

Case Study

Environmental Monitoring

The Client

ChemCentre employs the highest level of scientific expertise and state-of-the-art laboratory instrumentation to investigate and solve a vast array of complex analytical problems. Following community concerns the ChemCentre were called in by the Department of Transport who were operating for the Shire of Busselton to monitor hydrogen sulphide (rotten egg gas) during the removal (by-pass) of seagrass from a local beach.

The Challenge

Construction of poorly designed groynes at Port Geographe Marina near Busselton has changed the natural water flow, meaning that seagrass that would have once been “rolled” along the beach is now accumulating at the groyne and subsequently rotting on the beach and creating a perceived health hazard for local residents. Concerns have been raised by community groups over the potentially high levels of hydrogen sulphide (H₂S) produced by the decaying debris during previous by-passes.



During previous by-passes the Shire of Busselton have monitored H₂S on and near the affected beaches and found that H₂S levels were generally not at levels harmful to health, however local residents were not satisfied with the environmental report. Nigel West, Senior Chemist and Research Officer at ChemCentre explained the problem, “The data produced in the report was regarded as out of date as the report was not produced until several weeks after the readings were taken”.

The State Government has acknowledged the urgent need for a long term solution with the Department of Transport allocating \$938,000 to develop proposals to modify the existing coastal structures (Source: ABC News). In the meantime seagrass continues to build up on beaches close to resident’s property and the community lives with the worry of potentially toxic gas levels.

The Journey

The Shire of Busselton had previously monitored and recorded H₂S levels and had produced detailed reports on the air quality in the affected areas, however the local residents were dissatisfied as readings were taken on a 30 minute average, only reported weekly and did not appear to reflect the gas levels experienced in the marina area by residents on a daily basis. A way to enable real time H₂S levels to be monitored by the Shire, Department of Health, other

The Discovery

While looking for an alternative solution to address community concerns Nigel West turned to ETCorp. The GPAC System™ had been previously used by the ChemCentre to monitor a bomb disposal robot remotely. After seeing the GPAC System™ in action Nigel was impressed by the functionality of the system, particularly the internet connection which allowed all stakeholders remote access to real time data.

State of the Art Solution

ETCorp’s GPAC System™ is a unique software platform that allows remote monitoring and control of any fixed or mobile camera or device. Real time video and/or audio can be securely accessed from a standard web browser either on a computer or mobile phone, from any chosen location. The GPAC System™ is completely flexible, enabling ETCorp to develop a cost effective monitoring system based on the ChemCentre’s requirements.

GPACsystem™



Case Study

Environmental Monitoring

The completely portable GFLAK (GPAC System™ Fly Away Kit) case used in the trial was equipped with two H₂S sensors, the first from Thermo Fisher, set to 0.1-50 ppm (V) range and second supplied by EcoTech with a range of 0.001 - 2 ppm (V).

The GFLAK™ case used in the trial featured;

- Ability to browse directly into the case from any PC, PDA or Smartphone
- Open standards/vendor neutral operating platform
- Rugged compact PC and wireless 3G Modem
- Secure logins & data audit trails
- Automatic data quality and compliance checks
- Email or SMS for critical data alarms

The GFLAK™ case enabled the ChemCentre to record real time H₂S readings and share the data instantaneously with stakeholders, allowing fast response when necessary. Monitoring was controlled remotely and relevant personnel notified via SMS or email of any event or system failure. Automated triggers were set up enabling an email or SMS alert to be sent directly to Nigel West of the ChemCentre when H₂S levels reached 0.2, 0.4, 0.8 or 1.0 ppm (V).



Simple Implementation

The GFLAK™ case was installed in a local resident's backyard close to where the seagrass was accumulating. Both H₂S sensors were connected to the GFLAK™ which was able to pick up the 4-20mA outputs from the sensors and display the data on a secure web browser. A conversion module was used to process the data from the Thermo Fisher sensor and send to it over fiber optics to output a 4-20mA signal into the GFLAK™.

Effective Results

The GPAC System™ trial ran for a month beginning at the start of May, during this time H₂S levels in the range of 0.01 to 1.8 ppm (V) were detected, below the Health Department guidelines of 2 ppm (V).

Nigel West explained the benefits, "By using the GPAC System™ we were able to monitor real time H₂S levels and protect the community by reducing exposure to high level of gas. The automated triggers alerted us to potentially high levels of H₂S, enabling us to contact the contractors who were removing the seagrass to alert them to modify their behavior to minimize gas release. As a result, residents were not exposed to H₂S levels above Health Department recommendations for the length of the study".

The ability of the GPAC System™ to easily share real time data over the internet enabled the Department of Transport, Shire of Busselton, Department of Health and representatives from local community groups to all be able to log on to the system and view the data. Being able to view the data in real time, rather than waiting for a report several weeks later, enabled the results to be shared with residents immediately, resolving the problem of delayed access to H₂S levels and reducing anxiety.

Using the GPAC System™ to quickly and easily connect to the EcoTech and Thermo Fisher H₂S sensors to share live data over the internet enabled all of the different stakeholders to work together and local residents were quickly satisfied that the levels of H₂S were not harmful.