway, the disposal field can change to an irrigation system within the surf park development. We have identified that 5.0352 ha of land is required for disposal and that 6.93ha land is available if we exclude the designation areas completely, demonstrating that disposal excluding this area is possible.

Furthermore, it's noted that once the RTN is constructed, and with the support of NZTA, there will be redundant land not required, which could also be a suitable disposal field, estimated to be 6.54ha.

Stage	Area Available	Notes
Required (GD06)	5.0175 ha	Based on design flows
Before busway construction- Only designation	10.28 ha	Designation land available for disposal
After busway construction- No designation	6.93 ha	Future landscape area inside the development will be available

This provides the required disposal area, ensuring long-term capacity and operational resilience. Refer to drawings 3325-2-5200 and 3325-2-5201 for further information on landscape areas available for wastewater disposal.

The disposal field shall be subject to detail design and incorporate a farm style irrigation network attached to the underside of the solar farm array, or a subsurface system typically 150mm below ground level with grass or mulch cover to ensure effective and uniform effluent distribution. The disposal field shall maintain minimum separation distances shown below in accordance with GD06 requirements.

Flood hazard constraints and finished ground level interfaces for the wastewater disposal areas have been assessed with reference to the final flood modelling completed by Woods in the *Surf Park RC Flood Assessment – Final (02 February 2026)*. This assessment confirms that the proposed disposal field and associated servicing infrastructure can be appropriately located and designed outside of identified flood hazard areas, while maintaining safe overland flow conveyance across the site.

Site Feature	Separation Distance Adopted	GD06 Minimum Requirement
Buildings/Houses	3.0 m	1.5 m
Property Boundary	1.5 m	1.5 m
Surface Watercourse	10 m	10 m (Advanced tertiary effluent quality)
Groundwater	0.9 m	0.9 m

A 1,000m^3 balance tank located within the treatment plant will provide storage during wet periods and allow controlled release during favorable conditions. Early stages may include temporary irrigation beneath solar panel structures in the designation area, transitioning to permanent landscaped irrigation zones as they are completed.

5 PROPOSED WASTEWATER RETICULATION SYSTEM

The proposed wastewater reticulation and systems for this development have been designed to convey all wastewater toward the southern portion of the site, where a dedicated onsite WWTP will operate as the treatment solution. Wastewater infrastructure has been designed to ensure the development remains fully self-sufficient, with onsite treatment and land-based disposal established as the long-term servicing approach. No connection to a public wastewater network is proposed or required to service this development at this stage.

Given the site's topography and dispersed layout, a LPS system has been selected for wastewater conveyance throughout the development. The LPS system enables wastewater to be pumped efficiently from individual lots to the central WWTP without requiring extensive gravity reticulation or deep excavation. This approach is well-suited to rural development, provides servicing flexibility, reduces environmental disturbance during installation, and minimises infiltration and inflow risks compared with traditional gravity systems. EcoFlow is undertaking the detailed design of the LPS network, boundary pump kits, and treatment system is being designed by Apex Water NZ to ensure the solution meets long-term operational and environmental performance requirements.

Each dwelling or building unit will be serviced by an onsite boundary pump kit, comprising a sealed pump chamber, macerator/grinder pump, and associated electrical control and alarm system.

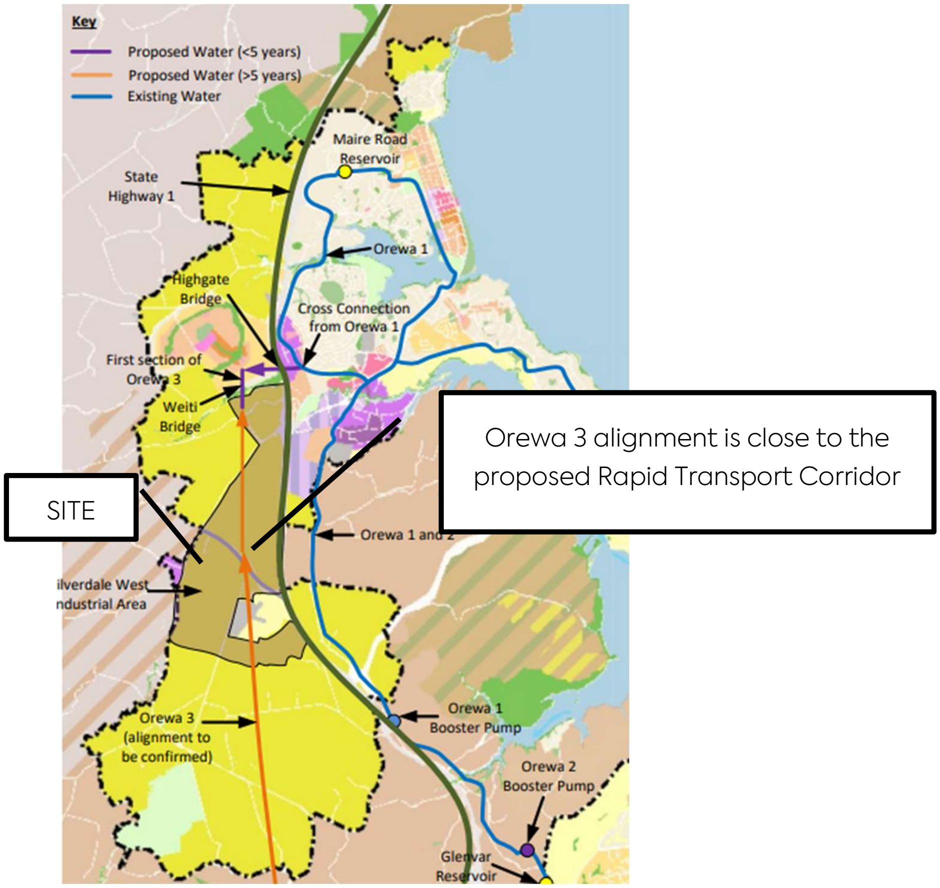
Wastewater from each dwelling will flow by gravity into the boundary pump chamber, where it will be macerated and pumped into the LPS network. These boundary kits ensure reliable system performance, reduce the risk of blockages and backflows, and support staged development. Telemetry and alarm capability may be incorporated to allow for proactive monitoring, early fault detection, and responsive system management.

All LPS infrastructure, boundary kits, and treatment and disposal components are being designed by Apex Water NZ in accordance with industry best practice and relevant engineering and environmental guidelines. The system will operate as a fully independent onsite wastewater collection, treatment, and disposal network, providing a resilient long-term servicing solution that enables sustainable development.

6 EXISTING WATER FACILITIES & FUTURE WATER LAYOUT

The site is currently not within the Watercare service area for Auckland. However, there are plans for future expansion of the Watercare watermain network which includes the proposed development area. An indicative concept plan of the expansion is shown in Figure *2*. The current trunk water supply to the Hibiscus Coast area is via the Orewa 1 and Orewa 2 watermains which are both routed along East Coast Road from the Glenvar Reservoir on the North Shore. To service land in the Structure Plan area, a new bulk watermain (Orewa 3) will be constructed.

This will connect from the Orewa 1 watermain in the Highgate Business Park across SH1 (future Highgate Bridge), through the Milldale area, across the Weiti Stream (future Weiti Bridge) and into the Silverdale West Industrial zone. This forms the northern part of the Orewa 3 watermain in the long term. A component of the pipeline within the Milldale area has already been constructed and the timing for the remainder is dependent on delivery of the Highgate and Weiti bridge projects.



SITE

Orewa 3 alignment is close to the proposed Rapid Transport Corridor

Figure 2 - Future Watercare Water Network Extension

7 ONSITE WATER TREATMENT

The proposed water requirement for the development is estimated based on typical water demand associated with the various development areas and occupancy types, as outlined in the water demand calculations provided in Appendix C.

To ensure long-term reliability and resilience, the development will adopt a diversified water-sourcing strategy. The primary water supply will be provided up to three deep groundwater bores, delivering redundancy and ensuring consistent base supply capacity. The proposed bores have confirmed capacity to fully serve the development. To supplement bore yield and respond to peak-demand periods, it is proposed to retain the river intake system that was consented under the Stage 1 fast track consent. Rainwater collection will supplement non-potable water uses, aligning with sustainability goals and reducing reliance on groundwater resources. However, it's not currently proposed on a wide scale and is intended to be optional on a per dwelling or building basis.

All raw water sources will be conveyed to a centralised onsite water treatment plant, where it will be processed to potable quality in accordance with the New Zealand Drinking Water Standards.

To maintain operational resilience and ensure consistent supply, the water treatment plant will be equipped with duty/assist pumping systems, providing operational redundancy and ensuring uninterrupted service. In addition, the system will incorporate an auxiliary pump connection point, enabling an external pump or emergency pumping configuration to be deployed if required. The treatment plant will be designed to allow scheduled downtime during non-peak hours, ensuring maintenance can occur while maintaining uninterrupted supply to the development. Water storage capacity will support these operational cycles.

A total of 2500m^3 of onsite water storage will be provided, delivering a minimum 48-hour security of supply while also satisfying FW2 firefighting water requirements under the Firefighting Water Supplies Code of Practice. Storage will be configured as two dedicated tanks initially, with allowance and space for the construction of a third future tank to facilitate a replacement tank that can be commissioned before the removal of an existing tank.

To support safe and reliable operation, the treatment plant will be manned 24/7, ensuring the ability to respond immediately to operational issues, pump or system alarms, or emergency situations. Continuous monitoring systems and operational controls will be implemented to maintain consistent water quality and supply performance. The treatment plant will have operating procedures to ensure the maintenance and repair has been carried out in accordance with best practice and all regulation.

While the system is designed to operate independently, provision for a future public network connection has been incorporated. Strategic isolation valves and connection points will be installed at the property boundary, enabling seamless integration should Council infrastructure become available in future years, without compromising the internal system.

8 PROPOSED WATER RETICULATION SYSTEM

This design and servicing strategy is consistent with the following relevant legislation, standards, and guidelines:

- Building Act 2004
- Auckland Unitary Plan
- Watercare Code of Practice for Water Supply
- Health and Safety at Work Act 2015
- Auckland Council's Future Development Strategy

8.1 Water Demand Estimate

The following demand estimates were considered for the development:

- Watercare Average Daily Demand: 220 L/p/d (adopted for conservatism)
- Watercare Dry Retail: 1 person per 50m^2 net floor area at 65 liters per person per day
- Watercare Office Buildings: 1 person per 15m^2 net floor area at 65 litres per person per day
- Watercare Wet Retail:15 litres per day per net m^2 of floor area
- Watercare Light Water Industry: 4.5 litres per square metre per day (L/m^2 /d)

Given the need for a conservative approach, Watercare's average daily demand factor of 2 and peak hourly demand factor of 2.5 was adopted in the model for the development. This ensures that the water supply network is robust and capable of meeting peak demand scenarios.

- Estimated Annual Demand: 256,230m^3/year
- Average Daily Demand: 7 L/s
- Peak Daily Demand: 12 L/s

8.2 Groundwater Supply and Availability

Based on the Feasibility Assessment for Groundwater Supply prepared by Williamson Water & Land Advisory (dated 4 December 2025), the groundwater supply from the Rangitopuni Waitemata aquifer has sufficient capacity to support the development. Bore Sustainable Yield Analysis has confirmed comprising 24-hour pumping at a constant flow rate of averaging 11.45 L/s

8.3 Water Supply Network Design

Hydraulic modelling and pipe sizing for the development was carried out using EPANET software, which was also used to assess network performance, pressure availability, and fire flow compliance. The model is used to evaluate pressure, flow capacity, and firefighting performance under peak demand and emergency scenarios. Key hydraulic parameters and assumptions used in the EPANET model include:

- Minimum residual pressure: 25 m under peak hour flow conditions
- Minimum residual pressure: 10 m during firefighting flow scenarios
- Fire flow demand: 50 L/s sustained for a minimum of 1 hour
- Peak daily and hourly demand factors based on Watercare guidelines
- Hazen-William's roughness coefficient: C = 130 for new ductile iron and PVC mains

Design:

- Water Supply Source: Bore 1 & 2
- Redundancy Bore 3
- Pump System: Submersible pump with a flow capacity of 22 L/s (Assuming 2 Bore x 10.9 L/s)
- Storage: Two storage tanks located at the treatment plant (2,000m^3)
- Pump Head: 250m

At this stage, a single bore has been constructed and successfully pump-tested, confirming a sustainable abstraction rate of 10.9 L/s under constant-flow conditions. Pump-test results indicated stable drawdown within acceptable limits and demonstrated favourable aquifer transmissivity and storability characteristics, confirming the capacity of the underlying groundwater system to support long-term extraction.

The proposed scheme includes the development of two additional production bores; all connected to the potable water treatment system. The operational philosophy is to run two bores in duty standby mode to meet demand, with one additional bore (bore 3) maintained as a full standby source to provide operational redundancy and resilience in accordance with secure supply principles (N+1 configuration). The standby bore will be available to maintain continuity of supply during maintenance activities, peak-demand periods, or unexpected reduction in bore performance.

To support distribution and ensure compliant potable water quality, the groundwater supply will be integrated with a booster pump system and a potable water treatment plant. The booster pump will be sized to maintain minimum network pressures under peak demand conditions, as well as to support fire-fighting supply requirements in accordance with the adopted FW3 classification. The treatment plant will provide appropriate groundwater treatment, including filtration and disinfection, to ensure the supply meets New Zealand Drinking Water Standards and secure-supply compliance. Together, the booster pump and treatment system will provide a robust and resilient supply solution, ensuring reliable delivery of treated water to the network under normal and contingency operating conditions.

Bore installation and commissioning will be undertaken in staged phases aligned with the development programme, allowing progressive verification of aquifer capacity and cumulative drawdown response across the well-field. This staged implementation ensures robust source capacity, redundancy, and a sustainable, independent groundwater supply to service all precincts throughout the development lifecycle.

8.4 Firefighting Water Supply

The firefighting water supply design is based on the requirements of SNZ PAS 4509:2008 – Firefighting Water Supplies Code of Practice. While the FW2 classification provides the performance requirements for this project, the system has been designed to exceed these standards by adopting an FW3 classification to provide additional safety and resiliency. This approach also ensures a longer firefighting duration and a more conservative design margin than the minimum standard requires.

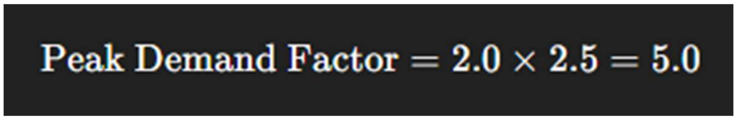
- 2 hydrants, each with a flow of 25 L/s, providing a total flow rate of 50 L/s.
- Firefighting Time: Increased to 1 hours (from the standard 30 minutes).
- Firefighting Water Storage: Increased to 180 m^3 (to support 1 hours of firefighting).

For the development, the firefighting system has been designed to meet these criteria, ensuring that there are sufficient hydrant capacity and storage to handle fire events until fire services arrive. It also has been equipped with the necessary number of hydrants, and storage has been designed accordingly.

8.5 System Simulation and Hydraulics

The water supply network was modeled in EPANET to evaluate its hydraulic performance under varying operating conditions, including average, peak daily, and peak hourly demand scenarios, as well as firefighting requirements. Peak demand variation was incorporated using a demand pattern that applies peak factors of 2.0 for peak-day conditions and 2.5 for peak-hour conditions.

The combined peak multiplier used for the most extreme demand condition is therefore:



$$\text{Peak Demand Factor} = 2.0 \times 2.5 = 5.0$$

Demand Factor Summary

Condition	Peak Factor	Notes
Average Demand	1.0	Normalized mean demand
Peak Daily Demand	2.0	Applied via EPANET pattern
Peak Hourly Demand	2.5	Applied via EPANET pattern
Maximum Combined Factor	5.0	Peak-day × Peak-hour

The system has achieved a balance state, ensuring that water supply is continuously available throughout the extended simulation period.

Key results from the simulation:

- ASPC development can be serviced sustainably by booster pump and buffering tank configurations (2500m^3).
- The design ensures that adequate pressure is maintained throughout the network, even during peak demand and firefighting scenarios.
- Hydrant flow rates and storage capacities meet the increased 1-hour firefighting duration, with sufficient reserve capacity to address emergencies.

Refer to Figure 3 for the EPANET map of the network layout.

Refer also to Figure 4 for the arrangement of bores, storage tanks, and booster pumps.

Figure 3 - EPANET Map

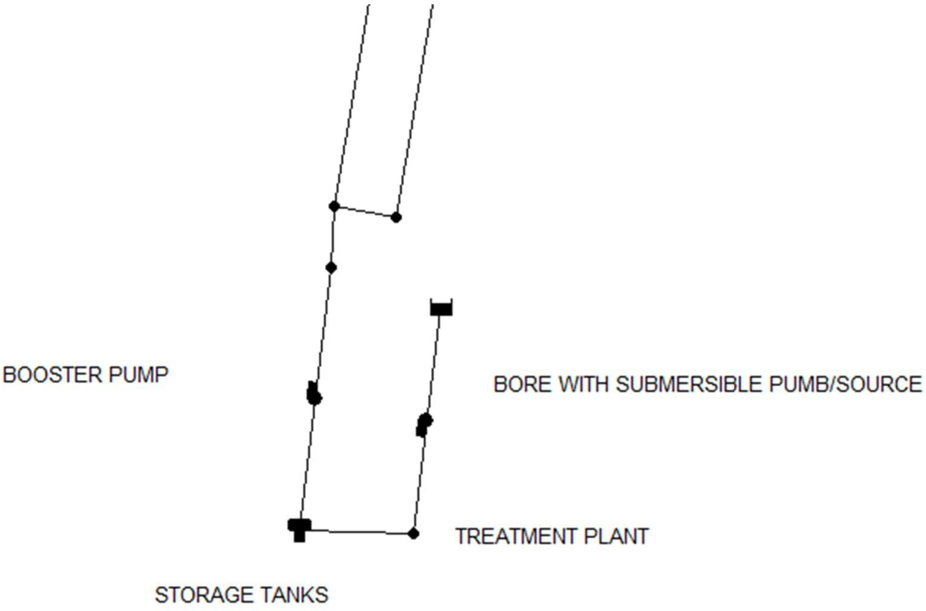


Figure 4 - Bore – Storage Tank – Booster Pump System

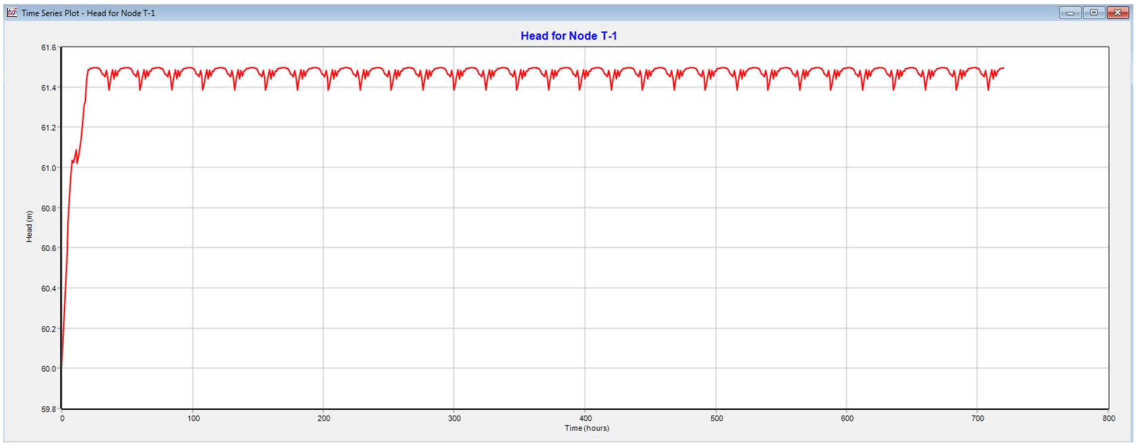


Figure 5 - Stage 1 Storage Tank Water Level Graph

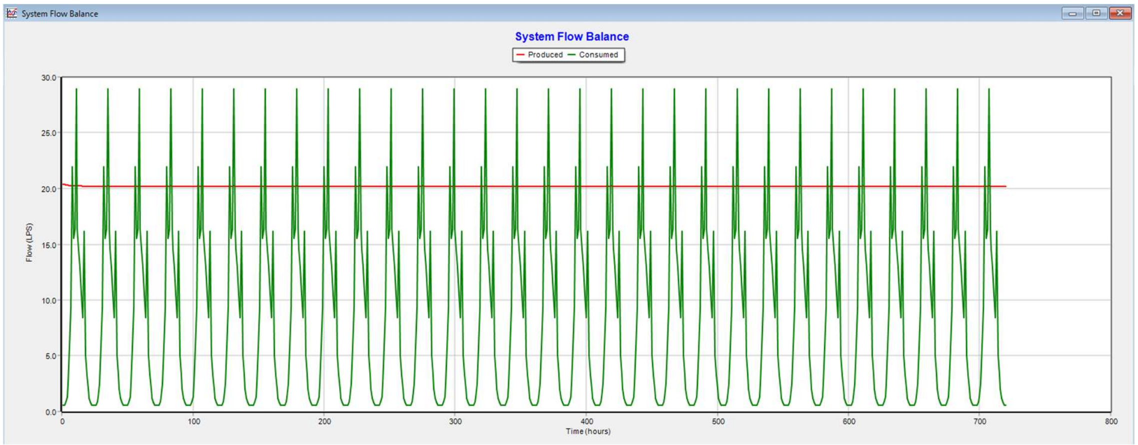


Figure 6 - Stage 1 Storage Tank Inflow Outflow Graph

8.6 Water Treatment Plant Specification

A central Water Treatment Plant (WTP) has been designed by Apex Water NZ to treat groundwater sourced from Bore 1 and Bore 2 prior to distribution across the precincts. The treatment system is engineered to comply fully with the New Zealand Drinking Water Standards (DWSNZ 2022) and to meet the water demand requirements of the entire development.

8.7 Conclusion

The private water supply network for the ASPC development has been comprehensively designed and analysed to ensure a safe, reliable, and sustainable water supply for all precincts. Groundwater from the Rangitopuni Waitemata aquifer has been confirmed to provide sufficient yield, with Bore 1 successfully pump-tested at a sustainable flow of 10.9 L/s. The network design, including additional bores, storage tanks, and booster pumps, provides operational redundancy and resilience, ensuring continuous supply even under peak daily, peak hourly, and firefighting demand scenarios.

EPANET simulations over a 720-hour period demonstrate that the proposed system maintains adequate pressure, meets peak demands, and delivers the required firefighting flows, including an extended 2-hour duration. The central WTP is designed to treat the groundwater in full compliance with New Zealand Drinking Water Standards (DWSNZ 2022), providing safe potable water to the entire development. Overall, the design confirms that the water supply system is robust, scalable, and capable of supporting the development's current and future water requirements.

8.8 Recommendations

1. Staged Bore Development: Implement the additional production bores in stages, as planned, to progressively verify aquifer capacity and monitor cumulative drawdown effects as demand comes online via the construction of the dwellings and commercial areas. Maintain the N+1 operational philosophy for redundancy. To facilitate any future changes in construction timelines A review of the overall water and wastewater demand should be conditioned to be submitted to the council prior to the issue of any building consent. This would facilitate any unforeseen future changes in circumstances such as a faster than anticipated construction build.
2. Regular Pump and Storage Monitoring: Conduct ongoing monitoring of pump performance, storage tank levels, and system hydraulics to ensure long-term reliability and detect any deviations early.
3. Water Quality Testing: Implement routine water quality monitoring at water treatment plant and distribution network to ensure ongoing compliance with DWSNZ 2022 standards.
4. Firefighting System Maintenance: Regularly inspect hydrants, pumps, and storage tanks to maintain firefighting readiness, including adherence to the 1-hour supply criteria.
5. Contingency Planning: Develop contingency plans for unforeseen events such as bore failures, extreme demand spikes, or water quality incidents, including temporary pumping strategies and alternative supply options.
6. Backup Power Provision: Install standby generator capacity to ensure continuous operation of bores, treatment systems, and booster pumps during electricity outages, supporting secure supply and firefighting capability in emergency conditions.

The design is expected to provide adequate fire protection and a sustained water supply for the development.

We recommend monitoring system performance during the initial 2 years of operation and adjusting pump capacities or storage as needed.

9 SAFETY IN DESIGN

Safety in Design principles have been applied throughout the development of the water supply, wastewater collection, treatment, and disposal systems to protect public health, environmental values, system operability, and long-term resilience.

9.1 Wastewater System Safety Considerations

Wastewater contamination of surface water, ground conditions, or groundwater is a key risk associated with onsite treatment and disposal systems. To mitigate this risk, the system has been designed with multiple layers of protection, including:

- Separation distances to streams, sensitive environments, property boundaries, and flood-affected areas, exceeding minimum guideline requirements to minimise environmental risk.
- A LPS network utilising individual sealed boundary pump chambers and maceration units to reduce leakage or blockage potential and prevent uncontrolled wastewater discharge. The LPS system also removes the requirement for manholes improving safety from accidental falls into underground structures.
- A centralised onsite treatment plant with duty/assist pumps, engineered containment, and automated alarm/telemetry systems to ensure operational resilience.
- Onsite land-based disposal and dispersal systems designed to meet standards under GD06, reducing contamination risk and protecting receiving environments.
- A robust maintenance and monitoring program to ensure the treatment plant and reticulation system remain in optimal working condition, including planned downtime during low-demand periods.
- 24/7 onsite staffing to enable rapid response to alarms, emergencies, or operational issues, reducing potential public health and environmental risks.

These design measures ensure risks associated with wastewater leakage, overflow, or treatment failure are minimised as far as reasonably practicable.

9.2 Water Supply System Safety Considerations

Safety in Design principles have also guided development of the multi-source water supply system, which incorporates three groundwater bores, a potential river intake, and rainwater harvesting, supported by a central treatment plant and 3,200m^3 of secured storage for potable water and FW2 firefighting capacity. Key safety measures include:

- Bore construction and sealing to prevent contamination from surface runoff, chemicals, or wastewater infiltration, with periodic water-quality sampling incorporated into the operating regime.
- River intake location and screening to avoid upstream contamination sources, protect aquatic life, and ensure resilience during high-flow and flood events.
- A centralised treatment plant designed to meet New Zealand Drinking Water Standards, incorporating filtration and disinfection to manage microbial and chemical risks.
- Duty/assist pump systems and provision for an external emergency pump connection to safeguard continuous supply.
- Dual-tank storage, with provision for a third tank to ensure continuity during

maintenance or future demand increases.

- Safe access and operational areas allow routine service without compromising safety or water quality.

9.3 General Safety in Design Measures

Additional Safety in Design features incorporated across both water and wastewater systems include:

- Telemetry and automated alarm systems for early fault detection.
- Emergency response capability supported by continuous onsite staffing.
- Redundancy and future-proofing across pumping, storage, and treatment systems.
- Design and operational compliance with relevant New Zealand standards, Council guidelines, public health requirements, and the Firefighting Water Supplies Code of Practice.

Together, these measures ensure the development's essential service systems are designed and operated to protect public health, maintain environmental quality, and provide long-term operational resilience.

9.4 Confined Space

Working close to the stream and on steep batters during earthworks and water and wastewater reticulation construction has been carefully considered in the design. The design approach minimises steep batter areas where machinery will operate, with a maximum working slope of 1 in 3 to ensure safe machinery operation.

Stream-adjacent work will be restricted to a defined safety buffer zone, with no machinery permitted to traverse closer to the stream edge than the height of the bank. If work is required within this zone, it will be undertaken using an excavator operating from outside the zone, thereby limiting exposure to slope hazards.

At the completion of earthworks, steep areas will be planted and stabilised, reducing the likelihood of access by personnel or machinery and improving long-term slope stability.

Groundwater intrusion into trenches is a potential hazard due to trench depth. As part of the Contractor's Health & Safety (H&S) plan, trenches deeper than 1.5 m must include shoring or benching, and pumps must be available to manage any groundwater accumulation.

Manholes within the stormwater and wastewater networks have depths of up to 4 m and are therefore classified as confined spaces. All works in manholes or other confined spaces must be addressed in the Contractor's H&S plan, including appropriate confined space entry procedures, monitoring, and rescue provisions.

McKenzie & Co. will review the Contractor's H&S plan prior to commencement to ensure it adequately addresses all of the above concerns, including:

- Working on steep batters and near stream edges

- Safe operation of machinery on slopes
- Groundwater management in trenches
- Confined space entry and rescue procedures

This approach ensures compliance with Health and Safety at Work Act 2015 requirements and best-practice construction safety standards.

10 CONCLUSION

The proposed consent for the onsite water and wastewater servicing of the ASPC development at 1320 & 1350 Dairy Flat Highway, 89 & 105 Lascelles Drive, and 253 & 237 Postman Road, Auckland has been designed to provide a safe, resilient, and fully functional infrastructure network capable of supporting the long-term operation of the development. The design complies with Auckland Unitary Plan (AUP) provisions and Council engineering standards, ensuring alignment with statutory and best-practice requirements.

The servicing strategy incorporates multi-source water supply, centralised treatment, LPS reticulation, boundary pump kits, land-based wastewater disposal, and sufficient storage and redundancy measures, all designed to minimise operational and environmental risks. Safety in Design principles have been applied to protect public health, ecological values, and operational reliability, including robust provisions for maintenance, monitoring, emergency response, and staff oversight.

Overall, the design carefully considers the potential environmental effects of the development and adopts accepted engineering practices to avoid, remedy, or mitigate impacts to the receiving environment. It provides a future-proof, self-contained, and sustainable servicing solution that supports the safe and efficient use and enjoyment of the ASPC development.

APPENDIX A – ENGINEERING PLANS

BOUND SEPARATELY

APPENDIX B – WASTEWATER CALCULATIONS

BOUND SEPERATELY

WASTEWATER DEMAND CALCULATIONS

PROJECT NAME:	AUCKLAND SURF PARK	**CREATED BY:**	SMB	**CHECK:**	SL
PROJECT NUMBER:	3325	**REV:**	C	**APPROVED:**	SL

	DEMAND AREA	**Type**	**Floor Area (m^2)**	**# of Units / Seats or People per m2**	**Seatings per Day**	**Population**	**Design Wastewater Flow Allowance (L)**	**Design-Flow (m^3/day)**	**(L/s)**	**PF- LPS**	**Peak Flow (L/s)**	**Peak Design Flow-PWWF (m^3/day)**	**Comments**
1	**Accommodation Precinct(Stream Park)**												
	-Stream Park Villa Accommodation	Residential	-	57		171	144	24.6	0.29	1.2	0.34	29.55	WWCOP 180l/p/d per Unit
	-Member Clubhouse with Dining/Pool/Social Area	Wet Retail	488	-		-	-	7.3	0.08	1.2	0.10	8.78	WWCOP 15 liters per day per net m^2
2	**Surf Lagoon + Amenity Precint**												
	The following areas are shown on WAM Design Statement Drawing 4.												
	-Surf Lagoon	Specific	22000					25.00	0.29	1.0	0.29	25.0	Values TBC - note service area line item may include this value
	-Surf Academy and 1st Aid	Dry Retail- II	575	50		11.5	52	0.60	0.01	1.2	0.01	0.7	One small toilet + Cleaners Room. 1 person per 50m^2 of GFA WWCOP.
	-Changing- Shower	Specific	215					36.80	0.43	1.2	0.51	44.2	Max Lagoon Capacity is 84 Surfers per Hr, hrs of operation are 7am-9pm (14hrs). Population 1176 max surfers. As per the operator 40% of the visitors use shower facility. i.e 471 pp*8min per shower* 12l/min=46m3
	-Changing- Toilet	Specific	215					7.68	0.09	1.2	0.11	9.2	Max Lagoon Capacity is 84 Surfers per Hr, hrs of operation are 7am-9pm (14hrs). Population 1176 max surfers. As per the operator 90% of the users the toilet facility. i.e 1059pp*9l/s(4.5l for the toilet and 4.5l for the hand basin)=9.6m3
	-Surf Rental	Dry Retail	475	50		9.5	52	0.49	0.01	1.2	0.01	0.6	WWCOP 1 person per 50m^2 @ 65L
	-Café	Wet Retail	45	73	3	219	16	3.50	0.04	1.2	0.05	4.2	20l per table as per GD06
	-Surf Retail	Dry Retail	255	50		5.1	52	0.27	0.00	1.2	0.00	0.3	WWCOP 1 person per 50m^2 @ 65L
	Surf Lounge	Office Building	75	15		5	52	0.26	0.00	1.2	0.00	0.3	WWCOP 1 person per 15m^2 @ 65L
	-Ticketing/Administration	Dry Retail	275	50		5.5	52	0.29	0.00	1.2	0.00	0.3	WWCOP 1 person per 50m^2 @ 65L
	-Lagoon Restaurant Lunch Service	Wet Retail	575	248	3	744	20	14.88	0.17	1.2	0.21	17.9	25l per table as per GD06
	-Lagoon Restaurant Dinner Service	Wet Retail		248	2	496	24	11.90	0.14	1.2	0.17	14.3	30l per table as per GD06
	-Hotel Accomodation	Hotels & Motels	7965	80		80	144	11.52	0.13	1.2	0.16	13.8	80 Rooms indicated from client. WWCOP 180l per Room
	-Hotel Lunch Service	Wet Retail		114	3	342	20	6.84	0.08	1.2	0.10	8.2	25l per table as per GD06
	-Hotel Dinner Service	Wet Retail		114	2	228	24	5.47	0.06	1.2	0.08	6.6	30l per table as per GD06
	-Surf Park Service Area	Specific	1410				8.8	12.41	0.14	1.2	0.17	14.9	Area TBC. 11l/m2/day heavy water user WWCOP. Rate TBC by operator
													160.49m^3 Surf Precint Total Daily Peak Flow
3	**Surf Village Center Precinct**												
	-Wellness Center	Dry Retail- II	814	1		54	52	2.8	0.03	1.2	0.04	3.4	WWCOP 1 person per 15m^2 @ 65L
	-Food & Beverage Lunch Service	Wet Retail		188	3	564	20	11.3	0.13	1.2	0.16	13.5	25l per table as per GD06
	-Food & Beverage Dinner Service	Wet Retail		188	2	376	24	9.0	0.10	1.2	0.13	10.8	30l per table as per GD06
	-Apartment Accommodation	Residential	5000	115		288	144	41.4	0.48	1.2	0.58	49.7	WWCOP 180l/p/d per Unit
	-Small Scale Retail Units on Ground Floor	Dry Retail	1400	1		28	52	1.5	0.02	1.2	0.02	1.7	WWCOP 1 person per 50m^2 @ 65L
	- Market	Wet Retail	700	1		-		10.5	0.12	1.2	0.15	12.6	WWCOP 15 liters per day per net m^2
	-Day Care	Child Day Care				50	36	1.8	0.02	1.2	0.03	2.2	assumed
						10	40	0.4	0.00	1.2	0.01	0.5	assumed
4	**Live/Work/Precinct**												
	- Work Terraces	Residential	3000	30		60	144	8.6	0.10	1.2	0.12	10.4	WWCOP 180l/p/d per Unit
5	**Data Center**												
	-Data Center Campus	Dry Retail	30111	3		602	52	31.3	0.36	1.2	0.43	37.6	WWCOP 1 person per 50m^2 @ 65L
	-Vacant lot Subdivision	Dry Industry Light	6900	9		-	-	31.1	0.36	1.2	0.43	37.3	WWCOP 4.5 litres per day per net m^2
6	**Neighbourhood Precinct(North-West)**												
	-Residential Neighbourhood	Residential	-	77		231	144	33.3	0.39	1.2	0.46	39.9	WWCOP 180l/p/d per Unit
7	**Neighbourhood Precinct(North-East)**												
	-Residential Neighbourhood	Residential	-	178		484	144	69.7	0.81	1.2	0.97	83.6	WWCOP 180l/p/d per Unit
8	**Neighbourhood Precinct (South)**												
	-Residential Neighbourhood	Residential	-	81		243	144	35.0	0.41	1.2	0.49	42.0	WWCOP 180l/p/d per Unit
9	**Stream Park**												
	- Water & Watewater Treatment Plant	Water treatment effluent	-	-		-	-	125.3	1.45	1.0	1.45	125.3	As per Apex Water's recommendation, 10% of the peak daily demand should be allocated as effluent flow following the water treatment process.
	Total							**583**	**7**		**8**	**669**	

APPENDIX C – WATER CALCULATIONS

BOUND SEPERATELY

WATER DEMAND CALCULATIONS

PROJECT NAME: Auckland Surf Park
CREATED BY: SMB
CHECK: SL
PROJECT NUMBER: 3325
REV C
APPROVED: **SL**

	DEMAND AREA	**Type**	**Floor Area**	**# of Units / Seats or People per m2**	**Seatings per Day**	**Population**	**Design Wastewater Flow Allowance**	**Average Day Demand**		**Peak Day Factor**	**Peak Day Demand**	**Peak Day Demand**	**Peak Hour Factor**	**Peak Hour Demand**	**Fire Fighting Demand**	**Comments**
			(m^2)				**(L)**	**(m^3/day)**	**(L/s)**		**(m^3/day)**	**(L/s)**		**(L/s)**	**(L/s)**	
1	**Accommodation Precinct(Stream Park)**		**22823**												43	As a guide, two thirds of the annual peak consumer demand should be used consecutively with fire flows from hydrants, with resulting reticulation pressures not less than 100 kPa, therefore 2/3 of 23 with the 24l/s requiremt for FW2
	-Stream Park Villa Accommodation	Residential	-	57		171	176	30.1	0.35	2	60.19	0.70	2.5	1.74	2.79	WWCOP 220l/p/d per Unit with 20% reduction for water reduction devices.
	-Member Clubhouse with Dining/Pool/Social Area	Wet Retail	488	-		-	-	7.3	0.08	2	14.64	0.17	2.5	0.42	0.68	WWCOP 15 liters per day per net m² with 20% reduction for water reduction devices.
2	**Surf Lagoon + Amenity Precint**		**58792**													
	The following areas are shown on WAM Design Statement Drawing 4.															
	-Surf Lagoon	Specific	22000					150.00	1.74	1.00	150	1.74	1.0	1.74	2.78	Values TBC by Operator
	-Surf Academy and 1st Aid	Dry Retail- II	575	50		11.5	52	0.60	0.01	2.00	1.20	0.01	2.5	0.03	0.06	One small toilet + Cleaners Room. 1 person per 50m² of GFA WWCOP with 20% reduction for water reduction devices.
	-Changing- Shower	Specific	215					36.80	0.43	2.00	73.60	0.85	2.5	2.13	3.41	Max Lagoon Capacity is 84 Surfers per Hr, hrs of operation are 7am-9pm (14hrs). Population 1176 max surfers. As per the operator 40% of the visitors use shower facility. i.e 471 pp*8min per shower* 12l/min=46m3 with 20% reduction for water reduction devices.
	-Changing- Toilet	Specific	215					7.68	0.09	2.00	15.36	0.18	2.5	0.44	0.71	Max Lagoon Capacity is 84 Surfers per Hr, hrs of operation are 7am-9pm (14hrs). Population 1176 max surfers. As per the operator 90% of the users the toilet facility. i.e 1059pp*9l/s(4.5l for the toilet and 4.5l for the hand basin)=9.6m3 with 20% reduction for water reduction devices.
	-Surf Rental	Dry Retail	475	50		9.5	52	0.49	0.01	2.00	0.99	0.01	2.5	0.03	0.05	WWCOP 1 person per 50m² @ 65L with 20% reduction for water reduction devices.
	-Café	Wet Retail	45	73	3	219	16	3.50	0.04	2.00	7.01	0.08	2.5	0.20	0.32	20l per table as per GD06 with 20% reduction for water reduction devices.
	-Surf Retail	Dry Retail	255	50		5.1	52	0.27	0.00	2.00	0.53	0.01	2.5	0.02	0.02	WWCOP 1 person per 50m² @ 65L with 20% reduction for water reduction devices.
	Surf Lounge	Office Building	75	15		5	52	0.26	0.00	2.00	0.52	0.01	2.5	0.02	0.02	WWCOP 1 person per 15m² @ 65L with 20% reduction for water reduction devices.
	-Ticketing/Administration	Dry Retail	275	50		5.5	52	0.29	0.00	2.00	0.57	0.01	2.5	0.02	0.03	WWCOP 1 person per 50m² @ 65L with 20% reduction for water reduction devices.
	-Lagoon Restaurant Lunch Service	Wet Retail	575	248	3	744	20	14.88	0.17	2.00	29.76	0.34	2.5	0.86	1.38	25l per table as per GD06 with 20% reduction for water reduction devices.
	-Lagoon Restaurant Dinner Service	Wet Retail		248	2	496	24	11.90	0.14	2.00	23.81	0.28	2.5	0.69	1.10	30l per table as per GD06 with 20% reduction for water reduction devices.
	-Hotel Accomodation	Hotels & Motels	7965	80		80	144	11.52	0.13	2.00	23.04	0.27	2.5	0.67	1.07	80 Rooms indicated from client. WWCOP 180l per Room with 20% reduction for water reduction devices.
	-Hotel Lunch Service	Wet Retail		114	3	342	20	6.84	0.08	2.00	13.68	0.16	2.5	0.40	0.63	25l per table as per GD06 with 20% reduction for water reduction devices.
	-Hotel Dinner Service	Wet Retail		114	2	228	24	5.47	0.06	2.00	10.94	0.13	2.5	0.32	0.51	30l per table as per GD06 with 20% reduction for water reduction devices.
	-Surf Park Service Area	Specific	1410				8.8	12.41	0.14	2.00	17.60	0.20	2.5	0.51	0.82	Area TBC. 11l/m2/day heavy water user WWCOP. Rate TBC by operator with 20% reduction for water reduction devices.
3	**Surf Village Center Precinct**		**42986**													
	-Wellness Center	Dry Retail- II	814	1		54	52	2.8	0.03	2	5.64	0.07	2.5	0.16	0.26	WWCOP 1 person per 15m² @ 65L, with 20% reduction for water reduction devices.
	-Food & Beverage Lunch Service	Wet Retail		188	3	564	25	14.10	0.16	2.00	28.20	0.33	2.5	0.82	1.31	25l per table as per GD06, with 20% reduction for water reduction devices.
	-Food & Beverage Dinner Service	Wet Retail		188	2	376	24	9.02	0.10	2.00	18.05	0.21	2.5	0.52	0.84	30l per table as per GD06, with 20% reduction for water reduction devices.
	-Apartment Accommodation	Residential	5000	115		288	176	50.6	0.59	2	101.20	1.17	2.5	2.93	4.69	WWCOP 220l/p/d per Unit with 20% reduction for water reduction devices.
	-Small Scale Retail Units on Ground Floor	Dry Retail	1400	1		28	52	1.5	0.02	2	2.91	0.03	2.5	0.08	0.14	WWCOP 1 person per 50m² @ 65L with 20% reduction for water reduction devices.
	- Market	Wet Retail	700	1		-	-	10.5	0.12	2	21.00	0.24	2.5	0.61	0.97	WWCOP 15 liters per day per net m² with 20% reduction for water reduction devices.
	-Day Care	Child Day Care				50	36.0	1.80	0.02	2	3.60	0.04	2.5	0.10	0.17	assumed 45L/day/Child with 20% reduction for water reduction devices.
						10	40.0	0.40	0.00	2	0.80	0.01	2.5	0.02	0.04	assumed 50L/day/staff with 20% reduction for water reduction devices.
4	**Live/Work/Precinct**		**19870**													
	- Work Terraces	Residential	3000	25		50	176	8.8	0.10	2	17.60	0.20	2.5	0.51	0.82	WWCOP 220l/p/d per Unit with 20% reduction for water reduction devices.
5	**Data Center**		**87537**													
	-Data Center Campus	Dry Retail	30111	3		-	-	2.8	0.03	2	5.54	0.06	2.5	0.08	0.13	WWCOP 1 person per 50m² @ 65L with 20% reduction for water reduction devices.
	-Vacant Lot Subdivision	Dry Industry Light	6900	9		-	-	31.1	0.36	2	62.10	0.72	2.5	0.90	1.44	WWCOP 4.5 litres per day per net m² with 20% reduction for water reduction devices.
6	**Neighbourhood Precinct(North-West)**		**53194**													
	-Residential Neighbourhood	Residential	-	77		231	176	40.7	0.47	2	81.31	0.94	2.5	2.35	3.77	WWCOP 220l/p/d per Unit with 20% reduction for water reduction devices.
7	**Neighbourhood Precinct(North-East)**		**44404**													
	-Residential Neighbourhood	Residential	-	178		484	176	85.2	0.99	2	170.37	1.97	2.5	4.93	7.90	WWCOP 220l/p/d per Unit with 20% reduction for water reduction devices.
8	**Neighbourhood Precinct (South)**		25825													
	-Residential Neighbourhood	Residential	-	81		243	176	42.8	0.50	2	85.54	0.99	2.5	2.48	3.97	WWCOP 220l/p/d per Unit with 20% reduction for water reduction devices.
	Total							**602**	**7**	**2.0**	**1,047**	**12**	**2.5**	**27**	**43**	

Appendix B – Williamson Water & Land Advisory Groundwater Take Assessment

Groundwater Take Assessment

Auckland Surf Park Community - Groundwater Take

AW HOLDINGS (LP) PARTNERSHIPS

WWLA1623 | Rev. 3

04 December 2025

Auckland Surf Park Community - Groundwater Take

Project no:	WWLA1623
Revision:	3
Date:	04 December 2025
Client name:	AW Holdings (LP) Partnerships
Project manager:	Jon Williamson
Author(s):	Asanka Thilakerathne
File name:	G:\Shared drives\Projects\AW Holdings 2021 (LP) Partnership\WWLA1623_Surf Park Water Supply Services\Deliverables\Reports\Groundwater take consent\WWLA Report_Rev_3_Groundwater Take Consent Application_041225.docx

Williamson Water & Land Advisory

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New Zealand
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Document history and status

Rev	Date	Description	By	Review	Approved
1	30 October 2025	First draft for internal review	Asanka Thilakerathne	Jon Willamson	Jon Willamson
2	17 November 2025	Second draft for internal review	Asanka Thilakerathne	Jon Willamson	Jon Willamson
3	04 December 2025	Third draft for internal review	Asanka Thilakerathne	Jon Williamson	Jon Williamson

Distribution of copies

Rev	Date issued	Issued to	Comments
1	30 October 2025	Inovo Ltd / Barkers Ltd	For review on behalf of the client.
2	17 November 2025	Inovo Ltd / Barkers Ltd	For review on behalf of the client.

Contents

1. Statement of Qualifications

1.1 Jon Williamson – Project Technical Director

Jonathan (Jon) Williamson holds a Bachelor of Science in Earth Science, and a Master of Science and Technology first class honours in Hydrology and Geology from the University of Waikato.

Jon is the Managing Director of Williamson Water & Land Advisory (WWLA), a firm he founded in January 2015. Jon has 30 years of professional experience in New Zealand, Australia and the Pacific regions. For the 15 years prior to WWLA he held various technical and managerial roles in the water resource management and irrigation sectors within the Auckland office of Sinclair Knight Merz (now Jacobs). Prior to that, Jon was employed in a global multidisciplinary consulting firm in Sydney and undertook a range of hydrogeological work in the mining and municipal water supply sectors.

Jon has specialist technical expertise in geology, hydrogeology, hydrology and irrigation engineering over a wide spectrum of services including data collection and analysis; field investigations and testing; modelling; engineering design; construction contract management; technical report writing, community and stakeholder consultation; resource consent hearings; and technical working panels.

Of key relevance to this project would be Jon's bore design, procurement and construction experience for a range of project types, including municipal, irrigation, stock and domestic bores. WWLA also owns and operates an Electrical Resistivity Tomography system, hence Jon is well versed in geophysical prospecting for groundwater. Jon also owned and managed a drilling company (WWLA Drilling Services Ltd) for three years that specialised in construction of water supply bores, hence has an innate understanding of the practical and theoretical sides of developing a groundwater supply.

Examples of Jon's previous relevant work experience includes assessment of groundwater effects from bore pumping and dewatering of mines, quarries, highways, tunnels, wind farms, and site developments. Key projects include:

• Dury South Expansion Sutton Block – Hydrogeological reviewer for the EPA	• Auckland International Airport – dewatering of various underground infrastructure developments over recent years
• Taharoa Ironsand Mine	• Maramarua, Rotowaro and Bathurst Coal Mines;
• Oceana Gold's WKP Mine	• Kings Quarry Auckland
• Southland Lignite Mines	• Pike River Underground Coal Mine
• Ihumatao Quarry Expansion	• Waverley Wind Farm
• Grey Lynn Tunnel Central Interceptor Extension	• Waipori Falls Hydroelectric Power Station Penstock Tunnels
• Victoria Park (Roading) Tunnel	• Waterview (Roading) Tunnel
• Puhoi to Wellsford Highway	• Hobson Bay Sewer Tunnel
• Numerous opencut coal mines in the Hunter Valley NSW	• Various gold and iron ore mines in other parts of Australia

Jon confirms that, in his capacity as reviewer of this report, he has read and will abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

1.2 Asanka Thilakerathne – Intermediate Hydrogeologist

The author of the report, Asanka Thilakerathne is an Intermediate Hydrogeologist employed with WWLA since February 2024.

Asanka holds a Bachelor of Science in Geology (University of Peradeniya, Sri Lanka, 2007) and a Master of Science in Hydrogeology and Environmental Management from the Technical University of Darmstadt, Germany (2013). In addition, he completed a Certificate Course in Numerical Groundwater Modelling at the IHE Delft Institute for Water Education, Netherlands (2019).

Asanka has over 13 years of professional experience in hydrogeology, with expertise in groundwater management, geophysical exploration, groundwater recharge studies, borehole construction, and pumping test analysis.

Since joining WWLA, Asanka has contributed to a range of groundwater and environmental projects, including:

- Assisting with the development of groundwater models for the Whanganui District Council and the Rotowaro Extension Mining Project for Bathurst Resources Ltd.
- Conducting groundwater assessments for the Milldale Stage 10–13 development for Fulton Hogan Land Development.
- Assessing dewatering requirements for a wastewater pipeline diversion project in Hamilton.
- Evaluating hydrogeological impacts of sand quarry operations and managing various groundwater consent renewal applications.

2. Introduction

2.1 Overview

This groundwater take assessment has been prepared on behalf of AW Holdings (LP) 2021 Partnerships (the Applicant). The assessment supports a resource consent application under the Fast-track Approvals Act 2024 (FTAA) for a groundwater take for a maximum daily volume of 1,303 m^3, with a maximum annual take of 256,230 m^3, for the purposes of supplying water to the Auckland Surf Park Community including a surf lagoon and associates amenities, a hyperscale artificial intelligence data centre, approximately 500 residential units and subdivision, accommodation, a town centre, and two industrial precincts at 1320 and 1350 Dairy Falt Highway, 89 and 105 Lascelles Drive and 253 and 237 Postman Road, Dairy Flat (the Site).

2.2 Applicant and Property Details

Table 1. Applicant and property details.

Applicant	AW Holdings (LP) 2021 Partnerships
Site address	1350 Dairy Falt Highway, Dairy Flat
Owner / occupier of application site	AW Holdings (LP) 2021 Partnerships
Site area	54.2 ha
Legal Description	Pt Allot 189 Parish of Pukeatua SO 1118A, Pt Allot S264 Parish of Pukeatua SO 1118A, PT ALLT 189 PARO Pukeatua, & Lot 15 DP 65979

2.3 Background

The Applicant is developing the Auckland Surf Park Community which includes a surf lagoon and associates amenities, a hyperscale artificial intelligence data centre, approximately 500 residential units and subdivision, accommodation, a town centre, and two industrial precincts.

Land use consent (Council reference: LUC60444889) was granted in September 2023 to construct three bores on the site to facilitate water requirements. To date, one bore has been completed (**Table 1**). A copy of the bore consent is included at **Appendix A** for reference.

The consent document noted that a further resource consent would be required before the bores could be used. This report focuses on the effects assessment for exercising of all three bores.

Table 1. Bore Locations

Bore ID	Status	Coordinate (East)	Coordinate (North)
Bore 1	Drilled	1747216	5942191
Bore 2	To be drill	1746746	5942043
Bore 3	To be drill	1746911	5942272

Groundwater testing following construction of Bore 1 confirmed that this bore alone has sufficient yield to meet the water requirement needs of the surf park and its associated activities, subject to obtaining the necessary approvals. The bore comprises the following key construction details:

- a bore casing diameter of 154 mm;
- a casing depth of 400 m (cement grouted in place);
- an open hole from 400 m to the base of bore at 680 m.

A copy of the as-built drilling log is included in **Appendix B**.

3. Environmental Setting

3.1 Site Location and Description

The proposed development site, as shown in **Figure 1**, covers an area of 54.2 hectares and was previously used for residential, agricultural and livestock farming purposes. Earthworks to support the planned development of Stage 1 have already commenced on the site.

The site is bounded by Postman's Road to the east and Dairy Flat Highway to the west, with rural lifestyle properties located to the north and south. Two unnamed tributaries, which receive water from farm drains, flow across the site and discharge into the Rangitopuni Stream, located approximately 100 m west of the site (refer to **Figure 1**). A recently constructed bore is situated near the centre of the site, approximately 88 m north and 200 m east of the two unnamed tributaries flows through the site.

3.2 Geology

The geology from the QMAP[1] database of the Auckland area is shown in **Figure 2** and summarised from the published text for the 1:250 000 geology map for Auckland[2] in **Table 2**

Table 2. Lithological classification for the area.

Unit	Main Rock	Sub Rock	Strata name	Description	Age Million Years	
					Min.	Max
Q5+Q2.und	mud	sand, silt, clay, peat	Tauranga Group	Predominantly pumiceous sand, silt, mud and clay, with interbedded gravel and peat.	0.014	0.128
lElOl.lst_all	limestone	sandstone, greensand	Mahurangi Limestone	Blue-grey to white, micritic, coccolith foraminiferal, muddy limestone, commonly with thin glauconitic sandstone beds: commonly closely shattered. Rare crystalline limestone.	16.4	49
eMi.sst7	turbidite	sandstone, mudstone, grit	East Coast Bays Formation	Alternating sandstone and mudstone with variable volcanic content and interbedded volcaniclastic grits.	16.4	23.8
lKPa.mst2_all	mudstone		Hukerenui Mudstone	Red, brown, green and grey, typically noncalcareous, commonly highly sheared mudstone, with small serpentinite bodies.	37	98.9
lKeE.mst_all	mudstone	siltstone	Whangai Formation	Cream to grey, siliceous and sometimes calcareous mudstone to fine sandy siltstone.	54.8	98.9

The area is directly underlain by older (Late-Middle Pleistocene) Tauranga Group alluvium (lQa) comprising mostly locally derived stream alluvium. The alluvial deposits are underlain by Mahurangi Limestone (lElOl.lst_all) of Northland Allochthon, which also outcrops in north and eastern part of the site where no alluvium is present.

---

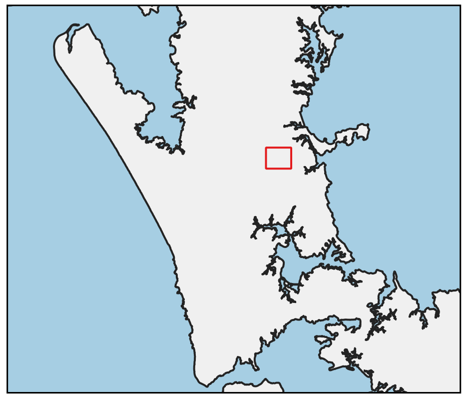
[1] GNS Science. (2012). 1:250 000 Geological Map of New Zealand [Data set]. GNS Science. https://doi.org/10.21420/QF82-7D42

[2] Edbrooke. S.W. (compiler) 2001: Geology of the Auckland area. Institute of Geological & Nuclear Sciences 1:250 000 geological map 3. 1 sheet +74 p. Lower Hutt„ New Zealand. Institute of Geological & Nuclear Sciences Limited.

Map Title:
Location Map

Project:
Surf Park Water Supply Services

Client:
AW Holdings (LP) 2021 Partnerships



Legend

Applicant Bore Locations

- ✚ **Drilled**
- ✚ **To be drill**
- — **Road**
- — **State Highway**
- — **River/Stream**
- 🟦 **Lake/Pond**
- 🟩 **Wetlands**
- ☐ **Land Parcells**

Data Provenance
Aerial Imagery from Land Information New Zealand

Drawn by: Asanka Thilakerathne
04/12/2025

Layout & Project File
Surface Water

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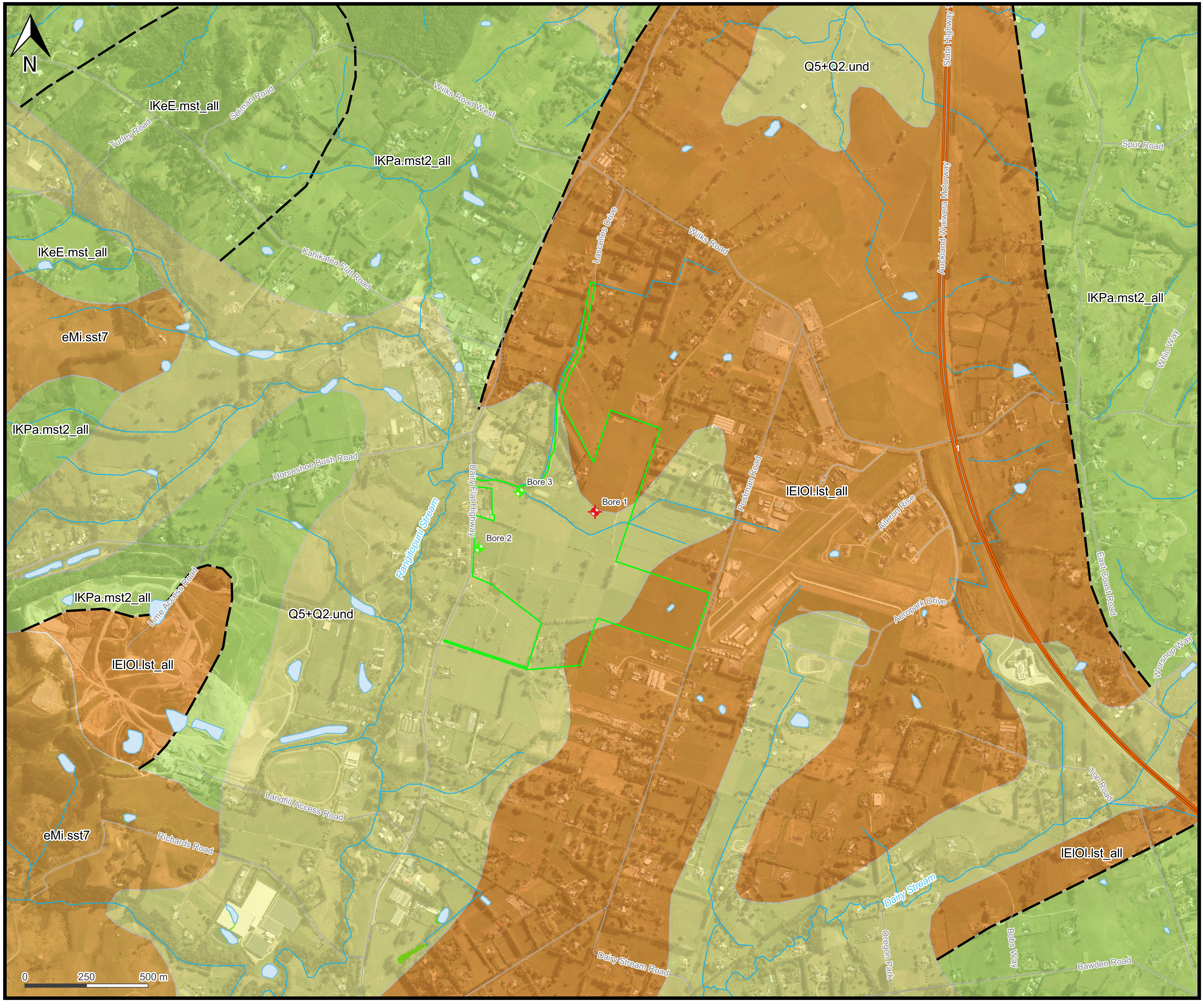
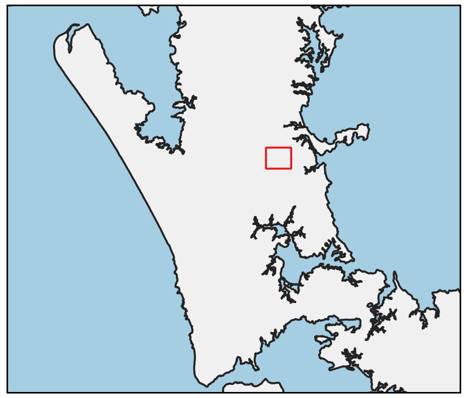
Figure 1



Map Title:
Geological Overview

Project:
Surf Park Water Supply Services

Client:
AW Holdings (LP) 2021 Partnerships



Legend

Applicant Bore Locations

- ✚ **Drilled**
- ✚ **To be drill**
- — **Road**
- — **State Highway**
- — **River/Stream**
- ▭ **Lake/Pond**
- 🟩 **Wetlands**
- ▭ **Land Parcells**

Geology

- — **Faults**

Geological units

- ▭ **Q5+Q2.und (mud)**
- ▭ **eMi.sst7 (turbidite)**
- ▭ **IEIOl.lst_all (limestone)**
- ▭ **IKPa.mst2_all (mudstone)**
- ▭ **IKeE.mst_all (mudstone)**

Data Provenance
Aerial Imagery from Land Information New Zealand

Drawn by: Asanka Thilakerathne
04/12/2025

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Surface Water

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Figure 2

The Mahurangi Limestone represents a marine sedimentary formation composed mainly of micritic, coccolith-foraminiferal, muddy limestone, with interbedded thin glauconitic sandstone layers. The rock is typically blue-grey to white, micritic, and commonly shattered, which can enhance secondary porosity and permeability, allowing for moderate groundwater yield through fractures and dissolution zones, if not infilled with clay - which is more typical of this rock. The formation's age ranges from approximately 16.4 to 49 million years (Eocene to Miocene), reflecting deposition in a shallow marine environment.

It is likely that the East Coast Bays Formation sandstone of the Waitematā Group, that outcrops to the west of site, underlies the Northland Allochthon mudstone. The adjacent Hukerenui Mudstone (lKPa.mst2_all), located west of the site, is red to grey, non-calcareous, and highly sheared, indicating low permeability and limited groundwater potential.

The basement rock in the area is inferred to be greywacke, although no outcrops have been observed in the vicinity. There are two faults mapped immediately to the west and east the site, which pre-date the alluvial deposits (**Figure 2**).

3.3 Geomorphology

The Dairy Flat area is characterised by a broad alluvial valley, gently rolling hills to the sides and weathered marine sediments overlain by volcanic and alluvial materials. The site lies along the flat terrain with an elevation ranging from approximately 49 to 68 mAMSL, the highest elevation was observed in northern and eastern boundaries of the site. Surface water flow direction is east to west.

3.4 Hydrogeology

Based on information available on the Auckland Council website, the aquifer underlying the site is Rangitopuni Aquifer[3], characterised as a sub group of the Waitemata Aquifer.

In Auckland Unitary Plan Operative in Part (AUP-OP) (Appendix 3: *Table 1. Aquifer water availabilities*), no specific water allocation limit is mentioned for Rangitopuni Waitemata Aquifer. Orewa Waitemata Aquifer is located north of the above aquifer, which has an allocation limit assigned and for context the quantum of this is 858,000 m^3/year.

Shallow groundwater discharges into unnamed tributaries at the middle of the site and ultimately flows to Rangitopuni Stream.

The production aquifer intersected by the applicant's bore comprises a 317 m thick greywacke formation that is overlain by approximately 290 m of Waitemata Group mudstone and siltstone, encountered between 73 m and 363 m below ground level (BGL), which given its limited fracturing and yield potential (hence reason for drilling deeper) forms an effective confining layer above the production aquifer. A shallow limestone bed, approximately 73 m thick, also contributes to the overall confinement. The static water level (SWL) measured upon completion of bore construction was 54 mBGL.

3.5 Surface Water

Raigitopuni Stream, which runs about 100 m from the western boundary to the site is approximately 17 km long and connect to the ocean at Riverhead. It is the primary surface drainage for the catchment.

The New Zealand Ministry for the Environment GIS database indicates that there are four wetlands within a 3 km radius of the current bore location, with wetland types classified as swamp and gumland. The closest wetland is a swamp 1,750 m to the south-west (**Figure 1**).

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[3] https://geomapspublic.aucklandcouncil.govt.nz/viewer/?utm_source

3.6 Surrounding Bore and Water Take

A review of bore logs from WellsNZ data base[4] for bores confirmed there are 33 bores including monitoring wells within 3 km radius of the newly constructed bore (**Figure 3**). The potential effects on other groundwater users are discussed further in **Section 5.2.1.2.**

Based on the available data, bores in the area have been drilled to depths ranging from 3.25 m to 135 m below ground level (m BGL). The recorded static water level (SWL) data indicates an average SWL of 13.5 m BGL and a maximum of 37 m BGL. The nearest bore (Council ID 22128) is located approximately 709 m northeast of the site and is likely a monitoring bore with a depth of 3.25 m.

Table 3. Details of the bores within 3 Km radius of Surf Park production bore

Council well number	Easting (NZTM)	Northing (NZTM)	Depth (m)	Diameter (mm)	Static water level (mBGL)	Drilling date	Distance from the Applicant's Bore (m)
22128	1746790	5942820	3.25	Not available	0.2	24/06/2004	709
5468	1747800	5942950	60	Not available	Not available	Not available	963
1119	1746100	5941700	Not available	Not available	Not available	Not available	1,191
1121	1746100	5941700	Not available	Not available	Not available	Not available	1,191
487	1746400	5941300	10	50	Not available	Not available	1,201
20251	1746000	5941600	13.5	Not available	Not available	4/06/1998	1,325
954	1746300	5941100	Not available	Not available	Not available	Not available	1,420
1074	1746000	5941400	Not available	Not available	Not available	Not available	1,430
1076	1746000	5941400	Not available	Not available	Not available	Not available	1,430
2294	1745700	5942200	85	Not available	Not available	1/01/1900	1,470
927	1746300	5941000	56	150	Not available	6/09/1988	1500
4799	1745540	5941885	Not available	Not available	Not available	Not available	1665
21761	1745490	5941800	Not available	Not available	Not available	23/09/2002	1732
21462	1748880	5941594	9.23	Not available	2.6	6/07/2001	1822
21241	1745442.1	5941574.9	59.4	165	7.9	29/06/2000	1845
485	1745300	5942100	10	50	Not available	Not available	1874
4940	1745300	5942000	13.5	100	Not available	12/12/1995	1883
5219	1745300	5942000	20.3	100	Not available	5/03/1996	1883
713	1745500	5941200	7.5	200	Not available	30/05/1991	1958
5272	1745300	5941600	29	Not available	Not available	10/04/1996	1971
29248	1745319	5941466	40	Not available	Not available	11/02/2004	2000
263	1745200	5941600	60	25	Not available	Not available	2066
2284	1745100	5942200	85	Not available	Not available	1/01/2000	2070
21529	1745168	5941624	36	32	0.3	15/12/2000	2090
29247	1745127	5941563	40	Not available	Not available	7/09/2006	2147

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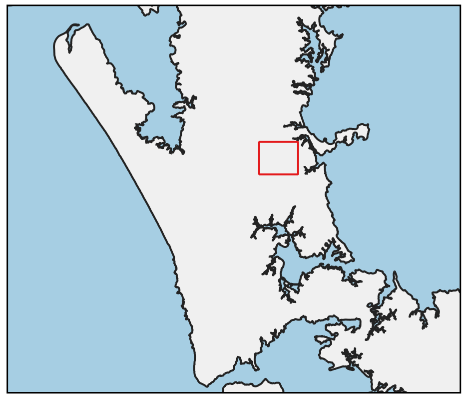
[4] https://wellsnz.teurukahika.nz/

Council well number	Easting (NZTM)	Northing (NZTM)	Depth (m)	Diameter (mm)	Static water level (mBGL)	Drilling date	Distance from the Applicant's Bore (m)
21528	1745288	5941046	40.5	32	2.5	7/12/2000	2220
21527	1744996	5941702	49.6	32	2	10/01/2001	2236
21323	1745206	5941150	40.5	32	3.2	2/12/2000	2238
27858	1744970.8	5941664.5	Not available	Not available	Not available	5/02/2010	2269
5218	1744900	5941700	10.5	100	Not available	25/03/1996	2330
20250	1745010	5941330	35.5	Not available	Not available	29/05/1998	2337
5309	1745000	5941200	8	100	Not available	8/03/1996	2399
21725	1749660	5941660	135	Not available	37	26/02/2003	2553

Map Title:
Bores within 3 km radius

Project:
Surf Park Water Supply Services

Client:
AW Holdings (LP) 2021 Partnerships



Legend

✛	Applicant Bore
✛	Surrounding Bores
—	Road
—	State Highway
—	River/Stream
▭	Lake/Pond
🟩	Wetlands
▭	Land Parcells
▭	3 km buffer

Data Provenance
Aerial Imagery from Land Information New Zealand

Drawn by: Asanka Thilakerathne
28/10/2025

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Figure 3

4. Description of Proposed Activity

4.1 Overview

It is proposed to abstract up to 1,303 m^3/day, with an annual take of up to 256,230 m^3/year of groundwater from the Rangitopuni Waitemata aquifer by the constructed bore.

4.2 Existing Bore

The existing bore was drilled and constructed on 11 September 2025 by DrillForce NZ Ltd. A copy of the bore log is included as **Appendix D** of this document.

The production bore (Permit No: LUC60444889) has the following specifications:

- Casing diameter of 154 mm;
- Total depth 680 m;
- Open hole from 400 to 680 mBGL; and
- Static water level at the time of drilling was 54 mBGL.

4.3 Water Use Requirement and Efficiency

The 256,230 m^3/year annual allocation requested is based largely on the water demand calculation prepared by the Mackenzie & Co (**Table 4**).

The Surf Park development has a total average day water demand of approximately 701.5 m^3/year (equivalent to around 8 L/s) and a peak day demand of about 1,303 m^3/year (approximately 15 L/s). The peak hour flow is estimated to reach 21.5 L/s for about 2.5 hours within a day, which will be met by on site storage in addition to the bore flows.

The highest water consumers are the planned residential neighbourhoods, particularly the North-East and South Precincts, which together contribute the majority of the total demand. The Surf Lagoon and associated amenities also account for a significant portion of the water use, due to the operational nature of this facility. Commercial and hospitality components such as the Lagoon Restaurant, Hotel, and Wellness Centre add moderate demand, while smaller uses like light industry, and data centre operations contribute relatively minor amounts.

Overall, the water demand pattern is dominated by residential and recreational uses, with daily consumption expected to increase substantially during peak periods.

Table 4. Water demand calculation.[5]

Demand Area	Type	Area	Units	No: of People	Water Demand	Average Day Demand		Peak Day Factor	Peak Day Demand	Peak Hour Factor	Peak Hour Demand
		(m^2)			(L/p/day)	(m^3/day)	(L/s)		(m^3/day)		(L/s)
Accommodation Precinct (Stream Park)		**22,823**									
Stream Park Villa Accommodation	Residential	-	60	180	220	39.6	0.46	2	79.2	2.5	1.15

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[5] WATER AND WASTEWATER SERVICING REPORT, Auckland Surf Park, AW Holdings Limited by Mackenzie &Co

Demand Area	Type	Area	Units	No: of People	Water Demand	Average Day Demand		Peak Day Factor	Peak Day Demand	Peak Hour Factor	Peak Hour Demand
		(m^2)			(L/p/day)	(m^3/day)	(L/s)		(m^3/day)		(L/s)
Member Clubhouse with Dining/Pool/Social Area	Wet Retail	700	-	-	-	7.5	0.12	2	15	2.5	0.3
Surf Lagoon + Amenity Precinct		**58,792**									
Surf Lagoon		-	-	-	-	100	1.74	1	100	1.5	2.6
Surf Park Operation	Dry Retail	1,410	1	28	65	1.8	0.02	2	3.67	2.5	0.05
Ticketing/Administration	Office Building	350	1	23	65	1.5	0.02	2	3.03	2.5	0.04
Changing	Specific	280	1	-	-	8.4	0.1	2	16.8	2.5	0.24
Surf Rental	Dry Retail	260	1	5	65	0.3	0.004	2	0.68	2.5	0.01
Surf Academy	Dry Retail- II	660	1	44	65	2.9	0.03	2	5.72	2.5	0.08
Surf Retail	Dry Retail	260	1	5.2	65	0.3	0.004	2	0.68	2.5	0.01
Lagoon Restaurant/F&B	Wet Retail	675	2	-	-	10.1	0.12	2	20.25	2.5	0.29
Hotel Accommodation	Hotels & Motels	1,102	81	-	-	18.2	0.21	2	36.4	2.5	0.53
Surf Village Centre Precinct		**42,986**									
Wellness Centre	Dry Retail- II	750	1	50	65	3.3	0.04	2	6.5	2.5	0.09
Food & Beverage Pavillion Building check for Brewery	Wet Retail	780	1	-	-	5	0.14	2	10	2.5	0.34
Apartment Accommodation	Residential	5,000	115	288	220	63.3	0.73	2	126.5	2.5	1.83
Small Scale Retail Units on Ground Floor	Dry Retail	1,400	1	28	65	1.8	0.02	2	3.64	2.5	0.05
Market	Wet Retail	700	1	-	-	10.5	0.12	2	21	2.5	0.3
Day Care	Child Day Care (Student)			50	45	2.25	0.03	2	4.5	2.5	0.07
	Child Day Care (Staff)			10	50	0.5	0.01	2	1	2.5	0.01
Live/Work/Precinct		**19,870**									
Work Terraces	Residential	3,000	30	60	220	13.2	0.15	2	26.4	2.5	0.38
Light Industrial/Workshops	Dry Industry Light	3,700	8	-	-	10	0.26	2	10	2.5	0.64
Data Center		**87,537**									
Data Centre Campus	Dry Retail	30,111	3	-	-	2.8	0.03	2	5.54	2.5	0.08
Industrial Subdivision	Dry Industry Light	15,252	9	-	-	40	0.79	2	80	2.5	1.98

Demand Area	Type	Area	Units	No: of People	Water Demand	Average Day Demand		Peak Day Factor	Peak Day Demand	Peak Hour Factor	Peak Hour Demand
		(m^2)			**(L/p/day)**	**(m^3/day)**	**(L/s)**		**(m^3/day)**		**(L/s)**
Neighbourhood Precinct (North-West)		**53,194**									
Residential Neighbourhood	Residential	-	73	329	220	72.3	0.84	2	144.54	2.5	2.09
Neighbourhood Precinct (North-East)		**44,404**									
Residential Neighbourhood	Residential	-	180	810	220	178.2	2.06	2	356.4	2.5	5.16
Neighbourhood Precinct (South)		25,825									
Residential Neighbourhood	Residential	-	111	500	220	109.9	1.27	2	219.78	2.5	3.18
Stream Park		**58,374**									
Water & Wastewater Treatment Plant	Dry Retail	850	4	17	65	1.1	0.01	2	2.21	2.5	0.03
Total						**701.5**	**9**		**1,303**		**21.57**

The applicant acknowledges the importance of using water efficiently and minimising wastage, and will implement the following conservation practices:

- ***Regular Maintenance*** - Regularly maintain irrigation systems, and other water-using equipment to prevent leaks and improve efficiency.
- ***Water Monitoring*** – The take will be installed with a water meter at the headworks and will record the volume of water taken on a 15 minute basis, with the data transmitted to Auckland Council via automatic telemetry on a daily basis.

5. Assessment of Effects

This section details the assessment of effects associated with the proposed groundwater take. This assessment also outlines the measures that the applicant proposes to avoid, remedy or mitigate any potential adverse effects on the environment.

5.1 Positive Effect

The proposed groundwater take will enable the Applicant to secure a reliable source of water to support operation of the Surf Park. This will be achieved by using water in an efficient manner, which will also enable existing users in the area to continue to be able to meet their reasonable and foreseeable needs. Therefore, it is concluded that the proposed groundwater take will contribute to the economic and social well-being of the area.

5.2 Resource and Allocation Availability

The aquifer underlying the site is classified in the AUP (Appendix 3. Table 1) as the Rangitopuni Waitemata Aquifer. Water availability from this aquifer has been provided by Auckland Council (Louwrens Le Roux, 17/11/25) as summarised in **Table 5**.

Table 5. Water Availability (m^3/year) for Rangitopuni Waitemata Aquifer.

Supply	Allocation Limit	530,000
Demand	Consented allocation	42,650
	Permitted Activity Takes	40,000
	AC model S14(3)(b)	81,423
	Total water demand	164,073
Remaining availability		365,927

AC has reported that the current allocation limit is 530,000 m^3/year, and consented and permitted allocation accounted for is 164,073 m^3/year. Therefore, 365,927 m^3/year remains available for allocation.

The current application seeks a maximum annual take of 256,230 m^3/year, which is well within the available allocation. Therefore, sufficient allocation remains to support the proposed take.

5.2.1 Effects on Groundwater

The following sections summarise the maximum level of effects that can be anticipated to result from the proposed groundwater take.

To assist in the assessment of pumping effects of the proposed water take, an analytical groundwater model was developed to simulate the groundwater response from the proposed maximum abstraction rate (256,230 m^3/annum). The modelling methodology and results are detailed in **Appendix C**, and the effects predicted by the model are summarised in the following sections.

5.2.1.1 Groundwater Drawdown

Predictive modelling undertaken for this assessment calculated 200 m of drawdown in the deep aquifer (represented by Layer 3 in the model) adjacent to the bore after 197 days of continuous pumping at the maximum rate, reducing to 1 m at a distance of 2.7 km from the bore. The details of the model setup and hydraulic parameters applied in the analytical model are provided in **Appendix C**.

After 197 days of pumping, model results show 0.13 m of shallow aquifer or water table drawdown (represented by Layer 1 in the model) adjacent to the bore, reducing to less than 0.1 m at a radius of 500 m from the bore.

5.2.1.2 Neighbouring Bores

Based on the data available in Wells Aotearoa NZ database, there are currently 36 bores within the 0.2 drawdown contour, extending 3,900 m from the pumping bore. **Table 6** lists the interference effects on neighbouring bores from pumping of the Applicant's bore and the estimated available drawdown remaining in these bores.

The assumptions applied for the calculations in **Table 6** are as follows:

- Bore pump has been positioned 2 m above the casing bottom
- The FWM (as described in **Appendix C**) has been used to calculate drawdown directly adjacent to the bore;
- The cumulative drawdown at neighbouring bores was determined from FWM results at the radius corresponding to the distance between the given bore and the application bore.

Available static water level (SWL) measurements were interpolated to estimate the SWL of all 36 bores within the potentially affected area, which was then used to assess the potential drawdown impact from the proposed take.

The closest bore of meaningful depth (#5468) located 963 m from the applicant's bore and screen within layer 1 is predicted to experience a drawdown of 0.05 m, representing 0.1% of its available drawdown. This is the maximum anticipated impacts for shallow bores in the area.

Greater potential drawdown effects occur with increasing depth, although there are no other bores located in the greywacke aquifer represented by Layer 3 of the model. There are twelve bores located in Layer 2 of the model. Examination of the anticipated drawdown in the closest of these (#1119) at a radius of 1,191 m indicates a potential drawdown of up to 4.5 m after 197 days of continuous pumping at the proposed rate. This represents 6% of the available drawdown in the bore and given there is 73.5 m of available drawdown remaining, is unlikely to impact on its production.

All other bores have a lesser drawdown impact. Based on the analysis, the drawdown effect on neighbouring bores within the zone of influence of the Applicant's bore are considered negligible.

Table 6. Maximum drawdown in neighbouring bores based on pumping in the Applicant bore.

Bore ID	Distance	Bore Depth	Model Layer	Base of Casing*	Static Water Level	Drawdown due to proposed take	Available drawdown**	Remaining available drawdown	% of impact
	(m)	(m)		(mBGL)	(mBGL)	(m)	(m)	(m)	
22128	709	3.25	1	0.25	0.2	Bore positioned in Layer 1 (Shallow bore < 20 m deep)			
5468	963	60	1	57	3.7	0.04	51.30	51.25	0.1
1119	1191	*100*	2	80	4.5	1.79	73.48	71.69	2.5
1121	1191	*100*	2	80	4.5	1.79	73.48	71.69	2.5
487	1201	10	1	7	3.7	Bore positioned in Layer 1 (Monitoring bore)			
20251	1325	13.5	1	10.5	5.1	Bore positioned in Layer 1 (Shallow bore < 20 m deep)			
954	1420	*100*	2	80	3.8	1.32	74.17	72.85	1.8
1074	1430	*100*	2	80	5.0	1.30	73.00	71.70	1.8
1076	1430	*100*	2	80	5.0	1.30	73.00	71.70	1.8
2294	1470	85	2	82	3.8	1.23	76.25	75.01	1.6
927	1500	56	1	53	3.7	0.02	47.26	47.25	0.0
4799	1665	*100*	2	80	5.1	0.94	72.88	71.94	1.3
21761	1732	*100*	2	80	5.5	0.85	72.51	71.66	1.2

Bore ID	Distance	Bore Depth	Model Layer	Base of Casing*	Static Water Level	Drawdown due to proposed take	Available drawdown**	Remaining available drawdown	% of impact
	(m)	(m)		(mBGL)	(mBGL)	(m)	(m)	(m)	
21462	1822	9.23	1	6.23	2.7	Bore positioned in Layer 1 (Shallow bore < 20 m deep)			
21241	1845	59.4	1	56.4	7.8	0.01	46.61	46.60	0.0
485	1874	10	1	7	3.3	Bore positioned in Layer 1 (Monitoring bore)			
4940	1883	13.5	1	10.5	3.4	Bore positioned in Layer 1 (Shallow bore < 20 m deep)			
5219	1883	20.3	1	17.3	3.4	0.01	11.87	11.86	0.1
713	1958	7.5	1	4.5	4.6	Bore positioned in Layer 1 (Shallow bore < 20 m deep)			
5272	1971	29	1	26	3.9	0.01	20.05	20.05	0.0
29248	2000	40	1	37	4.6	0.01	30.37	30.37	0.0
263	2066	60	1	57	1.3	0.01	53.69	53.68	0.0
2284	2070	85	2	82	2.7	0.51	77.33	76.82	0.7
21529	2090	36	1	33	0.4	0.01	30.60	30.59	0.0
29247	2147	40	1	37	1.1	0.01	33.90	33.90	0.0
21528	2220	40.5	1	37.5	2.5	0.00	32.96	32.95	0.0
21527	2236	49.6	1	46.6	2.0	0.00	42.64	42.64	0.0
21323	2238	40.5	1	37.5	3.2	0.00	32.30	32.30	0.0
27858	2269	*100*	2	80	1.8	0.37	76.23	75.87	0.5
5218	2330	10.5	1	7.5	1.9	Bore positioned in Layer 1 (Shallow bore < 20 m deep)			
20250	2337	35.5	1	32.5	2.1	0.00	28.44	28.44	0.0
5309	2399	8	1	5	2.2	Bore positioned in Layer 1 (Shallow bore < 20 m deep)			
21725	2553	135	2	80	37.0	0.23	41.00	40.77	0.6
2323	3067	216	2	80	21.5	0.09	56.53	56.45	0.2
4653	3666	85	1	82	6.1	0.00	73.89	73.89	0.0
21584	3742	22.84	1	19.84	32.7	0.00	-14.86	-14.86	0.0

*Base of the casing assumes 80 mBGL, if bore depth is more than 100 m else 3 m below bore depth.

**Available drawdown calculation assumes pump is 2 m above the bottom of the casing.

Italic underline- Assumed bore depth of 100 m.

Italic – Measured SWL

Bold – Bore diameter <= to 50 mm. Probably monitoring bores.

5.2.2 Stream Depletion Effects

Potential effects on surface water bodies were considered by calculating the portion of the groundwater take that is derived from each hydrogeological layer represented within the model, as presented in **Figure 6**. To produce a conservative assessment of potential stream depletion, it was assumed that all of the water deriving from Model Layer 1 was directly contributing to stream depletion.

The simulation results indicate that after 197 days of continuous pumping, about 14% of the abstraction volume derives from Layer 1, equating to a stream depletion effect of 182 m^3/day (2.1 L/s). A stream is typically considered to be an indirectly connected groundwater system if less than 60% of the water produced from the bore was derived from connection to a stream after a significant period of pumping. On that basis, the allocation would be considered as groundwater for consenting purposes and surface water regulations would not apply.

NIWA's NZ River Maps Web Application indicates the mean annual low flow (MALF) in the Rangitopuni Stream immediately downgradient of the site is 22.0 L/s or 1,900 m^3/day. The predicted impact is expected to be distributed over a large area and may also derive some of the water from Dairy Stream to the southeast, which has a MALF of 12.7 L/s (1,097 m^3/day). In the context of this application, the potential effects assuming 60% is experienced within Rangitopuni Stream and the remainder in Dairy Stream represent a weighted average stream depletion of 5.8% and a maximum of 6.7% of MALF.

Furthermore, i) the model does not account for recharge and ii) the assumed pumping rate of 1,303 m^3/year represents a maximum scenario, which is unlikely to occur continuously over the 197-day period. Therefore, given the estimated effect on MALF is less than the default surface water take allocation (30% MALF), no adverse effects on aquatic habitats are considered likely.

On this basis any stream depletion effects arising from the proposed take are considered to be insignificant.

5.2.3 Effects on Wetlands

The greatest drawdown predicted to wetland mapped by LENZ and is classified as 'Swamp', approximately 1,750 m south from the bore location. The maximum drawdown from Model Layer 1 at this location is predicted to be 0.012 m, which would reduce further when accounting for drainable porosity.

Given that the model does not account for the rainfall recharge and surface water flow which are the dominant water sources for wetlands in this area, given the disconnection from deep groundwater, the predicted drawdown is considered to be conservative. The overall effect on wetland is considered imperceptible.

5.2.4 Saline Intrusion Effects

This assessment considered potential for saline intrusion to occur as a result of the proposed take in the context of the lateral distance from any seawater source, the depth of the bore, and the hydrogeological conditions. The analysis of potential saline intrusion is presented in detail in **Section C.9** of **Appendix C**.

While the pumped water level was simulated to be on the order of 198 m below sea level, the closest sea water source, the estuary is approximately 7 km away. Given that the bore is cased to a depth of 400 m with impermeable materials vertically separating the deep Waitemata Aquifer from surface features such as the estuary and the coast, which are both also separated by a significant lateral distance, the actual risk of saline intrusion developing is considered low.

5.2.5 Ground Settlement Effects

Land settlement effects have the potential to occur when compressible layers within the ground are dewatered.

For this proposal the maximum drawdown occurs at depth in the Greywacke, which very stiff and of low compressibility. No subsidence is anticipated for this units of those above it which experience lesser subsidence rates, hence ground settlement effects would be irrelevant.

6. Conclusion

The proposal involves a groundwater take to support supplying water to Auckland Surf Park Community at 1320 and 1350 Dairy Falt Highway, 89 and 105 Lascelles Drive and 253 and 237 Postman Road, Dairy Flat. Based on the above report it is considered that any adverse effects in relation to the proposed groundwater take will be negligible.

Appendix A. Bore Drilling Consent

Appendix B. Production Bore as Built Drill Log

Production Bore As Built Design

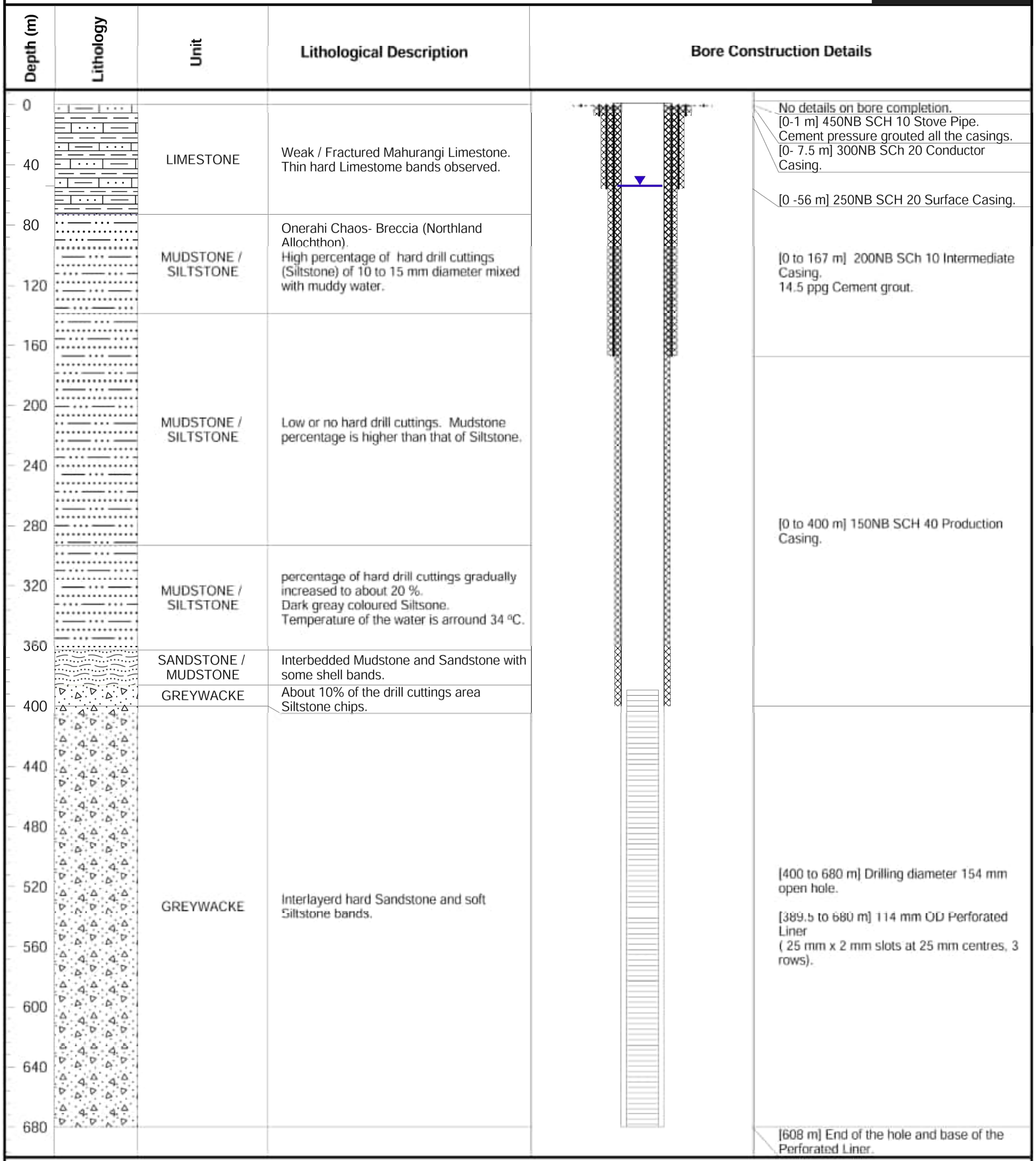
Bore: Water Supply Production Bore (31647 BH1)

Project Name:	Auckland Surf Park	**Location:**	1350 Dairyflat highway, Silverdale
Project Number:	WWLA1623	**Designer:**	Basset Plumbing Limited

BORE DRILLING DETAILS

Drilling Company:	Drill Force	**Diameter (mm):**	154	**Depth (m):**	680
Drilling Date:	Sept-2025	**Easting (m):**	17472170	**Northing (m):**	5942222
Drilling Method:	Mud Rotary	**Ground Elev.(approx.):**			

WWLA



Unit	Lithological Description
LIMESTONE	Weak / Fractured Mahurangi Limestone. Thin hard Limestone bands observed.
MUDSTONE / SILTSTONE	Onerahi Chaos- Breccia (Northland Allochthon). High percentage of hard drill cuttings (Siltstone) of 10 to 15 mm diameter mixed with muddy water.
MUDSTONE / SILTSTONE	Low or no hard drill cuttings. Mudstone percentage is higher than that of Siltstone.
MUDSTONE / SILTSTONE	percentage of hard drill cuttings gradually increased to about 20 %. Dark greay coloured Siltstone. Temperature of the water is arround 34 ºC.
SANDSTONE / MUDSTONE	Interbedded Mudstone and Sandstone with some shell bands.
GREYWACKE	About 10% of the drill cuttings area Siltstone chips.
GREYWACKE	Interlayerd hard Sandstone and soft Siltstone bands.

Bore Construction Details

No details on bore completion.

[0-1 m] 450NB SCH 10 Stove Pipe.

Cement pressure grouted all the casings.

[0- 7.5 m] 300NB SCh 20 Conductor Casing.

[0 -56 m] 250NB SCH 20 Surface Casing.

[0 to 167 m] 200NB SCh 10 Intermediate Casing.
14.5 ppg Cement grout.

[0 to 400 m] 150NB SCH 40 Production Casing.

[400 to 680 m] Drilling diameter 154 mm open hole.

[389.5 to 680 m] 114 mm OD Perforated Liner
(25 mm x 2 mm slots at 25 mm centres, 3 rows).

[608 m] End of the hole and base of the Perforated Liner.

Grainsize Classification (mm):

Boulders	Cobbles	Gravel			Sand			Silt			Clay
		Coarse	Medium	Fine	Coarse	Medium	Fine	Coarse	Medium	Fine	
200	60	20	6	2	0.6	0.2	0.06	0.02	0.006	0.002	

Appendix C. Groundwater Response Modelling

C.1 Introduction

This assessment used the Feather & Williamson Analytical Model (FWM), calibrated to measured flow and drawdown during test pumping, to simulate the proposed groundwater take in order to evaluate the potential effects on groundwater conditions.

C.2 Feather Williamson Analytical Model

The Feather and Williamson Model (FWM) is an analytical solution for drawdown calculation in a multi-layer aquifer system. By assigning the hydrogeologic parameters and thicknesses of individual layers based on the documented geology, drawdown is calculated for each individual layer the inverse Laplace transform of the groundwater flow equation. The model is available as freeware at https://www.wwla.kiwi/softwaredetail/fwm and we encourage Council staff or appointed peer reviewers of this application to download the software and confirm/test sensitivity of our predictions if desired.

In response to s92 requests on other recent groundwater take applications, which sought a comparison of the FWM to the Theis model, we provide the following comments:

- The Feather-Williamson Model (FWM) computes the drawdown through multiple layers in the bore.
- This approach is more accurate than Theis due to consideration of storage and leakage effects from overlying and underlying layers;
- The model provides a similar response to that of a numerical model.
- The FWM has been used widely throughout New Zealand for groundwater take applications and has passed scrutiny through the technical reviewer at Northland Regional Council, Waikato Regional Council, Bay of Plenty Regional Council, Hawkes Bay Regional Council, Gisborne District Council and Greater Wellington Regional Council by virtue of numerous consents being granted in these regions.
- Furthermore, it has recently been used in the Auckland region for the following consents, without any concerns:
  - ***Watercare Services Limited*** **-** Rautawhiri Park irrigation bore;
  - ***Tapora Resources Limited*** – Sand quarry groundwater supply;
  - ***Parakai Birds Limited*** – Chicken farm drinking water supply;
  - ***Summerset Retirement Villages*** – Landscaped area groundwater irrigation supply, for Milldale; and Warkworth developments.
  - ***Kumeu River Wines*** – Renewal for wine processing facility.
  - ***Zaknich Farms Limited*** – Renewal for strawberry growing operation in Taupaki.
  - ***Murray Jones & Lyn Thackwray*** – Farm take renewal in Kumeu.
  - ***Nga Raukau Nurseries*** – Irrigation for plant growing operation in Taupaki.
  - ***DG & BD Speedy Enterprises Limited*** – for potable water cartage operator in Waimauku.

C.3 Analytical Model Set-up

The FWM based analysis for the Surf Park bore was developed based on the geological layers documented in the bore log. Although bore log recorded 3 layers, for modelling purposes, the extra layer was added below the production zone for model stability, with each layer assumed to be homogeneous across the model domain.

The thickness for each model layer was determined from the corresponding layers noted in the bore log (**Appendix B** and **Appendix D**) while the hydraulic parameters, transmissivity and storativity, were set to be representative of the bulk material represented by the given layer of the FWM model. The thickness and material descriptions represented by each of the model layers is summarised below:

- Layer 0: The unsaturated zone extending from the surface to 56 mBGL. This layer intersects limestone layer. The water table before the test pumping begin was measured at 55.87 mBGL.
- Layer 1: From 56 to 73 mBGL comprised a moderate permeability limestone layer.
- Layer 2: alternating Mudstone and Siltstone layer from 73 to 400 mBGL most likely separates the production aquifer of the bore from overlying layer.
- Layer 3: The Greywacke layer encountered between 400 to 680 mBGL comprises the bore production zone.
- Layer 4: A 50 m thick bottom layer from 680 to 730 mBGL was incorporated as the final layer of the FWM.

As a conceptual summary, the low-permeability mudstone within Layer 2 is considered to effectively act as an aquitard causing confinement in underlying layers and effectively separating the productive aquifer from surface water and shallow groundwater.

C.4 Airlift Test and Test Pumping

Airlifting is a method of bore development and yield testing where compressed air is injected into the bore, causing water to be lifted up to the surface where it is discharged. The purpose of the test was twofold:

1. To provide an indicative flow rate upon which further analysis could be based; and
2. to provide a basis for production bore design.

The airlift test was run for 8 hours and produced a constant yield of 10.3 L/s. Thereafter, Step Test followed by a continues pumping test was conducted on 15 September 2025[6]. The results were used as calibration data for the modelling analysis detailed in the following sections of this report.

C.5 Model Calibration

The FWM was calibrated by simulating the measured average abstraction rate during Step Testing and calculated hydraulic parameters for the production layer. Other parameterisation was based on the aquifer hydraulic parameters for the geologic units in the development area as summarised in Jacobs (2019[7]), all the parameters was slightly adjusted and kept within the range of reported values to replicate the observed drawdown. The outcome of the calibration process was that the 100 m drawdown that was measured after long duration test producing a flow rate of 11.45 L/s was replicated using the hydrogeological parameters shown in **Table 7**.

Table 7. Hydrogeologic parameterisation in the FWM.

Model Layer	Transmissivity (m^2/day)	Storativity (-)	Thickness (m)	Depth at base (mBGL)	Anisotropy Kh:Kv (-)	Horizontal conductivity (m/s)	Geologic unit
0	n/a	n/a	56	56	n/a	n/a	Unsaturated Zone
1	0.25	0.085	17	73	10	1.7E-7	Limestone
2	9.4	0.00164	327	400	10	3.33E-7	Mudstone / Siltstone
3	10.3	0.0019	280	680	10	4.24E-07	Greywacke (Production Zone)
4	0.01	0.00034	50	730	10	2.31E-09	Deep Greywacke Basement

C.6 Proposed Pumping Scenario

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[6] WWLA letter, Bore Sustainable Yield Analysis – Auckland Surf Park, Dairy Flat, 25 September 2025.
[7] Jacobs GHD Joint Venture (2019). Warkworth to Wellsford Hydrogeology Assessment.

The calibrated model was applied to simulate abstraction at the proposed maximum groundwater take rate of 1,303 m^3/day for a duration of 197 days, such that the total abstraction was equal to the annual take of 256,230 m^3/annum that is specified in the application.

The following details assure that the simulation is conservative:

- The annual abstraction occurs over a period of 197 consecutive days, so that maximum effect is simulated; whereas in practice the maximum abstraction would not occur on a daily basis; and

- The model does not include recharge.

C.7 Groundwater Drawdown

The simulated drawdown adjacent to the production bore after 197 days of continuous pumping is represented for each model layer in **Figure 4.**

The maximum drawdown, 200 m, occurs in Model Layer 3, which is the layer with assigned discharge representing the production zone. The magnitude of drawdown reduces towards the surface, with less than 0.1 m of drawdown calculated to propagate to the surface. This is consistent with the interbedded nature of the Waitemata Group lithology, and the significant casing depth of the bore.

Furthermore, it is noted that all potential drawdown calculated by the model is a conservative estimate due to the lack of rainfall recharge included in the FWM model.

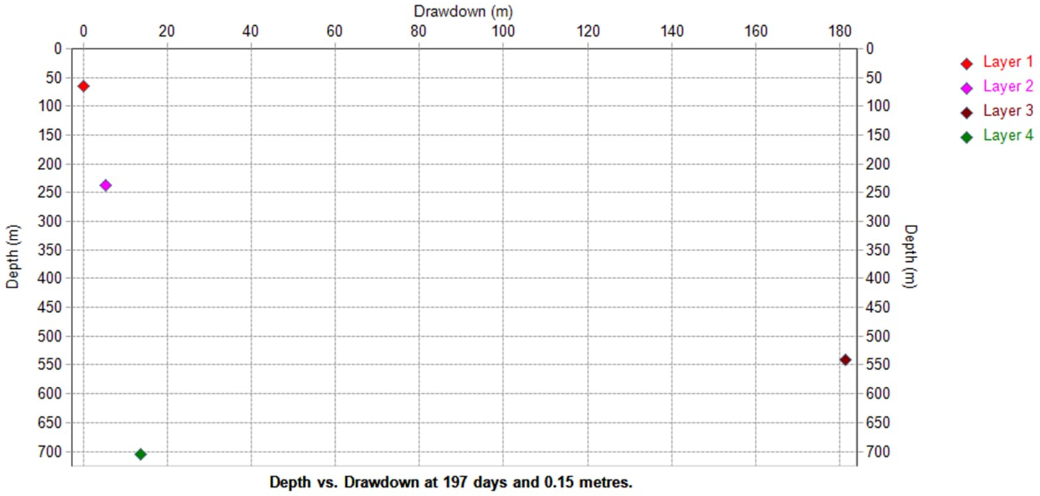
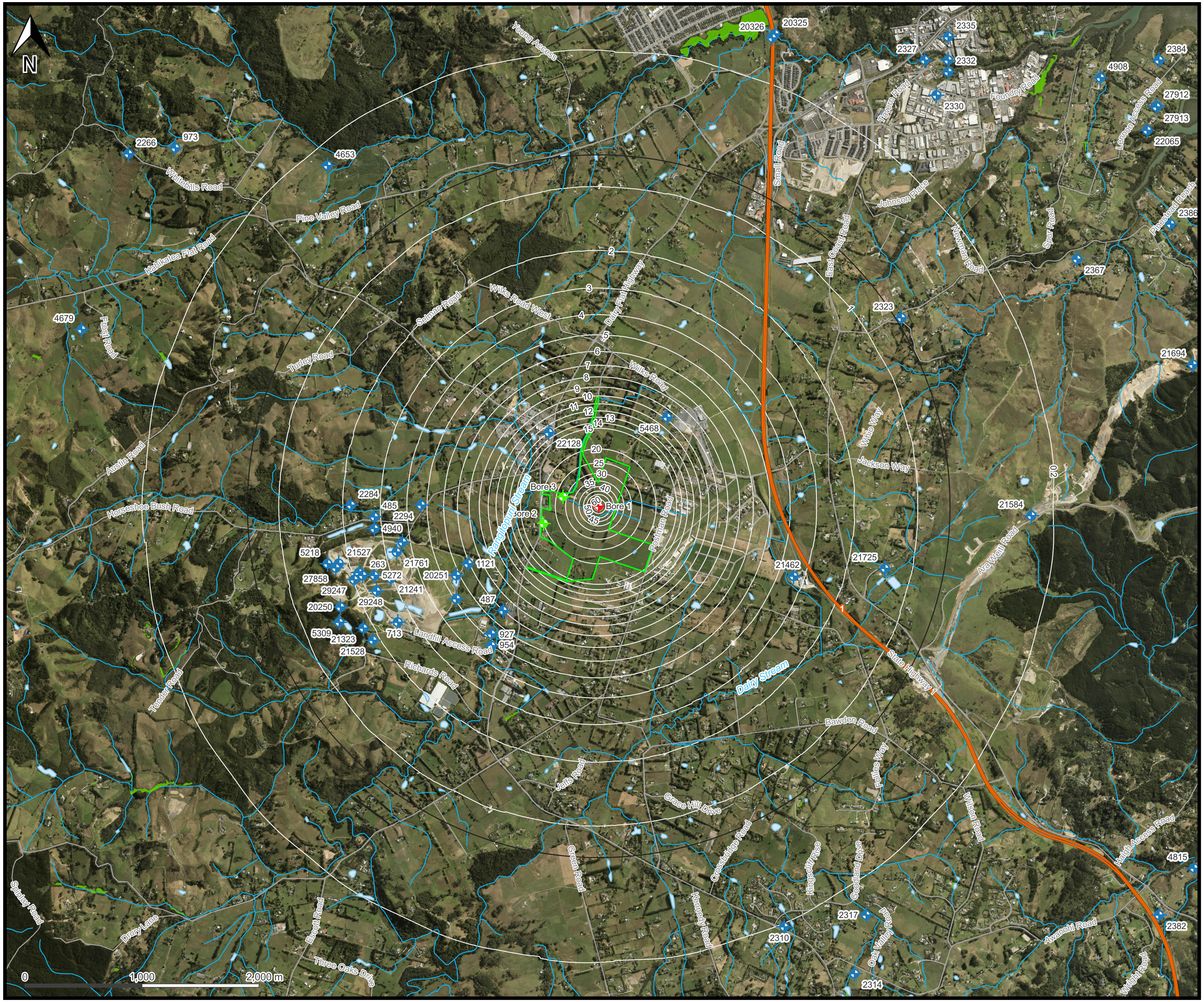


Figure 4. Simulated drawdown in each model layer at the Applicant's bore.

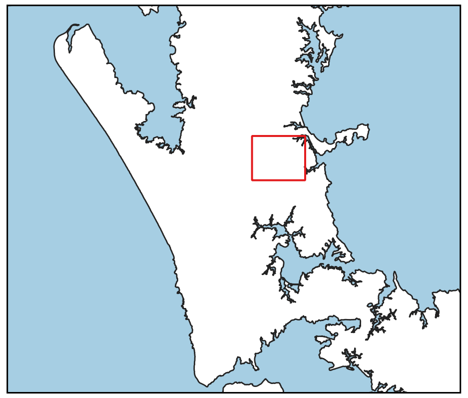
The lateral extent of drawdown in the production zone is presented in **Figure 5**. The drawdown is greatest in close proximity to the bore, reducing with distance, implicating that bore interference effects will only occur within close proximity to the bore and other groundwater users will not be effected, as noted in **Section 5.2.1.2** of the AEE. Simulation results indicate that after 197 days of continuous pumping (with no recharge), the 0.2 m drawdown contour in Model Layer 3 will be at approximately 3.9 km from the pumping bore.



Map Title:
Maximum Simulate Drawdown in the Production Zone

Project:
Surf Park Water Supply Services

Client:
AW Holdings (LP) 2021 Partnerships



Legend

Applicant Bore Locations

✚	**Drilled**
✚	**To be drill**
✚	**Surrounding Bores**
—	**Road**
—	**State Highway**
—	**River/Stream**
▭	**Lake/Pond**
🟩	**Wetlands**
▭	**Land Parcells**
▭	**3 km buffer**

Data Provenance
Aerial Imagery from Land Information New Zealand

Drawn by: Asanka Thilakerathne
04/12/2025

Layout & Project File
Surface Water

WILLIAMSON
WATER & LAND ADVISORY

Figure 5

C.8 Surface Water Connectivity

The FWM calculates the percentage of pumped groundwater derived from each layer in the model, as shown in **Figure 6**. The key features to note from this analysis are as follows:

- As pumping begins, 100% of the pumped water is derived from the production zone (Layer 3);
- Over time, the contribution of Layer 3 gradually decreases while and the Layer 2 contribution increases until this reaches a steady state of leakage after approximately 150 days pumping;
- After 197 days of continues pumping, contribution of Layer 2 and Layer 3 is respectively, 17% and 67%, as the cone of depression migrates upwards. The FWM has been calibrated for the maximum pumping scenario, therefore this magnitude of abstraction is unlikely to occur;
- After 197 days of continuous pumping, Layer 1 contributes 14% of the total flow from the bore.

For assessing the potential groundwater and surface water effects, it is assumed that Layer 1 is hydraulically connected with surface water bodies.

The implications of this analysis for surface water depletion are discussed in the assessment of hydrological effects in **Section 5.2.2**.

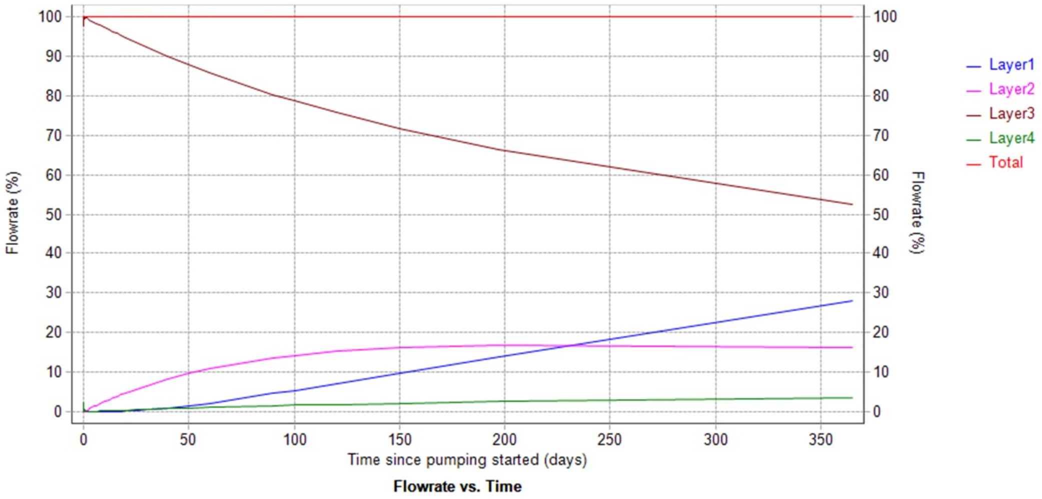


Figure 6. Flow partitioning of abstracted groundwater within the FWM layers.

C.9 Saline Intrusion Analysis

The bore is located approximately 6 km from the estuary situated at the mouth of the Okura River and approximately 7 km from the shore of the east coast. At this distance, the drawdown in the deep aquifer would be in the order of 0.008 m at the estuary and no drawdown at the coast. The Layer 1 drawdown at this distance is immeasurable.

The elevation of the pumping bore is 58 mAMSL and the static water level (SWL) measured at 56 mBGL, meaning that the SWL at the time of measurement was 2 mAMSL. The maximum drawdown, as modelled was 200 m, meaning that the water level in this case would be on the order of 198 m below sea level. Given that the bore is cased to a depth of 400 m with impermeable materials vertically separating the deep Waitemata Aquifer from surface features such as the estuary and the coast, which are both also separated by a significant lateral distance, the actual risk of saline intrusion developing is considered low.

C.10 Land Settlement Analysis

Land settlement effects have the potential to occur when compressible layers within the ground are dewatered.

The maximum drawdown for the proposed abstraction occurs at within the Waitemata Group Mudstone / Siltstone and Greywacke production zone. Both material types have low compressibility as is typical for siltstone / sandstone / mudstone materials ranging from 10-16 GPA[8]. Therefore, in practice there cannot be any compression of the units with dewatering, and consequently subsidence will not occur.

C.11 Conclusion

WWLA has developed a modelling application for the new production bore on the Surf Park development in Silverdale. The FWM was calibrated to flow and drawdown data collected during the test pumping on the bore, using a 4-layer modelling approach where the primary geologic units are represented with simulated abstraction sourced from the production zone within the Greywacke.

The model was applied to simulate the maximum abstraction that is being sought in the proposal, amounting to 1,303 m^3/day or 256,230 m^3/year, which equates to 197 days of pumping at the maximum rate. Model results were used to support an assessment of groundwater effects in terms of the potential level of impact on neighbouring groundwater users, and potential saline intrusion or land settlement resulting from the proposed take.

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[8] Malkowski P, Ostrowski L, Brodny J (2018). Analysis of Young's Modulus for Carboniferous Sedimentary Rocks and its Relationship with Uniaxial Compressive Strength Using Different Methods of Modulus Determination. Journal of Sustainable Mining vol 17(3).

Appendix D. Bore Log

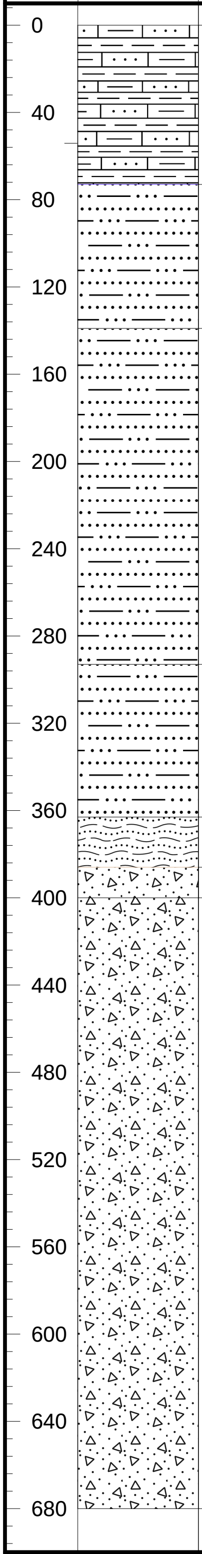
Production Bore As Built Design

Bore: Water Supply Production Bore (31647 BH1)

Project Name: Auckland Surf Park
Project Number: WWLA1623
Location: 1350 Dairyflat highway, Silverdale
Designer: Basset Plumbing Limited

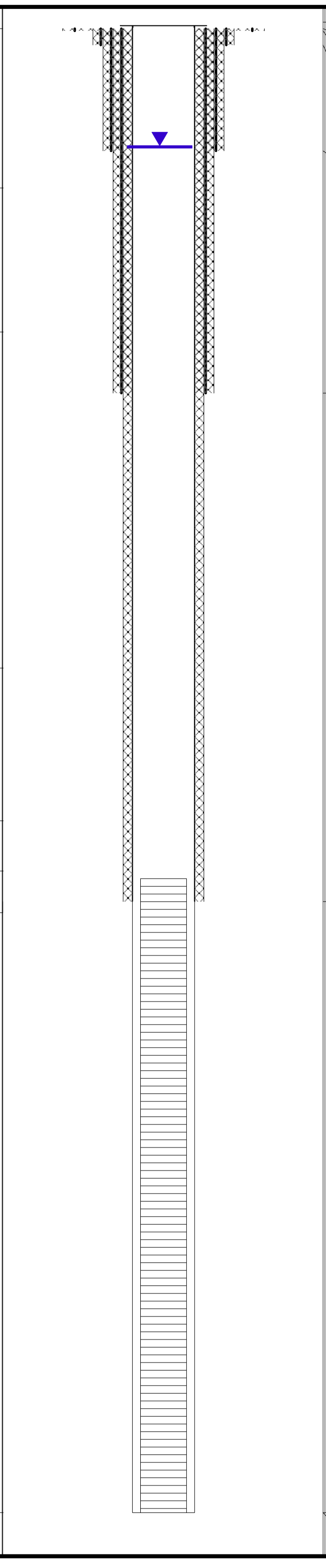
BORE DRILLING DETAILS

Drilling Company: Drill Force
Drilling Date: Sept-2025
Drilling Method: Mud Rotary
Diameter (mm): 154
Depth (m): 680
Easting (m): 17472170
Northing (m): 5942222
Ground Elev.(approx.):



Unit	Lithological Description
LIMESTONE	Weak / Fractured Mahurangi Limestone. Thin hard Limestone bands observed.
MUDSTONE / SILTSTONE	Onerahi Chaos- Breccia (Northland Allochthon). High percentage of hard drill cuttings (Siltstone) of 10 to 15 mm diameter mixed with muddy water.
MUDSTONE / SILTSTONE	Low or no hard drill cuttings. Mudstone percentage is higher than that of Siltstone.
MUDSTONE / SILTSTONE	percentage of hard drill cuttings gradually increased to about 20 %. Dark greay coloured Siltstone. Temperature of the water is arround 34 ⁰C.
SANDSTONE / MUDSTONE	Interbedded Mudstone and Sandstone with some shell bands.
GREYWACKE	About 10% of the drill cuttings area Siltstone chips.
GREYWACKE	Interlayerd hard Sandstone and soft Siltstone bands.

Bore Construction Details



No details on bore completion.
[0-1 m] 450NB SCH 10 Stove Pipe.
Cement pressure grouted all the casings.
[0- 7.5 m] 300NB SCh 20 Conductor Casing.

[0 -56 m] 250NB SCH 20 Surface Casing.

[0 to 167 m] 200NB SCh 10 Intermediate Casing.
14.5 ppg Cement grout.

[0 to 400 m] 150NB SCH 40 Production Casing.

[400 to 680 m] Drilling diameter 154 mm open hole.

[389.5 to 680 m] 114 mm OD Perforated Liner
(25 mm x 2 mm slots at 25 mm centres, 3 rows).

[608 m] End of the hole and base of the Perforated Liner.

Grainsize Classification (mm):

Boulders	Cobbles	Gravel			Sand			Silt			Clay
		Coarse	Medium	Fine	Coarse	Medium	Fine	Coarse	Medium	Fine	
200	60	20	6	2	0.6	0.2	0.06	0.02	0.006	0.002	

Appendix C – Demand Calculations

Attached separately

Appendix D – EPANET RESULTS

Auckland Surf Park

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n1	55.653803242144	0	0.00	169.35	113.70
Junc n2	55.717338609167	0	0.00	169.27	113.56
Junc n3	58.401878103841	0	0.00	168.63	110.23
Junc n4	57	0	0.00	168.63	111.63
Junc n5	55.515443166052	1.74	3.53	167.92	112.41
Junc n6	56.672754262699	0	0.00	167.90	111.23
Junc n7	57.05	0	0.00	167.73	110.68
Junc n8	57.05	0	0.00	167.72	110.67
Junc n9	57.05	0	0.00	167.68	110.63
Junc n10	57.05	0	0.00	167.67	110.62
Junc n11	56.438777680577	1.24	2.51	167.61	111.17
Junc n12	57.05	0	0.00	167.61	110.56
Junc n13	57.002354045858	0	0.00	167.61	110.60
Junc n14	56.725863964843	0	0.00	167.61	110.88
Junc n15	56.349853845749	0	0.00	167.61	111.26
Junc n16	56.607249465039	1.63	3.31	167.61	111.00
Junc n17	56.318932201189	0	0.00	167.65	111.33
Junc n18	56.844467796499	0	0.00	167.67	110.82
Junc n19	56.75	0	0.00	167.72	110.97
Junc n20	55.997599927623	0	0.00	167.79	111.79
Junc n21	55.735079776144	0	0.00	167.87	112.13
Junc n22	55.583840553399	0	0.00	167.91	112.32
Junc n23	55.467502287322	0	0.00	167.93	112.46
Junc n24	55.107932055938	0	0.00	168.92	113.81
Junc n25	53.984970665111	0	0.00	167.92	113.93
Junc n26	54.631451472584	0	0.00	167.92	113.28
Junc n27	55.989102459153	0	0.00	167.92	111.93
Junc n28	56.396468183035	0	0.00	167.92	111.52
Junc n29	56.334554960099	0.08	0.16	167.92	111.58
Junc n30	55.92390120014	0	0.00	167.92	111.99
Junc n31	55.513544095019	0	0.00	167.92	112.40

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n32	55.387033613981	0	0.00	167.92	112.53
Junc n33	55.295532322697	0	0.00	167.92	112.62
Junc n34	55.231371666758	0	0.00	167.92	112.69
Junc n35	55.242324298466	0	0.00	167.92	112.68
Junc n36	55.27501908863	0	0.00	167.92	112.65
Junc n37	55.479318163649	0	0.00	167.94	112.46
Junc n38	55.502864658634	0	0.00	167.96	112.45
Junc n39	55.924461793366	0	0.00	168.09	112.17
Junc n40	56.329171800603	0	0.00	168.39	112.06
Junc n41	56.956524867753	0	0.00	168.60	111.64
Junc n42	56.966332575967	0	0.00	168.61	111.64
Junc n43	56.654843861716	0	0.00	168.75	112.09
Junc n44	56.65554714498	0	0.00	168.77	112.12
Junc n45	56.735921659379	0	0.00	169.03	112.29
Junc n46	56.743108764816	0	0.00	169.04	112.30
Junc n47	56.952109464349	0	0.00	169.14	112.19
Junc n48	56.800839624743	0	0.00	169.18	112.38
Junc n49	55.737387801432	0	0.00	169.33	113.59
Junc n50	60.766884737521	0	0.00	168.63	107.86
Junc n51	61.547185449339	0	0.00	168.63	107.09
Junc n52	61.89578616598	0	0.00	168.63	106.73
Junc n53	61.700490201828	0	0.00	168.63	106.93
Junc n54	61.631601487299	0	0.00	168.63	107.00
Junc n55	61.626718525263	0	0.00	168.63	107.01
Junc n56	61.596251839663	0	0.00	168.63	107.04
Junc n57	60.911460881001	0	0.00	168.65	107.73
Junc n58	62.96184242749	0	0.00	168.58	105.62
Junc n59	63.491304175538	0	0.00	168.58	105.09
Junc n60	63.579005575804	0	0.00	168.58	105.00
Junc n61	63.632967076033	0	0.00	168.58	104.95
Junc n62	63.707821028021	0	0.00	168.58	104.87
Junc n63	63.852182792173	0	0.00	168.58	104.73
Junc n64	61.711026719565	0	0.00	168.60	106.89

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n65	62.258992463041	0	0.00	168.60	106.34
Junc n66	62.520354702685	0	0.00	168.60	106.08
Junc n67	62.666139905019	0	0.00	168.60	105.94
Junc n68	62.992682783705	0	0.00	168.60	105.61
Junc n69	59.936511011135	0	0.00	168.64	108.70
Junc n70	60.093117789855	0	0.00	168.64	108.54
Junc n71	61.156090449005	0	0.00	168.62	107.46
Junc n72	61.171191773807	0	0.00	168.62	107.44
Junc n73	64.109178644903	0	0.00	168.56	104.45
Junc n74	64.112225977807	0	0.00	168.56	104.44
Junc n75	64.12200891308601	0	0.00	168.56	104.44
Junc n76	67.002711040419	0	0.00	168.55	101.55
Junc n77	67.00683065944099	0	0.00	168.55	101.54
Junc n78	67.011916229441	0	0.00	168.55	101.54
Junc n79	67.02313745719999	0	0.00	168.55	101.53
Junc n80	67.037544331186	0	0.00	168.55	101.51
Junc n81	67.04363368159601	0	0.00	168.55	101.51
Junc n82	67.05039024192899	0	0.00	168.55	101.50
Junc n83	67.06168715730399	0	0.00	168.55	101.49
Junc n84	67.067436972051	0	0.00	168.55	101.48
Junc n85	67.06897524438	0	0.00	168.55	101.48
Junc n86	67.07059143730299	0	0.00	168.55	101.48
Junc n87	67.079385268317	0	0.00	168.55	101.47
Junc n88	67.084949786035	0	0.00	168.55	101.46
Junc n89	67.08635525107501	0	0.00	168.55	101.46
Junc n90	67.09179345257	0	0.00	168.55	101.46
Junc n91	67.087793766396	0	0.00	168.55	101.46
Junc n92	67.087629354264	0	0.00	168.55	101.46
Junc n93	67.080885673152	0	0.00	168.55	101.47
Junc n94	67.077454950929	0	0.00	168.55	101.47
Junc n95	67.07735480603201	0	0.00	168.55	101.47
Junc n96	67.076916790653	0	0.00	168.55	101.47
Junc n97	66.828083217266	0	0.00	168.55	101.72

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n98	66.827451791662	0	0.00	168.55	101.72
Junc n99	66.82361587323599	0	0.00	168.55	101.72
Junc n100	66.822845817966	0	0.00	168.55	101.72
Junc n101	66.82219858036	0	0.00	168.55	101.72
Junc n102	66.82560364366699	0	0.00	168.55	101.72
Junc n103	66.825620837237	0	0.00	168.55	101.72
Junc n104	66.826132787521	0	0.00	168.55	101.72
Junc n105	66.82022423433899	0	0.00	168.55	101.73
Junc n106	66.808269851006	0	0.00	168.55	101.74
Junc n107	66.80682463548899	0	0.00	168.55	101.74
Junc n108	66.799072752173	0	0.00	168.55	101.75
Junc n109	66.78656044099699	0	0.00	168.55	101.76
Junc n110	66.78193352151899	0	0.00	168.55	101.76
Junc n111	66.77206963519799	0	0.00	168.55	101.77
Junc n112	66.756606468031	0	0.00	168.55	101.79
Junc n113	66.748678646118	0	0.00	168.55	101.80
Junc n114	66.740140343292	0	0.00	168.55	101.81
Junc n115	66.739307944776	0	0.00	168.55	101.81
Junc n116	66.722648057089	0	0.00	168.55	101.82
Junc n117	66.71193672924601	0	0.00	168.55	101.83
Junc n118	66.71108108978299	0	0.00	168.55	101.84
Junc n119	66.70411749789901	0	0.00	168.55	101.84
Junc n120	66.69661837450499	0	0.00	168.55	101.85
Junc n121	64.845201233369	1.23	1.52	168.54	103.69
Junc n122	55.92302538838	0	0.00	169.17	113.24
Junc n123	55.935025388422	0.62	0.77	169.16	113.23
Junc n124	57.348252274563	0	0.00	168.63	111.28
Junc n125	62.067546429484	0	0.00	168.63	106.56
Junc n126	57.235919701888	0	0.00	168.63	111.39
Junc n127	62.040921026286	0	0.00	168.63	106.59
Junc n128	60.452415335225	0	0.00	168.65	108.20
Junc n129	59.106375681588	0	0.00	168.64	109.53
Junc n130	56.9545459282	0	0.00	168.63	111.68

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Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n131	56.954545928206	0	0.00	168.63	111.68
Junc n132	61.187479034967	0	0.00	168.63	107.44
Junc n133	61.157184585768	0	0.00	168.63	107.47
Junc n134	54.775821953359	0.59	0.73	168.59	113.82
Junc n135	54.775821942352	0	0.00	168.60	113.82
Junc n136	61.021195916545	0	0.00	168.63	107.61
Junc n137	61.106540257997	0	0.00	168.63	107.52
Junc n138	61.116110844193	0	0.00	168.63	107.51
Junc n139	61.132117686839	0	0.00	168.63	107.50
Junc n140	61.142714776771	0	0.00	168.63	107.49
Junc n141	61.170468789587	0	0.00	168.63	107.46
Junc n142	61.199372882608	0	0.00	168.63	107.43
Junc n143	61.229427055962	0	0.00	168.63	107.40
Junc n144	61.26063130955	0	0.00	168.63	107.37
Junc n145	61.288053991541	0	0.00	168.63	107.34
Junc n146	61.29298564329	0	0.00	168.63	107.34
Junc n147	61.326490057392	0	0.00	168.63	107.30
Junc n148	61.361144551763	0	0.00	168.63	107.27
Junc n149	61.396949126192	0	0.00	168.63	107.23
Junc n150	61.433903781141	0	0.00	168.63	107.20
Junc n151	61.472008516028	0	0.00	168.63	107.16
Junc n152	61.475637989198	0	0.00	168.63	107.16
Junc n153	61.48202642892	0	0.00	168.63	107.15
Junc n154	61.510530038127	0	0.00	168.63	107.12
Junc n155	61.547626465925	0	0.00	168.63	107.08
Junc n156	61.5832091374	0	0.00	168.63	107.05
Junc n157	61.61727805253	0	0.00	168.63	107.01
Junc n158	61.649833211081	0	0.00	168.63	106.98
Junc n159	61.652022542611	0	0.00	168.63	106.98
Junc n160	61.900523582709	0	0.00	168.63	106.73
Junc n161	57.363401342639	0	0.00	168.65	111.28
Junc n162	61.02864456222	0	0.00	168.65	107.62
Junc n163	57.355950080611	0	0.00	168.63	111.27

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n164	57.355947380764	0	0.00	168.63	111.27
Junc n165	57.335931073495	0	0.00	168.63	111.29
Junc n166	57.309855957595	0	0.00	168.63	111.32
Junc n167	57.28294765294	0	0.00	168.63	111.35
Junc n168	57.255206159478	0	0.00	168.63	111.38
Junc n169	57.227713761134	0	0.00	168.63	111.40
Junc n170	57.226631477268	0	0.00	168.63	111.40
Junc n171	57.197223606267	0	0.00	168.63	111.43
Junc n172	57.166982546495	0	0.00	168.63	111.46
Junc n173	57.135908297944	0	0.00	168.63	111.49
Junc n174	57.104000860597	0	0.00	168.63	111.53
Junc n175	57.084298294194	0	0.00	168.63	111.55
Junc n176	57.080760578962	0	0.00	168.63	111.55
Junc n177	57.071563499901	0	0.00	168.63	111.56
Junc n178	57.041466414306	0	0.00	168.63	111.59
Junc n179	57.014419966187	0	0.00	168.63	111.62
Junc n180	56.990424155636	0	0.00	168.63	111.64
Junc n181	56.96947898256	0	0.00	168.63	111.66
Junc n182	56.961120894659	0	0.00	168.63	111.67
Junc n183	56.951584447034	0	0.00	168.63	111.68
Junc n184	56.936740549024	0	0.00	168.63	111.69
Junc n185	56.924947288546	0	0.00	168.63	111.71
Junc n186	56.916204665595	0	0.00	168.63	111.71
Junc n187	56.910512680153	0	0.00	168.63	111.72
Junc n188	57.057168265551	0	0.00	168.63	111.57
Junc n189	57.063991806509	0	0.00	168.63	111.57
Junc n190	57.072325139843	0	0.00	168.63	111.56
Junc n191	57.073064043705	0	0.00	168.63	111.56
Junc n192	57.080658473177	0	0.00	168.63	111.55
Junc n193	57.08899180651	0	0.00	168.63	111.54
Junc n194	57.09732513984	0	0.00	168.63	111.53
Junc n195	57.101847426492	0	0.00	168.63	111.53
Junc n196	57.105658473175	0	0.00	168.63	111.53

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n197	57.113991806508	0	0.00	168.63	111.52
Junc n198	57.122325139845	0	0.00	168.63	111.51
Junc n199	57.130630809283	0	0.00	168.63	111.50
Junc n200	57.130658473176	0	0.00	168.63	111.50
Junc n201	57.138991806508	0	0.00	168.63	111.49
Junc n202	57.147325139846	0	0.00	168.63	111.48
Junc n203	57.155658473176	0	0.00	168.63	111.48
Junc n204	57.159414192075	0	0.00	168.63	111.47
Junc n205	57.163991806515	0	0.00	168.63	111.47
Junc n206	57.172325139846	0	0.00	168.63	111.46
Junc n207	57.180658473183	0	0.00	168.63	111.45
Junc n208	57.188197574868	0	0.00	168.63	111.44
Junc n209	57.188991806515	0	0.00	168.63	111.44
Junc n210	57.19732513985	0	0.00	168.63	111.43
Junc n211	57.205658473189	0	0.00	168.63	111.43
Junc n212	57.21399180652	0	0.00	168.63	111.42
Junc n213	57.21698095766	0	0.00	168.63	111.41
Junc n214	57.22232513985	0	0.00	168.63	111.41
Junc n215	57.230658473185	0	0.00	168.63	111.40
Junc n216	57.238991806519	0	0.00	168.63	111.39
Junc n217	57.245764340452	0	0.00	168.63	111.38
Junc n218	57.247325139855	0	0.00	168.63	111.38
Junc n219	57.255658473189	0	0.00	168.63	111.38
Junc n220	57.263991806522	0	0.00	168.63	111.37
Junc n221	57.272325139855	0	0.00	168.63	111.36
Junc n222	57.274547723243	0	0.00	168.63	111.36
Junc n223	57.280658473191	0	0.00	168.63	111.35
Junc n224	57.28899180652	0	0.00	168.63	111.34
Junc n225	57.297325139859	0	0.00	168.63	111.33
Junc n226	57.303331106033	0	0.00	168.63	111.33
Junc n227	57.305658473191	0	0.00	168.63	111.33
Junc n228	57.307224142355	0	0.00	168.63	111.32
Junc n229	57.313991806526	0	0.00	168.63	111.32

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n230	57.322325139859	0	0.00	168.63	111.31
Junc n231	57.330658473193	0	0.00	168.63	111.30
Junc n232	57.332114488847	0	0.00	168.63	111.30
Junc n233	57.338830347929	0	0.00	168.63	111.29
Junc n234	56.99532481823	0	0.00	168.63	111.64
Junc n235	56.993293393633	0	0.00	168.63	111.64
Junc n236	56.981586820318	0	0.00	168.63	111.65
Junc n237	56.968585913969	0	0.00	168.63	111.66
Junc n238	56.964920153651	0	0.00	168.63	111.67
Junc n239	56.948253486984	0	0.00	168.63	111.68
Junc n240	56.935215252133	0	0.00	168.63	111.70
Junc n241	56.93158682032	0	0.00	168.63	111.70
Junc n242	56.919564725702	0	0.00	168.63	111.71
Junc n243	56.84131148298	0	0.00	168.63	111.79
Junc n244	56.84012830848	0	0.00	168.63	111.79
Junc n245	56.837728752804	0	0.00	168.63	111.79
Junc n246	56.836938821176	0	0.00	168.63	111.79
Junc n247	56.836329197136	0	0.00	168.63	111.79
Junc n248	56.83603180109	0	0.00	168.63	111.79
Junc n249	56.835924596931	0	0.00	168.63	111.79
Junc n250	56.83592964146	0	0.00	168.63	111.79
Junc n251	56.836530085789	0	0.00	168.63	111.79
Junc n252	56.838130530118	0	0.00	168.63	111.79
Junc n253	56.840730974448	0	0.00	168.63	111.79
Junc n254	56.841126557291	0	0.00	168.63	111.79
Junc n255	56.844331418773	0	0.00	168.63	111.79
Junc n256	56.848931863102	0	0.00	168.63	111.78
Junc n257	56.854532307432	0	0.00	168.63	111.78
Junc n258	56.861132751765	0	0.00	168.63	111.77
Junc n259	56.866113513768	0	0.00	168.63	111.76
Junc n260	56.868733196083	0	0.00	168.63	111.76
Junc n261	56.870974459197	0	0.00	168.63	111.76
Junc n262	56.877333640421	0	0.00	168.63	111.75

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n263	56.886934084747	0	0.00	168.63	111.74
Junc n264	56.897534529077	0	0.00	168.63	111.73
Junc n265	56.909134973414	0	0.00	168.63	111.72
Junc n266	56.911664886451	0	0.00	168.63	111.72
Junc n267	56.921735417737	0	0.00	168.63	111.71
Junc n268	56.935335862064	0	0.00	168.63	111.70
Junc n269	56.949936306395	0	0.00	168.63	111.68
Junc n270	56.958951032593	0	0.00	168.63	111.67
Junc n271	57.038857322902	0	0.00	168.63	111.59
Junc n272	57.080139416701	0	0.00	168.63	111.55
Junc n273	57.12501048021	0	0.00	168.63	111.51
Junc n274	57.138515527522	0	0.00	168.63	111.49
Junc n275	57.203141638343	0	0.00	168.63	111.43
Junc n276	57.274017749165	0	0.00	168.63	111.36
Junc n277	57.351143859992	0	0.00	168.63	111.28
Junc n278	57.371267790009	0	0.00	168.63	111.26
Junc n279	57.433141361532	0	0.00	168.63	111.20
Junc n280	57.434519970814	0	0.00	168.63	111.20
Junc n281	57.524146081807	0	0.00	168.63	111.11
Junc n282	57.524530408528	0	0.00	168.63	111.11
Junc n284	61.90600176905	0	0.00	168.63	106.72
Junc n285	61.926842879044	0	0.00	168.63	106.70
Junc n286	61.933486199601	0	0.00	168.63	106.70
Junc n287	61.946554448088	0	0.00	168.63	106.68
Junc n288	61.964796066291	0	0.00	168.63	106.67
Junc n289	61.981812536303	0	0.00	168.63	106.65
Junc n290	61.986134173674	0	0.00	168.63	106.64
Junc n291	61.992270399611	0	0.00	168.63	106.64
Junc n292	61.997242564111	0	0.00	168.63	106.63
Junc n293	62.01133474828	0	0.00	168.63	106.62
Junc n294	62.01561988111	0	0.00	168.63	106.62
Junc n295	62.023891784322	0	0.00	168.63	106.61
Junc n296	62.035024901844	0	0.00	168.63	106.60

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n297	62.040288298216	0	0.00	168.63	106.59
Junc n298	62.044864243951	0	0.00	168.63	106.59
Junc n299	62.050583541223	0	0.00	168.63	106.58
Junc n300	62.053116436063	0	0.00	168.63	106.58
Junc n301	62.060101966288	0	0.00	168.63	106.57
Junc n302	62.062066151951	0	0.00	168.63	106.57
Junc n303	62.065493684571	0	0.00	168.63	106.57
Junc n304	62.068718872712	0	0.00	168.63	106.56
Junc n305	62.069553730654	0	0.00	168.63	106.56
Junc n306	62.072198360001	0	0.00	168.63	106.56
Junc n307	62.072849311086	0	0.00	168.63	106.56
Junc n308	62.07284944813	0	0.00	168.63	106.56
Junc n309	62.073184147016	0	0.00	168.63	106.56
Junc n310	62.073391451534	0	0.00	168.63	106.56
Junc n311	62.073442849105	0	0.00	168.63	106.56
Junc n312	62.07317701266	0	0.00	168.63	106.56
Junc n313	62.072736907215	0	0.00	168.63	106.56
Junc n314	62.071423599647	0	0.00	168.63	106.56
Junc n315	62.071257653305	0	0.00	168.63	106.56
Junc n316	62.068339715793	0	0.00	168.63	106.56
Junc n317	62.063850604395	0	0.00	168.63	106.57
Junc n318	62.060066967292	0	0.00	168.63	106.57
Junc n319	62.057859821447	0	0.00	168.63	106.57
Junc n320	62.050524641695	0	0.00	168.63	106.58
Junc n321	62.047903279891	0	0.00	168.63	106.58
Junc n322	62.047735211323	0	0.00	168.63	106.58
Junc n323	62.041711962328	0	0.00	168.63	106.59
Junc n324	62.036017710604	0	0.00	168.63	106.59
Junc n325	62.031876888555	0	0.00	168.63	106.60
Junc n326	62.021854915411	0	0.00	168.63	106.61
Junc n327	62.015134288683	0	0.00	168.63	106.62
Junc n328	62.011876888565	0	0.00	168.63	106.62
Junc n329	62.006106523685	0	0.00	168.63	106.62

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n330	62.001800955349	0	0.00	168.63	106.63
Junc n331	61.998521582074	0	0.00	168.63	106.63
Junc n332	61.991800842445	0	0.00	168.63	106.64
Junc n333	61.990915719061	0	0.00	168.63	106.64
Junc n334	61.909490299292	0	0.00	168.63	106.72
Junc n335	61.680746437311	0	0.00	168.63	106.95
Junc n336	61.682179690286	0	0.00	168.63	106.95
Junc n337	61.361590219138	0	0.00	168.63	107.27
Junc n338	61.235423287521	0	0.00	168.63	107.40
Junc n339	61.179799441953	0	0.00	168.63	107.45
Junc n340	61.132580293344	0	0.00	168.63	107.50
Junc n341	61.084308197422	0	0.00	168.63	107.55
Junc n342	61.06148385503	0	0.00	168.63	107.57
Junc n344	61.877498855241	0	0.00	168.63	106.75
Junc n345	61.895274350384	0	0.00	168.63	106.74
Junc n346	61.903500998881	0	0.00	168.63	106.73
Junc n347	61.90598630107	0	0.00	168.63	106.72
Junc n348	61.926840250133	0	0.00	168.63	106.70
Junc n349	61.933419322149	0	0.00	168.63	106.70
Junc n350	61.946361245923	0	0.00	168.63	106.68
Junc n351	61.964812075076	0	0.00	168.63	106.67
Junc n352	61.98167216364	0	0.00	168.63	106.65
Junc n353	61.992291246459	0	0.00	168.63	106.64
Junc n354	61.997074213814	0	0.00	168.63	106.63
Junc n355	61.998329170673	0	0.00	168.63	106.63
Junc n356	62.011298278942	0	0.00	168.63	106.62
Junc n357	62.015647076943	0	0.00	168.63	106.61
Junc n358	62.023818879409	0	0.00	168.63	106.61
Junc n359	62.034999151921	0	0.00	168.63	106.59
Junc n360	62.044765289073	0	0.00	168.63	106.58
Junc n361	62.050590224147	0	0.00	168.63	106.58
Junc n362	62.053073982646	0	0.00	168.63	106.58
Junc n363	62.06010487216	0	0.00	168.63	106.57

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n364	62.060897973875	0	0.00	168.63	106.57
Junc n365	62.061986525373	0	0.00	168.63	106.57
Junc n366	62.06543452767	0	0.00	168.63	106.56
Junc n367	62.069451651983	0	0.00	168.63	106.56
Junc n368	62.072167143711	0	0.00	168.63	106.56
Junc n369	62.072849312021	0	0.00	168.63	106.56
Junc n370	62.073174916113	0	0.00	168.63	106.56
Junc n371	62.073356643082	0	0.00	168.63	106.56
Junc n372	62.073424485673	0	0.00	168.63	106.56
Junc n373	62.0731657546	0	0.00	168.63	106.56
Junc n374	62.072698698412	0	0.00	168.63	106.56
Junc n375	62.071354656776	0	0.00	168.63	106.56
Junc n376	62.070752412744	0	0.00	168.63	106.56
Junc n377	62.068230448436	0	0.00	168.63	106.56
Junc n378	62.063772016546	0	0.00	168.63	106.56
Junc n379	62.060045322357	0	0.00	168.63	106.57
Junc n380	62.057733850601	0	0.00	168.63	106.57
Junc n381	62.050531011919	0	0.00	168.63	106.58
Junc n382	62.047637137004	0	0.00	168.63	106.58
Junc n383	62.041684219873	0	0.00	168.63	106.59
Junc n384	62.0359912075	0	0.00	168.63	106.59
Junc n385	62.031801913092	0	0.00	168.63	106.60
Junc n386	62.029338638486	0	0.00	168.63	106.60
Junc n387	62.021749229709	0	0.00	168.63	106.61
Junc n388	62.015121316506	0	0.00	168.63	106.61
Junc n389	62.011801913094	0	0.00	168.63	106.62
Junc n390	62.001787983175	0	0.00	168.63	106.63
Junc n391	61.998415896372	0	0.00	168.63	106.63
Junc n392	61.991811712464	0	0.00	168.63	106.64
Junc n393	61.990915719089	0	0.00	168.63	106.64
Junc n394	61.909497134547	0	0.00	168.63	106.72
Junc n395	61.901803463081	0	0.00	168.63	106.72
Junc n396	54.60751698672	0	0.00	168.60	113.99

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Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n397	61.297526004626	0	0.00	168.59	107.30
Junc n398	54.317719665657	0	0.00	168.59	114.28
Junc n400	61.264865844875	0	0.00	168.63	107.37
Junc n401	61.268931180644	0	0.00	168.63	107.36
Junc n402	61.278832739992	0	0.00	168.63	107.35
Junc n403	61.290972846239	0	0.00	168.63	107.34
Junc n404	61.301286164685	0	0.00	168.63	107.33
Junc n405	61.309772695313	0	0.00	168.63	107.32
Junc n406	61.309939674331	0	0.00	168.63	107.32
Junc n407	61.310775429427	0	0.00	168.63	107.32
Junc n408	61.296864984236	0	0.00	168.63	107.33
Junc n409	56.903722629321	0	0.00	168.63	111.73
Junc n410	57.057168265559	0	0.00	168.63	111.57
Junc n411	57.063991806524	0	0.00	168.63	111.57
Junc n412	57.072325139856	0	0.00	168.63	111.56
Junc n413	57.076218591618	0	0.00	168.63	111.55
Junc n414	57.080658473186	0	0.00	168.63	111.55
Junc n415	57.088991806522	0	0.00	168.63	111.54
Junc n416	57.097325139852	0	0.00	168.63	111.53
Junc n417	57.098314263597	0	0.00	168.63	111.53
Junc n418	57.10565847318	0	0.00	168.63	111.53
Junc n419	57.113991806513	0	0.00	168.63	111.52
Junc n420	57.120409935573	0	0.00	168.63	111.51
Junc n421	57.122325139845	0	0.00	168.63	111.51
Junc n422	57.130658473182	0	0.00	168.63	111.50
Junc n423	57.138991806515	0	0.00	168.63	111.49
Junc n424	57.142505607557	0	0.00	168.63	111.49
Junc n425	57.147325139848	0	0.00	168.63	111.48
Junc n426	57.155658473177	0	0.00	168.63	111.48
Junc n427	57.163991806509	0	0.00	168.63	111.47
Junc n428	57.164601279534	0	0.00	168.63	111.47
Junc n429	57.172325139845	0	0.00	168.63	111.46
Junc n430	57.180658473177	0	0.00	168.63	111.45

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n431	57.186696951517	0	0.00	168.63	111.44
Junc n432	57.188991806511	0	0.00	168.63	111.44
Junc n433	57.19732513984	0	0.00	168.63	111.43
Junc n434	57.205658473178	0	0.00	168.63	111.43
Junc n435	57.208792623498	0	0.00	168.63	111.42
Junc n436	57.213991806508	0	0.00	168.63	111.42
Junc n437	57.222325139843	0	0.00	168.63	111.41
Junc n438	57.230658473176	0	0.00	168.63	111.40
Junc n439	57.230888295479	0	0.00	168.63	111.40
Junc n440	57.238991806506	0	0.00	168.63	111.39
Junc n441	57.24732513984	0	0.00	168.63	111.38
Junc n442	57.252983967459	0	0.00	168.63	111.38
Junc n443	57.255658473176	0	0.00	168.63	111.38
Junc n444	57.263991806505	0	0.00	168.63	111.37
Junc n445	57.272325139836	0	0.00	168.63	111.36
Junc n446	57.275079639437	0	0.00	168.63	111.36
Junc n447	57.280658473174	0	0.00	168.63	111.35
Junc n448	57.288991806504	0	0.00	168.63	111.34
Junc n449	57.297175311418	0	0.00	168.63	111.33
Junc n450	57.297325139836	0	0.00	168.63	111.33
Junc n451	57.30565847317	0	0.00	168.63	111.33
Junc n452	57.307224137975	0	0.00	168.63	111.32
Junc n453	57.313991806502	0	0.00	168.63	111.32
Junc n454	57.319270983421	0	0.00	168.63	111.31
Junc n455	57.322325139834	0	0.00	168.63	111.31
Junc n456	57.330658473169	0	0.00	168.63	111.30
Junc n457	57.338830347903	0	0.00	168.63	111.29
Junc n458	57.116324782982	0	0.00	168.63	111.51
Junc n459	56.988708853402	0	0.00	168.63	111.64
Junc n460	56.97351653452	0	0.00	168.63	111.66
Junc n461	56.958113061564	0	0.00	168.63	111.67
Junc n462	56.95359704536	0	0.00	168.63	111.68
Junc n463	56.93202367725	0	0.00	168.63	111.70

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n464	56.908788359278	0	0.00	168.63	111.72
Junc n465	56.890810057048	0	0.00	168.63	111.74
Junc n466	56.813039158967	0	0.00	168.63	111.82
Junc n467	56.768585585969	0	0.00	168.63	111.86
Junc n468	56.766634141802	0	0.00	168.63	111.86
Junc n469	56.762236946314	0	0.00	168.63	111.87
Junc n470	56.759240330142	0	0.00	168.63	111.87
Junc n471	56.758384436666	0	0.00	168.63	111.87
Junc n472	56.757670161372	0	0.00	168.63	111.87
Junc n473	56.757497586689	0	0.00	168.63	111.87
Junc n474	56.758739729217	0	0.00	168.63	111.87
Junc n475	56.761404180093	0	0.00	168.63	111.87
Junc n476	56.765487104876	0	0.00	168.63	111.87
Junc n477	56.770982930903	0	0.00	168.63	111.86
Junc n478	56.777887225596	0	0.00	168.63	111.85
Junc n479	56.78619355163	0	0.00	168.63	111.84
Junc n480	56.795931585203	0	0.00	168.63	111.83
Junc n481	56.798731277304	0	0.00	168.63	111.83
Junc n482	56.806954252575	0	0.00	168.63	111.82
Junc n483	56.819431352656	0	0.00	168.63	111.81
Junc n484	56.833243264843	0	0.00	168.63	111.80
Junc n485	56.848397071328	0	0.00	168.63	111.78
Junc n486	56.864875765231	0	0.00	168.63	111.77
Junc n487	56.882659986348	0	0.00	168.63	111.75
Junc n488	56.901779907308	0	0.00	168.63	111.73
Junc n489	56.913578542964	0	0.00	168.63	111.72
Junc n490	57.00808974392	0	0.00	168.63	111.62
Junc n491	57.055934778257	0	0.00	168.63	111.57
Junc n492	57.121497621202	0	0.00	168.63	111.51
Junc n493	57.192033051313	0	0.00	168.63	111.44
Junc n494	57.26755996698	0	0.00	168.63	111.36
Junc n495	57.348083594081	0	0.00	168.63	111.28
Junc n496	57.36884536774	0	0.00	168.63	111.26

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n497	57.433609065161	0	0.00	168.63	111.20
Junc n498	57.524143846927	0	0.00	168.63	111.11
Junc n499	57.52452816687	0	0.00	168.63	111.11
Junc n501	56.6701462403	0	0.00	168.79	112.12
Junc n502	56.69238148013	0	0.00	168.79	112.10
Junc n503	56.71776370335	0	0.00	168.79	112.07
Junc n504	56.741737245593	0	0.00	168.79	112.05
Junc n505	56.763399746035	0	0.00	168.79	112.03
Junc n506	56.778780817604	0	0.00	168.79	112.01
Junc n507	56.783840380615	0	0.00	168.79	112.01
Junc n508	56.802421629757	0	0.00	168.79	111.99
Junc n509	56.818836983033	0	0.00	168.79	111.97
Junc n510	56.83418042556	0	0.00	168.79	111.96
Junc n511	56.840681949322	0	0.00	168.79	111.95
Junc n512	56.847737587943	0	0.00	168.79	111.94
Junc n513	56.85418365507	0	0.00	168.79	111.94
Junc n514	56.860503328719	0	0.00	168.79	111.93
Junc n515	56.870484593164	0	0.00	168.79	111.92
Junc n516	56.880285625434	0	0.00	168.79	111.91
Junc n517	56.887351742922	0	0.00	168.79	111.90
Junc n518	56.893670468608	0	0.00	168.79	111.90
Junc n519	56.895048853254	0	0.00	168.79	111.90
Junc n520	56.899024962807	0	0.00	168.79	111.89
Junc n521	56.902139069851	0	0.00	168.79	111.89
Junc n522	56.903722383938	0	0.00	168.79	111.89
Junc n523	56.903722611182	0	0.00	168.79	111.89
Junc n524	58.232398205153	0	0.00	168.73	110.49
Junc n525	58.923793354835	0	0.00	168.72	109.79
Junc n526	58.923809125173	0	0.00	168.72	109.79
Junc n527	58.925316459456	0	0.00	168.72	109.79
Junc n528	58.926914478773	0	0.00	168.72	109.79
Junc n529	58.928551343063	0	0.00	168.72	109.79
Junc n530	58.930478681154	0	0.00	168.72	109.79

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n531	58.932592761979	0	0.00	168.72	109.78
Junc n532	58.932921901991	0	0.00	168.72	109.78
Junc n533	58.934435036238	0	0.00	168.72	109.78
Junc n534	58.934822570698	0	0.00	168.72	109.78
Junc n535	58.937216969075	0	0.00	168.72	109.78
Junc n536	58.93968348238	0	0.00	168.72	109.78
Junc n537	58.942522739486	0	0.00	168.72	109.77
Junc n538	58.945566071242	0	0.00	168.72	109.77
Junc n539	58.946633480903	0	0.00	168.72	109.77
Junc n540	58.948513537452	0	0.00	168.72	109.77
Junc n541	58.951869996511	0	0.00	168.72	109.77
Junc n542	58.955463011047	0	0.00	168.72	109.76
Junc n543	58.959196736829	0	0.00	168.72	109.76
Junc n544	58.959444512047	0	0.00	168.72	109.76
Junc n545	59.245392414585	0	0.00	168.72	109.47
Junc n546	59.560349124344	0	0.00	168.71	109.15
Junc n547	59.565770306279	0	0.00	168.71	109.15
Junc n548	59.574303212927	0	0.00	168.71	109.14
Junc n549	59.574471216471	0	0.00	168.71	109.14
Junc n550	59.583959521896	0	0.00	168.71	109.13
Junc n551	59.593531712197	0	0.00	168.71	109.12
Junc n552	59.603233886975	0	0.00	168.71	109.11
Junc n553	59.61263098853	0	0.00	168.71	109.10
Junc n554	59.622586827641	0	0.00	168.71	109.09
Junc n555	59.624548748926	0	0.00	168.71	109.09
Junc n556	59.63276041644	0	0.00	168.71	109.08
Junc n557	59.641761268758	0	0.00	168.71	109.07
Junc n558	59.642863576318	0	0.00	168.71	109.07
Junc n559	59.653144112295	0	0.00	168.71	109.06
Junc n560	59.656060238393	0	0.00	168.71	109.06
Junc n561	59.654094480745	0	0.00	168.71	109.06
Junc n562	59.6533899849	0	0.00	168.71	109.06
Junc n563	59.652357598957	0	0.00	168.71	109.06

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n564	59.650736413063	0	0.00	168.71	109.06
Junc n565	59.649217040739	0	0.00	168.71	109.06
Junc n566	59.648134133972	0	0.00	168.71	109.07
Junc n567	59.312795313677	0	0.00	168.71	109.39
Junc n568	59.210434888577	0	0.00	168.71	109.50
Junc n569	59.208796514249	0	0.00	168.71	109.50
Junc n570	59.203773384921	0	0.00	168.71	109.50
Junc n571	59.203772188656	0	0.00	168.71	109.50
Junc n572	59.203071838178	0	0.00	168.71	109.50
Junc n573	59.170178904844	0	0.00	168.71	109.53
Junc n574	57.365658367039	0	0.00	168.78	111.42
Junc n575	57.282543306858	0	0.00	168.78	111.49
Junc n576	57.311771995067	0	0.00	168.77	111.45
Junc n577	60.911459611532	0	0.00	168.65	107.73
Junc n578	55.260355383559	0	0.00	169.04	113.78
Junc n579	55.143188271414	0	0.00	168.99	113.85
Junc n580	56.432933000289	0	0.00	169.18	112.74
Junc n581	56.731912891399	0	0.00	169.17	112.44
Junc n582	56.18677355573	0	0.00	169.11	112.92
Junc n583	56.230117139249	0	0.00	169.08	112.85
Junc n584	56.229970000621	0	0.00	169.08	112.85
Junc n585	56.215910929674	0	0.00	169.08	112.86
Junc n586	56.203496947432	0	0.00	169.08	112.87
Junc n587	56.201142854134	0	0.00	169.08	112.88
Junc n588	56.18734102376	0	0.00	169.08	112.89
Junc n589	56.175751052935	0	0.00	169.08	112.90
Junc n590	55.915575400073	0	0.00	169.07	113.15
Junc n591	55.832936402319	0	0.00	169.06	113.23
Junc n592	56.310576647902	0	0.00	169.20	112.89
Junc n593	56.492264718297	0	0.00	169.20	112.70
Junc n594	56.502263260314	0	0.00	169.20	112.69
Junc n595	56.518929926974	0	0.00	169.20	112.68
Junc n596	56.523451136247	0	0.00	169.20	112.67

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n597	56.203973198473	0	0.00	169.18	112.98
Junc n598	56.199986000031	0	0.00	169.18	112.98
Junc n599	56.195219844961	0	0.00	169.18	112.99
Junc n600	56.193736000026	0	0.00	169.18	112.99
Junc n601	56.187485999967	0	0.00	169.18	112.99
Junc n602	56.187066838782	0	0.00	169.18	113.00
Junc n603	56.15558837438	0	0.00	169.18	113.02
Junc n604	56.161188333355	0	0.00	169.18	113.02
Junc n605	56.167955606628	0	0.00	169.18	113.01
Junc n606	56.168116821217	0	0.00	169.18	113.01
Junc n607	56.269612903205	0	0.00	169.18	112.91
Junc n608	56.271605000038	0	0.00	169.18	112.90
Junc n609	56.277855000012	0	0.00	169.18	112.90
Junc n610	56.284105000024	0	0.00	169.18	112.89
Junc n611	56.290355000036	0	0.00	169.18	112.89
Junc n612	56.296605000064	0	0.00	169.18	112.88
Junc n613	56.297609998308	0	0.00	169.18	112.88
Junc n614	56.302855000038	0	0.00	169.18	112.87
Junc n615	56.309105000022	0	0.00	169.18	112.87
Junc n616	56.315355000037	0	0.00	169.18	112.86
Junc n617	56.321605000054	0	0.00	169.18	112.85
Junc n618	56.327067916429	0	0.00	169.18	112.85
Junc n619	56.055191244674	0	0.00	169.17	113.11
Junc n620	56.719735049021	0	0.00	169.18	112.46
Junc n621	56.719108741779	0	0.00	169.18	112.46
Junc n622	56.53959080596	0	0.00	169.18	112.64
Junc n623	63.360575779132	0	0.00	169.63	106.27
Junc n624	63.413139159627	0	0.00	169.63	106.22
Junc n625	65.209747917352	0	0.00	169.67	104.46
Junc n626	65.239648488936	0	0.00	169.66	104.42
Junc n627	64.512135188526	0	0.00	169.66	105.15
Junc n628	64.475699000045	0	0.00	169.66	105.18
Junc n629	64.43194900005599	0	0.00	169.66	105.23

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n630	64.388199000048	0	0.00	169.66	105.27
Junc n631	64.368649339267	0	0.00	169.66	105.29
Junc n632	64.34445247088	0	0.00	169.66	105.31
Junc n633	64.300699000051	0	0.00	169.66	105.36
Junc n634	64.256949000064	0	0.00	169.66	105.40
Junc n635	64.22281600218	0	0.00	169.66	105.43
Junc n636	64.213199000053	0	0.00	169.66	105.44
Junc n637	64.169449000047	0	0.00	169.66	105.49
Junc n638	64.125699000062	0	0.00	169.66	105.53
Junc n639	64.081949000053	0	0.00	169.66	105.58
Junc n640	64.076982668843	0	0.00	169.66	105.58
Junc n641	64.038199000059	0	0.00	169.66	105.62
Junc n642	63.994449000054	0	0.00	169.66	105.66
Junc n643	63.950699000044	0	0.00	169.66	105.71
Junc n644	63.931149335513	0	0.00	169.66	105.73
Junc n645	63.906949000062	0	0.00	169.66	105.75
Junc n646	63.863199000058	0	0.00	169.66	105.79
Junc n647	63.819449000056	0	0.00	169.66	105.84
Junc n648	63.785316002171	0	0.00	169.66	105.87
Junc n649	63.775699000045	0	0.00	169.66	105.88
Junc n650	63.731949000055	0	0.00	169.66	105.92
Junc n651	63.688199000058	0	0.00	169.66	105.97
Junc n652	63.644449000043	0	0.00	169.65	106.01
Junc n653	63.639482668841	0	0.00	169.65	106.02
Junc n654	63.600699000053	0	0.00	169.65	106.05
Junc n655	63.556949000046	0	0.00	169.65	106.10
Junc n656	63.513199000041	0	0.00	169.65	106.14
Junc n657	63.493649335506	0	0.00	169.65	106.16
Junc n658	63.47328035463	0	0.00	169.65	106.18
Junc n659	61.441603750575	0	0.00	169.64	108.20
Junc n660	61.442005166694	0	0.00	169.64	108.20
Junc n661	61.435330855513	0	0.00	169.64	108.21
Junc n662	61.362033545036	0	0.00	169.64	108.28

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n663	61.359044010473	0	0.00	169.64	108.28
Junc n664	61.417946624022	0	0.00	169.64	108.22
Junc n665	61.584075789479	0	0.00	169.64	108.05
Junc n666	61.825518502964	0	0.00	169.64	107.81
Junc n667	62.139853179373	0	0.00	169.63	107.50
Junc n668	63.025357163078	0	0.00	169.63	106.61
Junc n669	63.310878654614	0	0.00	169.63	106.32
Junc n670	63.504345271341	0	0.00	169.63	106.13
Junc n671	56.331191753282	0	0.00	169.75	113.42
Junc n672	56.349597300902	0	0.00	169.75	113.40
Junc n673	59.495092785399	0	0.00	169.75	110.25
Junc n674	59.589041285241	0	0.00	169.75	110.16
Junc n675	59.703521517322	0	0.00	169.75	110.04
Junc n676	59.781238954185	0	0.00	169.75	109.97
Junc n677	59.820444290295	0	0.00	169.75	109.93
Junc n678	59.93986706326	0	0.00	169.75	109.81
Junc n679	60.06178983623	0	0.00	169.75	109.69
Junc n680	60.1524834361	0	0.00	169.75	109.60
Junc n681	60.186122084502	0	0.00	169.75	109.56
Junc n682	60.29918357908	0	0.00	169.75	109.45
Junc n683	60.311122084503	0	0.00	169.75	109.44
Junc n684	60.436122084504	0	0.00	169.75	109.31
Junc n685	60.561122084499	0	0.00	169.75	109.19
Junc n686	60.686122084499	0	0.00	169.75	109.06
Junc n687	60.8111220845	0	0.00	169.75	108.94
Junc n688	60.829158782075	0	0.00	169.75	108.92
Junc n689	60.936122084498	0	0.00	169.75	108.81
Junc n690	61.0611220845	0	0.00	169.75	108.69
Junc n691	61.186122084493	0	0.00	169.75	108.56
Junc n692	61.311122084497	0	0.00	169.75	108.44
Junc n693	61.359133985065	0	0.00	169.75	108.39
Junc n694	61.436122084497	0	0.00	169.75	108.31
Junc n695	61.561122084502	0	0.00	169.75	108.19

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n696	61.686122084483	0	0.00	169.74	108.06
Junc n697	61.811122084497	0	0.00	169.74	107.93
Junc n698	61.889109188058	0	0.00	169.74	107.85
Junc n699	61.936122084491	0	0.00	169.74	107.80
Junc n700	62.061122084489	0	0.00	169.74	107.68
Junc n701	62.18611709057	0	0.00	169.74	107.55
Junc n702	62.311122084497	0	0.00	169.73	107.42
Junc n703	62.419084391098	0	0.00	169.73	107.31
Junc n704	62.436122084486	0	0.00	169.73	107.30
Junc n705	62.561122084499	0	0.00	169.73	107.17
Junc n706	62.686122084491	0	0.00	169.73	107.04
Junc n707	62.81112208449	0	0.00	169.73	106.92
Junc n708	62.936122084482	0	0.00	169.73	106.79
Junc n709	62.949059594092	0	0.00	169.73	106.78
Junc n710	63.061122084491	0	0.00	169.72	106.66
Junc n711	63.186122084489	0	0.00	169.72	106.54
Junc n712	63.311122084484	0	0.00	169.72	106.41
Junc n713	63.436122084491	0	0.00	169.72	106.28
Junc n714	63.479034797072	0	0.00	169.72	106.24
Junc n715	63.518112340544	0	0.00	169.72	106.20
Junc n716	63.623217046685	0	0.00	169.72	106.09
Junc n717	63.748088084958	0	0.00	169.71	105.96
Junc n718	63.872958288165	0	0.00	169.71	105.84
Junc n719	63.987890030888	0	0.00	169.71	105.72
Junc n720	63.997757057683	0	0.00	169.71	105.71
Junc n721	64.120068735667	0	0.00	169.71	105.59
Junc n722	64.122193930249	0	0.00	169.71	105.59
Junc n723	64.24638655663701	0	0.00	169.71	105.46
Junc n724	64.371783915018	0	0.00	169.70	105.33
Junc n725	64.496436978967	0	0.00	169.70	105.21
Junc n726	64.511622096385	0	0.00	169.70	105.19
Junc n727	64.621052905458	0	0.00	169.70	105.08
Junc n728	64.643760002394	0	0.00	169.70	105.06

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n729	64.820255750782	0	0.00	169.70	104.88
Junc n730	64.826052498823	0	0.00	169.70	104.87
Junc n731	64.87512144433001	0	0.00	169.70	104.82
Junc n732	64.91027991220901	0	0.00	169.70	104.79
Junc n733	64.989081870428	0	0.00	169.69	104.71
Junc n734	65.03294117773299	0	0.00	169.69	104.66
Junc n735	65.062736281355	0	0.00	169.69	104.63
Junc n736	65.131540014745	0	0.00	169.69	104.56
Junc n737	65.195468518238	0	0.00	169.69	104.50
Junc n738	65.219042040879	0	0.00	169.69	104.47
Junc n739	65.243704340137	0	0.00	169.69	104.45
Junc n740	65.275342695151	0	0.00	169.69	104.41
Junc n741	65.286530818177	0	0.00	169.69	104.40
Junc n742	65.296462573006	0	0.00	169.69	104.39
Junc n743	65.29668948271799	0	0.00	169.69	104.39
Junc n744	65.321255591842	0	0.00	169.69	104.36
Junc n745	65.331668929538	0	0.00	169.69	104.35
Junc n746	65.348204031446	0	0.00	169.68	104.34
Junc n747	65.438530308431	0	0.00	169.68	104.24
Junc n748	65.43563840548001	0	0.00	169.68	104.25
Junc n749	65.434323622362	0	0.00	169.68	104.25
Junc n750	65.43820855538399	0	0.00	169.68	104.24
Junc n751	65.43892272139701	0	0.00	169.68	104.24
Junc n752	65.452142892461	0	0.00	169.68	104.23
Junc n753	65.45861066677	0	0.00	169.68	104.22
Junc n754	65.459723076587	0	0.00	169.68	104.22
Junc n755	65.45974983648701	0	0.00	169.68	104.22
Junc n756	65.45869885158901	0	0.00	169.68	104.22
Junc n757	65.458573355729	0	0.00	169.68	104.22
Junc n758	65.458322990367	0	0.00	169.68	104.22
Junc n759	65.447102500155	0	0.00	169.68	104.23
Junc n760	65.447471306623	0	0.00	169.68	104.23
Junc n761	65.448319566585	0	0.00	169.68	104.23

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n762	65.44886136734201	0	0.00	169.68	104.23
Junc n763	65.44896620428	0	0.00	169.67	104.23
Junc n764	65.449066330273	0	0.00	169.67	104.23
Junc n765	65.44927291175399	0	0.00	169.67	104.22
Junc n766	65.44948075367	0	0.00	169.67	104.22
Junc n767	65.44962785050799	0	0.00	169.67	104.22
Junc n768	65.449689495722	0	0.00	169.67	104.22
Junc n769	65.449898776041	0	0.00	169.67	104.22
Junc n770	65.450107323575	0	0.00	169.67	104.22
Junc n771	65.450221463684	0	0.00	169.67	104.22
Junc n772	65.426058590887	0	0.00	169.67	104.24
Junc n773	65.31609583097701	0	0.00	169.67	104.35
Junc n774	65.23848378613501	0	0.00	169.67	104.43
Junc n775	64.484135188511	0	0.00	169.66	105.18
Junc n776	64.481927334647	0	0.00	169.66	105.18
Junc n777	64.447699000029	0	0.00	169.66	105.21
Junc n778	64.403949000024	0	0.00	169.66	105.26
Junc n779	64.36019900002201	0	0.00	169.66	105.30
Junc n780	64.336094001882	0	0.00	169.66	105.32
Junc n781	64.316452525375	0	0.00	169.66	105.34
Junc n782	64.272699000016	0	0.00	169.66	105.39
Junc n783	64.228949000013	0	0.00	169.66	105.43
Junc n784	64.19026066746601	0	0.00	169.66	105.47
Junc n785	64.185199000026	0	0.00	169.66	105.47
Junc n786	64.141449000018	0	0.00	169.66	105.52
Junc n787	64.097699000017	0	0.00	169.66	105.56
Junc n788	64.05394900001301	0	0.00	169.66	105.61
Junc n789	64.044427334123	0	0.00	169.66	105.61
Junc n790	64.010199000013	0	0.00	169.66	105.65
Junc n791	63.966449000013	0	0.00	169.66	105.69
Junc n792	63.922699000015	0	0.00	169.66	105.74
Junc n793	63.898594000785	0	0.00	169.66	105.76
Junc n794	63.878949000005	0	0.00	169.66	105.78

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n795	63.835199000005	0	0.00	169.66	105.82
Junc n796	63.791449000011	0	0.00	169.66	105.87
Junc n797	63.752760667449	0	0.00	169.66	105.90
Junc n798	63.747699000002	0	0.00	169.66	105.91
Junc n799	63.703949000002	0	0.00	169.66	105.95
Junc n800	63.660199	0	0.00	169.66	106.00
Junc n801	63.616449000006	0	0.00	169.66	106.04
Junc n802	63.606927334108	0	0.00	169.66	106.05
Junc n803	63.572698999989	0	0.00	169.66	106.08
Junc n804	63.528948999995	0	0.00	169.66	106.13
Junc n805	63.485198999995	0	0.00	169.65	106.17
Junc n806	63.461094000767	0	0.00	169.65	106.19
Junc n807	63.445280354567	0	0.00	169.65	106.21
Junc n808	61.416630504284	0	0.00	169.64	108.22
Junc n809	61.407918374696	0	0.00	169.64	108.23
Junc n810	61.401827110184	0	0.00	169.64	108.24
Junc n811	61.396078480579	0	0.00	169.64	108.24
Junc n812	61.385215148965	0	0.00	169.64	108.26
Junc n813	61.381926302099	0	0.00	169.64	108.26
Junc n814	61.37532837985	0	0.00	169.64	108.27
Junc n815	61.366419522405	0	0.00	169.64	108.27
Junc n816	61.365976428886	0	0.00	169.64	108.27
Junc n817	61.363484529048	0	0.00	169.64	108.28
Junc n818	61.361588087312	0	0.00	169.64	108.28
Junc n819	61.361527447494	0	0.00	169.64	108.28
Junc n820	61.360547004819	0	0.00	169.64	108.28
Junc n821	61.360422869663	0	0.00	169.64	108.28
Junc n822	61.360491437638	0	0.00	169.64	108.28
Junc n823	61.360542971746	0	0.00	169.64	108.28
Junc n824	61.361515577625	0	0.00	169.64	108.28
Junc n825	61.362695512062	0	0.00	169.64	108.28
Junc n826	61.363464342976	0	0.00	169.64	108.27
Junc n827	61.371390476884	0	0.00	169.64	108.27

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n828	61.375137217204	0	0.00	169.64	108.26
Junc n829	61.379213071552	0	0.00	169.64	108.26
Junc n830	63.556616057764	0.36	1.80	169.63	106.07
Junc n831	55.400820813525	0	0.00	173.74	118.34
Junc n832	55.386820813555	0.05	0.06	173.61	118.23
Junc n833	55.452658171717	0	0.00	172.40	116.94
Junc n834	55.182424335938	0	0.00	172.29	117.10
Junc n835	55.090122995926	0	0.00	172.25	117.16
Junc n836	55.069762257913	0	0.00	172.24	117.17
Junc n837	55.065024112358	0	0.00	172.20	117.14
Junc n838	55.524788870964	0	0.00	172.11	116.59
Junc n839	55.540611701524	0	0.00	172.10	116.56
Junc n840	55.546097300892	0	0.00	172.10	116.55
Junc n841	55.560020008658	0	0.00	172.08	116.52
Junc n842	55.612449574973	0	0.00	172.04	116.43
Junc n843	55.629330393891	0	0.00	172.02	116.39
Junc n844	55.799298938906	0	0.00	171.87	116.07
Junc n845	55.818971052373	0	0.00	171.85	116.03
Junc n846	55.821425599199	0	0.00	171.85	116.02
Junc n847	55.831407019654	0	0.00	171.84	116.01
Junc n848	55.834111645333	0	0.00	171.83	116.00
Junc n849	55.846804891301	0	0.00	171.82	115.97
Junc n850	55.859492390933	0	0.00	171.81	115.95
Junc n851	55.872179890664	0	0.00	171.80	115.93
Junc n852	55.884867390288	0	0.00	171.79	115.90
Junc n853	55.897554889974	0	0.00	171.77	115.88
Junc n854	55.910242389659	0	0.00	171.76	115.85
Junc n855	55.922929889346	0	0.00	171.75	115.83
Junc n856	55.935617388979	0	0.00	171.74	115.80
Junc n857	55.9483048887	0	0.00	171.72	115.78
Junc n858	55.960992388311	0	0.00	171.71	115.75
Junc n859	55.973679888057	0	0.00	171.70	115.73
Junc n860	55.986367387649	0	0.00	171.69	115.70

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n861	55.999054887365	0	0.00	171.68	115.68
Junc n862	56.011742387076	0	0.00	171.66	115.65
Junc n863	56.024429886717	0	0.00	171.65	115.63
Junc n864	56.037117386386	0	0.00	171.64	115.60
Junc n865	56.049804886058	0	0.00	171.63	115.58
Junc n866	56.062492385735	0	0.00	171.61	115.55
Junc n867	56.075179885398	0	0.00	171.60	115.53
Junc n868	56.087867385061	0	0.00	171.59	115.50
Junc n869	56.100560391685	0	0.00	171.58	115.48
Junc n870	56.103797828393	0	0.00	171.57	115.47
Junc n871	56.113240513821	0	0.00	171.57	115.45
Junc n872	56.125929884096	0	0.00	171.55	115.43
Junc n873	56.138617383786	0	0.00	171.54	115.40
Junc n874	56.151304883412	0	0.00	171.53	115.38
Junc n875	56.163992383419	0	0.00	171.52	115.35
Junc n876	56.176679360635	0	0.00	171.50	115.33
Junc n877	56.189367382757	0	0.00	171.49	115.30
Junc n878	56.202054882146	0	0.00	171.48	115.28
Junc n879	56.214743712455	0	0.00	171.47	115.25
Junc n880	56.225184909315	0	0.00	171.46	115.23
Junc n881	56.227423882175	0	0.00	171.46	115.23
Junc n882	56.24011685896	0	0.00	171.44	115.20
Junc n883	56.252810386251	0	0.00	171.43	115.18
Junc n884	56.25602533683	0	0.00	171.43	115.17
Junc n885	56.264707993266	0	0.00	171.42	115.15
Junc n886	56.269378585482	0	0.00	171.41	115.14
Junc n887	56.276396323415	0	0.00	171.41	115.13
Junc n888	56.276929297911	0	0.00	171.41	115.13
Junc n889	56.302773848967	0	0.00	171.38	115.08
Junc n890	56.331135847258	0	0.00	171.35	115.02
Junc n891	53.945851710892	0	0.00	170.41	116.47
Junc n892	52.87746290793	0	0.00	170.37	117.49
Junc n893	56.333056448459	0	0.00	169.82	113.49

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n894	57.515566956736	0.03	0.03	169.82	112.30
Junc n895	61.170290509079	0	0.00	169.76	108.59
Junc n896	56.15174435786	0	0.00	169.59	113.44
Junc n897	55.931014567162	0	0.00	169.06	113.13
Junc n898	55.908586838047	0	0.00	169.06	113.16
Junc n899	55.838893768312	0	0.00	169.06	113.23
Junc n900	55.733264663786	0	0.00	169.06	113.33
Junc n901	55.658556341081	0	0.00	169.06	113.41
Junc n902	55.634956444958	0	0.00	169.06	113.43
Junc n903	55.619204290902	0	0.00	169.06	113.45
Junc n904	55.60494896811	0	0.00	169.06	113.46
Junc n905	55.501563178948	0	0.00	169.06	113.56
Junc n906	55.50139772691	0	0.00	169.06	113.56
Junc n907	55.391680853421	0	0.00	169.06	113.67
Junc n908	55.265144393403	0	0.00	169.06	113.80
Junc n909	55.786254120155	0	0.00	169.06	113.28
Junc n910	55.915640649392	0	0.00	169.06	113.15
Junc n911	55.983345475587	0	0.00	169.06	113.08
Junc n912	56.004665248659	0	0.00	169.06	113.06
Junc n913	56.04042081737	0	0.00	169.06	113.02
Junc n914	56.076942897374	0	0.00	169.06	112.99
Junc n915	56.113577393481	0	0.00	169.06	112.95
Junc n916	56.145022988423	0	0.00	169.06	112.92
Junc n917	56.172685901839	0	0.00	169.06	112.89
Junc n918	56.186298109836	0	0.00	169.06	112.88
Junc n919	56.188024612957	0	0.00	169.06	112.88
Junc n920	56.197895654928	0	0.00	169.06	112.87
Junc n921	56.124620171028	0	0.00	169.06	112.94
Junc n922	55.50975646788	0	0.00	169.05	113.54
Junc n923	55.439197161184	0	0.00	169.05	113.61
Junc n924	55.23849365344	0	0.00	169.04	113.81
Junc n925	55.229672139084	0	0.00	169.04	113.82
Junc n926	55.203927065671	0	0.00	169.05	113.84

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n927	55.199644821428	0	0.00	169.05	113.85
Junc n928	55.198023938984	0	0.00	169.05	113.85
Junc n929	55.190220133876	0	0.00	169.05	113.86
Junc n932	55.988515470624	0	0.00	169.26	113.28
Junc n933	55.738349978525	0	0.00	169.27	113.54
Junc n934	55.7457675546	0	0.00	169.27	113.53
Junc n935	55.75298894975	0	0.00	169.27	113.52
Junc n936	55.760960180434	0	0.00	169.27	113.51
Junc n937	55.769086765082	0	0.00	169.27	113.50
Junc n938	55.878248961989	0	0.00	169.25	113.38
Junc n939	55.933589619195	0	0.00	169.25	113.32
Junc n940	55.981261046692	0	0.00	169.24	113.26
Junc n941	56.006074558804	0	0.00	169.24	113.23
Junc n942	56.028638432621	0	0.00	169.23	113.21
Junc n943	56.041266602418	0	0.00	169.23	113.19
Junc n944	56.053109169416	0	0.00	169.23	113.17
Junc n945	56.060489642709	0	0.00	169.23	113.17
Junc n946	56.087051248639	0	0.00	169.23	113.14
Junc n947	56.11806258067	0	0.00	169.22	113.11
Junc n948	56.120180899363	0	0.00	169.22	113.10
Junc n949	56.136895276425	0	0.00	169.22	113.09
Junc n950	56.178786387343	0	0.00	169.22	113.04
Junc n951	56.232803046114	0	0.00	169.21	112.98
Junc n952	56.247983060608	0	0.00	169.21	112.96
Junc n953	56.274063894735	0	0.00	169.20	112.93
Junc n954	56.516857889285	0	0.00	169.18	112.66
Junc n955	56.131319668121	0	0.00	169.18	113.04
Junc n956	55.95000983237	0	0.00	169.18	113.23
Junc n957	55.935575923935	0	0.00	169.18	113.24
Junc n958	55.931173229884	0	0.00	169.18	113.24
Junc n959	55.354844126448	0	0.00	172.33	116.98
Junc n960	55.314254297407	0.13	0.16	172.31	117.00
Junc n961	56.67014333696	0	0.00	168.92	112.25

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n962	55.850952528006	0	0.00	168.92	113.07
Junc n963	55.850952807929	0	0.00	168.92	113.07
Junc n964	55.851197225368	0	0.00	168.92	113.07
Junc n965	55.852004334188	0	0.00	168.92	113.06
Junc n966	55.852240917108	0	0.00	168.92	113.06
Junc n967	55.852298031209	0	0.00	168.92	113.06
Junc n968	55.516662920882	0	0.00	168.92	113.40
Junc n969	55.505081810515	0	0.00	168.92	113.41
Junc n970	55.484311967411	0	0.00	168.92	113.43
Junc n971	55.469443121451	0	0.00	168.92	113.45
Junc n972	55.24085295804	0	0.00	168.92	113.68
Junc n973	55.229533022975	0	0.00	168.92	113.69
Junc n974	55.226744026412	0	0.00	168.92	113.69
Junc n975	55.211201230833	0	0.00	168.92	113.71
Junc n976	55.06754126195	0	0.00	168.92	113.85
Junc n977	55.785941301467	0	0.00	169.31	113.53
Junc n978	55.784893047854	0	0.00	169.31	113.53
Junc n979	55.776559714524	0	0.00	169.32	113.54
Junc n980	55.768532619848	0	0.00	169.32	113.55
Junc n981	55.768226381189	0	0.00	169.32	113.55
Junc n982	55.759893047855	0	0.00	169.32	113.56
Junc n983	55.75155971452	0	0.00	169.32	113.57
Junc n984	55.747822140273	0	0.00	169.33	113.58
Junc n985	55.743226381189	0	0.00	169.33	113.58
Junc n986	55.734893047856	0	0.00	169.34	113.60
Junc n987	55.727111660699	0	0.00	169.34	113.62
Junc n988	55.72655971452	0	0.00	169.34	113.62
Junc n989	55.718226381186	0	0.00	169.35	113.64
Junc n990	55.709893047855	0	0.00	169.36	113.65
Junc n991	55.706751316027	0	0.00	169.37	113.66
Junc n992	55.645259661421	0	0.00	169.43	113.78
Junc n993	55.01703730606	0	0.00	169.59	114.58
Junc n994	55.006020952748	0	0.00	169.61	114.60

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n995	54.997786193786	0	0.00	169.61	114.62
Junc n996	54.993520952749	0	0.00	169.62	114.62
Junc n997	54.981020952756	0	0.00	169.63	114.65
Junc n998	54.968520952705	0	0.00	169.64	114.67
Junc n999	54.956020952699	0	0.00	169.66	114.70
Junc n1000	54.94872120579	0	0.00	169.66	114.71
Junc n1001	54.943520952731	0	0.00	169.67	114.72
Junc n1002	54.931020952692	0	0.00	169.68	114.75
Junc n1003	54.918520952742	0	0.00	169.70	114.78
Junc n1004	54.906020952766	0	0.00	169.76	114.85
Junc n1005	54.899656217871	0	0.00	169.79	114.89
Junc n1006	54.893520952762	0	0.00	169.81	114.92
Junc n1007	54.881020952709	0	0.00	169.87	114.99
Junc n1008	54.868520952718	0	0.00	169.92	115.05
Junc n1009	54.856020952761	0	0.00	169.98	115.12
Junc n1010	54.850591229889	0	0.00	170.00	115.15
Junc n1011	54.843520952729	0	0.00	170.03	115.19
Junc n1012	54.831020952708	0	0.00	170.09	115.26
Junc n1013	54.822767269478	0	0.00	170.12	115.30
Junc n1014	54.822766769457	0	0.00	170.12	115.30
Junc n1015	54.818520952759	0	0.00	170.14	115.32
Junc n1016	54.806020952752	0	0.00	170.20	115.39
Junc n1017	54.801526241906	0	0.00	170.22	115.41
Junc n1018	54.793520952689	0	0.00	170.25	115.46
Junc n1019	54.783153203507	0	0.00	170.29	115.51
Junc n1020	54.910020952774	0	0.00	170.31	115.40
Junc n1021	54.897520952773	0	0.00	170.36	115.46
Junc n1022	54.885021452774	0	0.00	170.42	115.53
Junc n1023	54.885020952774	0	0.00	170.42	115.53
Junc n1024	54.881461373687	0	0.00	170.43	115.55
Junc n1025	54.872520952774	0	0.00	170.47	115.60
Junc n1026	54.860020952774	0	0.00	170.52	115.66
Junc n1027	54.847520952774	0	0.00	170.58	115.73

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n1028	54.835020952774	0	0.00	170.63	115.80
Junc n1029	54.83239656741	0	0.00	170.65	115.81
Junc n1030	54.822520952774	0	0.00	170.69	115.87
Junc n1031	54.810020952774	0	0.00	170.74	115.93
Junc n1032	54.797520952774	0	0.00	170.80	116.00
Junc n1033	54.785020952774	0	0.00	170.85	116.07
Junc n1034	54.783331761132	0	0.00	170.86	116.08
Junc n1035	54.772520952774	0	0.00	170.91	116.14
Junc n1036	54.760020952774	0	0.00	170.96	116.20
Junc n1037	54.747520952774	0	0.00	171.02	116.27
Junc n1038	54.735020952774	0	0.00	171.07	116.34
Junc n1039	54.734266954856	0	0.00	171.08	116.34
Junc n1040	54.722520952774	0	0.00	171.13	116.40
Junc n1041	54.710020952774	0	0.00	171.18	116.47
Junc n1042	54.705059126844	0	0.00	171.20	116.50
Junc n1043	54.712597300905	0	0.00	171.24	116.52
Junc n1044	54.7249161051	0	0.00	171.29	116.57
Junc n1045	54.725097300904	0	0.00	171.29	116.57
Junc n1046	54.737597300904	0	0.00	171.35	116.61
Junc n1047	54.750097300905	0	0.00	171.40	116.65
Junc n1048	54.762597300904	0	0.00	171.46	116.69
Junc n1049	54.773980911378	0	0.00	171.51	116.73
Junc n1050	54.775097300904	0	0.00	171.51	116.74
Junc n1051	54.787597300904	0	0.00	171.57	116.78
Junc n1052	54.797564057381	0	0.00	171.61	116.82
Junc n1053	54.819963121411	0	0.00	171.72	116.90
Junc n1054	54.842362185441	0	0.00	171.83	116.99
Junc n1055	54.861743183369	0	0.00	171.92	117.06
Junc n1056	55.045123312152	0	0.00	172.19	117.15
Junc n1057	55.423690999964	0	0.00	174.23	118.81
Junc n1058	53.251858695845	0	0.00	169.99	116.74
Junc n1059	56.509658665267	0	0.00	169.76	113.25
Junc n1060	56.934918581218	0	0.00	169.77	112.83

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n1061	53.90861218357	0	0.00	169.86	115.95
Junc n1062	55.122185604994	0	0.00	167.92	112.79
Junc n1063	54.923184465333	0	0.00	167.91	112.99
Junc n1064	54.681994783002	0	0.00	167.91	113.23
Junc n1065	54.233032279968	0	0.00	167.91	113.68
Junc n1066	52.887380780633	0	0.00	167.91	115.02
Junc n1067	51.207251165335	0.47	0.95	167.91	116.70
Junc n1068	52.010010874325	0	0.00	167.91	115.90
Junc n1069	52.742328395914	0	0.00	167.91	115.17
Junc n1070	53.605599646978	0	0.00	167.91	114.31
Junc n1071	55.355896360081	0	0.00	167.92	112.56
Junc n1072	54.921041804269	0	0.00	169.69	114.77
Junc n1073	55.496378809589	0	0.00	169.48	113.99
Junc n1074	55.531792303413	0	0.00	169.43	113.90
Junc n1075	55.876873636566	0	0.00	169.35	113.47
Junc n1076	56.052958635665	0	0.00	169.35	113.30
Junc n1077	56.076421294005	0	0.00	169.35	113.27
Junc n1078	56.083880152301	0	0.00	169.35	113.27
Junc n1079	56.093760388786	0	0.00	169.35	113.26
Junc n1080	56.10376038879	0	0.00	169.35	113.25
Junc n1081	56.113880152299	0	0.00	169.35	113.24
Junc n1082	56.123760388792	0	0.00	169.35	113.23
Junc n1083	56.133624890988	0	0.00	169.35	113.22
Junc n1084	56.136680374092	0	0.00	169.35	113.21
Junc n1085	56.147556289187	0	0.00	169.35	113.20
Junc n1086	56.14758883345	0	0.00	169.35	113.20
Junc n1087	56.516858661329	0	0.00	169.35	112.84
Junc n1088	55.997005231036	0	0.00	169.35	113.36
Junc n1089	55.969270318329	0	0.00	169.35	113.38
Junc n1090	55.957265454703	0	0.00	169.35	113.40
Junc n1091	55.947810687659	0	0.00	169.35	113.41
Junc n1092	55.939256260913	0	0.00	169.35	113.42
Junc n1093	55.930256766146	0	0.00	169.35	113.42

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n1094	55.921248804896	0	0.00	169.35	113.43
Junc n1095	55.912287417534	0	0.00	169.35	113.44
Junc n1096	55.903265119138	0	0.00	169.35	113.45
Junc n1097	55.894284484204	0	0.00	169.35	113.46
Junc n1098	55.885248804907	0	0.00	169.35	113.47
Junc n1099	55.876248804907	0	0.00	169.35	113.48
Junc n1100	55.867244584468	0	0.00	169.35	113.49
Junc n1101	55.858248804899	0	0.00	169.35	113.50
Junc n1102	55.849248804905	0	0.00	169.35	113.51
Junc n1103	55.840284484212	0	0.00	169.35	113.51
Junc n1104	55.831284484214	0	0.00	169.35	113.52
Junc n1105	55.822248804909	0	0.00	169.35	113.53
Junc n1106	55.81328448422	0	0.00	169.35	113.54
Junc n1107	55.804242471533	0	0.00	169.35	113.55
Junc n1108	55.795284484218	0	0.00	169.35	113.56
Junc n1109	55.786248804915	0	0.00	169.35	113.57
Junc n1110	55.777248798588	0	0.00	169.35	113.58
Junc n1111	55.768284484219	0	0.00	169.35	113.59
Junc n1112	55.759284484223	0	0.00	169.35	113.60
Junc n1113	55.75024880492	0	0.00	169.36	113.60
Junc n1114	55.741251194294	0	0.00	169.36	113.61
Junc n1115	55.732284484225	0	0.00	169.36	113.62
Junc n1116	55.72328448422	0	0.00	169.36	113.63
Junc n1117	55.719548100035	0	0.00	169.36	113.64
Junc n1118	55.711273642297	0	0.00	169.36	113.64
Junc n1119	55.702273386778	0	0.00	169.36	113.65
Junc n1120	55.693270200048	0	0.00	169.36	113.66
Junc n1121	55.68426688539	0	0.00	169.36	113.67
Junc n1122	55.673011582677	0	0.00	169.36	113.68
Junc n1123	55.663258387622	0	0.00	169.36	113.69
Junc n1124	55.651252794816	0	0.00	169.36	113.70
Junc n1125	55.639257379362	0	0.00	169.36	113.72
Junc n1126	55.569711902362	0	0.00	169.36	113.79

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n1127	55.265130923541	0	0.00	169.16	113.90
Junc n1128	55.937184161619	0	0.00	169.12	113.18
Junc n1129	55.937341009221	0	0.00	169.12	113.18
Junc n1130	56.026367970801	0	0.00	169.11	113.08
Junc n1131	56.037455634674	0	0.00	169.11	113.07
Junc n1132	56.057305767599	0	0.00	169.11	113.05
Junc n1133	56.077235855283	0	0.00	169.10	113.03
Junc n1134	56.095687298009	0	0.00	169.10	113.01
Junc n1135	56.112693912946	0	0.00	169.10	112.99
Junc n1136	56.128840183465	0	0.00	169.10	112.97
Junc n1137	56.143541626184	0	0.00	169.10	112.95
Junc n1138	56.156843152447	0	0.00	169.09	112.94
Junc n1139	56.16919451164	0	0.00	169.09	112.92
Junc n1140	56.180025978776	0	0.00	169.09	112.91
Junc n1141	56.189742391948	0	0.00	169.09	112.90
Junc n1142	56.198298839825	0	0.00	169.08	112.89
Junc n1143	56.205425218278	0	0.00	169.08	112.88
Junc n1144	56.211451725281	0	0.00	169.08	112.87
Junc n1145	56.21610804461	0	0.00	169.08	112.86
Junc n1146	56.219484627099	0	0.00	169.07	112.86
Junc n1147	56.219566223831	0	0.00	169.07	112.86
Junc n1148	56.221072473619	0	0.00	169.07	112.85
Junc n1149	56.22106358687	0	0.00	169.07	112.85
Junc n1150	55.515253025909	0	0.00	169.01	113.49
Junc n1151	54.966708007613	0	0.00	168.98	114.01
Junc n1152	55.51142299773	0	0.00	168.94	113.43
Junc n1153	55.526291480783	0	0.00	168.94	113.41
Junc n1154	55.576293159963	0	0.00	168.94	113.36
Junc n1155	55.626294828299	0	0.00	168.93	113.31
Junc n1156	55.676296414546	0	0.00	168.93	113.26
Junc n1157	55.726298095961	0	0.00	168.93	113.20
Junc n1158	55.735924967581	0	0.00	168.93	113.19
Junc n1159	55.774790694924	0	0.00	168.93	113.15

Node ID	Elevation m	Base Demand LPS	Demand LPS	Head m	Pressure m
Junc n1160	55.818740065954	0	0.00	168.92	113.11
Junc n1161	55.858059897525	0	0.00	168.92	113.06
Junc n1162	55.89274998584	0	0.00	168.92	113.03
Junc n1163	55.922810784137	0	0.00	168.92	112.99
Junc n1164	55.929643624709	0	0.00	168.92	112.99
Junc n1165	55.850349147803	0	0.00	168.87	113.02
Junc n1166	55.848810931975	0	0.00	168.87	113.02
Junc n1167	55.841101400204	0	0.00	168.87	113.03
Junc n1168	55.834921463811	0	0.00	168.86	113.03
Junc n1169	55.834858712619	0	0.00	168.86	113.03
Junc n1170	56.711333690198	0	0.00	168.79	112.08
Junc n1171	57.570992732957	0	0.00	168.78	111.21
Junc n1172	57.586865250384	0	0.00	168.78	111.20
Junc n1173	57.603348523613	0	0.00	168.78	111.18
Junc n1174	57.603897060882	0	0.00	168.78	111.18
Junc n1175	58.202006870636	0	0.00	168.78	110.58
Junc 7	55	0	0.00	62.75	7.75
Resvr 1	-200	#N/A	-20.25	-200.00	0.00
Tank T-1	55	#N/A	4.71	61.02	6.02

Network Table - Links at 0:00 Hrs

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p1	16.43	100	130	0	0	4.60	0.59	4.53	0.026
Pipe p2	50	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p3	13.46	100	130	0	0	2.71	0.35	1.70	0.028
Pipe p4	98.21	100	130	0	0	2.71	0.35	1.70	0.028
Pipe p5	5.561	100	130	0	0	2.71	0.35	1.70	0.028
Pipe p6	23.67	100	130	0	0	2.71	0.35	1.70	0.028
Pipe p7	8.23	100	130	0	0	2.71	0.35	1.70	0.028
Pipe p8	34.97	100	130	0	0	2.71	0.35	1.70	0.028
Pipe p9	17.01	100	130	0	0	0.20	0.02	0.01	0.041
Pipe p10	45.33	100	130	0	0	0.20	0.02	0.01	0.041
Pipe p11	7.681	100	130	0	0	0.20	0.02	0.01	0.046
Pipe p12	34.37	100	130	0	0	0.20	0.02	0.01	0.041
Pipe p13	25.03	100	130	0	0	0.20	0.02	0.01	0.040
Pipe p14	19.25	100	130	0	0	-3.11	0.40	2.19	0.027
Pipe p15	7.727	100	130	0	0	-3.11	0.40	2.19	0.027
Pipe p16	22.91	100	130	0	0	-3.11	0.40	2.19	0.027
Pipe p17	33.82	100	130	0	0	-3.11	0.40	2.19	0.027
Pipe p18	35.34	100	130	0	0	-3.11	0.40	2.19	0.027
Pipe p19	17.48	100	130	0	0	-3.11	0.40	2.19	0.027
Pipe p20	8.963	100	130	0	0	-3.11	0.40	2.19	0.027
Pipe p21	109.84	100	130	0	0	6.70	0.85	9.07	0.024
Pipe p22	45.56	100	130	0	0	0.46	0.06	0.06	0.037
Pipe p23	29.52	100	130	0	0	0.46	0.06	0.06	0.036
Pipe p25	52.73	100	130	0	0	0.02	0.00	0.00	0.084
Pipe p26	22.53	100	130	0	0	0.02	0.00	0.00	0.000
Pipe p27	17.35	100	130	0	0	-0.14	0.02	0.01	0.040
Pipe p28	14.07	100	130	0	0	-0.14	0.02	0.01	0.041
Pipe p29	7.814	100	130	0	0	-0.14	0.02	0.01	0.044
Pipe p31	11.44	100	130	0	0	-0.66	0.08	0.12	0.034
Pipe p32	11.84	100	130	0	0	-0.66	0.08	0.12	0.034
Pipe p33	6.248	100	130	0	0	-0.66	0.08	0.13	0.035

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p34	36.83	100	130	0	0	-0.66	0.08	0.12	0.035
Pipe p35	4.635	100	130	0	0	-3.77	0.48	3.13	0.027
Pipe p36	4.994	100	130	0	0	-3.77	0.48	3.13	0.027
Pipe p37	43.62	100	130	0	0	-3.77	0.48	3.13	0.027
Pipe p38	95.4	100	130	0	0	-3.77	0.48	3.13	0.027
Pipe p39	66.82	100	130	0	0	-3.77	0.48	3.13	0.027
Pipe p40	2.098	100	130	0	0	-3.77	0.48	3.12	0.027
Pipe p41	45.22	100	130	0	0	-3.77	0.48	3.13	0.027
Pipe p42	8.469	100	130	0	0	-3.77	0.48	3.13	0.027
Pipe p43	82.35	100	130	0	0	-3.77	0.48	3.13	0.027
Pipe p44	3.063	100	130	0	0	-3.77	0.48	3.13	0.027
Pipe p45	32.81	100	130	0	0	-3.77	0.48	3.13	0.027
Pipe p46	11.61	100	130	0	0	-3.77	0.48	3.13	0.027
Pipe p47	48.44	100	130	0	0	-3.77	0.48	3.13	0.027
Pipe p48	67.82	100	130	0	0	-0.60	0.08	0.10	0.035
Pipe p49	4.855	100	130	0	0	-0.73	0.09	0.15	0.034
Pipe p50	7.129	100	130	0	0	-0.73	0.09	0.15	0.034
Pipe p51	4.08	100	130	0	0	-0.73	0.09	0.15	0.034
Pipe p52	8.409	100	130	0	0	-0.73	0.09	0.15	0.034
Pipe p54	50.96	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p55	3.694	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p56	4.902	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p57	4.203	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p58	13.12	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p59	36.89	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p60	16.35	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p61	5.124	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p62	20.41	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p63	7.533	100	130	0	0	0.92	0.12	0.23	0.033
Pipe p65	0.7876	100	130	0	0	1.52	0.19	0.59	0.031
Pipe p67	0.1305	100	130	0	0	0.48	0.06	0.00	0.000
Pipe p68	0.3973	100	130	0	0	0.48	0.06	0.09	0.050
Pipe p69	100.3	100	130	0	0	0.48	0.06	0.07	0.036

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p70	0.2449	100	130	0	0	0.48	0.06	0.08	0.041
Pipe p71	0.3606	100	130	0	0	0.48	0.06	0.05	0.028
Pipe p72	0.7955	100	130	0	0	0.48	0.06	0.07	0.037
Pipe p73	1.156	100	130	0	0	0.48	0.06	0.08	0.043
Pipe p74	0.5481	100	130	0	0	0.48	0.06	0.07	0.036
Pipe p75	0.6081	100	130	0	0	0.48	0.06	0.06	0.033
Pipe p76	1.156	100	130	0	0	0.48	0.06	0.06	0.034
Pipe p77	0.7354	100	130	0	0	0.48	0.06	0.08	0.041
Pipe p78	0.1968	100	130	0	0	0.48	0.06	0.00	0.000
Pipe p79	0.2239	100	130	0	0	0.48	0.06	0.08	0.044
Pipe p80	1.156	100	130	0	0	0.48	0.06	0.06	0.034
Pipe p81	0.9227	100	130	0	0	0.48	0.06	0.08	0.043
Pipe p82	0.2332	100	130	0	0	0.48	0.06	0.08	0.043
Pipe p83	1.156	100	130	0	0	0.48	0.06	0.06	0.034
Pipe p84	1.11	100	130	0	0	0.48	0.06	0.07	0.036
Pipe p85	0.04565	100	130	0	0	0.48	0.06	0.00	0.000
Pipe p86	1.156	100	130	0	0	0.48	0.06	0.06	0.034
Pipe p87	1.156	100	130	0	0	0.48	0.06	0.06	0.034
Pipe p88	0.1418	100	130	0	0	0.48	0.06	0.13	0.070
Pipe p89	0.6203	100	130	0	0	0.48	0.06	0.06	0.032
Pipe p90	33.25	100	130	0	0	0.48	0.06	0.07	0.036
Pipe p91	0.1712	100	130	0	0	0.48	0.06	0.11	0.058
Pipe p92	0.9625	100	130	0	0	0.48	0.06	0.08	0.041
Pipe p93	0.1933	100	130	0	0	0.48	0.06	0.00	0.000
Pipe p94	1.155	100	130	0	0	0.48	0.06	0.06	0.034
Pipe p95	1.15	100	130	0	0	0.48	0.06	0.08	0.043
Pipe p96	0.005809	100	130	0	0	0.48	0.06	0.00	0.000
Pipe p97	0.4539	100	130	0	0	0.48	0.06	0.04	0.022
Pipe p98	0.7021	100	130	0	0	0.48	0.06	0.08	0.042
Pipe p99	1.156	100	130	0	0	0.48	0.06	0.06	0.034
Pipe p100	0.1817	100	130	0	0	0.48	0.06	0.10	0.055
Pipe p101	0.9741	100	130	0	0	0.48	0.06	0.06	0.031
Pipe p102	1.156	100	130	0	0	0.48	0.06	0.08	0.043

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p103	0.3692	100	130	0	0	0.48	0.06	0.05	0.027
Pipe p104	0.7869	100	130	0	0	0.48	0.06	0.07	0.038
Pipe p105	1.156	100	130	0	0	0.48	0.06	0.06	0.034
Pipe p106	0.5567	100	130	0	0	0.48	0.06	0.07	0.036
Pipe p107	0.5995	100	130	0	0	0.48	0.06	0.06	0.033
Pipe p108	0.06592	100	130	0	0	0.48	0.06	0.00	0.000
Pipe p109	1.09	100	130	0	0	0.48	0.06	0.07	0.036
Pipe p110	0.6935	100	130	0	0	0.48	0.06	0.08	0.043
Pipe p111	0.05064	100	130	0	0	0.48	0.06	0.00	0.000
Pipe p112	0.4121	100	130	0	0	0.48	0.06	0.09	0.048
Pipe p113	0.4978	100	130	0	0	0.48	0.06	0.04	0.020
Pipe p114	97.14	100	130	0	0	0.48	0.06	0.07	0.036
Pipe p115	9.00	100	130	0	0	1.69	0.21	0.70	0.030
Pipe p116	111.5	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p117	106.7	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p119	15.3	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p120	16.43	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p121	15.30	100	130	0	0	-0.73	0.09	0.15	0.034
Pipe p122	2.594	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p123	0.1014	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p124	0.1646	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p125	0.109	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p126	0.2736	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p127	0.2738	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p128	0.2739	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p129	0.274	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p130	0.2324	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p131	0.0418	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p132	0.2743	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p133	0.2744	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p134	0.2746	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p135	0.2747	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p136	0.2749	100	130	0	0	0.00	0.00	0.00	0.000

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p137	0.02571	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p138	0.04526	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p139	0.204	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p140	0.2747	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p141	0.2745	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p142	0.2744	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p143	0.2742	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p144	0.01891	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p147	4.553e-005	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p148	0.3331	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p149	0.4215	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p150	0.4216	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p151	0.4216	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p152	0.4057	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p153	0.01598	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p154	0.4217	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p155	0.4218	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p156	0.4219	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p157	0.4219	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p158	0.2553	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p159	0.04633	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p160	0.1205	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p161	0.4218	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p162	0.4216	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p163	0.4214	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p164	0.4212	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p165	0.1967	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p166	0.2245	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p167	0.421	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p168	0.4209	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p169	0.4208	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p170	0.4208	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p172	1.185	100	130	0	0	0.00	0.00	0.00	0.000

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p173	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p174	0.1284	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p175	1.319	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p176	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p177	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p178	0.7856	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p179	0.662	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p180	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p181	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p182	1.443	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p183	0.004806	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p184	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p185	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p186	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p187	0.6524	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p188	0.7952	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p189	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p190	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p191	1.31	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p192	0.138	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p193	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p194	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p195	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p196	0.5193	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p197	0.9283	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p198	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p199	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p200	1.176	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p201	0.2711	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p202	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p203	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p204	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p205	0.3861	100	130	0	0	0.00	0.00	0.00	0.000

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p206	1.062	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p207	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p208	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p209	1.043	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p210	0.4043	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p211	0.272	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p212	1.176	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p213	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p214	1.448	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p215	0.2529	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p216	1.167	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p218	0.1749	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p219	1.008	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p220	1.109	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p221	0.3255	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p222	1.435	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p223	1.123	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p224	0.3124	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p225	1.035	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p226	10.08	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p227	0.2105	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p228	0.5499	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p229	0.3104	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p230	0.2396	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p231	0.2401	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p232	0.2547	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p233	0.05524	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p234	0.5499	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p235	0.5499	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p236	0.5499	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p237	0.06043	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p238	0.4895	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p239	0.5499	100	130	0	0	0.00	0.00	0.00	0.000

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p240	0.5499	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p241	0.55	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p242	0.3604	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p243	0.1896	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p244	0.1497	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p245	0.4004	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p246	0.55	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p247	0.55	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p248	0.55	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p249	0.1105	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p250	0.4396	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p251	0.5501	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p252	0.5501	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p253	0.3222	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p254	4.461	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p255	1.855	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p256	1.824	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p257	0.549	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p258	2.373	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p259	2.374	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p260	2.374	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p261	0.5896	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p262	1.745	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p263	0.03889	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p264	2.374	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p265	0.009837	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p267	1.155	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p268	0.3913	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p269	0.7827	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p270	1.174	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p271	1.174	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p272	0.3234	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p273	0.4592	100	130	0	0	0.00	0.00	0.00	0.000

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p274	0.3913	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p275	1.174	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p276	0.3913	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p277	0.7826	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p278	1.174	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p279	0.628	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p280	0.5459	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p281	0.7826	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p282	0.3913	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p283	1.174	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p284	0.3913	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p285	0.7826	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p287	0.2414	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p288	1.174	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p289	0.4347	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p290	0.0001174	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p291	0.3477	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p292	0.3913	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p293	0.6786	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p294	0.4953	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p295	0.3913	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p296	0.7826	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p297	0.06317	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p298	1.111	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p299	1.174	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p300	0.7826	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p301	0.3913	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p302	1.174	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p303	0.3677	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p304	0.02358	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p305	0.7826	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p307	0.4953	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p308	1.174	100	130	0	0	0.00	0.00	0.00	0.000

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p309	0.7826	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p310	0.3913	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p311	0.6723	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p312	0.5016	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p313	0.3913	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p314	0.7826	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p315	0.1042	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p316	8.122	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p317	22.77	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p318	9.361	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p319	0.6571	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p320	0.2897	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p322	0.6716	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p323	0.3126	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p325	15.28	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p326	0.2447	100	130	0	0	0.73	0.09	0.15	0.035
Pipe p327	0.2755	100	130	0	0	0.73	0.09	0.14	0.031
Pipe p328	0.01342	100	130	0	0	0.73	0.09	1.39	0.315
Pipe p329	0.8132	100	130	0	0	0.73	0.09	0.14	0.031
Pipe p330	0.2755	100	130	0	0	0.73	0.09	0.14	0.031
Pipe p331	0.5509	100	130	0	0	0.73	0.09	0.17	0.038
Pipe p332	0.8263	100	130	0	0	0.73	0.09	0.14	0.031
Pipe p333	0.8263	100	130	0	0	0.73	0.09	0.16	0.036
Pipe p334	0.5509	100	130	0	0	0.73	0.09	0.14	0.031
Pipe p335	0.2754	100	130	0	0	0.73	0.09	0.20	0.046
Pipe p336	0.0729	100	130	0	0	0.73	0.09	0.00	0.000
Pipe p337	0.7533	100	130	0	0	0.73	0.09	0.15	0.034
Pipe p338	0.2754	100	130	0	0	0.73	0.09	0.20	0.046
Pipe p339	0.5508	100	130	0	0	0.73	0.09	0.14	0.031
Pipe p340	0.8262	100	130	0	0	0.73	0.09	0.16	0.036
Pipe p341	0.8262	100	130	0	0	0.73	0.09	0.14	0.031
Pipe p342	0.5508	100	130	0	0	0.73	0.09	0.17	0.038
Pipe p343	0.2754	100	130	0	0	0.73	0.09	0.14	0.031

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p344	0.8261	100	130	0	0	0.73	0.09	0.16	0.036
Pipe p345	0.1161	100	130	0	0	0.73	0.09	0.16	0.036
Pipe p346	0.1593	100	130	0	0	0.73	0.09	0.12	0.027
Pipe p347	0.5508	100	130	0	0	0.73	0.09	0.14	0.031
Pipe p348	0.8261	100	130	0	0	0.73	0.09	0.16	0.036
Pipe p349	0.8261	100	130	0	0	0.73	0.09	0.16	0.036
Pipe p350	0.3059	100	130	0	0	0.73	0.09	0.12	0.028
Pipe p351	0.2448	100	130	0	0	0.73	0.09	0.15	0.034
Pipe p352	0.2754	100	130	0	0	0.73	0.09	0.14	0.031
Pipe p353	0.4776	100	130	0	0	0.73	0.09	0.16	0.035
Pipe p354	0.3486	100	130	0	0	0.73	0.09	0.16	0.036
Pipe p355	0.2754	100	130	0	0	0.73	0.09	0.14	0.031
Pipe p356	0.5508	100	130	0	0	0.73	0.09	0.17	0.038
Pipe p357	0.1593	100	130	0	0	0.73	0.09	0.12	0.027
Pipe p358	0.6669	100	130	0	0	0.73	0.09	0.14	0.032
Pipe p359	0.8261	100	130	0	0	0.73	0.09	0.16	0.036
Pipe p360	0.5508	100	130	0	0	0.73	0.09	0.14	0.031
Pipe p361	0.2754	100	130	0	0	0.73	0.09	0.14	0.031
Pipe p362	0.8261	100	130	0	0	0.73	0.09	0.16	0.036
Pipe p363	0.2754	100	130	0	0	0.73	0.09	0.14	0.031
Pipe p364	0.5508	100	130	0	0	0.73	0.09	0.17	0.038
Pipe p365	0.4776	100	130	0	0	0.73	0.09	0.16	0.035
Pipe p366	0.3486	100	130	0	0	0.73	0.09	0.11	0.024
Pipe p367	0.2024	100	130	0	0	0.73	0.09	0.18	0.042
Pipe p368	0.6237	100	130	0	0	0.73	0.09	0.15	0.034
Pipe p369	0.5508	100	130	0	0	0.73	0.09	0.14	0.031
Pipe p370	0.2754	100	130	0	0	0.73	0.09	0.20	0.046
Pipe p371	0.8262	100	130	0	0	0.73	0.09	0.14	0.031
Pipe p372	0.2754	100	130	0	0	0.73	0.09	0.20	0.046
Pipe p373	0.5508	100	130	0	0	0.73	0.09	0.14	0.031
Pipe p374	0.07335	100	130	0	0	0.73	0.09	0.25	0.058
Pipe p375	8.142	100	130	0	0	0.73	0.09	0.15	0.034
Pipe p376	0.8112	100	130	0	0	0.73	0.09	0.16	0.036

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p378	141.25	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p380	0.4144	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p381	0.1951	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p382	0.475	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p383	0.67	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p384	0.67	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p385	0.6699	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p386	0.01502	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p387	0.07516	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p388	9.485	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p390	1.544	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p391	1.886	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p392	0.881	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p393	1.005	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p394	1.886	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p395	1.886	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p396	0.2238	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p397	1.662	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p398	1.886	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p399	1.452	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p400	0.4334	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p401	1.886	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p402	1.886	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p403	0.7951	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p404	1.091	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p405	1.886	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p406	1.886	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p407	0.1379	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p408	1.748	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p409	1.886	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p410	1.366	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p411	0.5193	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p412	1.886	100	130	0	0	0.00	0.00	0.00	0.000

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p413	1.886	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p414	0.7092	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p415	1.177	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p416	1.886	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p417	1.886	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p418	0.05201	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p419	1.834	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p420	1.886	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p421	1.281	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p422	0.6052	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p423	1.886	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p424	1.886	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p425	0.6233	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p426	1.262	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p427	1.886	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p428	1.852	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p429	0.0339	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p430	1.886	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p431	0.3543	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p432	1.531	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p433	1.195	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p434	0.6911	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p435	1.886	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p436	1.849	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p437	66.56	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p438	12.11	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p439	1.583	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p440	1.488	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p441	0.4367	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p442	1.932	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p443	1.943	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p444	1.413	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p445	5.531	100	130	0	0	0.00	0.00	0.00	0.000

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p446	4.632	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p447	0.5845	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p448	1.598	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p449	1.601	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p450	0.6926	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p451	0.8936	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p452	1.607	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p453	1.601	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p454	1.601	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p455	1.601	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p456	1.599	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p457	1.598	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p458	1.595	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p459	1.598	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p460	0.4227	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p461	1.157	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p462	1.586	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p463	1.578	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p464	1.573	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p465	1.566	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p466	1.559	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p467	1.554	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p468	0.9042	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p469	4.484	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p470	2.084	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p471	2.658	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p472	2.651	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p473	2.645	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p474	2.641	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p475	0.6554	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p476	1.983	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p477	2.637	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p478	0.01089	100	130	0	0	0.00	0.00	0.00	0.000

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p480	0.4213	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p481	0.4215	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p482	0.4214	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p483	0.4213	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p484	0.317	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p485	0.1043	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p486	0.4211	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p487	0.421	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p488	0.421	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p489	0.186	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p490	0.235	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p491	0.2126	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p492	0.2084	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p493	0.4208	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p494	0.4208	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p495	0.4208	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p496	0.4208	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p497	0.1083	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p498	0.3125	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p499	0.4207	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p500	0.3716	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p501	4.545e-005	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p502	87.51	100	130	0	0	0.59	0.07	0.10	0.035
Pipe p503	0.003288	100	130	0	0	0.59	0.07	0.00	0.000
Pipe p504	0.2399	100	130	0	0	0.59	0.07	0.08	0.027
Pipe p505	0.2397	100	130	0	0	0.59	0.07	0.16	0.054
Pipe p506	0.2397	100	130	0	0	0.59	0.07	0.08	0.027
Pipe p507	0.2397	100	130	0	0	0.59	0.07	0.08	0.027
Pipe p508	0.2397	100	130	0	0	0.59	0.07	0.08	0.027
Pipe p509	0.03582	100	130	0	0	0.59	0.07	0.52	0.182
Pipe p510	0.1646	100	130	0	0	0.59	0.07	0.11	0.040
Pipe p511	0.03931	100	130	0	0	0.59	0.07	0.00	0.000
Pipe p512	0.2397	100	130	0	0	0.59	0.07	0.08	0.027

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p513	0.2397	100	130	0	0	0.59	0.07	0.08	0.027
Pipe p514	0.2397	100	130	0	0	0.59	0.07	0.16	0.054
Pipe p515	0.2397	100	130	0	0	0.59	0.07	0.08	0.027
Pipe p516	0.08684	100	130	0	0	0.59	0.07	0.00	0.000
Pipe p517	0.1529	100	130	0	0	0.59	0.07	0.12	0.043
Pipe p518	0.2397	100	130	0	0	0.59	0.07	0.16	0.054
Pipe p519	0.2397	100	130	0	0	0.59	0.07	0.08	0.027
Pipe p520	0.2397	100	130	0	0	0.59	0.07	0.08	0.027
Pipe p521	0.01274	100	130	0	0	0.59	0.07	0.00	0.000
Pipe p522	13.06	100	130	0	0	0.59	0.07	0.10	0.035
Pipe p523	14.45	100	130	0	0	0.59	0.07	0.10	0.035
Pipe p524	0.1237	100	130	0	0	0.59	0.07	0.00	0.000
Pipe p525	0.2429	100	130	0	0	0.59	0.07	0.15	0.054
Pipe p526	0.004785	100	130	0	0	0.59	0.07	0.00	0.000
Pipe p527	0.2399	100	130	0	0	0.59	0.07	0.08	0.027
Pipe p528	0.2399	100	130	0	0	0.59	0.07	0.08	0.027
Pipe p529	0.2399	100	130	0	0	0.59	0.07	0.08	0.027
Pipe p530	0.2399	100	130	0	0	0.59	0.07	0.16	0.054
Pipe p531	0.2399	100	130	0	0	0.59	0.07	0.08	0.027
Pipe p532	0.04628	100	130	0	0	0.59	0.07	0.00	0.000
Pipe p533	0.1937	100	130	0	0	0.59	0.07	0.10	0.034
Pipe p534	0.2142	100	130	0	0	0.59	0.07	0.09	0.030
Pipe p535	0.02577	100	130	0	0	0.59	0.07	0.72	0.253
Pipe p536	0.2399	100	130	0	0	0.59	0.07	0.08	0.027
Pipe p537	0.2397	100	130	0	0	0.59	0.07	0.08	0.027
Pipe p538	0.2397	100	130	0	0	0.59	0.07	0.08	0.027
Pipe p539	0.09726	100	130	0	0	0.59	0.07	0.19	0.067
Pipe p540	0.1425	100	130	0	0	0.59	0.07	0.13	0.046
Pipe p541	0.2397	100	130	0	0	0.59	0.07	0.08	0.027
Pipe p542	0.2397	100	130	0	0	0.59	0.07	0.08	0.027
Pipe p543	0.1953	100	130	0	0	0.59	0.07	0.10	0.033
Pipe p544	64.92	100	130	0	0	0.59	0.07	0.10	0.035
Pipe p545	8.994	100	130	0	0	0.59	0.07	0.10	0.035

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p546	0.1939	100	130	0	0	0.59	0.07	0.10	0.034
Pipe p547	0.7078	100	130	0	0	0.59	0.07	0.11	0.037
Pipe p548	0.0001932	100	130	0	0	0.59	0.07	0.00	0.000
Pipe p549	0.1153	100	130	0	0	0.59	0.07	0.00	0.000
Pipe p550	14.22	100	130	0	0	0.59	0.07	0.10	0.035
Pipe p551	7.067	100	130	0	0	2.25	0.29	1.21	0.029
Pipe p552	8.384	100	130	0	0	2.25	0.29	1.21	0.029
Pipe p554	15.3	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p555	16.28	100	130	0	0	3.83	0.49	3.23	0.027
Pipe p556	6.029	100	130	0	0	0.83	0.11	0.19	0.033
Pipe p558	36.91	100	130	0	0	1.75	0.22	0.75	0.030
Pipe p559	0.005602	100	130	0	0	1.75	0.22	0.00	0.000
Pipe p560	0.3127	100	130	0	0	1.75	0.22	0.71	0.028
Pipe p561	0.263	100	130	0	0	1.75	0.22	0.78	0.031
Pipe p562	0.04988	100	130	0	0	1.75	0.22	0.75	0.030
Pipe p563	0.3127	100	130	0	0	1.75	0.22	0.77	0.031
Pipe p564	0.2464	100	130	0	0	1.75	0.22	0.76	0.030
Pipe p565	13.01	100	130	0	0	1.75	0.22	0.75	0.030
Pipe p566	3.067	100	130	0	0	1.75	0.22	0.76	0.030
Pipe p567	6.124	100	130	0	0	1.02	0.13	0.28	0.032
Pipe p568	0.3251	100	130	0	0	1.02	0.13	0.29	0.033
Pipe p569	0.5418	100	130	0	0	1.02	0.13	0.27	0.032
Pipe p570	0.147	100	130	0	0	1.02	0.13	0.25	0.029
Pipe p571	51.25	100	130	0	0	1.02	0.13	0.28	0.032
Pipe p572	0.1662	100	130	0	0	1.02	0.13	0.22	0.026
Pipe p573	0.1986	100	130	0	0	1.02	0.13	0.28	0.033
Pipe p574	0.06184	100	130	0	0	1.02	0.13	0.30	0.035
Pipe p575	0.2604	100	130	0	0	1.02	0.13	0.29	0.033
Pipe p576	0.01747	100	130	0	0	1.02	0.13	0.00	0.000
Pipe p577	12.11	100	130	0	0	1.02	0.13	0.28	0.032
Pipe p578	0.364	100	130	0	0	1.02	0.13	0.31	0.036
Pipe p579	0.4398	100	130	0	0	1.02	0.13	0.25	0.029
Pipe p580	0.01048	100	130	0	0	1.02	0.13	0.00	0.000

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p581	10.15	100	130	0	0	1.02	0.13	0.28	0.032
Pipe p582	0.05979	100	130	0	0	1.02	0.13	0.31	0.036
Pipe p583	0.1875	100	130	0	0	1.02	0.13	0.30	0.035
Pipe p584	0.1875	100	130	0	0	1.02	0.13	0.30	0.035
Pipe p585	0.1875	100	130	0	0	1.02	0.13	0.30	0.035
Pipe p586	0.1875	100	130	0	0	1.02	0.13	0.30	0.035
Pipe p587	0.03017	100	130	0	0	1.02	0.13	0.00	0.000
Pipe p588	0.1574	100	130	0	0	1.02	0.13	0.24	0.027
Pipe p589	0.1875	100	130	0	0	1.02	0.13	0.30	0.035
Pipe p590	0.1875	100	130	0	0	1.02	0.13	0.30	0.035
Pipe p591	0.1875	100	130	0	0	1.02	0.13	0.30	0.035
Pipe p592	0.1639	100	130	0	0	1.02	0.13	0.23	0.026
Pipe p593	24.22	100	130	0	0	1.02	0.13	0.28	0.032
Pipe p594	5.154	100	130	0	0	1.02	0.13	0.28	0.032
Pipe p595	70.39	100	130	0	0	-0.67	0.08	0.13	0.034
Pipe p596	0.6838	100	130	0	0	-0.67	0.08	0.14	0.037
Pipe p597	6.165	100	130	0	0	-0.67	0.08	0.13	0.035
Pipe p598	9.315	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p599	12	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p600	21.4	100	130	0	0	0.91	0.12	0.23	0.033
Pipe p601	0.8336	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p602	1.001	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p603	1.001	100	130	0	0	0.91	0.12	0.24	0.035
Pipe p604	0.4473	100	130	0	0	0.91	0.12	0.21	0.030
Pipe p605	0.5536	100	130	0	0	0.91	0.12	0.24	0.034
Pipe p606	1.001	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p607	1.001	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p608	0.7809	100	130	0	0	0.91	0.12	0.21	0.031
Pipe p609	0.22	100	130	0	0	0.91	0.12	0.25	0.037
Pipe p610	1.001	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p611	1.001	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p612	1.001	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p613	0.1136	100	130	0	0	0.91	0.12	0.33	0.048

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p614	0.8873	100	130	0	0	0.91	0.12	0.21	0.031
Pipe p615	1.001	100	130	0	0	0.91	0.12	0.24	0.035
Pipe p616	1.001	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p617	0.4473	100	130	0	0	0.91	0.12	0.21	0.030
Pipe p618	0.5537	100	130	0	0	0.91	0.12	0.24	0.034
Pipe p619	1.001	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p620	1.001	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p621	0.7809	100	130	0	0	0.91	0.12	0.21	0.031
Pipe p622	0.22	100	130	0	0	0.91	0.12	0.25	0.037
Pipe p623	1.001	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p624	1.001	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p625	1.001	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p626	0.1136	100	130	0	0	0.91	0.12	0.33	0.048
Pipe p627	0.8873	100	130	0	0	0.91	0.12	0.23	0.034
Pipe p628	1.001	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p629	1.001	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p630	0.4473	100	130	0	0	0.91	0.12	0.21	0.030
Pipe p631	0.466	100	130	0	0	0.91	0.12	0.24	0.035
Pipe p632	59.34	100	130	0	0	0.91	0.12	0.23	0.033
Pipe p633	0.01014	100	130	0	0	0.91	0.12	0.00	0.000
Pipe p634	0.2779	100	130	0	0	0.91	0.12	0.20	0.029
Pipe p635	3.719	100	130	0	0	0.91	0.12	0.23	0.033
Pipe p636	0.9286	100	130	0	0	0.91	0.12	0.24	0.035
Pipe p637	4.677	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p638	5.088	100	130	0	0	0.91	0.12	0.23	0.033
Pipe p639	5.052	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p640	5.071	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p641	11.21	100	130	0	0	0.91	0.12	0.23	0.033
Pipe p642	3.896	100	130	0	0	0.91	0.12	0.22	0.033
Pipe p644	3.692	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p645	240.4	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p646	1.978	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p647	2.363	100	130	0	0	0.00	0.00	0.00	0.000

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p648	1.57	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p649	0.7918	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p650	2.362	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p651	2.362	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p652	1.726	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p653	0.6356	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p654	2.136	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p655	0.2256	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p656	2.362	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p657	2.362	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p658	2.362	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p659	2.362	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p660	0.3408	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p661	2.021	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p662	2.362	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p663	2.362	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p664	2.362	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p665	0.9072	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p666	1.455	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p667	2.362	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p668	2.362	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p669	2.362	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p670	1.474	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p671	0.8883	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p672	2.362	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p673	2.362	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p674	2.362	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p675	2.04	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p676	0.3219	100	130	0	0	1.80	0.23	0.81	0.030
Pipe p677	2.362	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p678	2.362	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p679	2.362	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p680	2.362	100	130	0	0	1.80	0.23	0.80	0.030

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p681	0.2445	100	130	0	0	1.80	0.23	0.76	0.028
Pipe p682	2.117	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p683	2.362	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p684	2.362	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p685	2.362	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p686	0.8108	100	130	0	0	1.80	0.23	0.78	0.029
Pipe p687	0.7384	100	130	0	0	1.80	0.23	0.81	0.030
Pipe p688	2.192	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p689	2.425	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p690	2.425	100	130	0	0	1.80	0.23	0.79	0.030
Pipe p691	2.233	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p692	0.1917	100	130	0	0	1.80	0.23	0.78	0.029
Pipe p693	2.214	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p694	0.03806	100	130	0	0	1.80	0.23	0.49	0.018
Pipe p695	2.425	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p696	2.425	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p697	2.425	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p698	0.2955	100	130	0	0	1.80	0.23	0.76	0.028
Pipe p699	2.129	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p700	0.4097	100	130	0	0	1.80	0.23	0.82	0.031
Pipe p701	3.521	100	130	0	0	1.80	0.23	0.79	0.030
Pipe p702	0.1161	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p703	0.8458	100	130	0	0	1.80	0.23	0.79	0.030
Pipe p704	0.633	100	130	0	0	1.80	0.23	0.82	0.031
Pipe p705	1.478	100	130	0	0	1.80	0.23	0.79	0.030
Pipe p706	0.8803	100	130	0	0	1.80	0.23	0.78	0.029
Pipe p707	0.598	100	130	0	0	1.80	0.23	0.81	0.030
Pipe p708	1.478	100	130	0	0	1.80	0.23	0.79	0.030
Pipe p709	1.478	100	130	0	0	1.80	0.23	0.79	0.030
Pipe p710	0.5754	100	130	0	0	1.80	0.23	0.81	0.030
Pipe p711	0.8889	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p712	1.46	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p713	0.6168	100	130	0	0	1.80	0.23	0.78	0.029

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p714	0.8794	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p715	0.8946	100	130	0	0	1.80	0.23	0.79	0.030
Pipe p716	0.8804	100	130	0	0	1.80	0.23	0.78	0.029
Pipe p717	0.3963	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p718	0.8115	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p719	4.071	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p720	0.9403	100	130	0	0	1.80	0.23	0.81	0.030
Pipe p721	0.2036	100	130	0	0	1.80	0.23	0.73	0.027
Pipe p722	0.2963	100	130	0	0	1.80	0.23	0.82	0.031
Pipe p723	0.05352	100	130	0	0	1.80	0.23	0.70	0.026
Pipe p724	1.053	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p725	1.045	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p726	0.3611	100	130	0	0	1.80	0.23	0.77	0.029
Pipe p727	0.04672	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p728	0.5066	100	130	0	0	1.80	0.23	0.81	0.030
Pipe p729	0.05647	100	130	0	0	1.80	0.23	0.66	0.025
Pipe p730	0.08427	100	130	0	0	1.80	0.23	0.88	0.033
Pipe p731	1.523	100	130	0	0	1.80	0.23	0.79	0.030
Pipe p732	0.01844	100	130	0	0	1.80	0.23	1.01	0.038
Pipe p733	0.546	100	130	0	0	1.80	0.23	0.78	0.029
Pipe p734	1.044	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p735	0.5339	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p736	0.5099	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p737	1.044	100	130	0	0	1.80	0.23	0.78	0.029
Pipe p738	1.044	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p739	0.7356	100	130	0	0	1.80	0.23	0.78	0.029
Pipe p740	0.3083	100	130	0	0	1.80	0.23	0.84	0.032
Pipe p741	1.044	100	130	0	0	1.80	0.23	0.78	0.029
Pipe p742	0.9954	100	130	0	0	1.80	0.23	0.80	0.030
Pipe p743	0.641	100	130	0	0	1.80	0.23	0.78	0.029
Pipe p744	0.3456	100	130	0	0	1.80	0.23	0.81	0.030
Pipe p745	1.572	100	130	0	0	1.80	0.23	0.79	0.030
Pipe p746	1.003	100	130	0	0	1.80	0.23	0.80	0.030

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p748	0.07573	100	130	0	0	0.89	0.11	0.25	0.038
Pipe p749	1.174	100	130	0	0	0.89	0.11	0.21	0.032
Pipe p750	1.501	100	130	0	0	0.89	0.11	0.22	0.034
Pipe p751	1.501	100	130	0	0	0.89	0.11	0.21	0.032
Pipe p752	0.8268	100	130	0	0	0.89	0.11	0.23	0.034
Pipe p753	0.6737	100	130	0	0	0.89	0.11	0.22	0.034
Pipe p754	1.501	100	130	0	0	0.89	0.11	0.21	0.032
Pipe p755	1.501	100	130	0	0	0.89	0.11	0.21	0.032
Pipe p756	1.327	100	130	0	0	0.89	0.11	0.22	0.034
Pipe p757	0.1736	100	130	0	0	0.89	0.11	0.21	0.033
Pipe p758	1.501	100	130	0	0	0.89	0.11	0.21	0.032
Pipe p759	1.501	100	130	0	0	0.89	0.11	0.22	0.034
Pipe p760	1.501	100	130	0	0	0.89	0.11	0.21	0.032
Pipe p761	0.3266	100	130	0	0	0.89	0.11	0.23	0.035
Pipe p762	1.174	100	130	0	0	0.89	0.11	0.21	0.032
Pipe p763	1.501	100	130	0	0	0.89	0.11	0.22	0.034
Pipe p764	1.501	100	130	0	0	0.89	0.11	0.21	0.032
Pipe p765	0.8268	100	130	0	0	0.89	0.11	0.23	0.034
Pipe p766	0.6738	100	130	0	0	0.89	0.11	0.22	0.034
Pipe p767	1.501	100	130	0	0	0.89	0.11	0.21	0.032
Pipe p768	1.501	100	130	0	0	0.89	0.11	0.22	0.034
Pipe p769	1.327	100	130	0	0	0.89	0.11	0.21	0.032
Pipe p770	0.1736	100	130	0	0	0.89	0.11	0.21	0.033
Pipe p771	1.501	100	130	0	0	0.89	0.11	0.21	0.032
Pipe p772	1.501	100	130	0	0	0.89	0.11	0.22	0.034
Pipe p773	1.501	100	130	0	0	0.89	0.11	0.21	0.032
Pipe p774	0.3266	100	130	0	0	0.89	0.11	0.23	0.035
Pipe p775	1.174	100	130	0	0	0.89	0.11	0.22	0.034
Pipe p776	1.501	100	130	0	0	0.89	0.11	0.21	0.032
Pipe p777	1.501	100	130	0	0	0.89	0.11	0.21	0.032
Pipe p778	0.8268	100	130	0	0	0.89	0.11	0.23	0.034
Pipe p779	0.5424	100	130	0	0	0.89	0.11	0.21	0.031
Pipe p780	60.34	100	130	0	0	0.89	0.11	0.22	0.033

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p781	0.9457	100	130	0	0	0.89	0.11	0.22	0.033
Pipe p782	0.7073	100	130	0	0	0.89	0.11	0.24	0.036
Pipe p783	0.6675	100	130	0	0	0.89	0.11	0.20	0.030
Pipe p784	1.374	100	130	0	0	0.89	0.11	0.22	0.033
Pipe p785	0.4574	100	130	0	0	0.89	0.11	0.20	0.031
Pipe p786	0.9174	100	130	0	0	0.89	0.11	0.22	0.034
Pipe p787	1.374	100	130	0	0	0.89	0.11	0.22	0.033
Pipe p788	0.2076	100	130	0	0	0.89	0.11	0.18	0.027
Pipe p789	1.167	100	130	0	0	0.89	0.11	0.22	0.034
Pipe p790	1.332	100	130	0	0	0.89	0.11	0.21	0.032
Pipe p791	0.0426	100	130	0	0	0.89	0.11	0.44	0.067
Pipe p792	1.374	100	130	0	0	0.89	0.11	0.22	0.033
Pipe p793	0.6932	100	130	0	0	0.89	0.11	0.21	0.033
Pipe p794	0.3893	100	130	0	0	0.89	0.11	0.19	0.029
Pipe p795	0.2926	100	130	0	0	0.89	0.11	0.25	0.039
Pipe p796	1.374	100	130	0	0	0.89	0.11	0.22	0.033
Pipe p797	0.8322	100	130	0	0	0.89	0.11	0.20	0.031
Pipe p798	0.5423	100	130	0	0	0.89	0.11	0.24	0.037
Pipe p799	1.374	100	130	0	0	0.89	0.11	0.22	0.033
Pipe p800	0.5823	100	130	0	0	0.89	0.11	0.19	0.029
Pipe p801	0.6335	100	130	0	0	0.89	0.11	0.23	0.036
Pipe p803	11.50	100	130	0	0	7.57	0.96	11.37	0.024
Pipe p804	108.64	100	130	0	0	7.50	0.96	11.20	0.024
Pipe p806	8.026	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p807	2.6	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p808	7.3	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p809	19.15	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p810	3.008	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p811	1.046	100	130	0	0	4.65	0.59	4.59	0.026
Pipe p812	2.656	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p813	9.999	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p814	3.22	100	130	0	0	4.65	0.59	4.60	0.026
Pipe p815	33.99	100	130	0	0	4.65	0.59	4.61	0.026

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p816	3.876	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p817	0.5127	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p818	2.085	100	130	0	0	4.65	0.59	4.60	0.026
Pipe p819	0.5649	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p820	2.651	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p821	2.65	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p822	2.65	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p823	2.65	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p824	2.65	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p825	2.65	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p826	2.65	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p827	2.651	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p828	2.651	100	130	0	0	4.65	0.59	4.60	0.026
Pipe p829	2.651	100	130	0	0	4.65	0.59	4.60	0.026
Pipe p830	2.651	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p831	2.651	100	130	0	0	4.65	0.59	4.60	0.026
Pipe p832	2.651	100	130	0	0	4.65	0.59	4.60	0.026
Pipe p833	2.651	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p834	2.651	100	130	0	0	4.65	0.59	4.60	0.026
Pipe p835	2.651	100	130	0	0	4.65	0.59	4.60	0.026
Pipe p836	2.651	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p837	2.651	100	130	0	0	4.65	0.59	4.60	0.026
Pipe p838	2.651	100	130	0	0	4.65	0.59	4.60	0.026
Pipe p839	2.651	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p840	2.653	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p841	0.6766	100	130	0	0	4.65	0.59	4.59	0.026
Pipe p842	1.973	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p843	2.652	100	130	0	0	4.65	0.59	4.60	0.026
Pipe p844	2.652	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p845	2.652	100	130	0	0	4.65	0.59	4.60	0.026
Pipe p846	2.652	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p847	2.652	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p848	2.652	100	130	0	0	4.65	0.59	4.60	0.026

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p849	2.652	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p850	2.653	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p851	2.183	100	130	0	0	4.65	0.59	4.60	0.026
Pipe p852	0.4681	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p853	2.654	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p854	2.654	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p855	0.6721	100	130	0	0	4.65	0.59	4.62	0.026
Pipe p856	1.97	100	130	0	0	4.65	0.59	4.60	0.026
Pipe p857	1.06	100	130	0	0	4.65	0.59	4.62	0.026
Pipe p858	1.592	100	130	0	0	4.65	0.59	4.60	0.026
Pipe p859	0.121	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p860	5.53	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p861	5.672	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p862	204.1	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p863	9.947	100	130	0	0	4.65	0.59	4.61	0.026
Pipe p865	11.94	100	130	0	0	1.16	0.15	0.35	0.032
Pipe p866	189.04	100	130	0	0	1.12	0.14	0.33	0.032
Pipe p868	0.9484	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p869	0.9993	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p870	0.9938	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p871	0.9869	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p872	0.9783	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p873	0.9897	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p874	0.9143	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p875	8.464	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p876	0.00822	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p877	8.744	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p878	121.7	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p879	26.07	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p880	7.179	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p881	4.062	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p882	0.9294	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p883	0.7458	100	130	0	0	0.00	0.00	0.00	0.000

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p884	0.7182	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p885	0.7055	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p886	0.7069	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p887	0.7228	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p888	0.7536	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p889	0.5013	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p890	3.337	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p891	10.51	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p893	2.284	100	130	0	0	1.75	0.22	0.75	0.030
Pipe p894	9.489	100	130	0	0	1.75	0.22	0.75	0.030
Pipe p895	0.4225	100	130	0	0	-2.09	0.27	1.06	0.029
Pipe p896	0.6784	100	130	0	0	-2.09	0.27	1.04	0.029
Pipe p897	0.6793	100	130	0	0	-2.09	0.27	1.04	0.029
Pipe p898	0.6762	100	130	0	0	-2.09	0.27	1.05	0.029
Pipe p899	0.8034	100	130	0	0	-2.09	0.27	1.04	0.029
Pipe p900	5	100	130	0	0	-2.09	0.27	1.05	0.029
Pipe p905	9.858	100	130	0	0	-2.09	0.27	1.05	0.029
Pipe p906	0.9038	100	130	0	0	2.52	0.32	1.48	0.028
Pipe p907	0.7911	100	130	0	0	2.52	0.32	1.48	0.028
Pipe p908	0.6644	100	130	0	0	2.52	0.32	1.48	0.028
Pipe p909	0.7058	100	130	0	0	2.52	0.32	1.48	0.028
Pipe p910	0.8144	100	130	0	0	2.52	0.32	1.48	0.028
Pipe p911	9.78	100	130	0	0	2.52	0.32	1.48	0.028
Pipe p912	4.039	100	130	0	0	2.52	0.32	1.48	0.028
Pipe p913	4.767	100	130	0	0	2.52	0.32	1.48	0.028
Pipe p914	2.129	100	130	0	0	2.52	0.32	1.48	0.028
Pipe p915	2.869	100	130	0	0	2.52	0.32	1.48	0.028
Pipe p916	1.856	100	130	0	0	2.52	0.32	1.48	0.028
Pipe p917	2.31	100	130	0	0	2.52	0.32	1.48	0.028
Pipe p918	0.8163	100	130	0	0	2.52	0.32	1.48	0.028
Pipe p919	0.9599	100	130	0	0	2.52	0.32	1.47	0.028
Pipe p920	0.9731	100	130	0	0	2.52	0.32	1.49	0.029
Pipe p921	0.1339	100	130	0	0	2.52	0.32	1.39	0.027

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p922	0.958	100	130	0	0	2.52	0.32	1.48	0.028
Pipe p923	3.465	100	130	0	0	2.52	0.32	1.48	0.028
Pipe p924	4.944	100	130	0	0	2.52	0.32	1.48	0.028
Pipe p925	1.501	100	130	0	0	2.52	0.32	1.49	0.028
Pipe p926	2.384	100	130	0	0	2.52	0.32	1.47	0.028
Pipe p929	10.24	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p930	0.9187	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p931	0.2443	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p932	11.91	100	130	0	0	2.86	0.36	1.87	0.028
Pipe p933	62.61	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p934	0.004181	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p935	0.3076	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p936	0.3479	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p937	0.07109	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p938	0.01716	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p939	48.26	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p940	1.726	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p941	3.095	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p942	0.4381	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p943	7.623	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p944	0.4151	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p945	0.4729	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p946	3.058	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p947	12.16	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p949	0.2531	100	130	0	0	-2.65	0.34	1.62	0.028
Pipe p950	2.012	100	130	0	0	-2.65	0.34	1.62	0.028
Pipe p951	1.938	100	130	0	0	-2.65	0.34	1.63	0.028
Pipe p952	0.07393	100	130	0	0	-2.65	0.34	1.51	0.026
Pipe p953	2.012	100	130	0	0	-2.65	0.34	1.63	0.028
Pipe p954	2.012	100	130	0	0	-2.65	0.34	1.62	0.028
Pipe p955	0.9023	100	130	0	0	-2.65	0.34	1.63	0.028
Pipe p956	1.11	100	130	0	0	-2.65	0.34	1.63	0.028
Pipe p958	1.879	100	130	0	0	-4.80	0.61	4.90	0.026

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p959	0.1333	100	130	0	0	-4.80	0.61	4.88	0.026
Pipe p960	2.012	100	130	0	0	-4.80	0.61	4.89	0.026
Pipe p961	2.012	100	130	0	0	-4.80	0.61	4.90	0.026
Pipe p962	0.7585	100	130	0	0	-4.80	0.61	4.91	0.026
Pipe p963	12.3	100	130	0	0	-4.80	0.61	4.90	0.026
Pipe p964	33.81	100	130	0	0	-4.80	0.61	4.90	0.026
Pipe p965	2.299	100	130	0	0	-4.80	0.61	4.90	0.026
Pipe p966	1.678	100	130	0	0	-4.80	0.61	4.90	0.026
Pipe p967	0.8693	100	130	0	0	-4.80	0.61	4.90	0.026
Pipe p968	2.548	100	130	0	0	-4.80	0.61	4.89	0.026
Pipe p969	2.548	100	130	0	0	-4.80	0.61	4.90	0.026
Pipe p970	2.548	100	130	0	0	-4.80	0.61	4.90	0.026
Pipe p971	1.488	100	130	0	0	-4.80	0.61	4.89	0.026
Pipe p972	1.06	100	130	0	0	-4.80	0.61	4.90	0.026
Pipe p973	2.548	100	130	0	0	-4.80	0.61	4.90	0.026
Pipe p975	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p976	1.297	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p977	1.25	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p978	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p979	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p980	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p981	1.107	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p982	1.441	100	130	0	0	-10.67	1.36	21.50	0.023
Pipe p983	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p984	1.682	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p985	0.0001019	100	130	0	0	-10.67	1.36	0.00	0.000
Pipe p986	0.8654	100	130	0	0	-10.67	1.36	21.50	0.023
Pipe p987	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p988	0.9161	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p989	1.632	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p990	2.057	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p991	0.5073	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p992	2.548	100	130	0	0	-10.67	1.36	21.49	0.023

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p993	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p994	0.0001019	100	130	0	0	-10.67	1.36	0.00	0.000
Pipe p995	0.7255	100	130	0	0	-10.67	1.36	21.51	0.023
Pipe p996	1.822	100	130	0	0	-10.67	1.36	21.48	0.023
Pipe p997	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p998	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p999	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1000	0.5349	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1001	2.013	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1002	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1003	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1004	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1005	0.3443	100	130	0	0	-10.67	1.36	21.51	0.023
Pipe p1006	2.203	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1007	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1008	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1009	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1010	0.1537	100	130	0	0	-10.67	1.36	21.54	0.023
Pipe p1011	2.394	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1012	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1013	1.011	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1014	1.536	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1015	2.511	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1016	0.03693	100	130	0	0	-10.67	1.36	21.66	0.023
Pipe p1017	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1018	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1019	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1020	2.32	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1021	0.2275	100	130	0	0	-10.67	1.36	21.51	0.023
Pipe p1022	2.548	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1023	2.225	100	130	0	0	-10.67	1.36	21.50	0.023
Pipe p1024	5	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1025	5	100	130	0	0	-10.67	1.36	21.49	0.023

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p1026	4.326	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1027	12.68	100	130	0	0	-10.67	1.36	21.49	0.023
Pipe p1029	200.5	100	130	0	0	2.19	0.28	1.14	0.029
Pipe p1030	199.8	100	130	0	0	-1.30	0.17	0.44	0.031
Pipe p1031	9.595	100	130	0	0	0.43	0.06	0.06	0.037
Pipe p1032	7.245	100	130	0	0	0.43	0.06	0.06	0.036
Pipe p1033	9.095	100	130	0	0	0.43	0.06	0.06	0.037
Pipe p1034	31.92	100	130	0	0	0.43	0.06	0.06	0.037
Pipe p1035	65.06	100	130	0	0	0.43	0.06	0.06	0.037
Pipe p1036	27.91	100	130	0	0	-0.52	0.07	0.08	0.036
Pipe p1037	3.213	100	130	0	0	-0.52	0.07	0.08	0.034
Pipe p1038	3.836	100	130	0	0	-0.52	0.07	0.08	0.037
Pipe p1039	56.99	100	130	0	0	-0.52	0.07	0.08	0.036
Pipe p1040	28.98	100	130	0	0	5.87	0.75	7.10	0.025
Pipe p1041	7.23	100	130	0	0	5.87	0.75	7.10	0.025
Pipe p1042	11.72	100	130	0	0	5.87	0.75	7.10	0.025
Pipe p1043	9.298	100	130	0	0	-0.34	0.04	0.04	0.037
Pipe p1044	17.57	100	130	0	0	-0.34	0.04	0.04	0.038
Pipe p1045	2.309	100	130	0	0	-0.34	0.04	0.04	0.041
Pipe p1046	1.137	100	130	0	0	-0.34	0.04	0.03	0.033
Pipe p1047	1.586	100	130	0	0	-0.34	0.04	0.05	0.048
Pipe p1048	1.586	100	130	0	0	-0.34	0.04	0.04	0.036
Pipe p1049	1.586	100	130	0	0	-0.34	0.04	0.04	0.036
Pipe p1050	1.586	100	130	0	0	-0.34	0.04	0.04	0.036
Pipe p1051	1.586	100	130	0	0	-0.34	0.04	0.04	0.036
Pipe p1052	0.4904	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1053	1.088	100	130	0	0	-0.34	0.04	0.03	0.035
Pipe p1054	0.1025	100	130	0	0	-0.34	0.04	0.18	0.185
Pipe p1055	57.56	100	130	0	0	-0.34	0.04	0.04	0.038
Pipe p1056	35.23	100	130	0	0	-0.34	0.04	0.04	0.038
Pipe p1057	1.843	100	130	0	0	-0.34	0.04	0.04	0.041
Pipe p1058	0.8795	100	130	0	0	-0.34	0.04	0.02	0.022
Pipe p1059	0.7882	100	130	0	0	-0.34	0.04	0.05	0.048

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p1060	0.7858	100	130	0	0	-0.34	0.04	0.05	0.048
Pipe p1061	0.901	100	130	0	0	-0.34	0.04	0.02	0.021
Pipe p1062	0.9698	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1063	0.9809	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1064	0.9816	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1065	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1066	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1067	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1068	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1069	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1070	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1071	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1072	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1073	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1074	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1075	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1076	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1077	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1078	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1079	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1080	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1081	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1082	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1083	0.9812	100	130	0	0	-0.34	0.04	0.02	0.019
Pipe p1084	0.9812	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1085	0.4045	100	130	0	0	-0.34	0.04	0.05	0.047
Pipe p1086	0.8849	100	130	0	0	-0.34	0.04	0.04	0.043
Pipe p1087	0.916	100	130	0	0	-0.34	0.04	0.04	0.042
Pipe p1088	0.8706	100	130	0	0	-0.34	0.04	0.04	0.044
Pipe p1089	0.8249	100	130	0	0	-0.34	0.04	0.02	0.023
Pipe p1090	0.9664	100	130	0	0	-0.34	0.04	0.04	0.039
Pipe p1091	0.7804	100	130	0	0	-0.34	0.04	0.05	0.049
Pipe p1092	0.8863	100	130	0	0	-0.34	0.04	0.02	0.021

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p1093	0.8128	100	130	0	0	-0.34	0.04	0.05	0.047
Pipe p1094	4.603	100	130	0	0	-0.34	0.04	0.04	0.037
Pipe p1095	133.5	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1096	33.6	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1097	0.1066	100	130	0	0	2.47	0.31	1.40	0.028
Pipe p1098	4.452	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1099	0.8705	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1100	1.586	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1101	1.586	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1102	1.586	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1103	1.586	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1104	1.586	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1105	1.586	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1106	1.586	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1107	1.586	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1108	1.586	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1109	1.586	100	130	0	0	2.47	0.31	1.42	0.028
Pipe p1110	1.586	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1111	1.586	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1112	1.586	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1113	1.586	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1114	1.586	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1115	0.04983	100	130	0	0	2.47	0.31	1.49	0.030
Pipe p1116	3.844	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1117	0.157	100	130	0	0	2.47	0.31	1.42	0.028
Pipe p1118	41.76	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1119	12.63	100	130	0	0	2.47	0.31	1.43	0.028
Pipe p1120	9.716	100	130	0	0	2.25	0.29	1.21	0.029
Pipe p1121	33.48	100	130	0	0	2.25	0.29	1.21	0.029
Pipe p1122	0.5744	100	130	0	0	2.25	0.29	1.20	0.029
Pipe p1123	1.931	100	130	0	0	2.25	0.29	1.20	0.029
Pipe p1124	1.931	100	130	0	0	2.25	0.29	1.20	0.029
Pipe p1125	1.931	100	130	0	0	2.25	0.29	1.20	0.029

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe p1126	1.931	100	130	0	0	2.25	0.29	1.21	0.029
Pipe p1127	0.3719	100	130	0	0	2.25	0.29	1.20	0.029
Pipe p1128	1.56	100	130	0	0	2.25	0.29	1.20	0.029
Pipe p1129	1.931	100	130	0	0	2.25	0.29	1.20	0.029
Pipe p1130	1.931	100	130	0	0	2.25	0.29	1.20	0.029
Pipe p1131	1.931	100	130	0	0	2.25	0.29	1.21	0.029
Pipe p1132	1.931	100	130	0	0	2.25	0.29	1.20	0.029
Pipe p1133	0.4877	100	130	0	0	2.25	0.29	1.18	0.028
Pipe p1134	39.67	100	130	0	0	2.25	0.29	1.21	0.029
Pipe p1135	0.4189	100	130	0	0	2.25	0.29	1.20	0.029
Pipe p1136	1.652	100	130	0	0	2.25	0.29	1.20	0.029
Pipe p1137	1.46	100	130	0	0	2.25	0.29	1.21	0.029
Pipe p1138	0.01985	100	130	0	0	2.25	0.29	0.94	0.022
Pipe p1139	61.89	100	130	0	0	2.25	0.29	1.21	0.029
Pipe p1140	4.638	100	130	0	0	2.25	0.29	1.21	0.029
Pipe p1141	11.71	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p1142	1.72	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p1143	1.822	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p1144	0.0617	100	130	0	0	0.00	0.00	0.00	0.000
Pipe p1145	57.94	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 1	201.67	100	130	0	0	0.73	0.09	0.15	0.034
Pipe 2	2.68	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 3	2.68	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 4	19.22	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 5	48.13	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 6	65.30	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 7	0.58	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 8	0.10	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 9	24.06	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 10	11.23	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 11	43.37	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 12	32.85	100	130	0	0	2.25	0.29	1.21	0.029
Pipe 13	30.76	100	130	0	0	1.67	0.21	0.69	0.030

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe 14	43.07	100	130	0	0	2.25	0.29	1.21	0.029
Pipe 15	15.30	100	130	0	0	1.33	0.17	0.45	0.031
Pipe 16	68.79	100	130	0	0	0.92	0.12	0.23	0.033
Pipe 17	27.91	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 18	32.60	100	130	0	0	0.92	0.12	0.23	0.033
Pipe 19	19.30	100	130	0	0	1.52	0.19	0.58	0.031
Pipe 20	38.30	100	130	0	0	-1.52	0.19	0.58	0.030
Pipe 21	40.35	100	130	0	0	-1.52	0.19	0.58	0.030
Pipe 22	22.28	100	130	0	0	-1.52	0.19	0.58	0.030
Pipe 23	24.79	100	130	0	0	1.33	0.17	0.45	0.031
Pipe 24	3.27	100	130	0	0	0.73	0.09	0.15	0.034
Pipe 25	118.27	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 26	3.91	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 27	20.52	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 28	10.16	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 29	20.52	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 30	8.81	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 31	0.55	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 32	0.39	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 33	0.33	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 34	0.33	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 35	17.04	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 36	243.17	100	130	0	0	-2.65	0.34	1.62	0.028
Pipe 37	0.54	100	130	0	0	6.41	0.82	8.37	0.025
Pipe 38	1.47	100	130	0	0	2.65	0.34	1.62	0.028
Pipe 39	1.92	100	130	0	0	-4.80	0.61	4.89	0.026
Pipe 40	0.63	100	130	0	0	-10.67	1.36	21.50	0.023
Pipe 41	9.40	100	130	0	0	1.80	0.23	0.80	0.030
Pipe 42	89.82	100	130	0	0	-2.81	0.36	1.82	0.028
Pipe 43	91.46	100	130	0	0	-0.63	0.08	0.11	0.035
Pipe 44	101.45	100	130	0	0	0.68	0.09	0.13	0.034
Pipe 45	82.74	100	130	0	0	4.65	0.59	4.61	0.026
Pipe 46	92.95	100	130	0	0	2.46	0.31	1.42	0.028

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe 47	94.62	100	130	0	0	1.16	0.15	0.35	0.032
Pipe 48	0.91	100	130	0	0	1.80	0.23	0.80	0.030
Pipe 49	21.44	100	130	0	0	0.89	0.11	0.22	0.033
Pipe 50	39.09	100	130	0	0	0.89	0.11	0.22	0.033
Pipe 51	2.58	100	130	0	0	1.80	0.23	0.80	0.030
Pipe 52	0.88	100	130	0	0	0.91	0.12	0.23	0.034
Pipe 53	2.58	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 54	5.57	100	130	0	0	7.50	0.96	11.20	0.024
Pipe 55	10.51	100	130	0	0	4.65	0.59	4.61	0.026
Pipe 56	11.37	100	130	0	0	15.54	1.98	43.11	0.022
Pipe 57	114.30	100	130	0	0	7.97	1.02	12.53	0.024
Pipe 58	5.50	100	130	0	0	10.67	1.36	21.49	0.023
Pipe 59	3.65	100	130	0	0	2.52	0.32	1.48	0.028
Pipe 60	38.59	100	130	0	0	1.50	0.19	0.56	0.031
Pipe 61	2.67	100	130	0	0	0.83	0.11	0.20	0.034
Pipe 62	6.33	100	130	0	0	0.83	0.11	0.19	0.033
Pipe 63	20.11	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 64	16.16	100	130	0	0	-1.75	0.22	0.75	0.030
Pipe 65	14.97	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 66	19.93	100	130	0	0	-0.02	0.00	0.00	0.000
Pipe 67	9.16	100	130	0	0	-0.46	0.06	0.06	0.037
Pipe 68	9.06	100	130	0	0	0.66	0.08	0.13	0.035
Pipe 69	5.48	100	130	0	0	0.14	0.02	0.01	0.042
Pipe 70	70.08	100	130	0	0	0.83	0.11	0.19	0.033
Pipe 71	73.08	100	130	0	0	1.75	0.22	0.75	0.030
Pipe 72	0.19	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 73	0.92	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 74	6.56	100	130	0	0	0.00	0.00	0.00	0.000
Pipe 81	24.53	100	130	0	0	20.25	2.58	70.37	0.021
Pipe 78	203.00	100	130	0	0	-2.09	0.27	1.04	0.029
Pipe 75	21.68	100	130	0	0	1.61	0.21	0.65	0.030
Pipe 76	20.89	100	130	0	0	4.05	0.52	3.57	0.026
Pipe 77	16.09	100	130	0	0	0.00	0.00	0.00	0.000

Link ID	Length m	Diameter mm	Roughness	Bulk Coeff.	Wall Coeff.	Flow LPS	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe 79	131.40	100	130	0	0	-2.81	0.36	1.82	0.028
Pipe 80	60.35	100	130	0	0	-1.05	0.13	0.29	0.032
Pump PU-1	#N/A	#N/A	#N/A	#N/A	#N/A	20.25	0.00	-262.75	0.000
Pump PU-2	#N/A	#N/A	#N/A	#N/A	#N/A	15.54	0.00	-113.21	0.000