



■ Dow Chemical 2018 Review for EMT

21st Aug 2018

■ Company Updates : May – August 2018

1. Personal injury

- ZERO recordable injury since May 2016

2. Process Safety Containment Event

- One recordable containment loss in March 2018 of 4-29 kg of non-hazardous product into inadequate secondary containment.

Operational Highlights

- Oxide Emission Reduction Projects is in final stages of mechanical completion.
 - EPA Works Approval division has sighted the project – July 2018
 - After commissioning, Energy Safe Victoria will also verify incineration system

- Successfully completed mini-turnaround in the end of July for equipment and cooling tower inspection.

Regulatory Compliance

EPA:

- Annual Performance Statement (APS) and National Pollutant Inventory (NPI) reporting due end of September
- Progress made in addressing the Improvement Notices from the EPA and results have been shared accordingly.
- 2 improvement notices on environmental risk assessment and site assessment have been completed and Dow has received revocation notices.

Worksafe:

- No reportable events
- 1 oversight visit since granting of renewed MHF license

City West Water:

- 1 license condition exceedance (Glycol) in June 2018



■ Questions?





■ Annual EMT Remediation Review

21th August 2018

Agenda

- Project background
- Review of Clean Up Plan implementation progress
- Questions and discussion

■ Project background

- **January 2016:** Received Amended Clean Up Notice (CUN)
- **February 2016:** Submitted Clean Up Plan (CUP) and Auditor Verification Report to EPA
- **April 2016:** EPA formally approved CUP
- **April 2016:** Submitted Annual Progress Report to EPA
- **April 2016 - Ongoing:** Further assessments and remediation in accordance with the CUP
- **April 2017:** Submitted Annual Progress Report to EPA
- **October 2017:** Received Pollution Abatement Notice (PAN) for site areas not currently managed under the CUP
- **April 2018:** Submitted Annual Progress Report to EPA
- **July 2018:** PAN withdrawn

■ Review of Clean Up Plan (CUP)

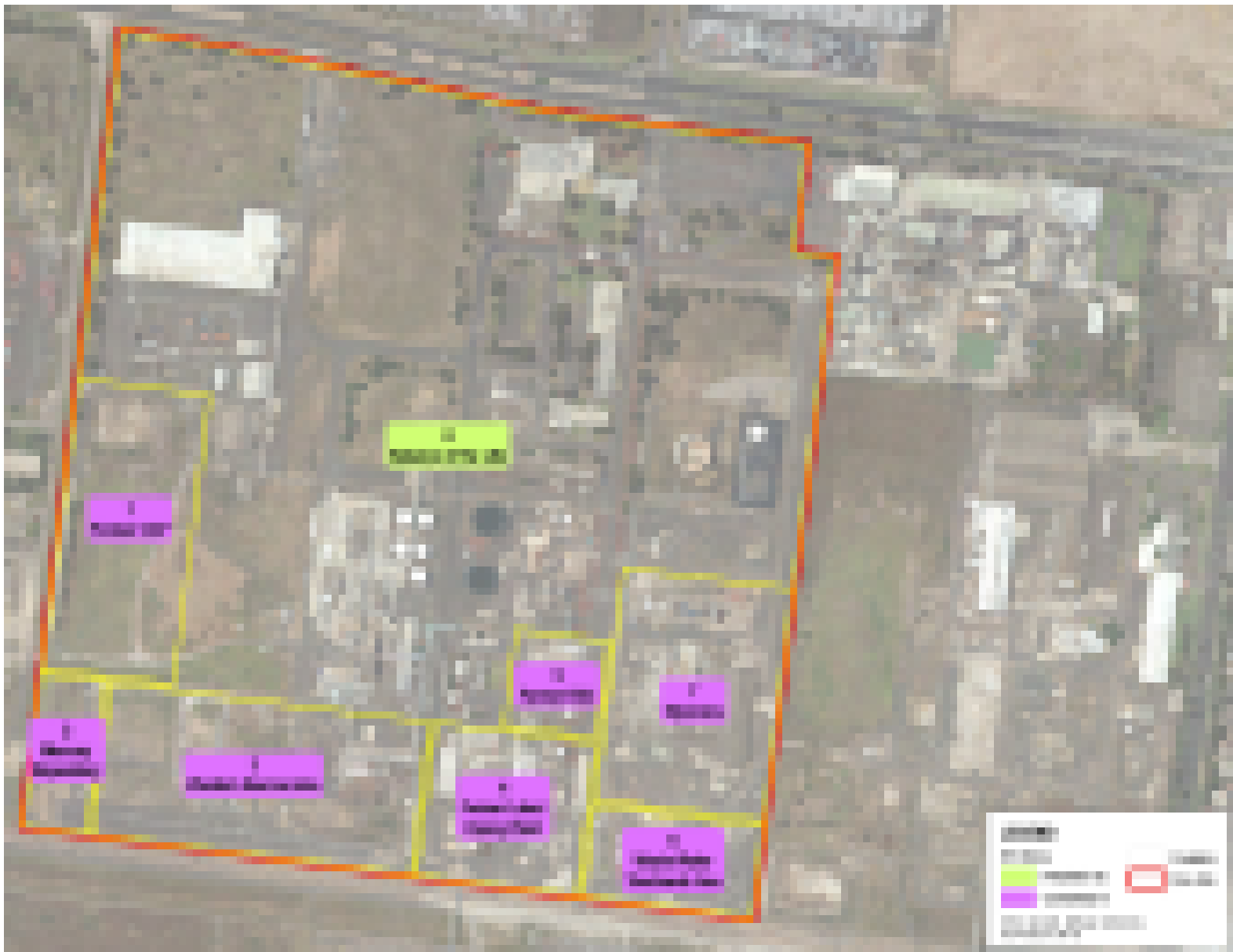
- The CUP is a 200+ page technical document to present and discuss:
 - Background, regulatory requirements and key drivers for clean up
 - Conceptual Site Model (CSM) unique to Altona site
 - Remediation objectives
 - Previous and current remediation measures
 - Remediation strategy, implementation and timetable
- The CUP includes key supporting documents, along with executive summaries of key source materials
- CUP was reviewed and endorsed by two EPA-appointed auditors
- Formally approved by EPA on April 2016
- To be reviewed and re-endorsed by April 2020

■ CUP – Remediation Strategy Overview

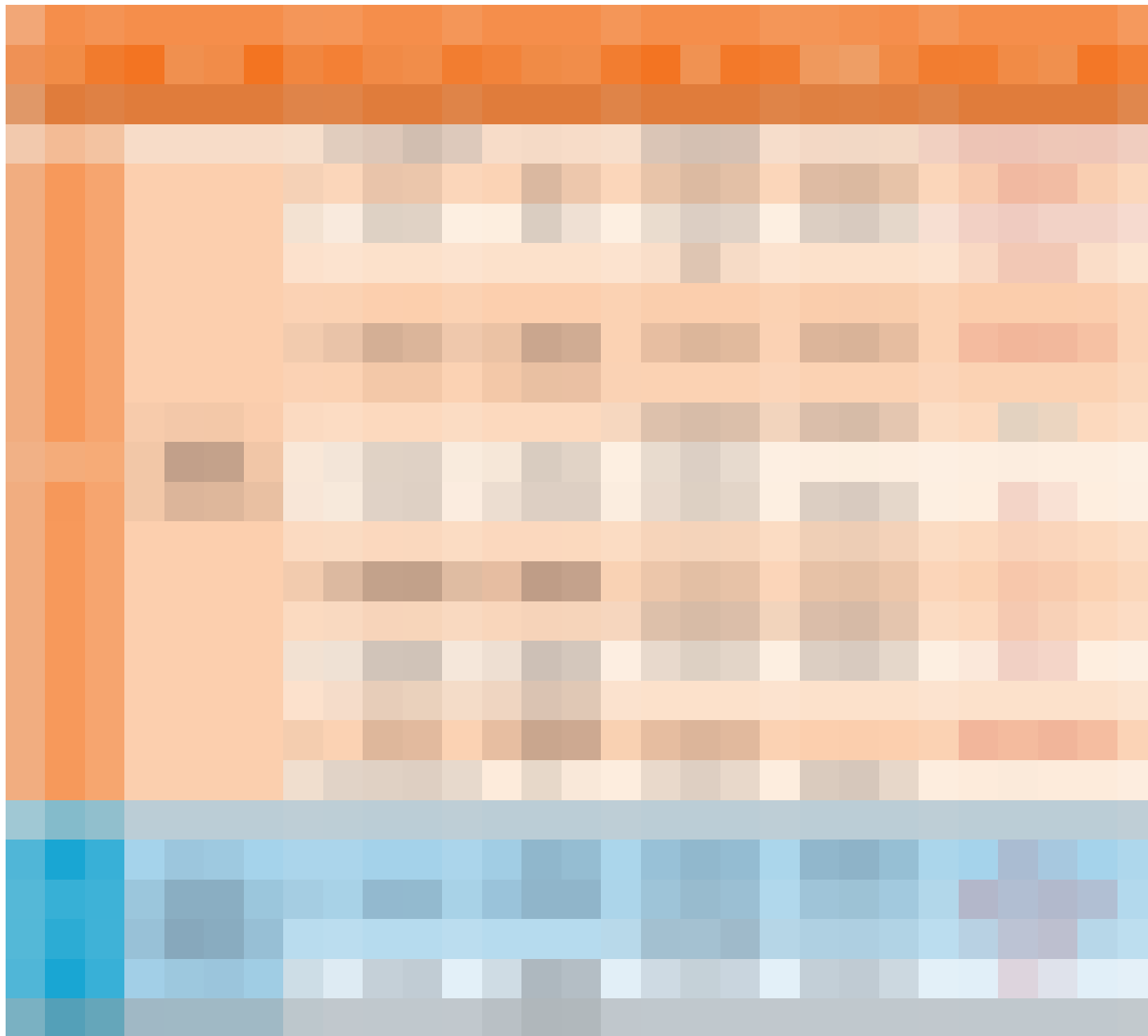
- Reduce volume of heavily impacted soil and groundwater on site
- Reduce mass of contaminants flowing off site through groundwater
- Monitor new technological developments and adopt where appropriate
- Keep independent Auditors informed and involved as work progresses



Site Overview



CUP Road Map



1 - Former Chloralkali Plant

Status

- Remediation contracts soon to be signed

Progress made since last EMT meeting

- Conducted tender process

Plans for 2018/2019

- Undertake remediation works (soil stabilisation and offsite disposal)



2 - Repository

Status

- Pre-remedial studies

Progress made since last EMT meeting

- Completed soil stabilisation tests

Plans for 2018/2019

- Undertake remediation in conjunction with the former Chloralkali Plant (CAP)



3 - Western Source Area

- Status
 - Remediation in progress
 - Technologies applied:
 - Enhanced In-Situ Bioremediation (EISB)
 - Soil Vapour Extraction (SVE)
 - In-Situ Chemical Reduction (ISCR)
- Progress made since last EMT meeting
 - Continued groundwater and soil vapour monitoring activities
 - Constructed a Permeable Reactive Barrier (PRB) and commenced associated performance monitoring



3 - Western Source Area

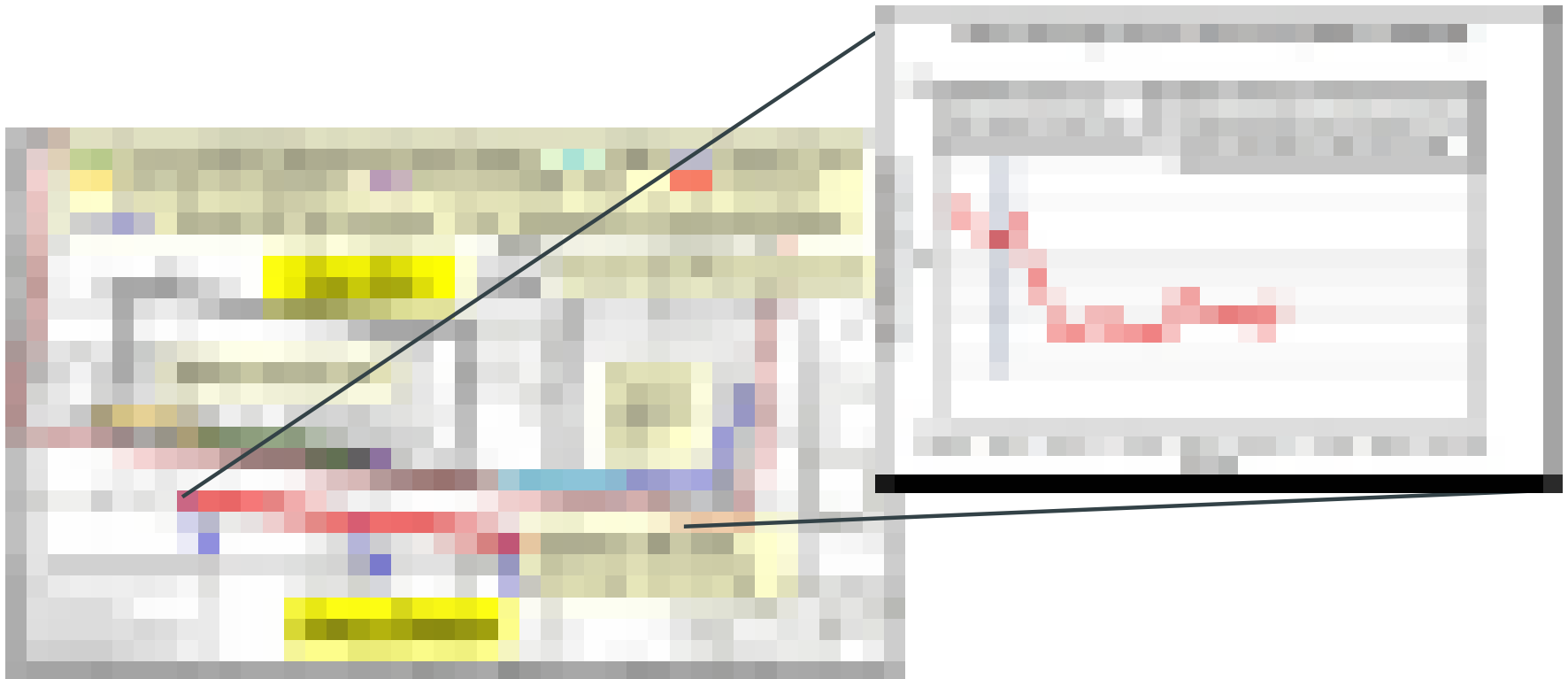
- A Permeable Reactive Barrier is a trench that has been filled with reactive material which treats the groundwater as it flows through to reduce contaminant levels



3 – Western Source Area

Progress towards CUP objectives

- Offsite monitoring indicates that contamination in the groundwater leaving the site has reduced by 73%
- Since December 2016, the SVE system removed approximately 6.5 tonnes of chlorinated hydrocarbons from the soil above the groundwater



3 – Western Source Area

Plans for 2018/2019

- Continue remediation and expand EISB in deeper levels
- Continue remediation and expand SVE system
- Continue remediation by ISCR
- Continue monitoring effectiveness of remediation



4 – Former Latex / Epoxy Plant

Status

- Remediation in progress
- Technologies applied:
 - Monitored Natural Attenuation (MNA)
- Further assessments in progress

Progress made since last EMT meeting

- Continued groundwater monitoring activities
- Conducted further assessments and installed additional monitoring wells

Plans for 2018/2019

- Continue and expand groundwater monitoring
- Update Conceptual Site Model (CSM) and develop future options



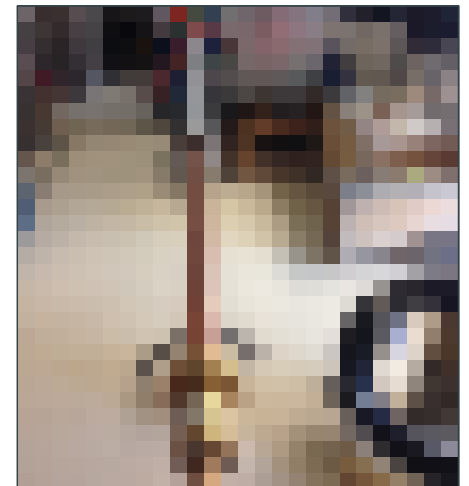
5 – Former Ethylene Dichloride Plant

Status

- Remediation in progress
- Technology applied:
 - Enhanced In Situ Bioremediation (EISB)
 - Radio Frequency Heating (RFH) pilot system being installed

Progress made since last EMT meeting

- Designed, procured and commenced construction of the RFH system



5 – Former Ethylene Dichloride Plant

Plans for 2018/2019

- Install RFH system and commence operation



6 – Waste Water Treatment Area

Status

- Remediation in progress
- Technology applied:
 - EISB and Pump and Treat (P&T)

Progress made since last EMT meeting

- Continued groundwater monitoring activities

Plans for 2018/2019

- Continue groundwater monitoring
- Continue remediation by EISB



7 – Styrenics

Status

- Remediation in progress
- Technology applied:
 - Soil Vapour Extraction (SVE)
 - Soil excavation and offsite disposal / treatment

Progress made since last EMT meeting

- Removed and disposed / treated shallow impacted soil
- Commenced remediation by passive SVE

Plans for 2018/2019

- Continue remediation by passive SVE



8 – Balance of the Site

Status

- Assessments in progress

Progress made since last EMT meeting

- Completed Phase I Environmental Site Assessment:
 - Developed a comprehensive history of the site
 - Identified data gaps

Plans for 2018/2019

- Conduct Phase II assessment to address data gaps identified in Phase I



Offsite area overview



9 – Offsite

Status

- Remediation in progress and upgrade design
- Technology applied:
 - Monitored Natural Attenuation (MNA)
 - Enhanced In Situ Bioremediation (EISB)

Progress made since last EMT meeting

- Continued groundwater monitoring activities
- Completed groundwater modelling and pumping tests
- Completed preliminary design of the EISB groundwater recirculation system
- Commenced discussions with stakeholders (i.e., City Council, VicRoads, Southern Rural Water)



9 – Offsite

Progress towards CUP objectives

- Concentrations in groundwater are no longer increasing



9 – Offsite

Plans for 2018/2019

- Continue groundwater monitoring activities
- Commence and complete construction of the EISB groundwater recirculation system



10 – Offsite

Status

- Remediation in progress
- Technology applied:
 - MNA

Progress made since last EMT meeting

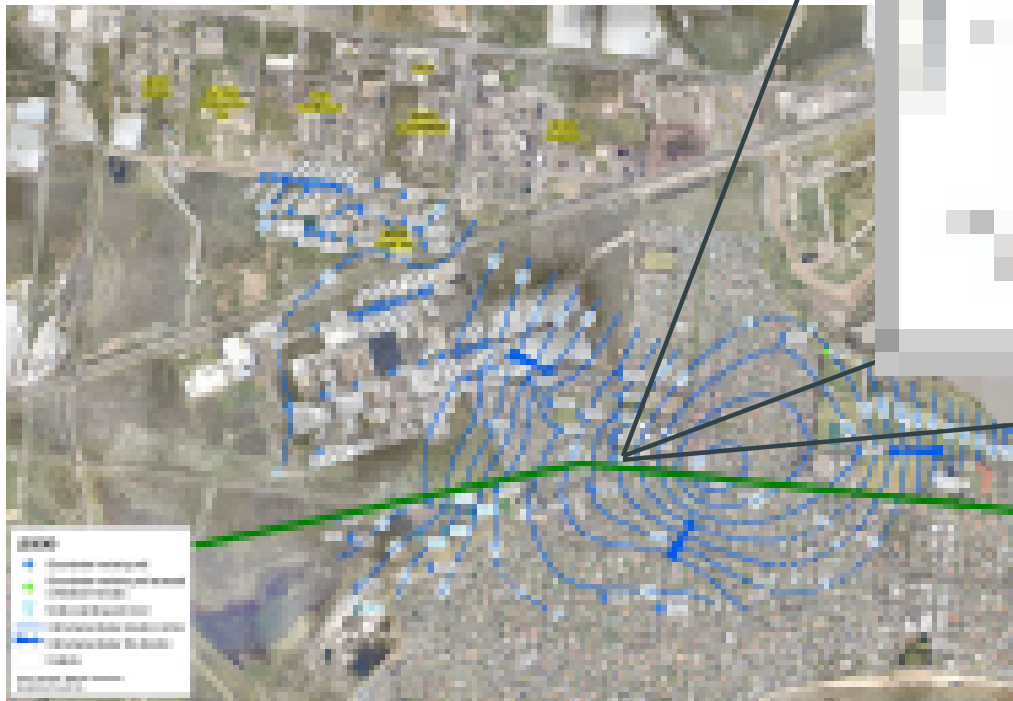
- Continued groundwater monitoring activities



10 – Offsite

Progress towards CUP objectives

- Concentrations in groundwater are no longer increasing



10 – Offsite

Plans for 2018/2019

- Continue groundwater monitoring activities



■ Conclusions

- Good progress on all implemented technologies
- Highlight of the year was the installation of the PRB
- Emerging technologies are being actively investigated and applied
- Meeting timelines to achieve CUP objectives