

Odour from Dalmuir WwTW

A Victorian WWTW with a population equivalent of 600,000 was upgraded to provide primary and secondary treatment for 16,000m³/hr. Short-term peak flows are held in storm tanks. The upgrading was the focus of great public concern due to a history of widespread odour complaints mostly provoked by open air sludge handling at the old works. The planning conditions require that odour should not exceed 2.5 OU_E/m³ at the boundary, 98% of the hours in any year. Uncovered sources at the new works include preliminary tanks, aeration tanks, clarifiers and a fast flowing open weir channel and highly turbulent spillway out-fall. Odour from the inlet works, covered primary tanks and sludge pumping is collected and passed through a two stage odour control unit. Sludge from the works is now stored in tanks and pumped off-site by buried pipeline for treatment elsewhere.

Emissions from the OCU were measured before and after the scrubber. The OCU reduces 71 - 88% of the odour. Liquor from open tanks was sampled in triplicate throughout the works and Odour Potentials measured using the published WRC method. OP values ranged from 500 - 20,000 with a high correlation between OU_E/m³ and H₂S. Emissions from open tanks were estimated using the STOP model. The surveys include winter and summer conditions to take account of different treatment flows and biological activity. Odour at receptors was predicted using a dispersion model. Time varying emissions were used to estimate odour from the open tanks taking seasonal variation, surface wind speed and hydraulic conditions into account. The estimation of odour from a works is highly complex and varies according to flow, season, wind conditions, influent load and short-term operational conditions. There are significant uncertainties both in terms of source estimates and dispersion inputs. The main contribution at sensitive receptors is from storm tanks. The extent of the predicted impact depends on the assumptions made about frequency of tank use. The OCU makes only a minor contribution off-site. Other sources are of marginal significance. Odour from all sources at the works is predicted to be 2 - 4 OU_E/m³ 98%ile at the nearest residential receptors.

This quantitative approach is appropriate at design stage to assess abatement requirements, but is unsuitable for use as a planning condition on grounds of both cost and enforceability.

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