
# PROJECT FOR CONSTRUCTION WATER REUSE

MORPHUM environmental

pipevision

*flowing **better** together*

# BACKGROUND

## 2020 – Auckland Drought

- 77 days no rain
- Water restrictions
- Construction continued
- Construction water sites in Auckland

COVID

pipevision
flowing better together

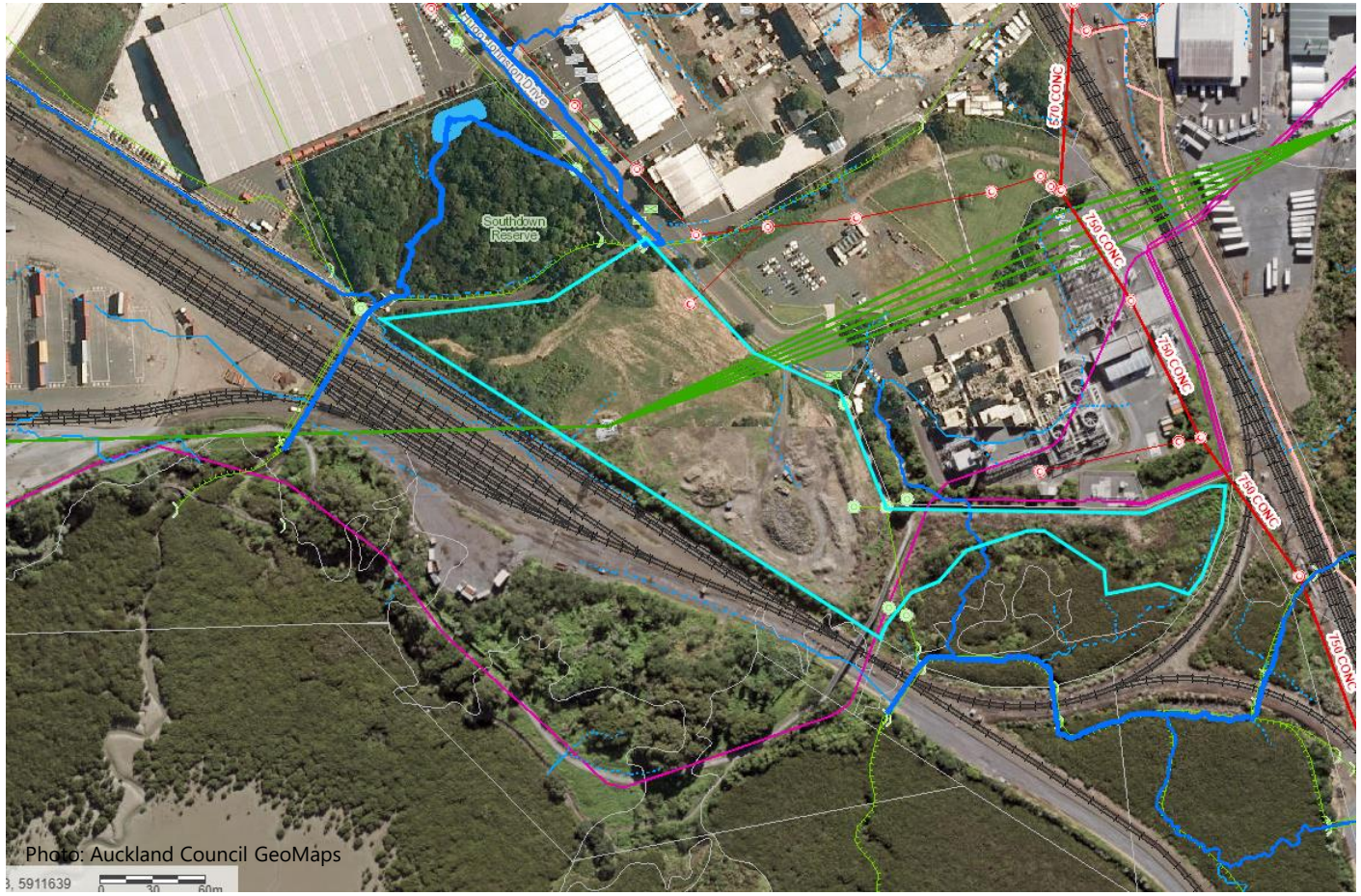
## 2021 Project

- Reduce disposal costs
- Construction water resilience

# THE SITE

**Stage 1a – Desktop Feasibility**

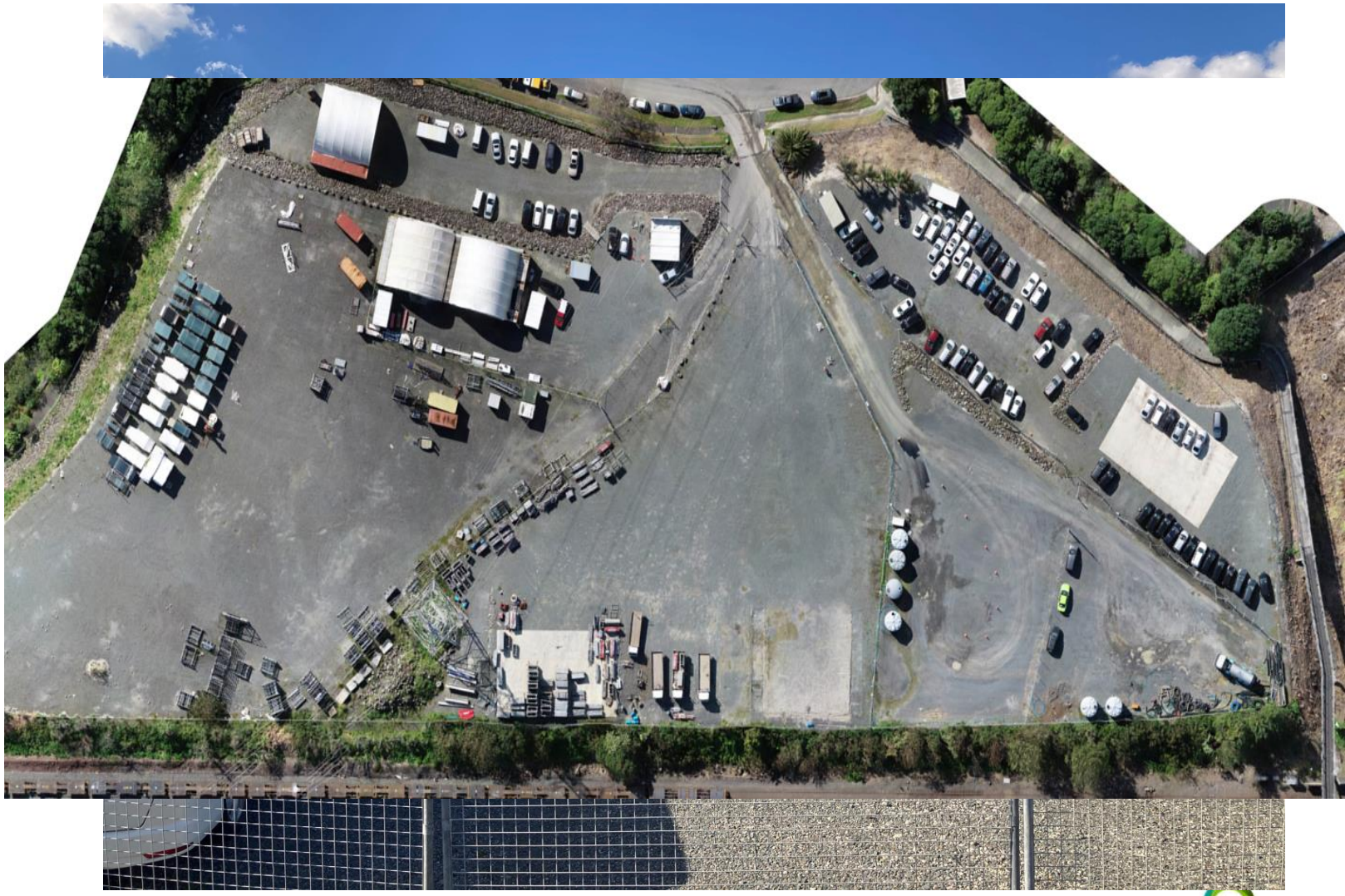
- Preliminary Assessments
  - Multiple designations - NZTA
  - Coastal wetland – NES-FM
  - Non-engineered fill
  - Asbestos contamination
  - Electricity Transmission



# INVESTIGATIONS

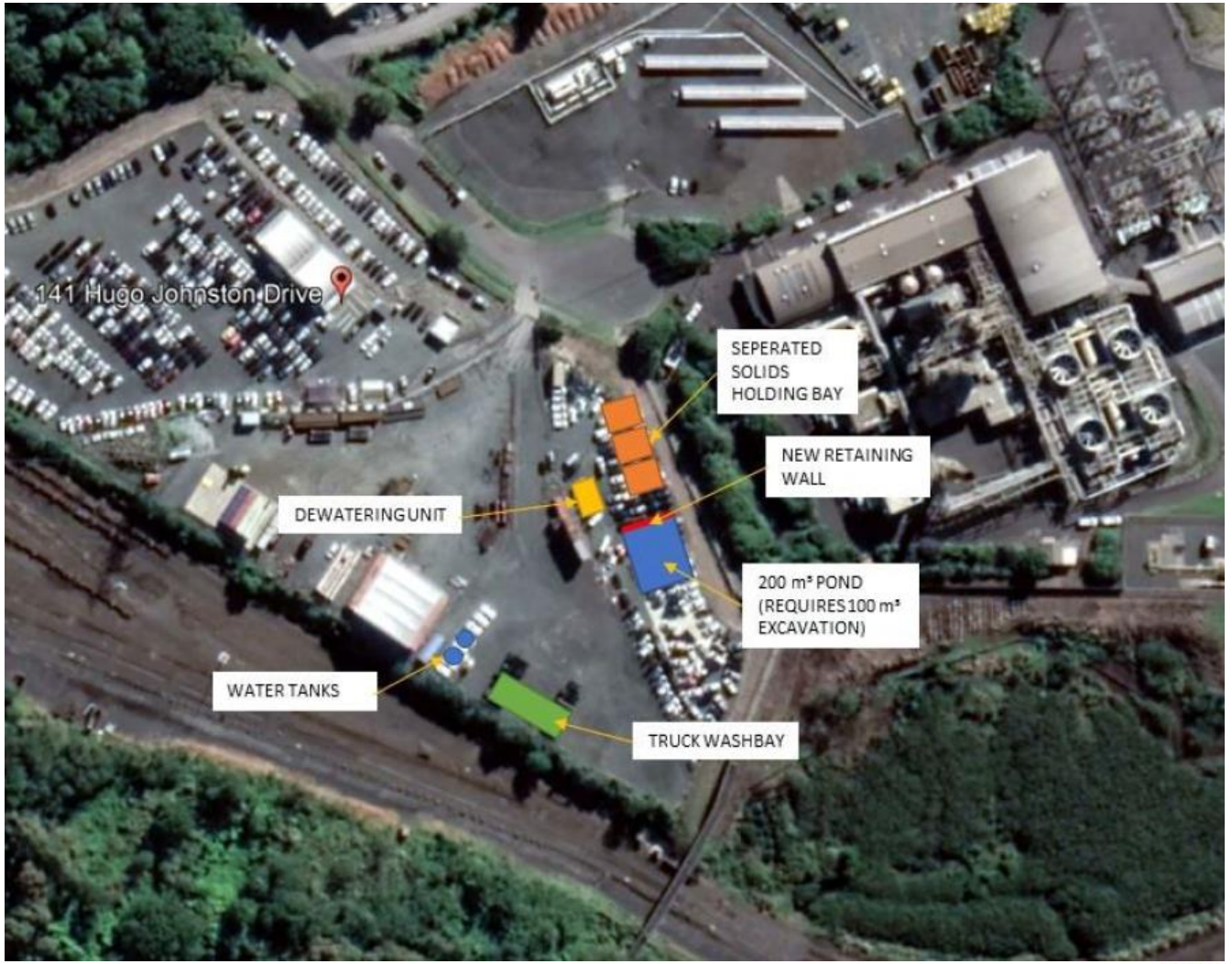
## Stage 1b – Site Investigation

- Site Visit
- Updated Imagery
- Site Topographical Survey
- Geotechnical Investigation
- Soil Sampling and testing



# SYSTEM SETUP (ITERATION 1 – CONCEPT)

- Large Pond
- A slurry pump
- Processing Unit
- Soil Bays
- Water re-use tanks
- Trade Waste discharge for overflow



# THE CONSENTS

| | |
|---|---|
| Building Consent | Required |
| Resource Consent | Not Required |
| Trade Waste Consent | Required |

Trade Waste

- Flow - 110 $m^3$/day and 5 L/s
- 1000 mg/L TSS

# THE SYSTEM

Photo : Nathan Wall, June 2024

## Vibrating Screen

- Capable of processing 5 t dry mass/hour
- Capable of separating particle sizes ≥0.07 mm≤100 mm
- 0.07mm – 5 mm
- 5 mm – 100 mm
- Some water reuse required

# THE PARAMETERS

- **Input Quantity:** 100 t/day
- **Flow constituency:** 1.25-1.6 t/$m^3$
- **Processing Rate:** Unknown
- **Output Quantities:** Solids and water
- **Other Considerations:** Truck Wash and break room

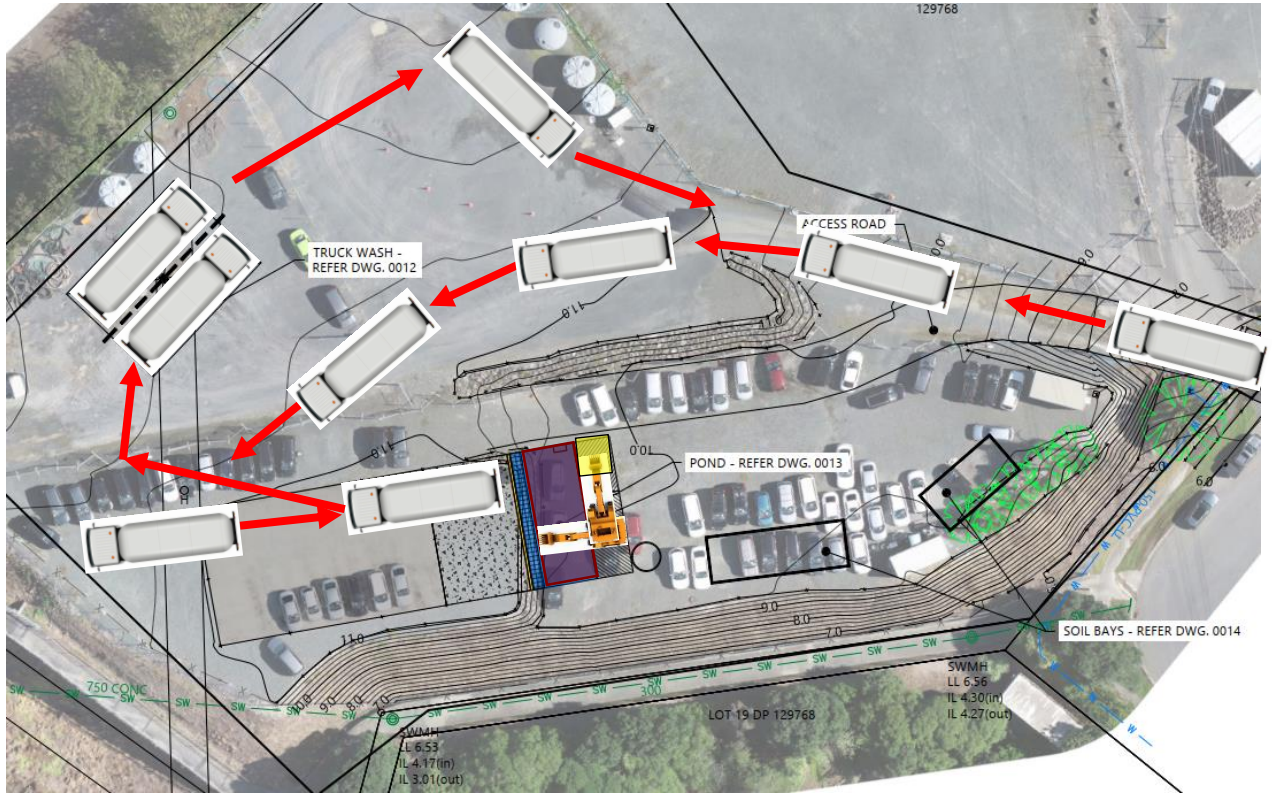
# SITE ENGINEERING REQUIREMENTS

- Engineering Designs
  - Geotechnical
  - Structural
  - Civil
  - Site Layout and Operation
  - Manufacturers

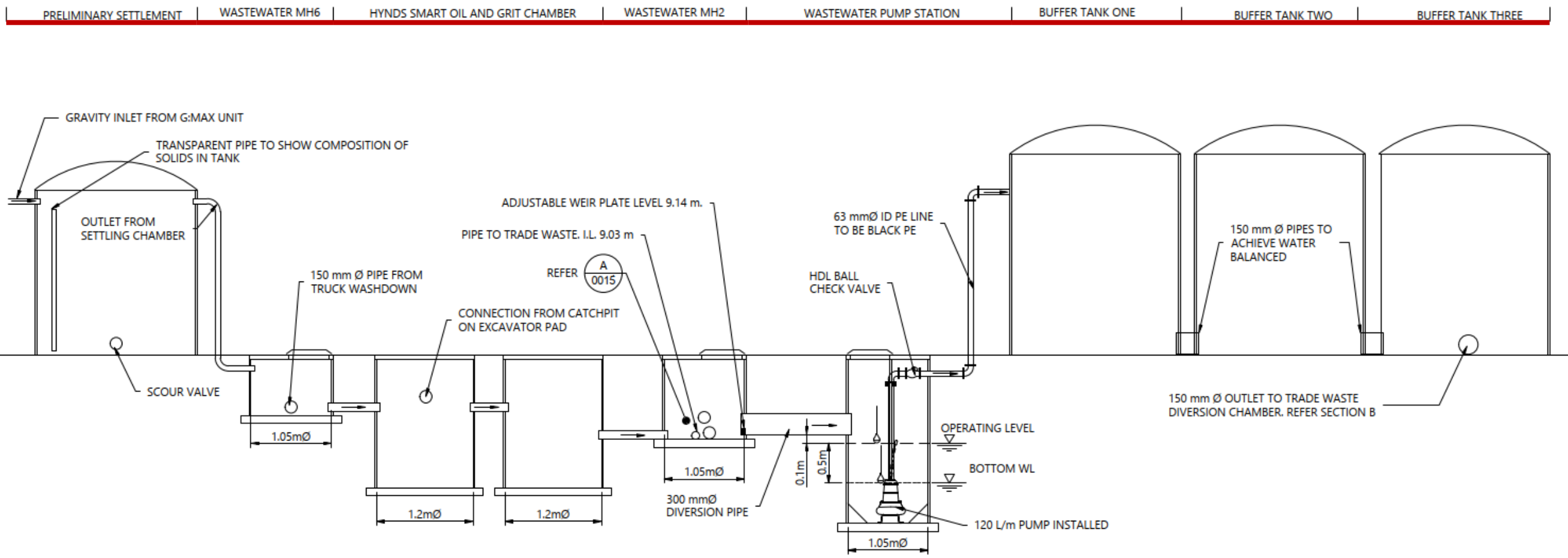
- Client involvement in every step

# DESIGN (ITERATION 2)

- To meet Trade Waste Limits
  - 100 $m^3$ pond
  - Use of long reach excavator
  - Flow restrictions to trade waste through orifice
  - Pump station and Buffer Storage



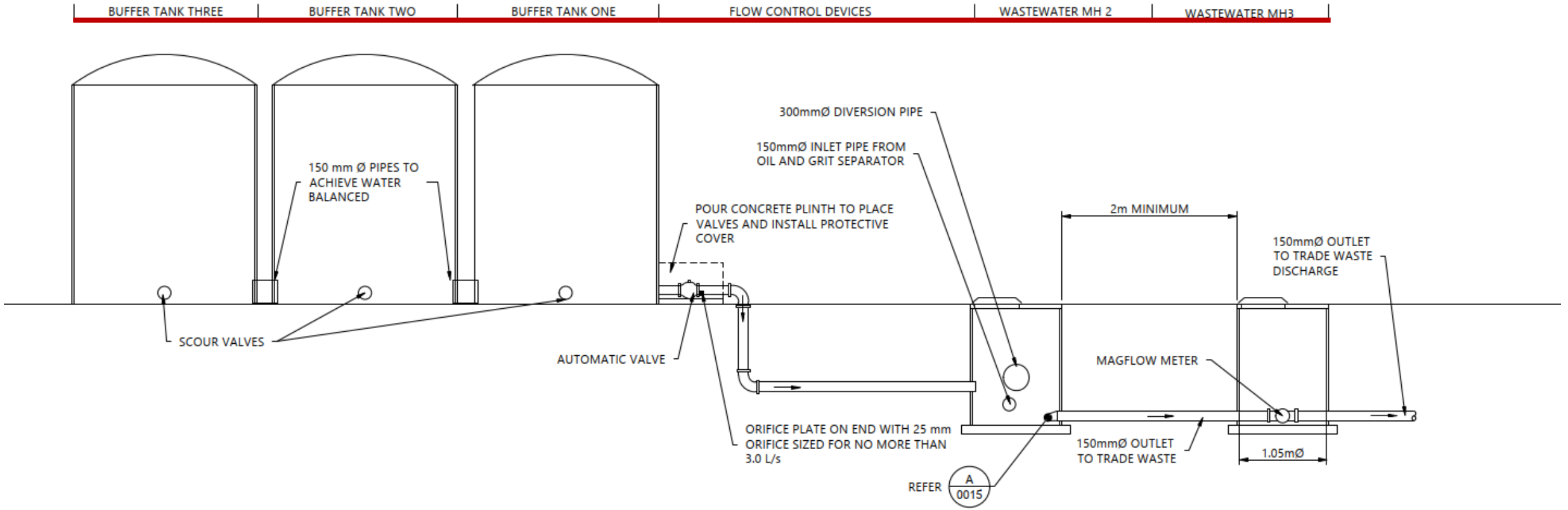
# THE SCHEMATIC OF THE BUFFER SYSTEM




PIPEWORK PROCESS FROM G:MAX UNIT TO DIVERSION MANHOLE AND OVERFLOW TO BUFFER STORAGE

SCALE: 1: NTS

# SCHEMATIC OF SYSTEM DISCHARGE




PIPEWORK PROCESS FROM BUFFER STORAGE TO DIVERSION MANHOLE AND TRADE WASTE

SCALE: 1: NTS

# VALUE ENGINEERING

- Reduced buffer storage
- Water re-use opportunities
- Manual control to discharge trade waste
- Removal of truck wash
- Additional treatment

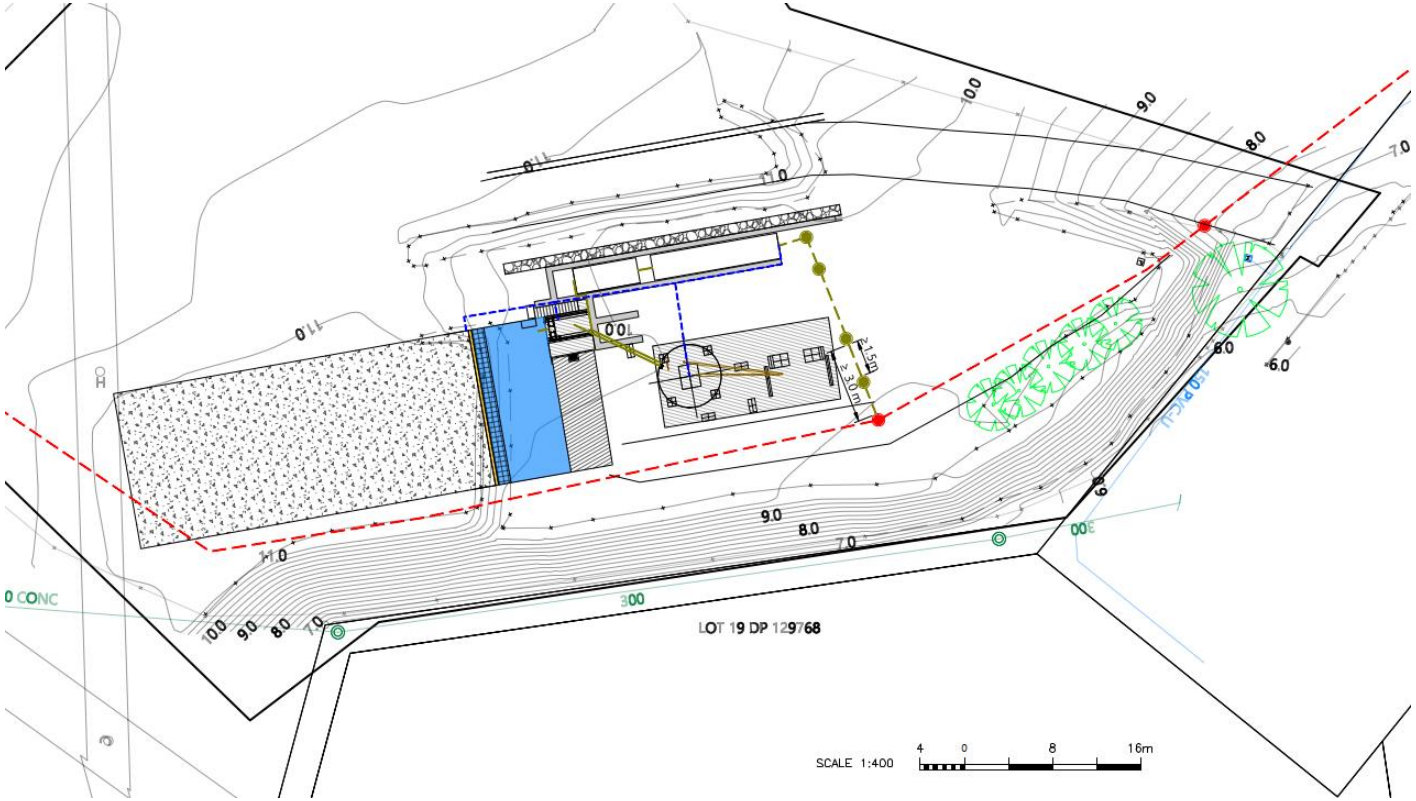
# SUBSEQUENT TREATMENT SYSTEM

**Dosing Unit**

- Capable of processing 100 $m^3$/hour
- Can achieve 90 % recovery of water for re-circulation
- Minimal trade waste discharge
- Reduced sediment in trade waste discharge

# DESIGN (ITERATION 3)

- To incorporate dosing plant
  - Excavator and slurry pump
  - Manual controls
  - Two stage dewatering system
  - Retention tanks to re-use water
  - Re-circulating pipework between machinery



# OUTCOMES

- Sustainable solution for uncontaminated waste
- Both waste streams (water and soil) have re-use potential
- The dewatering plant continues to adapt
- Around 80% of the water is reported to be reused
- Over 100,000 tonnes of waste diverted from landfill


THANK YOU.