Watercare Services Limited

PRELIMINARY SITE INVESTIGATION

QUEEN STREET WASTEWATER DIVERSION PROGRAMME: PART 3 - PART 6 LINK & PART 6 ALIGNMENT

13 JANUARY 2025

PUBLIC

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ABBREVIATIONS AND DEFINITIONS

AC	Auckland Council
AEE	Assessment of Environmental Effects
AT	Auckland Transport
AUP-OP	Auckland Unitary Plan (Operative in Part)
CLMG	Contaminated Land Management Guidelines
MfE	Ministry for the Environment
NESCS	Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011
P3-P6 Link	The Part 3 – Part 6 Link being the construction of a wastewater pipeline from the Part 3 Mayoral Shaft to the new Part 3 – Part 6 shaft at the intersection of Queen Street and Marmion Street.
Part 6	Part 6 being the construction of a wastewater pipeline from the new Part 3 – Part 6 Marmion Shaft at the intersection of Queen Street and Marmion Street, to a new shaft at the intersection of Marmion Street and White Street, as well as two wastewater pipelines extending from this shaft on White Street connecting to existing infrastructure.
Site	The “site” refers collectively to the P3-P6 Link and Part 6 portions of the Queen Street Wastewater Diversion Programme.
Watercare	Watercare Services Limited
WSP	WSP New Zealand Limited

EXECUTIVE SUMMARY

Watercare Services Limited ('Watercare') are proposing to upgrade the existing wastewater network of the upper (southern) catchment of Auckland city centre. The programme of works proposed around Queen Street has been split into separate parts. The purpose of this Preliminary Site Investigation (PSI) report is to provide an assessment as to whether potential contaminating activities have occurred at the Part 3 – Part 6 (P3-P6) Link and Part 6 portions of the programme (collectively the "site"), that could result in concentrations of contaminants of concern at levels that could be a risk to human health.

The P3-P6 Link lies to the immediate north and south of the intersection of Queen Street and Mayoral Drive. It extends from the 'Mayoral Shaft', established under the Part 3 consent, to a new shaft opposite the intersection of Queen Street and Marmion Street, referred to as the 'Marmion Shaft'. Construction of the P3-P6 Link will be by trenchless tunnelling. The Part 6 portion is currently in the preliminary design stage. The current design is to connect the proposed Marmion Shaft to a new shaft located at the intersection of Marmion Street and White Street through trenchless tunnelling. The remainder of the Part 6 portion along White Street will then be of open trench construction.

A historical aerial photograph review noted that Queen Street was depicted from at least the 1940s in its current orientation, surrounded by residential and commercial buildings. By 1972, the portion of Mayoral Drive west of Queen Street had been constructed and the portion to the east was under construction in 1985 (depicted complete in 2005). The area surrounding Marmion Street and White Street underwent significant residential development between 2005 and 2022 to its present day configuration.

A Site Contamination Enquiry was submitted to Auckland Council (AC) for the site and property files were ordered for relevant nearby *Hazardous Activities and Industries List* (HAIL) (MfE, 2011) activities identified by AC to provide further context. No notable HAIL activities were identified as likely to potentially impact the site.

Based on the findings of the PSI, it can be concluded that none of the identified HAIL activities are more likely than not to have the potential to impact soil quality at the site; therefore, the *Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011* (NESCS) are not considered applicable to the proposed works.

Given the site is not expected to contain elevated levels of contaminants, Chapter E30 (Contaminated Land) of the *Auckland Unitary Plan – Operative in Part 2016* is not considered to apply to the proposed works. Additionally, with a Site Management Plan (SMP) in place (as recommended below), no discharge of contaminants is expected to occur during the works.

Based on the results of the PSI, WSP recommend that soil sampling is undertaken along the site prior to or during construction, to assess soils in relation to disposal and re-use options.

1 INTRODUCTION

1.1 OVERVIEW

Watercare Services Limited ('Watercare') is a lifeline utility providing water and wastewater services to a population of 1.7 million people in Auckland and northern Waikato. Its services are vital for life, keeping people safe and helping communities to flourish. More specifically, Watercare is the council-controlled organisation of Auckland Council (AC) responsible for municipal water supply and wastewater treatment within Auckland, and the provider of bulk water and wastewater services to Pokeno and Tuakau in the Waikato District.

Watercare is proposing to upgrade the existing wastewater network of the upper (southern) catchment of Auckland city centre. The current network has insufficient capacity to meet the future needs based on increased development in the area. The wider programme of works has been split into separate parts for the purpose of design, consenting and construction. The consenting and construction packages of the Queen Street programme are shown below in Figure 1-1.

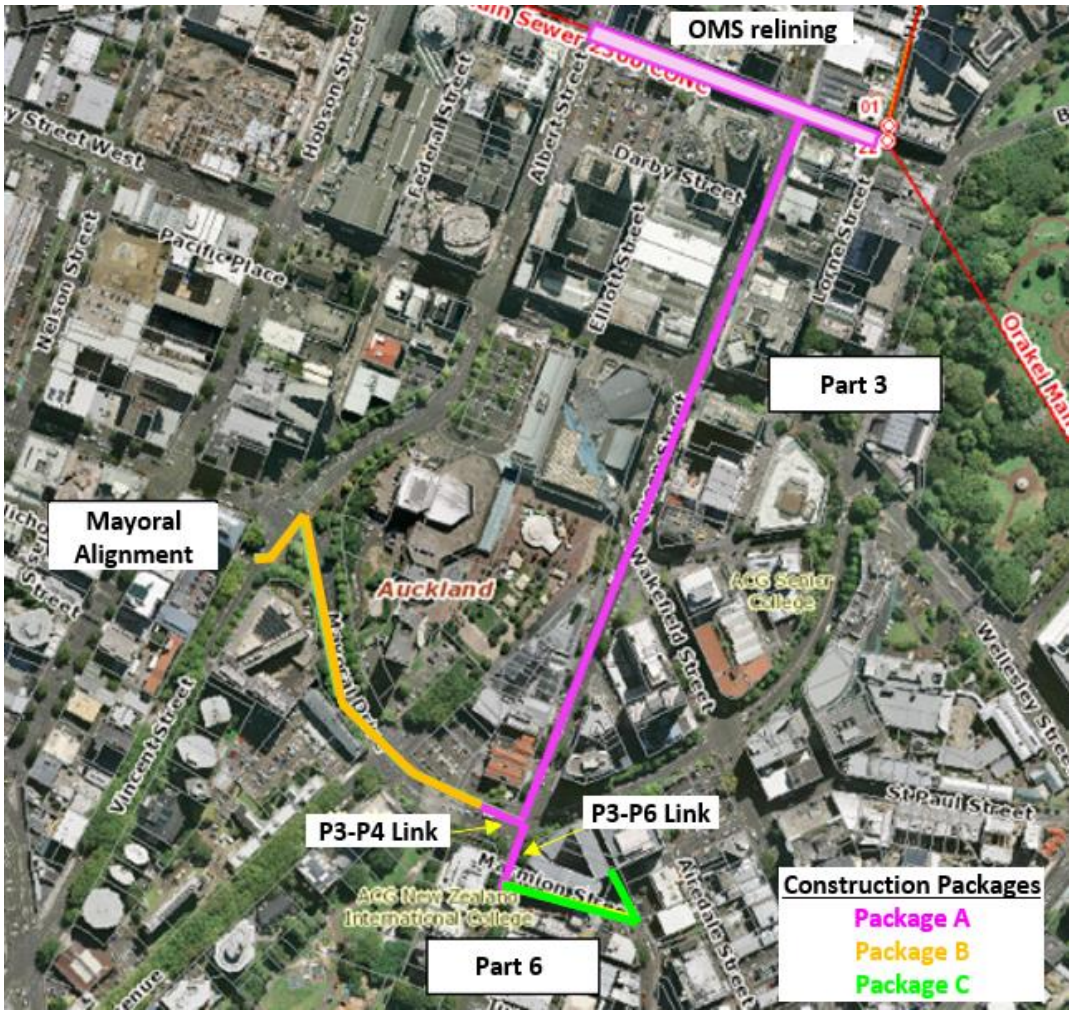

Figure 1-1: Queen Street Wastewater Diversion Programme

This report covers the Part 3 – Part 6 Link (P3-P6 Link) and Part 6 portions of the Queen Street Wastewater Diversion Programme.

1.2 CONSENTING BACKGROUND

Resource consents for two sections of the wider Queen Street Programme have already been approved by Auckland Council, being:

1) Part 3 Alignment/Resource Consent No. BUN60422974:

A 650m-long, 1200mm diameter wastewater pipeline within Queen Street between the intersections of Mayoral Drive and Victoria Street, with connections to the local network at Wellesley Street and the Orakei Main Sewer at Victoria Street. This consent was approved on 4 July 2024 and was amended via s127 of the Resource Management Act 1991 (RMA) (BUN60422974-A) on 5 September 2024.

2) Part 3 – Part 4 Connector Tunnel/Resource Consent No. BUN60425924:

A 43m-long, 700mm diameter tunnel between the Mayoral Drive shaft established under Part 3 and a new shaft within the Construction Support Area ('CSA') within 329 Queen Street. The tunnel will initially be utilised to provide services to the micro-TBM for Part 3 construction and will be utilised as a permanent wastewater pipeline once Part 3 construction has been completed. This consent was approved on 9 July 2024.

The resource consent application for the following project is currently being prepared and is expected to lodged with Council in April 2025.

3) Mayoral Drive Alignment (Yet to be lodged)

The Mayoral Drive alignment involves the construction of a new wastewater pipe within or adjacent to the road reserve of Mayoral Drive, between the intersection with Queen Street and Vincent Street. The works include a 375 - 700mm diameter wastewater pipeline between the Part 3-Part 4 Connector Tunnel and a new manhole within Vincent Street.

1.3 PURPOSE OF THIS REPORT

The purpose of this report it to provide an assessment as to whether potential contaminating activities have occurred at the P3-P6 Link and Part 6 portions of the programme (collectively the "site") that could result in concentrations of contaminants of concern at levels that could be a risk to human health. WSP undertook the Preliminary Site Investigation (PSI) to assess whether:

- It is more likely than not that an activity or industry described in the *Hazardous Activities and Industries List* (HAIL) is being or has been undertaken on site.
- Determine whether the *Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011* (NESCS) is applicable to the proposed works on the site.
- Determine the activity status of the proposed works under the *Auckland Unitary Plan – Operative in Part 2016* (AUP-OP) (AC, 2024).

1.4 SCOPE OF WORKS

The scope of works for the PSI comprised:

- Desktop review of:

- Environmental setting information, geology, and hydrogeology.
- Historic aerial photographs available on Retrolens and Google Earth.
- AC property files and HAIL database.
- Previous environmental investigations.

- Preparation of a PSI report documenting the desktop review, discussion of findings, likelihood of contamination posed by site activities, potential for human health risk, and requirements for further investigation if required. This investigation has been undertaken with reference to the *Contaminated land management guidelines No. 1: Reporting on Contaminated Sites in New Zealand (Revised 2021)* (CLMG No. 1) (MfE, 2021).

1.5 CERTIFYING STATEMENT

This PSI meets the requirements of the NESCS as it has been undertaken with reference to the CLMG No. 1 and completed by an investigator and certified by a principal who meet the interpretation of a Suitably Qualified and Experienced Practitioners (SQEPs) referenced in the Ministry for the Environment (MfE) *User's Guide: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health* (MfE, 2012). The investigation manager and principal certifier details are provided in Table 1-1 below.

Table 1-1: Suitably Qualified and Experienced Practitioners

ITEM	DETAILS
Author	
Name	Laurence Shotliff
Job title	Environmental Scientist
Years industry experience	6
Certifier	
Name	Gregory Coffin
Job title	Principal Environmental Scientist
Years industry experience	22

2 DESCRIPTION OF EXISTING ENVIRONMENT

The following provides a description of the existing environment applicable to the application.

2.1 LOCATION AND PHYSICAL ENVIRONMENT

The site is located within Auckland city centre. Queen Street is generally two lanes in width (following the pedestrian upgrades undertaken in 2021), with some vehicle access restrictions between Wakefield and Wellesley Street to enable priority for bus movements. Mayoral Drive is an arterial road linking Wellesley Street, Cook Street and Queen Street and is generally five lanes in width with a painted central median. Marmion Street is a one-way laneway-style street that primarily provides access to adjacent residential apartment buildings. White Street is a two-lane street with roadside parking on both sides.

The land use surrounding the project area is typified by medium and high-density development containing apartments, offices, accommodation, education facilities and entertainment, with retail predominantly occupying the ground level of most buildings. The area contains a combination of heritage and special character buildings (such as the Auckland Sunday School Union Building at 323-327 Queen Street) and modern buildings. The Auckland Civic Precinct is located a short distance to the north-west and contains a range of landmarks including Auckland Town Hall, Aotea Square, Aotea Centre and the former Civic Administration building, which has been recently renovated and converted into apartments.

The P3-P6 Link lies to the immediate north and south of the intersection of Queen Street and Mayoral Drive. It extends from the 'Mayoral Shaft', established under the Part 3 consent, to a new shaft opposite the intersection of Queen Street and Marmion Street (the 'Marmion Shaft') as shown in Figure 2-1 below

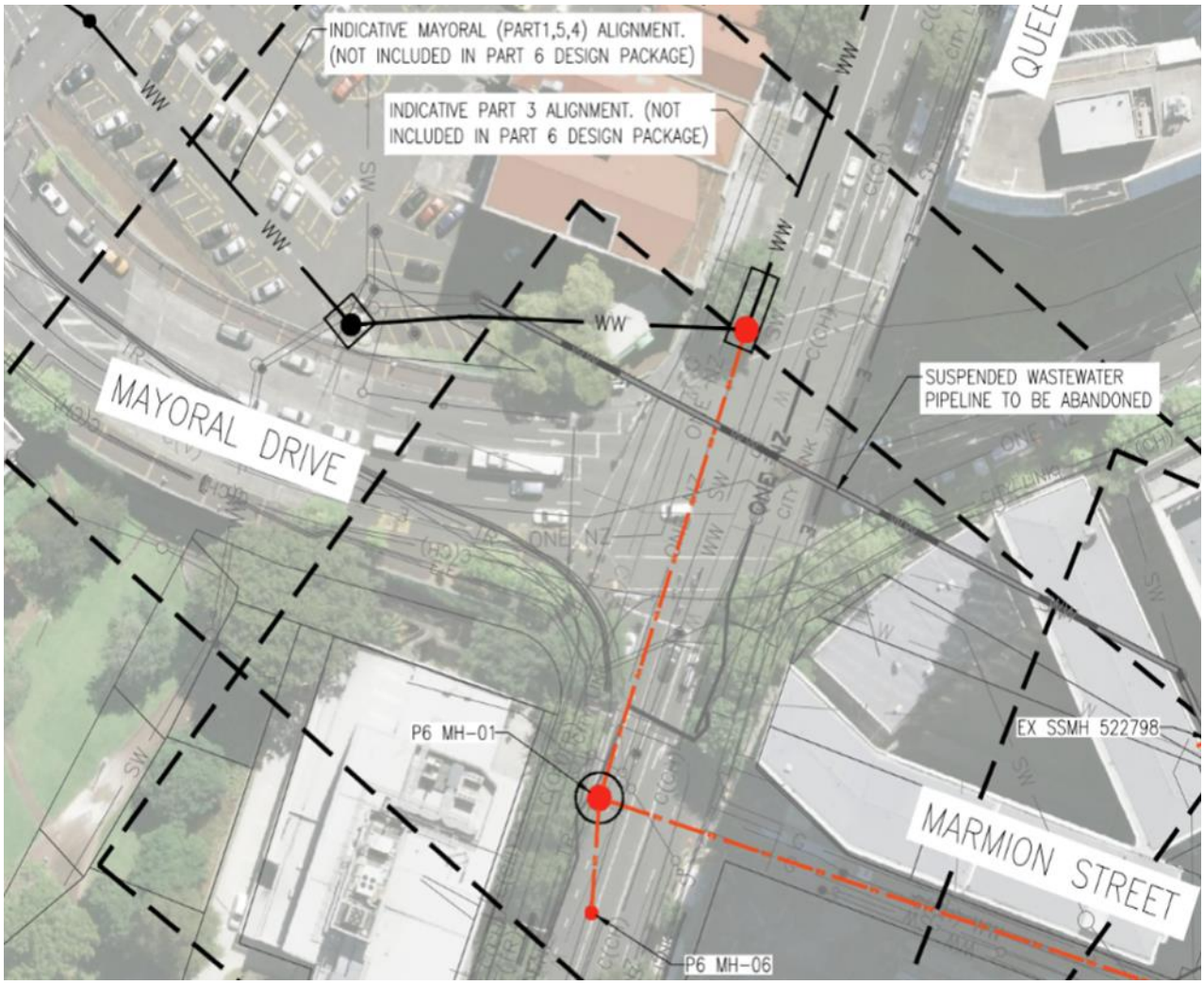

Figure 2-1: P3-P6 Link

The Part 6 alignment is currently in the preliminary design stage. The current design is to connect the proposed Marmion Shaft to a new shaft located at the intersection of Marmion Street and White Street through trenchless tunnelling. The remainder of Part 6 along White Street will then be of open trench construction. The proposed Part 6 alignment is shown on Figure 2-2.

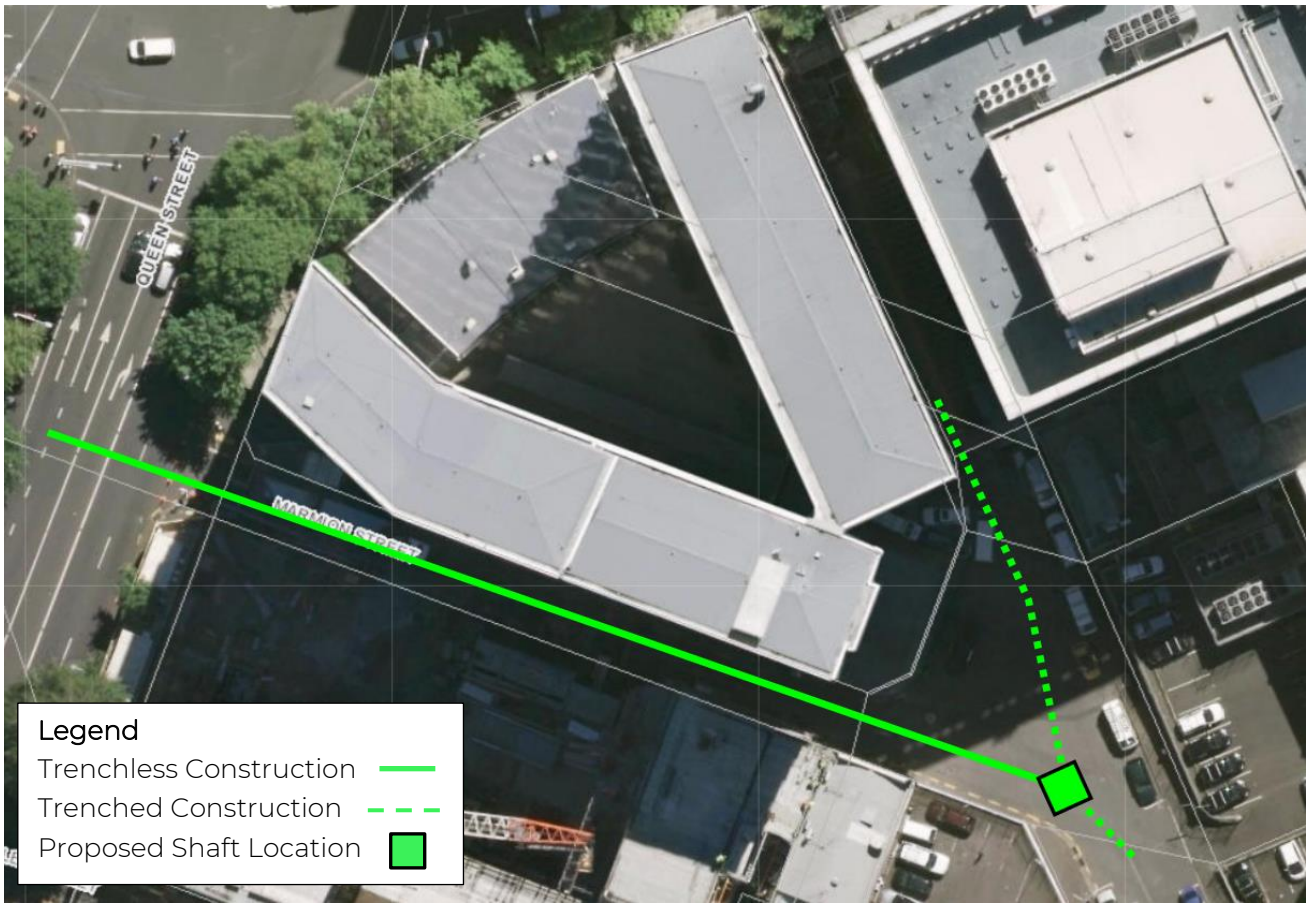

Figure 2-2: Part 6 proposed layout

2.2 GEOLOGY

The institute of Geological and Nuclear Sciences (GNS) Geological Map 'New Zealand Geology webmap' at 1:250,000 scale (Edbrooke, 2001) indicates that the site is underlain by sandstone and mudstone of the East Coast Bays Formation (ECBF) of the Warkworth Subgroup. This comprises alternating sandstone and mudstone with variable volcanic content and interbedded volcaniclastic grits.

Test boreholes from the New Zealand Geotechnical Database (NZGD)[1], WSP databases and recent investigations for the Part 3 alignment confirm the presence of the mapped ECBF, with significant thickness of fill in places and locally weak underlying alluvium that is not detailed in the GNS maps.

2.3 TOPOGRAPHY, SURFACE WATER AND HYDROGEOLOGY

A review of topographical contours on AC GeoMaps[2] indicates the site slopes generally upwards from west to east starting at the northern end of the P3-P6 Link on Queen Street at approximately 28 metres above mean sea level (m amsl), increasing to 32 m amsl at the intersection of Queen Street and Marmion Street, before decreasing to 26 m amsl at the eastern end of the site.

[1] NZGD: https://www.nzgd.org.nz/ARCGISMapViewer/mapviewer.aspx

[2] AC GeoMaps: https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html

A review of catchments and hydrology on AC GeoMaps indicates that part of the eastern portion of the site along Marmion Street and White Street is noted to be in a flood prone area.

According to AC GeoMaps, the site is noted to be within the Auckland Isthmus Waitemata aquifer zone.

Limited groundwater monitoring undertaken for the Part 3 alignment included borehole BH22/01, drilled near the north end of the P3-P6 Link (WSP, 2023). A piezometer installed within the ECBF indicated a consistent groundwater level of approximately 10.3 m below ground level (m bgl) (RL 17.7). The adjacent shallow monitoring well installed within fill material recorded groundwater at approximately 3.4 m bgl and showed greater fluctuation in response to rainfall events. The invert level at the north end of the P3-P6 Link is at RL 18.9 which is above the recorded level within the ECBF in BH22/01.

3 NATURE OF WORK (ACTIVITIES) SUBJECT TO ASSESSMENT

The following subsections provide a description of the planned P3-P6 Link works. The Part 6 works are in the preliminary design phase and so only a minimal description is provided for this portion in Section 3.8.

3.1 OVERVIEW

Watercare are proposing a programme of works to upgrade the wastewater network in the upper section of Auckland city centre to accommodate the substantial and sustained urban growth from residential, municipal and commercial development. The P3-P6 Link relates to the construction of a new wastewater sewer line from the existing Mayoral Shaft to a new shaft opposite the intersection of Queen Street and Marmion Street.

The P3-P6 Link will be constructed using a combination of trenchless pilot boring to construct the wastewater pipeline tunnel and secant piling to construct the temporary shaft. An overview of the proposed construction activities is shown below as Figure 3-1.

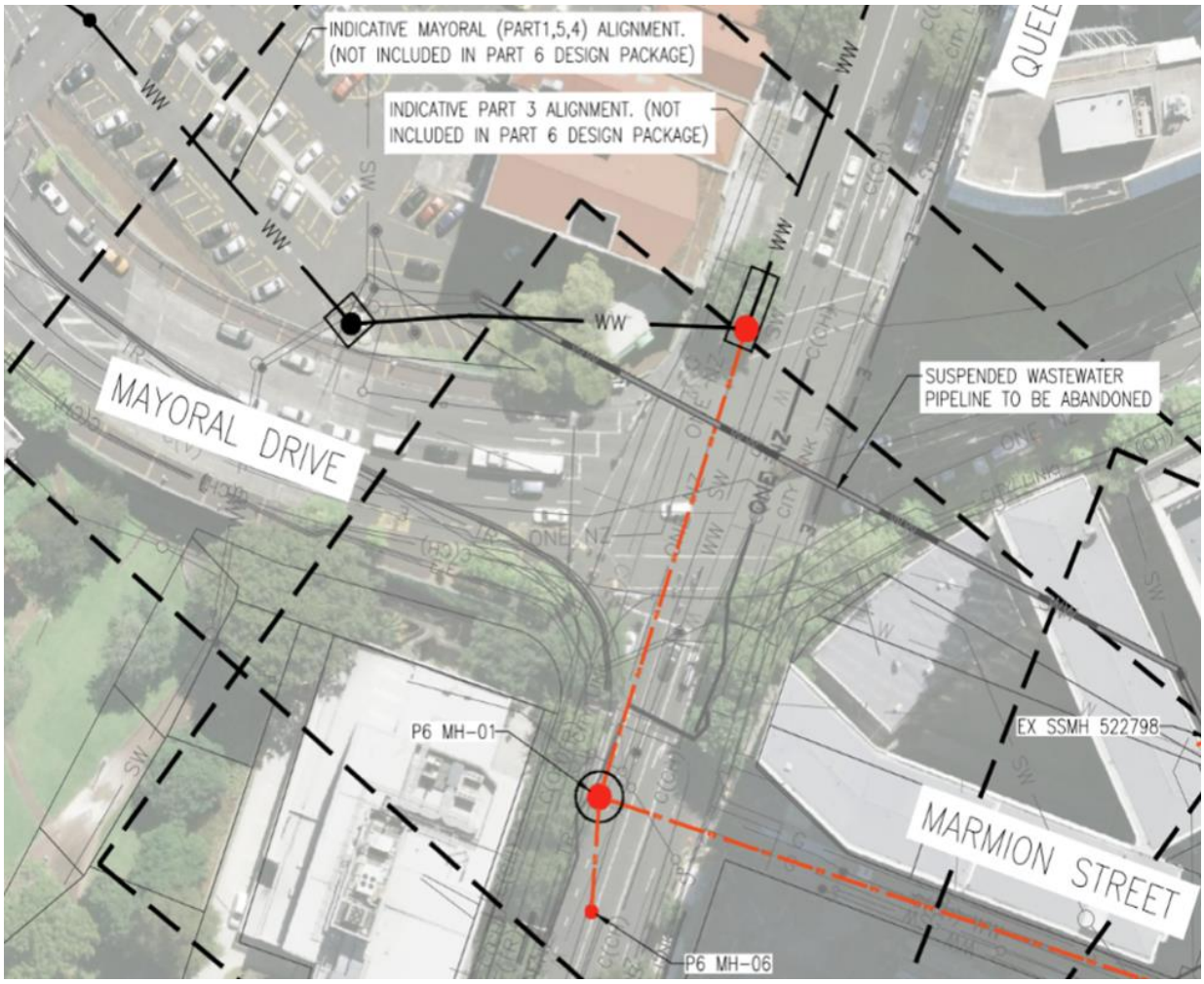

Figure 3-1: Overview of construction works

3.2 TEMPORARY CONSTRUCTION SHAFT

The temporary shaft opposite Marmion Street will be used as a reception pit for the Pilot Guided Boring Machine. The shaft's outside diameter will be 6.4m constructed using 600 - 900mm piles, 200mm in-situ shotcrete lining. The shaft will have a 4m internal diameter and will be up to 17m deep.

The shaft will be constructed as follows:

1. A concrete guide wall will be excavated and formed at ground level to guide the drill rig
2. Soft piles will be drilled in a hit and miss fashion to avoid damaging the adjacent pile while they are curing.
3. The missed soft piles will then be constructed.
4. Hard piles will then be drilled through the soft piles creating a continuous retaining wall.
5. Steps 2 to 4 will then be repeated until all piles are constructed and there is a continuous retaining wall.

Once the shaft has been excavated to approximately 1m below the invert, a 300-500mm thick concrete plug will be poured to form the base. This plug creates a level working platform while also retaining the groundwater from below. Once the plug has been constructed, the dewatering requirements will significantly reduce or stop.

The shaft will be lined using shotcrete in 2m lifts to the depth of the shaft. The shaft lining and secant piles will remain in place and form part of the permanent works.

3.3 TRENCHLESS TUNNELLING WORKS

The proposed wastewater pipeline will be installed using a Pilot Guided Boring Machine. This method drills a smaller diameter pilot bore from the launch pit to the reception pit. A reamer is then connected in the reception pit and guided back to the launch pit. A soft pile window will be constructed on the pipe alignment at each shaft to allow the boring machine to breakthrough. A summary of the key steps of the boring machine is as follows:

3.3.1 PILOT BORE

1. Set up the Guidance System in the Launch Pit.
2. Place drill rig in launching pit and align rack.
3. Place Drill Head on Drill Rack.
4. Connect all supporting items including vacuum to carry the slurry.
5. Commence pilot bore.

3.3.2 REAMER AND PIPE INSTALLATION

1. Install pusher unit at the Reception Pit.
2. Attach the reamer to the pilot bore.
3. Place pipe on pusher and install vacuum system through the pipe.

4. Start the reamer and push pipe into bore.
5. Place next pipe disconnect vacuum system and install through second pipe.
6. Repeat steps 3-5 until all the pipes have reached the launch pit.

3.4 MANHOLE CONSTRUCTION AND ROAD REINSTATEMENT

A manhole will be installed in the shaft and the road surface reinstated upon completion of the shaft and tunnelling construction works.

3.5 NETWORK UTILITY RELOCATIONS

The existing network utilities within the carriageway of Queen Street will need to be relocated to enable construction of the Marmion Shaft. As a flexible 'consenting envelope' is being sought. The exact utilities to be diverted are yet to be confirmed, but will likely include potable water, electricity, wastewater, stormwater and communications.

Open-cut progressive trenching will be utilised to relocate any utilities that are required to be relocated. The trenches are expected to typically be between 0.4m and 2m in width and between 0.3m and 4m deep, depending on the location of the utility, and will be constructed in 3 to 10m-long sections per day (depending on depth of trench). Once the new ducts and pipes are installed, the trenches shall be backfilled with the footpath and / or road reinstated.

Where trench works are required within the road corridor, this will involve a combination of reduced traffic lanes and full closure of traffic lanes to enable utility relocation works to be completed.

The following high-level methodology will apply to network utility relocations:

Table 3.1: High-level network utility relocation methodology

Stage	Construction Activities	Equipment and Materials
Site set out	Set up traffic management and fencing. Identify and mark-out position of trenches along the affected roadway and footpath areas.	Truck, handheld service locator, spray paint
Pavement removal	Saw cut and remove existing pavement.	Concrete saw, handheld concrete breaker (only where necessary), 8T excavator, truck.
Trench construction	Expose, identify, and support existing utilities up to a 1.5m – 3m depth. Trenches will be constructed to a width of approximately 1m. All spoil will be loaded onto trucks and disposed of off-site.	Hydro vac, excavator, truck, trench shields, air actuated compaction equipment, compressor and mobile generator.

Stage	Construction Activities	Equipment and Materials
Utilities installation	Once trench is at required depth, bedding will be placed in the trench, with the new utility assets installed.	Trench shield, 4 -8 wheeled truck, excavators, plate compactor, concrete trucks, asphalt paver, double drum roller, small water cart or water blaster.
Reinstatement	Once installed, the trench will be backfilled and compacted in layers as specified. Surface is then reinstated with asphalt. Backfill material will be imported. Fill will be a mixture of cut to fill aggregate from site and imported fill. Backfill may be stockpiled on site for a short period.	

The network utilities within the Marmion Shaft's consenting envelope which may need to be relocated or protected are outlined in Table 3.2 below.

Table 3.2: Summary of potentially affected network utilities

Asset ID	Type	Owner	Action
N/A	Electricity – 11 kV	Vector	Relocate
N/A	Electricity - HV	Vector	Avoid
Cable ID HOB-PEN-A-CBL	Electricity – LV	Transpower	Relocate
Manholes – IDs 2000465764, 2000308548, 2000017189	Stormwater	Healthy Waters	Protect
Pipes – IDs 2000110404, 2000937040, 2000486432	Stormwater	Healthy Waters	Protect
Pipes – IDs 2000277930, 2000679895	Stormwater	Healthy Waters	Relocate
Pipe ID 852334	Wastewater	Watercare	Relocate
Manhole ID 522814	Wastewater	Watercare	Protect
Pipe ID 1650257	Potable Water	Watercare	Relocate
N/A	Communications	Vector	Relocate
N/A	Communications	One NZ	Relocate
N/A	Communications	City Link	Relocate

Due to the proximity of these services to each other, a wider trench may be necessary to divert the services in a common service trench which would be either benched or shored. This may increase the earthworks volumes described in Table 3.3 below.

3.6 EARTHWORKS

The following table provides an estimate of the earthworks requirements for the P3-P6 Link:

Table 3.3: Earthworks summary for the P3-P6 Link

Activity	Approximate Area	Approximate Volume
Network utility relocations	260m^2	507.5m^3
Crane & piling platform	216m^2	152m^3
Shaft construction	32m^2	544m^3
Trenchless (pilot bore)	46m^2	25m^3
Total	554m^2	1,228.5m^3

The spoil material will be drilled out using an SR-45 or SR-65 and loaded using a 20T excavator into 6-8-wheeler trucks to be carted offsite over a period of 1-2 weeks.

3.7 CONSTRUCTION SUPPORT AREA AND COMPOUND

To support the proposed construction activities, a Construction Support Area (CSA) within the public carpark at 38 Greys Avenue and 329 Queen Street will be required. This CSA has been initially established to support the Part 3 Alignment and Part 3 – Part 4 Connector Tunnel projects.

The CSA contains site offices and welfare facilities, along with some limited site laydown and materials storage areas. Most excavated materials will be immediately removed from site, while construction materials (such as pipes and aggregates) will be delivered to site on a 'just in time' basis.

The site layout for the Greys Avenue CSA (as approved in the Part 3 consent) is shown below in Figure 3-2.

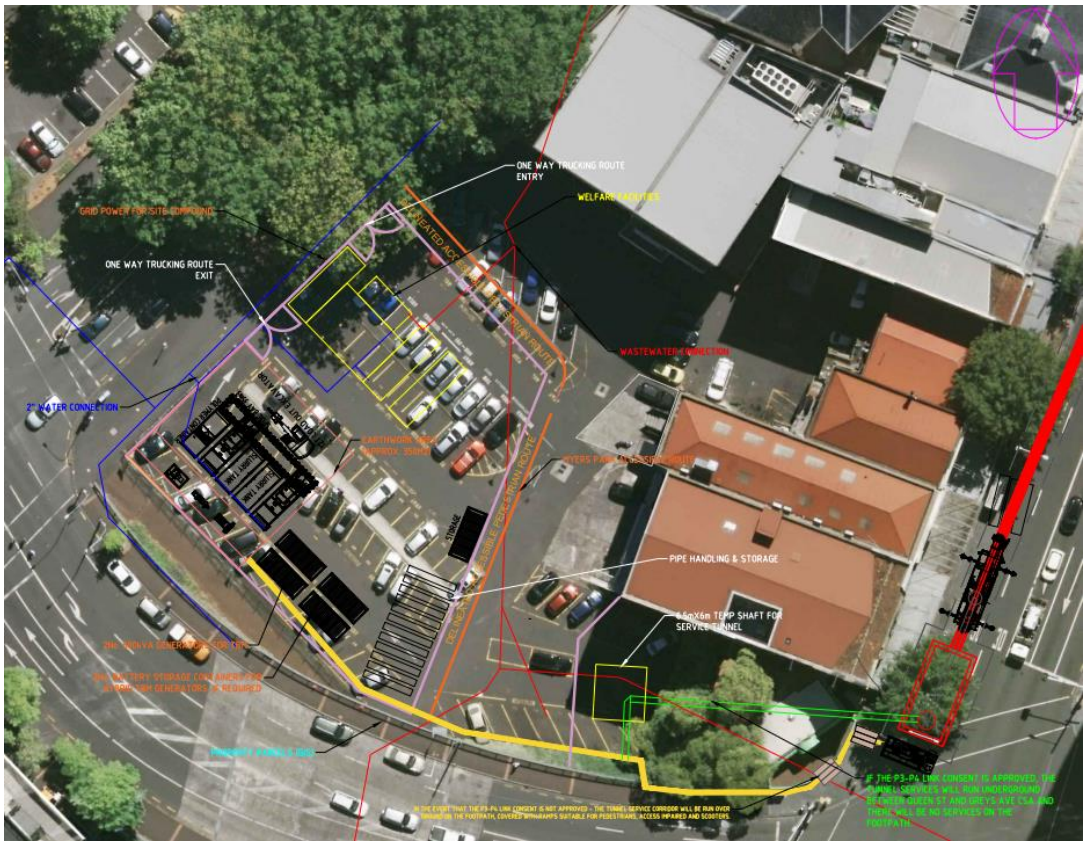

Figure 3-2: Greys Avenue CSA Layout

A 45m long by 11m wide compound will be set up around the Marmion Shaft to allow for the construction of the shaft and the tunnelling operations. The compound will make use of temporary concrete or steel barriers with hoardings around the perimeter of each, with access gates one or both ends.

Figure 3-3 below shows the consenting envelope for the proposed Marmion Shaft (red box). The construction compound for the shaft, defined by the pink lines for the hoarding and traffic barrier, will move with the shaft as drawn below, and will be finalised in the Construction Management Plan to be prepared by Fulton Hogan.

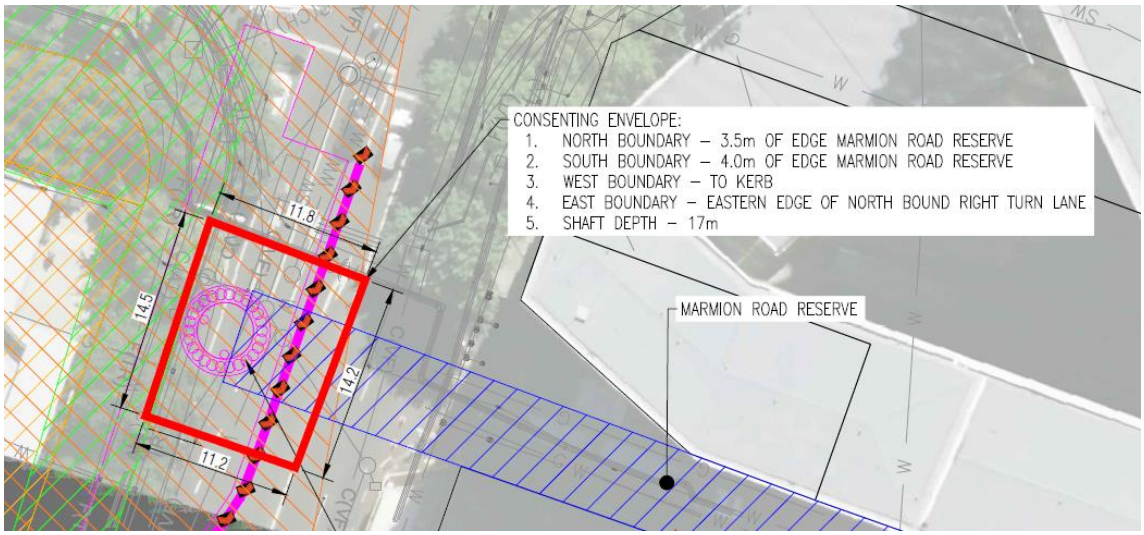

Figure 3-3: Shaft footprint and indicative compound

3.8 PART 6 PRELIMINARY DESIGN

The current preliminary design for Part 6 consists of a new wastewater pipeline connecting the proposed Marmion Shaft to a new shaft located at the intersection of Marmion Street and White Street through trenchless tunnelling. The wastewater pipeline will extend through the Marmion Street road reserve to connect these two shafts.

The remainder of Part 6 will be of open cut construction and will include the following. A wastewater pipeline extending to the south of the Marmion Street and White Street shaft, connecting to an existing manhole. A wastewater pipeline will also extend north from the Marmion Street and White Street shaft connecting to an existing manhole at 31 Airedale Street.

The open cut portion of Part 6 along White Street will be 1.5 m wide and go to 0.5 m below the designed pipeline invert: up to 4.42 m bgl.

The White Street & Marmion Street Shaft will require excavation to 5 m bgl and will be of post and panel construction. The shaft will have a footprint of 6 m x 6 m.

Note: this section of the PSI will be reviewed once the final design for Part 6 is confirmed.

4 DESKTOP REVIEW

4.1 HISTORICAL AERIAL PHOTOGRAPHY REVIEW

WSP reviewed historical aerial photographs for the site and surrounding area sourced on 5 February 2024 from Retrolens and AC GeoMaps dating between 1940 and 2022. A summary of observed land uses, and land use changes are described in Table 4-1 below. Copies of aerial photographs have been included in Appendix A.

Table 4-1 Summary of historical aerial review

Year (Source)	Site
1940 (Retrolens)	Queen Street is well established with Marmion Street forming a lane between existing buildings. To the north of Marmion Street is a large rectangular building which runs the length of the lane with smaller ancillary buildings at the Queen Street intersection and the eastern terminus. To the east of Marmion Street in the location of White Street are the rear sections of the residential dwellings and garden spaces on Airedale Street. A cleared city block is visible directly east of the large rectangular building. To the south of Marmion Street is a collection of smaller commercial/industrial buildings flanked by residential dwellings. While there is a commercial/industrial presence the area remains largely residential.
1950 (Retrolens)	No discernible change to Marmion Street. Increase in residential development on Queen Street, adjacent to the alignment.
1957 (Retrolens)	Development of high intensity residential buildings to the north, and demolition of commercial building to the west. Removal of some of the smaller residential buildings on Airedale Street, which have been replaced with a single larger multi-storey building.
1963 (Retrolens)	Area of commercial buildings previously demolished to the west of Queen Street now developed to a car park.
1972 (Retrolens)	Major development of roading infrastructure to the west. Replacement of surrounding vegetation with byroads and carparking. White Street is paved, and further development of Airedale Street properties is visible.
1985 (Retrolens)	Major development of area to northeast to extend Mayoral Drive.
2005 (AC Geomaps)	Mayoral Drive extension completed. Residential building project at the north end of White Street is completed.
2009 (AC Geomaps)	Large apartment complex constructed to the north of Marmion Street and east of the Queen Street/Mayoral Drive intersection.
2017 (AC Geomaps)	Large redevelopment on-going adjacent to the south of Marmion Street.

Year (Source)	Site
2022 (AC Geomaps)	Large 'L' shaped apartment/office complex constructed adjacent to the south of Marmion Street.

4.2 REVIEW OF PREVIOUS REPORTS

WSP have reviewed the following previous reports as part of this assessment.

4.2.1 WSP (2023) – QUEEN STREET WASTEWATER DIVERSION PART 6 – DESKTOP HAIL ASSESSMENT

WSP undertook a limited desktop HAIL assessment for Part 6 in July 2023 to review evidence and determine the likelihood that any HAIL activities have occurred on or within 100 metres of the site. Nine properties in the vicinity of the site were identified as being potential HAIL sites, one of which is intersected by the site (31 Airedale Street). The HAIL activity at 31 Airedale Street related to underground storage tanks (USTs), for which a previous report was provided by AC and is discussed below.

WSP recommended that a PSI and DSI be undertaken in order to characterise potential soil and groundwater contamination which may be encountered during soil disturbance.

The site contamination enquiry submitted to Auckland Council as part of this HAIL assessment is reviewed in Section 4.3.

4.2.2 GOLDER (2016) – TANK PULL REPORT

An underground petroleum storage system (UPSS) was removed from 31 Airedale Street in May 2016, with environmental benchmarking of the site undertaken by Golder Associates (NZ) Limited (Golder). The UPSS consisted of three separate 20,000 L diesel tanks in three concrete lined tank pits for the purpose of supplying fuel to backup generators for the building.

The tank pull report titled *31 Airedale Street, Spark MDR Exchange – Underground Storage Tank Removal* (Golder, 2016) outlines the environmental benchmarking undertaken including an inspection of the tank pits, collection of four representative samples of the stockpiled tank pit fill material and analysis of the samples for total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAH).

No PAHs were detected above the laboratory limit of reporting (LoR) with the exception of pyrene, detected in all samples ranging from 0.03 to 0.14 milligrams per kilogram (mg/kg). TPH fractions C_{10}-C_{14} and C_{15}-C_{36} were recorded above the laboratory LoR in all samples, with C_{10}-C_{14} ranging from 48 to 77 mg/kg and C_{15}-C_{36} from 260 to 460 mg/kg.

As the site was to remain an office building, there was no change of land use, so the soil analysis results were compared with the MfE Tier 1 soil acceptance criteria for commercial/industrial land use. Sample results indicated concentration of hydrocarbons were below the selected criteria and Golder considered that there was unlikely to be a risk to human health or the environment from hydrocarbons.

A copy of the Tank Pull report has been provided in Appendix B.

4.3 REVIEW OF AUCKLAND COUNCIL CONTAMINATED LAND REGISTER

A Site Contamination Enquiry was completed by WSP as part of the HAIL Assessment for Part 6. The response from AC was received by WSP on 17 November 2022. Table 4-2 below summaries the findings of the enquiries regarding properties within 100 metres of the site which may have been subject to activities and industries that fall on the HAIL. The AC site contamination enquiry responses are attached in Appendix C. A location plan of the HAIL sites is provided in the attached Figure 1.

Table 4-2 Summary of AC Contaminated Land Register Review

Site Name/Activity Type	Address	Approximate Distance from the Project Site	Potential HAIL Activity	Property file review required
Southern Cross Cables Limited	31 Airedale Street	Adjacent east	Underground storage tanks	Yes
City Garage	16 Waverley Street	Adjacent south	Vehicle repair shop	Yes
Queens Square Residences	438 Queen Street	Adjacent south	Listed as Unknown by AC. Property files indicate historical use as garage and car showroom.	Yes
Telecommunication Building	39-43 Airedale Street	20 m east	Listed as Unknown by AC. Property files indicate site is used as a telephone exchange.	Yes
Myers Park	72 Greys Avenue	40 m west	Unknown	No
Spark Datacentre	45-61 Airedale Street	40 m southeast	Listed as Unknown by AC. Property files indicate underground diesel storage tanks.	Yes
Student Accommodation	35-39 Wakefield Street	60 m northeast	Unknown	No

Site Name/Activity Type	Address	Approximate Distance from the Project Site	Potential HAIL Activity	Property file review required
ASB Bank	69 Airedale Street	100 m southeast	Unknown	No
Residential	71 Wakefield Street	100 m east	Unknown	No

Based on the distance of the HAIL site from the alignment, five property files were ordered to investigate potential HAIL activities, discussed below.

4.4 REVIEW OF AUCKLAND COUNCIL PROPERTY FILES

WSP sent a request to AC for the property files relating to 31 Airedale Street, 16 Waverley Street, 438 Queen Street, 39-43 Airedale Street, and 45-61 Airedale Street. WSP received 3,019 files combined across the five sites, as part of the request. WSP reviewed these files for any relevant information relating to the site.

4.4.1 31 AIREDALE STREET

Tank pull report reviewed within Section 4.2.2. No other relevant reports were provided.

4.4.2 16 WAVERLEY STREET

The following reports were reviewed in relation to 16 Waverley Street:

- Technical memo for a resource consent relating to soil contamination, Auckland Council, 28 November 2019 (AC, 2019)
- Assessment of Effects on the Environment and Statutory Assessment, Mt Hobson Group, 30 August 2019 (Mt Hobson Group, 2019)
- Report on Foundation Investigation for Proposed Building, Foundation Engineering Limited, 30 August 1984 (FEL, 1984)

As part of a 13-level hotel and apartment planning application, an Assessment of Effects on the Environment and Statutory Assessment (AEE) was submitted by Mt Hobson Group. According to the AEE report, the property is occupied by a six level (plus basement) building located to the southern end of the property with the topography resulting in a semi basement level (partially below ground). The basement is accessed from Marmion Street and contains car parking spaces. The ground level contains an automotive repair business with parking at the rear (north) above the basement car park. The upper levels of the building, accessed from the western side of the Waverley Street frontage contain offices. Google Street View images from September 2022 show that the property has remained as described here.

A technical memo on a resource consent application relating to the above was produced by AC. The memo included a summary of a Ground Contamination Desk Study prepared by Tonkin and Taylor Ltd (T&T) produced in November 2019. The memo noted that residential and commercial buildings have historically occupied the site, with the motor vehicle workshop established on the ground floor in 2015. A previous geotechnical report was noted to record fill to depths of 1.5 to 3.75 m bgl, consisting of silty clays with basalt inclusions, topsoil, and some building rubble, gravel, and

scoria. The HAIL activities F4 (motor vehicle workshop) and I (uncertified fill material) were reported for the property, and a DSI was recommended.

The technical memo also included a summary of a draft Site Management Plan (SMP). The SMP noted the vehicle workshop was recently constructed and is located over a basement, therefore limited to no impact to subsurface soils is expected from this activity. An intrusive soil investigation was still proposed to confirm this, it is not known if this has been undertaken.

4.4.3 438 QUEEN STREET

This property was redeveloped to a retail and residential apartment building between 2016 and 2022. A Geotechnical Investigation Report was produced by T&T in July 2015 as part of development works. Details of the site development history note that the previous building was reportedly used as a garage and car showroom from 1945, though more recently occupied by retail stores and residential units. The recent redevelopment of the property comprised an 18-storey residential apartment building with a partial basement daylighting to the northeast.

The geotechnical investigation comprised the drilling of seven boreholes and installation of two piezometers, to up to 14.1 m depth. Encountered ground conditions comprised:

- Undifferentiated fill, 1 to 2m thick.
- Residual ECBF soils, 3 to 8 m thick
- ECBF rock, >5 m thick

Groundwater monitoring reported the water level to range from 27.6 to 28.4 m RL, expected to represent perched groundwater within the surficial soils.

4.4.4 39-43 AIREDALE STREET

According to a building compliance audit from April 2009, the property is used as a telephone exchange. No other relevant information was noted within the property files.

4.4.5 45-61 AIREDALE STREET

Property files identify the building to be in use as a telecommunications exchange by Telecom (NZ) Ltd (Telecom).

The following relevant files and information was identified in the received property files:

- Fire Engineering Report, 45 Airedale Street, March 2012 - This report notes that the building is eight stories and was constructed in 1968. The lower ground floor is noted to hold engine alternators, transformers, and cooling plant. A lower ground floor plan identifies two small rooms labelled with “Fuel”, presumed to be fuel storage supplying the engine alternators.
- Pollution incident 98/219, 15 April 1998 – A pollution incident report by Auckland Regional Council (ARC) reported the discharge of diesel to the stormwater system at this property. A diesel spill reportedly occurred during refuelling of Telecom’s UST due to a valve malfunction. The diesel fuel flowed into a nearby stormwater cesspit and subsequently seeped into the soil bank below the cesspit. The diesel then in turn drained from the bank onto the road. ARC requested further details on the spillage and for an investigation into the extent of soil contamination; however, no further reports on the matter were identified in the property files.

5 SITE INSPECTION

A walkover of the site was undertaken on 8 March 2024 by Laurence Shotliff of WSP. A photolog of the inspection is provided in Appendix D and an annotated aerial plan of notable features is provided on the attached Figure 2.

The site inspection confirmed the majority of the findings of the desktop review:

- The properties on either side of Marmion Street and to the north of White Street are primarily occupied by ground floor commercial stores with apartments on the upper floors.
- A motor vehicle workshop (City Garage) is present on the ground floor of 16 Waverley Street. The ground floor is completely surfaced by concrete and a car park was noted beneath the workshop.

31 Airedale Street, the property that formerly contained USTs, was noted to have two above-ground diesel fuel tanks adjacent to the site:

- An approximately 4,000 L steel above-ground storage tank (AST) was noted at the southwestern corner of 31 Airedale Street, stored on concrete hardstand with two fuel polishers attached to the southern side of the tank. The fuel lines appeared to all be above ground and no notable staining was observed around the tank. The 4,000 L AST is located in approximately the same area of the UST.
- A second approximately 2,000 L AST was noted at the western boundary of 31 Airedale Street. The AST was also stored on concrete hardstand with above-ground fuel lines, but it was unable to be inspected thoroughly due to it being located too far from the property boundary.

A small outbuilding attached to the southeast of 430 Queen Street, adjacent to the site, had a “Danger High Voltage” sign and is likely to hold a sub-station or transformer. The outbuilding is on a concrete base with brick walls.

No other notable activities were recorded in the vicinity of the site.

6 DISCUSSION

The PSI identified multiple potential HAIL activities occurring on or nearby to the site.

The likelihood of these HAIL activities occurring within 50 m of the site to the extent that they may pose a human health risk when soil is disturbed in these locations has been qualitatively ranked based on the collation of the data described above. Sites are described as either 'Unlikely', 'Potentially' or 'Likely' to pose a risk as summarised in Table 4-1.

Table 6-1: Summary of identified HAIL activities.

Address	Proximity to site	HAIL ID	HAIL description	Potential contaminants of concern	Potential impact to site
31 Airedale Street	Adjacent to east. 15 m length portion of site within HAIL property.	A17	Storage of tanks or drums for fuel, chemicals, or liquid waste	Lead, TPH and PAH. Tank pull investigation identified TPH and PAH above background but below commercial industrial land use criteria.	**Historical UST: Unlikely** – Given tank pull report from 2016 (Golder, 2016) that detailed fuel tanks and associated concrete lined tank pits were in good condition, and low levels of contaminants reported in fill material within the tank pits. **Current diesel ASTs: Unlikely** – Given they are above ground, sited on concrete and with no notable issues. Additionally, the surrounding areas are surfaced with concrete or asphalt.
16 Waverley Street	Adjacent south	F4 and G3	F4 – Motor vehicle workshops G3 – Landfill sites	F4 – Hydrocarbons, solvents, and metals. G3 – hydrocarbons, metals, and asbestos	**F4: Unlikely –** Vehicle workshop on the ground floor. Considered unlikely given the workshop is built on hard standing with a basement underneath. **G3: Potentially -** Large thickness of fill material recorded on the property (up to 3.75 m bgl), potentially extending on to or affecting subsurface conditions at the site.

Address	Proximity to site	HAIL ID	HAIL description	Potential contaminants of concern	Potential impact to site
430 Queen Street	Adjacent east	B2	Electrical transformers	Asbestos, polychlorinated biphenyls (PCB), hydrocarbons, copper, tin, lead, and mercury	**Unlikely** – Given location within a secure building on a concrete base.
438 Queen Street	Adjacent south	F4	F4 – Motor vehicle workshops	Hydrocarbons, solvents, and metals.	**Unlikely –** Historical vehicle workshop noted on the property. Property was redeveloped between 2016-2022 to a retail and residential apartment building including a partial basement. Considered unlikely given age and redevelopment of property, as well as trenchless construction in this area.
45-61 Airedale Street	40 m southeast	A17 and B2	A17 - Storage of tanks or drums for fuel, chemicals, or liquid waste B2 – Electrical transformers	A17 - Lead, TPH and PAH. B2 – Polychlorinated biphenyls (PCBs), hydrocarbons, copper, tin, lead, and mercury.	**A17: Unlikely** – Basement level underground storage tanks (UST) containing diesel. Historical spill reported in 1998; however, considered unlikely to affect the site given distance from site and age. **B2: Unlikely** - Transformers located in basement level of building. Considered unlikely to potentially affect the site given they are located within a building and the distance from site.

7 CONCLUSIONS AND RECOMMENDATIONS

Queen Street was depicted in aerial photography from at least the 1940s in its current orientation, surrounded by residential and commercial buildings. Small changes in the layout of the surrounding properties occurred between this time and the 1970s. By 1972, the portion of Mayoral Drive west of Queen Street had been constructed and the portion to the east was under construction in 1985 (depicted complete in 2005). Between 2005 and 2022, the area surrounding Marmion Street and White Street underwent significant residential development. This included new apartment blocks to the northeast of White Street (31 Airedale Street), and the properties adjacent to the north and south of Marmion Street.

A Site Contamination Enquiry was submitted to Auckland Council for the site and property files were ordered for relevant nearby HAIL activities identified by AC to provide further context. Notable HAIL activities identified included the following:

- 31 Airedale Street, HAIL A17 (storage of fuel tanks), historical and current fuel tanks:
    - Historical USTs: A tank pull report from 2016 reported three underground fuel tanks contained in concrete lined tank pits supplying fuel to backup generators for the building. The fuel tanks and concrete lined pits were reported to be in good condition, and soil sampling of fill material within the tank pits reported low levels of contaminants. Therefore, this HAIL activity is deemed Unlikely to potentially impact the site.
    - Current ASTs: Two diesel ASTs (~4,000 and 2,000 L capacity) were noted on the property, adjacent to the site. Considered Unlikely to potentially impact the site given they are above ground, sited on concrete and with no noted issues.
- 16 Waverley Street, two HAIL activities noted:
    - HAIL F4 (motor vehicle workshop) – A motor vehicle workshop was reported to have been established on the ground floor of this property in 2015. Given the recent age and that the workshop is located on hard standing with a basement underneath, it is considered Unlikely to potentially impact the site.
    - HAIL G3 (landfill sites) – A previous geotechnical investigation identified a large thickness of fill material underlying the property (up to 3.75 m bgl), potentially extending on to or affecting subsurface conditions at the site. This HAIL activity is considered to Potentially impact the site.
- 430 Queen Street, HAIL B2 (electrical transformers) – Potential electrical transformer or substation within an outbuilding noted. Considered Unlikely to potentially impact the site given it is located within a secure building on hardstand.
- 438 Queen Street, HAIL F4 (motor vehicle workshop) - A vehicle workshop was reported to have been on the property from 1945, though more recently the property was reported to have been occupied by retail stores and residential units. The property was redeveloped from 2016 to 2022 to residential apartments, including a partial basement for car parking. Given the age of the workshop, the recent property redevelopment and trenchless construction planned near to this property, this HAIL activity is considered Unlikely to potentially impact the site.
- 45-61 Airedale Street, two HAIL activities noted:

- HAIL A17 (storage of fuel tanks) – Basement level underground storage tanks (UST) containing diesel. Historical spill reported in 1998; however, considered Unlikely to affect the site given distance from site and age.
- HAIL B2 (electrical transformers) – Transformers located in basement level of building, considered Unlikely to potentially affect the site given they are located within a building and the distance from site.

Based on the findings of the PSI, it can be concluded that none of the identified HAIL activities are more likely than not to have occurred with the potential to impact soil quality at the site. Therefore, the NESCS is not considered to be applicable to the proposed works.

Given the site is not expected to contain elevated levels of contaminants, Part E30 (Contaminated Land) of the *Auckland Unitary Plan – Operative in Part 2016* is not considered to apply to the proposed works. Additionally, with a Site Management Plan (SMP) in place (as recommended below), no discharge of contaminants should be expected to occur during the works.

Based on the results of the PSI, WSP recommend that soil sampling is undertaken along the site prior to or during construction, to assess soils in relation to disposal and re-use options.

8 REFERENCES

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Mt Hobson Group. (2019). *Assessment of Effects on the Environment and Statutory Assessment, produced by Mt Hobson Group, 30 August 2019* .

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9 LIMITATIONS

This report ('Report') has been prepared by WSP New Zealand Limited ('WSP') exclusively for Watercare Services Limited ('Client') in relation to the Queen Street Wastewater Diversion Programme: Part 3 – Part 6 Link & Part 6 Preliminary Site Investigation ('Purpose') and in accordance with the TO-WSP-026 TOCN-24 signed 12th December 2023 ('Agreement'). The findings in this Report are based on and are subject to the assumptions specified in the Report and TO-WSP-026 TOCN-24. WSP accepts no liability whatsoever for any use or reliance on this Report, in whole or in part, for any purpose other than the Purpose or for any use or reliance on this Report by any third party.

FIGURES

APPENDIX A – HISTORICAL AERIALS

APPENDIX B – TANK PULL REPORT

APPENDIX C – SITE CONTAMINATION ENQUIRY

APPENDIX D – SITE INSPECTION PHOTOLOG