Odour Control Theory and Practice: Wastewater Treatment Plants

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Case History

Odours at Swords Wastewater Treatment Plant
History

- 1927 – 2 Imhoff settlement tanks – 400 people
- 1965 – Oxidation ditch – 1,100 people
- 1981 – Conventional Activated Sludge Plant – 22,500 people
- Odours
- 2000 – 2004 – upgrade to 60,000 PE
  - Design and Build contract
  - Conventional Activated Sludge Plant
  - Sludge Treatment – Class A
  - SCADA
  - Odour Control Measures
Odour Control Measures

- Cover odourous processes & extract air
- Air blown through odour control units (biofilters)
- 4m x 4m x 4m box of mussel shells
- Neutral smelling air out the other end
- 3 odour control units on the site
Odour Control Measures

- **Odour Control Unit 1**: inlet building (screens, grit chamber, skips), primary settlement tanks, primary sludge sump/pump chamber, anaerobic zone of aeration tank, sludge holding/stabilisation tank
- **Odour Control Unit 2**: primary settlement tanks, primary sludge sump/pump chamber, storm water holding tank
- **Odour Control Unit 3**: sludge processing building, sludge holding tanks (and buffer tank), centrate sump and pump chamber
Quantum Leap

- 4\textsuperscript{th} March 2004: Upgraded plant handed over to Fingal
- Enormous Improvements:
  - Odour releases
  - No. of Complaints
- Some residual complaints
Bad News in Early 2005

- January – April 2005: 50 odour complaints
- Media interest
- Councillors – questions/motions
- Hot topic
- Something has gone wrong
Action

• Meetings held internally to deal with the issue
• 3 prong approach

ODOUR

Identify immediate problems and fix them
Public relations program
Get in outside odour expertise
Prong 1 - Identify immediate problems

- Blocked sludge transfer pipes
- OCU pipes blocked or damaged
- Sludge stream problems
- Awareness raised with operational staff
  - Closed door policy
  - Appropriate times – cleaning and maintenance
- Tackled problems during 2005, some still outstanding
Prong 2 - Public Relations

- Liaison group
- Open days
- Fliers
- Invited people to make direct contact with plant
- Invited local press for interviews and photographs
- Special Meetings with Councillors
Prong 3 - Outside expertise

- 3 companies invited to talk to us
- OMI Ltd selected late 2005
- Brief: Overview of odour matters at the plant and provide recommendations
- Detailed investigation in 2006
  - Sources of odour
  - Dispersion model
  - Health of existing OCU’s
Odour Plume – Existing Conditions

\[ \leq 1.50 \text{ OuE/m}^3 \text{ at the}
98\text{th (blue)},
97\text{th (red)},
96\text{th (purple)},
95\text{th (green) percentile} \]
Prong 3 - OMI Ltd
Recommendations

- Upgrade OCUs
- Further enclose odour processes
- Sealing of enclosed processes
- Mobile OCU for plant maintenance
- Monitoring equipment – OCUs
- Fenceline H2S monitoring
- Changes to management system
Odour Plume with OMI recommendations

≤ 1.50 OuE/m³ at the
98th (blue),
97th (red),
96th (purple)
95th (green) percentile
Odours Aug 05 – Mar 07

- Good performance
- 30 complaints
- Into the future