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ULAN COAL MINE USE OF OSOMFLO FILTERS AND DMI-65 FOR TREATING WATER FOR ENVIRONMENTAL DISCHARGE

Ulan Coal Mines Limited (UCML, the Principal) operates the Ulan Mine located near Mudgee in NSW. The mine includes underground and open cut operations. This requires the extraction of large volumes of water. The on-site water treatment facilities need to be able to produce sufficient permeate to blend with other on-site waters to generate up to 30 ML/d of blended water of suitable quality for environmental river discharge.

A reverse osmosis (RO) plant and Ultra-Filtration (UF) pre-treatment system provided by Osmoflo currently treats water from East Pit, which is a large capacity surface dam. This enables the water to be recycled back into the ecosystem along with on-site irrigation.

Water requiring treatment includes water that has been accumulated on-site (East Pit) and water pumped from underground and open cut mine workings, as well as surface run-off from rainfall that makes its way to East Pit from the site catchment. The mine water, including that from East Pit, is generally very high in dissolved manganese (approximately 3 mg/L). Some raw water streams from individual pump stations can exhibit manganese levels significantly above 3 mg/L. (e.g. The pump station E20 generates mine water containing approximately 9 mg/L of manganese.) High Manganese concentrations similarly to iron have a tendency to foul up ultrafiltration and reverse osmosis systems with a black sludge that can restrict the flow and performance.

Osmoflo are now using the water filtration media technology known as DMI-65, a catalytic filter media that is designed to remove high concentrations of manganese from the feedwater supply when operated in the presence of chlorine. Experience to date has found that DMI-65 is best available catalytic material for removing high concentrations of manganese and iron to pre-treat and protect UF and RO technology.

The DMI-65 consists of grains of sand that have had proprietary products infused into them. This means that the active ingredients do not form a coating but become homogenous within the grains of sand. The DMI-65 acts as a catalyst in the presence of an oxidation environment created by the continuous injection of chlorine. The chlorine injection must be maintained to yield a free chlorine residual of 0.1 to 0.3 ppm at the filter effluent. The oxidation reaction causes dissolved manganese and iron to form a solid, insoluble precipitate that is captured by the DMI-65 filter media. The captured iron is released during the filter backwash cycle.

The DMI-65 has been tested in applications for reducing manganese levels in excess of 3ppm down to less than 0.01 ppm. Based on Australian experience in the mining and municipal drinking water industries the DMI-65 is expected to have a lifespan of up to 10 years of continuous use.