# ETHEKWINI MUNICIPALITY
## Occupational Health & Safety Unit

# BASELINE RISK ASSESSMENT

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|---|---|
| Document Title | Baseline Risk Assessment |
| Client | eThekwini Municipality – Water and Sanitation |
| Project | Trenance 3 Reservoir: The Construction of a 6 Mℓ Reinforced Concrete Reservoir, Pump Station, Inlet & Outlet Pipework,400 Kℓ Elevated Tank and Ancillary Works: Ward 59 |
| Contract Number | 32269-5W |
| Compiled by (Safety Officer) | Name and Surname: Hlengiwe Njapha<br>Signature: HNJAPHA<br>Date: 20/08/2025 |
| Approved by (Safety and Risk Manager) | Name and Surname:<br>Signature:<br>Date: 20/08/2025 |
| Revision Number | BRA429/08/2025 |

# BASELINE RISK ASSESSMENT

**1. INTRODUCTION:** In accordance with the Occupational Health and Safety Act, (Act 85 of 1993) the Legislator places specific requirements on an Employer. One of these is prescribed in Section 8(i) of the Act where it requires the Employer to ascertain the risks and dangers which may occur within the workplace or section of the workplace and then goes on to establish working procedures or practices.

**2. PURPOSE:** This is conducted to create a benchmark of the potential risks that apply to the whole project or business operation.

**3. SCOPE:** This assessment could be approached on a site, regional or national level concerning any facet of the business operation or process or activity.

**4. REVIEW AND MONITORING PLAN**

The risk assessment form part of the health and safety plan to be applied on the site and must include the following:

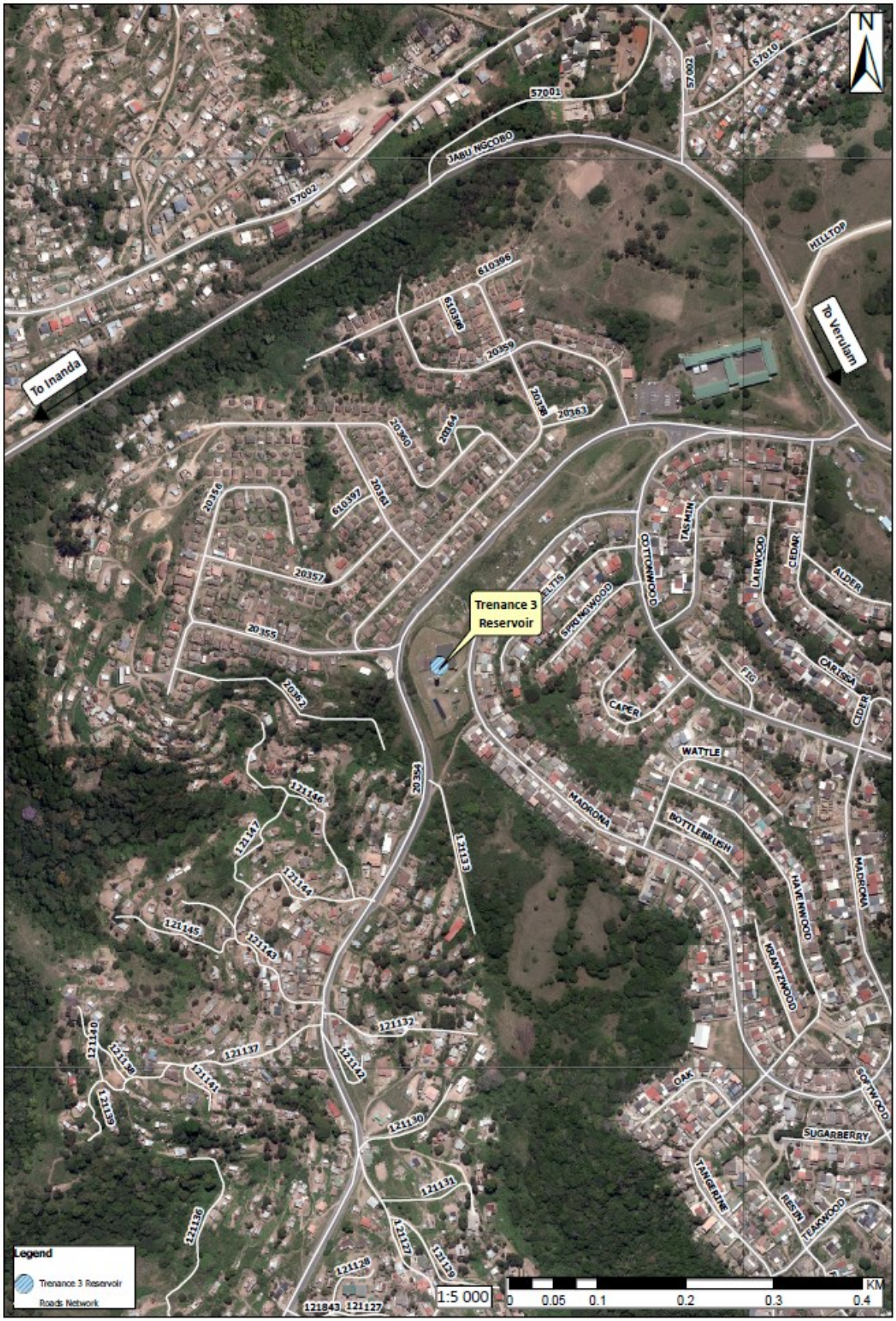
(a) The identification of the risk and hazards to which persons may be exposed.
(b) An analysis and evaluation of the risks and hazards identified based on a documented method

**5. REFERENCES**

(a) **Tender document 32269-5W**

(b) Occupational Health & Safety Act and its Regulation

# LOCALITY PLAN



# SCOPE OF WORK

**Civil and Structural**

- Construction of a watertight reinforced concrete reservoir consisting of a single cell with internal dimensions of 38 m x 26 m x 6.6 m high, including the construction of wall bases, column bases and columns, semi-propped cantilever walls, inlet and outlet works, and a reinforced concrete roof.
- Under-drainage system beneath the reservoir floor;
- Construction of a new pump station building including the telemetry room;
- Reinforced concrete chambers;
- Brick cladding of the new 6Ml reservoir;
- Construction of a 400Kℓ elevated steel tank with an approximate stand height of 20 m;
- Bulk Earthworks for reservoir site and access road where applicable, pipeline and cable trenching;
- Laying, bedding, jointing, testing and disinfecting of steel pipes, fittings and valves of diameter up to and including DN 400;
- Planning for ordering and ordering of all materials especially long lead items;
- Proving and locating existing reservoir inlet and outlet pipes at the reservoir site;
- Proving and locating existing elevated tower inlet and outlet pipes at the reservoir site;
- Installation of all control valves and isolating valves on the inlets, outlet and scour pipelines;
- Barricading all earthworks and trenches;
- Accommodation of traffic where works is required in existing roads;
- Reinforced concrete chambers;
- Repair of chambers at Sherwood and Chatsworth;
- Protection of all services affected by the construction of the reservoir, elevated tower, pumpstation and pipe work;
- Construction of a new block paving access road;
- Dry stack retaining walls;
- Top-soiling and grassing;
- Repair of existing palisade fencing;
- Construction of storm water drainage systems;
- Supplying, laying and jointing of gravity drains and overflow pipes with manholes and head walls;
- Bulk meter installation on the reservoir and elevated tower inlet and outlet pipelines;

- Planning and liaising with eThekwini Operations for shutdowns of reservoir inlet supply pipelines or reservoir outlet pipelines, including all risk assessments and method statements which are to be approved by the Employer's Representative and EWS Operations;

**Mechanical, Electrical and Instrumentation**

- Telemetry equipment instrumentation, power supply, all ducting and cabling;
- Supply and installation of 2 new horizontal single stage axially split volute casing pumps including motors and baseplates;
- Manufacturing and pump outlet manifold;
- Supply and installation of new variable speed drives (VSD) and motor control centre (MCC);
- New batteries for the UPS section incorporated into the MCC;
- Cabling from the MCC to the new VSDs;
- Separate motor junction boxes for motor power cabling and sensors/instruments cabling installed locally at the motor for ease of disconnection;
- Cabling and cable support systems from the MCC/VSD to the motor junction boxes for power to motors and instrumentation;
- New motor cable termination junction boxes at the pump motors;
- Cabling and cable support systems for instrumentation equipment including low level float switches, no flow switches, pressure sensors and level instruments in the reservoirs and elevated tank;
- Instrumentation including no flow switches on the delivery pipework of each pump and PT100 thermistors for the pumps and motors;
- Reservoir ( 3 in series ) low level floats with stainless steel chain and weights. Floats and weights must not contain mercury or lead or other un-safe products used in potable water;
- Ultrasonic level sensor and transmitters in the reservoirs (3 No) and elevated tank;
- Power supply to the new MCC at the pump station;
- Earthing of the complete electrical installation of the MCC and associated electrical installation and pumps. Separate earth wires are to be installed from the MCC to the VSDs and to the motors;
- Lightning protection and earthing to the pump station, reservoirs and elevated tank;
- Refurbishment of the existing stand-by diesel generator;
- New cabling from the stand-by generator change over panel to the new MCC;
- New lighting and small power points in the pump station including light fittings;

- Cabling and connecting the ultrasonic flow meters;
- Telemetry system integration to the SCADA system at EWS Control Room;
- Integrating the MCC to new Telemetry system including the new ultrasonic flow meters;
- Commissioning of all mechanical, electrical and telemetry equipment;

### C3.1.3 TEMPORARY WORKS

The Contractor shall carry out such temporary work, including the necessary access and construction roads, shoring of trenches and excavations etc., as he may require enabling the permanent work to be constructed. He shall allow for the cost of all temporary works, including design and their removal, in his tendered rates.

Temporary works are expected to include:

- necessary site access and deviations for traffic where the proposed works will disrupt traffic;
- shoring, dewatering and related temporary works required during excavation of trenches and excavations as required to enable the permanent works to be constructed. The design of the lateral support is to be undertaken by the Contractors Professional Engineer and included in the tendered rate. The design of the lateral support solution will be dependent on the technique used by the contractor to perform the excavation, as well as programmed to fit into the Contractors construction programme. The Contractor is to submit the detailed design for the approval and acceptance of the project geotechnical engineer;
- Any temporary support structures required to protect and maintain services;
- Any temporary pipe specials and fittings.

## 1. RISK ESTIMATION AND EVALUATION

RISK CLASSIFICATION USING A RISK SCORE TECHNIQUE

| **Exposure (E) How frequently does the hazardous event occur** | **Risk classification** |
|---|---|
| Continuously | 10 |
| Frequently (daily) | 6 |
| Occasionally (weekly) | 3 |
| Unusually (monthly) | 2 |
| Rarely (few a year) | 1 |

| **Probability (P) The probability of a loss when the hazardous event does occur** | **Risk classification** |
|---|---|
| Frequent (happens often) | 10 |
| Probable (quite possible) | 6 |
| Occasional (unusual, but possible) | 3 |
| Remotely possible (has happened somewhere) | 1 |
| Improbable (practically impossible) | 0.5 |

| **Severity (S) Consequences of the hazardous event** | **Risk classification** |
|---|---|
| **Catastrophic** many fatalities; or interruption of longer than 2 weeks; or asset or environmental damage (or both) exceeding R100m | 100 |
| **Disaster** (few fatalities; or interruption between one and 2 weeks; or asset or environmental damage (or both) exceeding R10m) | 40 |
| **Very serious** (one fatality; or interruption of 6 days; or asset or environmental damage (or both) exceeding R100,000 | 7 |
| **Important** (temporary disability; or interruption between 6 and 24 hours; or damage exceeding R10,000 | 3 |
| **Noticeable** (first aid needed; or interruption of less than 6 hours; damage exceeding R1000) | 1 |

**Risk classification (Risk score = E x P x S )**

| **Risk score** | **Risk classification** |
|---|---|
| Over 400---------5 | Very high risk – discontinue operation or activity |
| 200 to 400 ------ 4 | High risk – immediate correction needed |
| 70 to 200------- 3 | Substantial risk – correction needed |
| 20 to 70--------- 2 | Possible risk – attention needed |
| Under 20 -------- 1 | Risk accepted |

**BASELINE RISK ASSESSMENT WORKSHEET: IDENTIFYING EXISTING & POTENTIAL RISKS**

| 1 | **Site Access** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Activity** | **Hazard** | **Risk** | **Risk Evaluation** | | | **Risk Score** | **Risk level** | **Risk Rank** |
| | | | | E | P | S | | | |
| | Accessing the site using construction vehicles or walking to site.<br>Delivering of equipment and material to the site | Excessive speed, head on collusion, employees knocked by moving vehicles.<br>Road blocked off due to community protest.<br>Manual Handling and excessive lifting. | Accidents, damage to equipment or severe injuries or death.<br>Back injuries, | 6 | 6 | 7 | 252 | | 4 |
| **2** | **Site Establishment** | | | | | | | | |
| | Manual and mechanical clearing of the land.<br>Off-loading and positioning of offices by mobile crane.<br>Fencing.<br>Installation of temporary water supply, electricity, ablution facilities, | Dust, Snakes, Bees & Wasps.<br>Incompetent operator.<br>Poor connection of temporary services. | Poisoned and death.<br>Collision/impacts of mobile lifting equipment loads and dropped loads with process plant, pipe work, electrical cables and people.<br>Water leaks, Electrocution, improper connection | 6 | 6 | 7 | 252 | | 4 |

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| **3** | **Bulk Earthwork** | | | | | | | | |
| | Mechanical excavation<br>Stockpiling | Incompetent operator.<br>Machine running out of control.<br>Open excavation.<br>Dust<br>Poor stockpiling.<br>Operating mobile plant next to open excavation | Personal injury/amputations<br>Property damage.<br>Respiratory problem.<br>Obstruction of walkways | 6 | 6 | 7 | 252 | | 4 |
| **4** | **Traffic Accommodation** | | | | | | | | |
| | Installation of temporally signs<br>Traffic diverting/ Management | Knocked down by moving vehicles, poor demarcation/ displaying of signs.<br>Poor traffic management plan.<br>Incompetent traffic controllers | Personal injuries or death.<br>Road Accident | 6 | 6 | 3 | 108 | | 3 |
| **5** | **Drainage/Storm water** | | | | | | | | |
| | Lay, bed and joint of pipes | Unsafe access to excavation<br>Manual handling of pipes<br>Possible pinch of fingers<br>Engulfment of excavation | Personal injuries.<br>Possible pinch<br>Death/ body injury | 6 | 6 | 3 | 108 | | 3 |

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| **6** | **Existing Services** | | | | | | | | |
| | Identify the existing services | Snakes<br>Unforeseen hazards | Poisoned and death.<br>Personal injuries. | 6 | 6 | 7 | 252 | | 4 |
| **7** | **Excavation** | | | | | | | | |
| | Mechanical and manual excavation.<br>Back filling mechanical and manual | Unauthorized operator.<br>Machine running out of control.<br>Open excavation.<br>Dust.<br>Operating mobile plant next to open excavation. | Personal injury/possible disabling injuries.<br>Property to damage<br>Respiratory problem. | 6 | 6 | 7 | 420 | | 5 |
| **8** | **Pipelaying** | | | | | | | | |
| | Accessing trenches<br>Mechanical lifting of Pipe and | Trench collapse, falling objects/material<br>Incorrect lifting of pipes | Personal injuries/death<br>Injury to muscle | 6 | 6 | 7 | 252 | 4 | |
| **9** | **Compaction** | | | | | | | | |
| | Operating a bomag roller, wacker etc. | Incompetent operator.<br>Noise.<br>Vibration. | Personal injuries and damage to property.<br>Noise Induce. Hearing loss.<br>Kidney problem.<br>Body pain. | 6 | 6 | 3 | 108 | | 3 |

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| **10** | **Working at height** | | | | | | | | |
| | Erection of Scaffolding by a Competent person | Unsafe scaffolding/ trestle scaffolds | Unsafe scaffolding could collapse resulting in critical injuries | 6 | 6 | 7 | 252 | | 4 |
| **11** | **Steelfixing** | | | | | | | | |
| | Placing steel reinforcement<br>Cutting steel reinforcement | Struck by piece of steel<br>Operating electric angle grinder or drop saw<br>Cutting steel with Oxy Acetylene | Serious cut or eye damage<br>Electric shock, burns or electrocution<br>Fire and/or burns to the body<br>Damage to eyes | 6 | 6 | 7 | 252 | | 4 |
| **12** | **Erecting, Installing of Shutters** | | | | | | | | |
| | Install Shutters prior to casting pouring | Sling might break/snap; Material might slip out of sling hold<br>Incorrectly interpreted signs from Banks man could result in an accident | Injury to employee;<br>Damage to property | 6 | 6 | 7 | 252 | | 4 |
| **13** | **Construction of paving and access road** | | | | | | | | |
| | Layer works<br>Compaction | Nose, dust<br>Inclement weather, including localized flooding<br>Smoking/open fires | Rain causing slippery conditions and localised flooding causing property damage, injury and possible death | 6 | 6 | 7 | 252 | | 4 |

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| | | Vibration (rolling compaction) | Heat stroke from being exposed to the sun for too long and sunburn<br>Bush fires caused by cigarette/open fires causing smoke, inhalation possible death | | | | | | |
| **14** | **Construction Mobile Plant and Equipment** | | | | | | | | |
| | Use of Plant & Equipment on site | Incompetent operator<br>Unsafe plant & equipment.<br>Collusion with other vehicles.<br>Petrol and oil spillages. | Personal injuries.<br>Motor vehicle accident.<br>Environmental contamination. | 6 | 6 | 7 | 252 | | 4 |
| **15** | **Emergency Management** | | | | | | | | |
| | Development and Implementation of an Emergency Management Plan | Failure to have a basic, site specific emergency management plan.<br>Workers not trained in the Emergency Plan.<br>Insufficient or no emergency equipment or | Injury or damage to property.<br>Inability to respond to emergencies.<br>Insufficient or no emergency equipment. | 6 | 6 | 3 | 108 | | 3 |

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|---|---|---|---|---|---|---|---|---|---|
| | | personnel. | | | | | | | |
| **16** | **Community Risk Management** | | | | | | | | |
| | Managing community risk | Failure to adequately monitor and manage the multi-faced social issues. | Violent protests.<br>Injury to employees and property damage. | 6 | 6 | 3 | 108 | | 3 |
| **17** | **Subcontractor Management** | | | | | | | | |
| | Managing subcontractors | Failure to adequately assess subcontractors S.H.E Management System before work commences and at regular intervals.<br>Inadequate Supervision.<br>Utilizing incompetent Subcontractors. | Injury and non-compliance to legislation.<br>High level of employee unsafe behavior.<br>Accidents and property damage. | 6 | 6 | 3 | 108 | | 3 |
| **18** | **Block work** | | | | | | | | |
| | Block work and mixing mortar. | Manual handling of blocks.<br>Mortar inhalation.<br>Mortar contact with body. | Injury to hands.<br>Respiratory problem.<br>Skin problems. | 6 | 6 | 3 | 108 | | 3 |

**RISK PROFILE:** Trenance 3 Reservoir: The Construction of a 6 Mℓ Reinforced Concrete Reservoir, Pump Station, Inlet & Outlet Pipework,400 Kℓ Elevated Tank and Ancillary Works: Ward 59