

## Switch to Results in Wastewater Treatment with Online Process Evaluation and Risk Analysis (OPERA)

A wastewater treatment plant is designed and built for current population, while considering future growth in the region. Over time the plant's flows and loads can change, the assets may be replaced, and the plant and machinery age, reducing the operating efficiency. The operations staff may lose track of the original design and the changes mentioned could introduce bottlenecks in plant operations when assets in any section are taken down for maintenance or have unplanned breakdowns. This can seriously impact the operation of the plant and may lead to the plant's discharge permit conditions being breached.

EcoEnergy's Online Process Evaluation and Risk Analysis (OPERA) creates interactive process maps to allow personnel to quickly understand where the site's key pinch points are, based on current asset availability and operational parameters. OPERA can provide a rapid assessment of hydraulic and biological headroom at a process element level.

OPERA enables operations staff to predict the site's likely treatment performance when unplanned breakdowns or planned maintenance cause process elements to be taken out of service. The insights delivered by OPERA can be used to prioritise operational spend or plan the capital investment required and also to ensure that the site has sufficient capacity to enable it to reliably meet the requirements of its discharge permit.

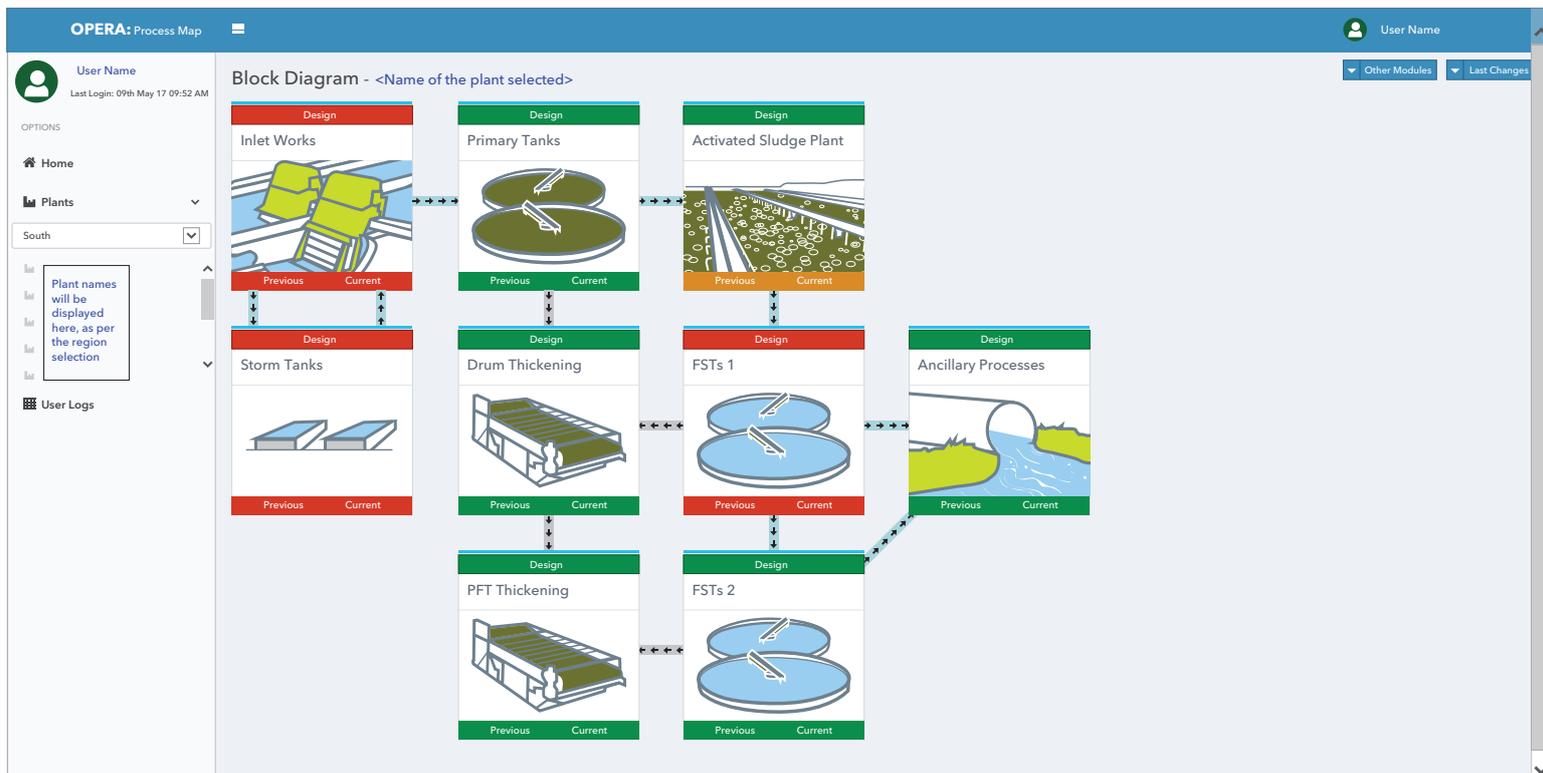
### FEATURES

Depending on your individual requirements, OPERA can deliver a broad range of features and benefits:

- "What if" scenario risk assessment
- Basic process modelling for site personnel without external support
- Automated reporting - regional and individual site reports
- Integration with existing centralised data systems to prevent duplication of data entry across several systems
- Data capture for asset availability and operational performance figures
- Centralised whiteboard information for operational asset information (e.g. expected repair dates)
- Multi-level and customisable user access

### BENEFITS

- Ad-hoc compliance risk analysis for:
  - Planned maintenance activities
  - Supply and demand gap or growth issues
  - Sludge import / export management
- High level OPEX vs CAPEX budget planning based on site headroom analysis
- Analysis of the impact of changes in asset availability on energy and chemical consumption
- Impact tracking of asset availability on OPEX spend



OPERA process module

## CASE STUDY

Validating downtime impact on process compliance for a large utility

**MODULE:** Primary Settlement at Site A

**ASSET UNDER REPAIR:** Failed scraper bridge gearbox. The site had sufficient primary settlement tank headroom capacity and this type of work had been done before, and had never caused any issues with final effluent compliance.

**CHALLENGE:** On the day of the tank being taken out of service, a failed actuated valve resulted in one lane of the activated sludge plant receiving less air than normally required, resulting in a Dissolved Oxygen (DO) concentration that was significantly below safe operating limits. In addition, a failure at an offsite sludge treatment centre meant that the site had also taken in additional sludge imports. Before scheduling the downtime for maintenance, site operations validated the scenario of how this downtime would affect the process using OPERA.

**OPERA'S RESPONSE:** The above scenario when simulated in OPERA, indicated that taking the primary tank offline would result in a breach of the site's final effluent ammonia permit limit. The repairs were therefore delayed until the other issues could be rectified, and a permit breach was prevented.