





## TARRAWONGA


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### WHC-PLN-OC-TAR-Water Management Plan Addendum

# WATER MANAGEMENT PLAN ADDENDUM

## USE OF EVAPORATOR FANS FOR MINE WATER MANAGEMENT

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#### 1 PURPOSE

The Tarrawonga Coal Mine (**TCM**) Water Management Plan is required to include details of water management on site and a description of the mine water management systems.

This addendum to the TCM Water Management Plan provides for the use of mobile evaporator fans as a supplementary measure to manage surplus mine water on site. The evaporator fans will be used for the purpose of ensuring that mine water is effectively and safely managed on site (especially after prolonged periods of heavy rainfall).

Once this addendum is approved by the Planning Secretary, it will form part of the TCM Water Management Plan which is required to be implemented under the TCM State significant development consent (PA 11\_0047).

#### 2 MINE WATER MANAGEMENT – USE OF EVAPORATOR FANS

Water pumped out of the active mining areas (mine water) is stored in Pit Water Dam (**PWD**) 6 (Figure 1). This water is utilised for dust suppression on roads in the active mining and production areas. Water for dust suppression is pumped into water carts via standpipes.

During periods of higher rainfall, when inflows into the pit exceed the water demand for dust suppression, TCM will accelerate the evaporation of mine water by utilising mobile evaporator fans. Mine water stored in PWD6 will be pumped to the evaporator fans located on the highwall of the pit (Figure 2). These evaporator fans will assist in mine water management by increasing the mine water loss to evaporation (by ‘misting’ the water pumped through them, increasing the surface area of the water and therefore exposing it to higher rates of evaporation). The use of the evaporator fans will reduce the volume of mine water stored on site. This will assist in ensuring that adequate storage is maintained on site for safely managing mine water.

An updated Site Water Balance including the operation of these fans is included in Table 1. The Water Management System (including the evaporator fans) is depicted schematically in Figure 3.

The evaporator fans will be located on the highwall and water ‘misted’ through them will evaporate over the void/open cut. The evaporator fans will be placed and operated such that the spray does not drift outside of the approved disturbance area.

Evaporator fans will generally be operated in daylight hours. If good evaporation conditions are present beyond daylight hours (for example, on a hot summer evening) the fans may be operated outside of daylight hours. The evaporator fans will each pump up to 2ML of water through them per day. This amount may vary depending on the weather conditions. Wind speed, ambient temperature and humidity also impact the evaporation potential. In highly suitable weather conditions, each evaporator fan may evaporate more than 1.5ML per day. An operational protocol for the fans is outlined in Section 3.



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Table 1: Site Water Balance

	Description	Very Dry Year 2019 (ML/year)	Dry Year 2018 (ML/year)	Median Year 2011 (ML/year)	Wet Year 2021 (ML/year)	Very Wet Year 1950 (ML/year)
<b>Water Source (Inputs)</b>	Total runoff	332	510	825	1,840	4,182
	Groundwater inflow	73	73	73	73	73
	Moisture in coal	256	256	256	256	256
	External water	0	0	0	0	0
	<b>Total Input</b>	<b>661</b>	<b>839</b>	<b>1,154</b>	<b>2,169</b>	<b>4,511</b>
<b>Water Losses and Usage (Outputs)</b>	Evaporation (from water storage)	176	190	204	292	434
	<b>PW6 Fan Evaporation</b>	<b>134</b>	<b>151</b>	<b>149</b>	<b>156</b>	<b>156</b>
	Moisture loss in coal	256	256	256	256	256
	Crusher dust suppression	35	35	35	35	35
	Haul road and ROM pad dust suppression	622	644	673	555	575
	Vehicle washdown	1	1	1	1	1
	Offsite and licensed discharges	0	0	0	36	624
	Water contained in spoil	112	156	279	525	1,226
	<b>Total Output</b>	<b>1,336</b>	<b>1,433</b>	<b>1,597</b>	<b>1,856</b>	<b>3,307</b>
<b>Water Surplus/Deficit</b>	<b>Total Input-Total Output</b>	<b>-675</b>	<b>-594</b>	<b>-443</b>	<b>313</b>	<b>1,204</b>



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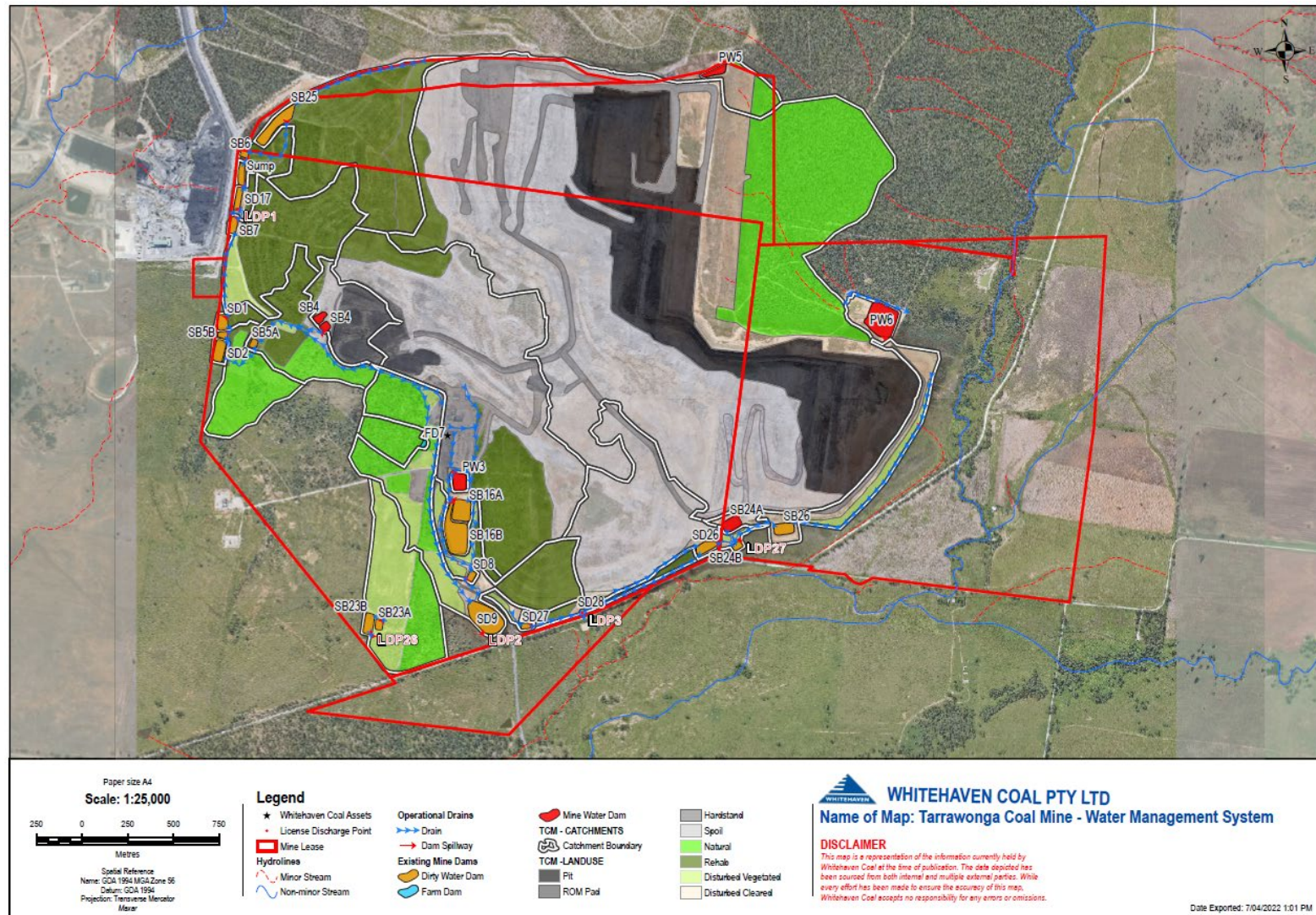


Figure 1: Water Management System Layout





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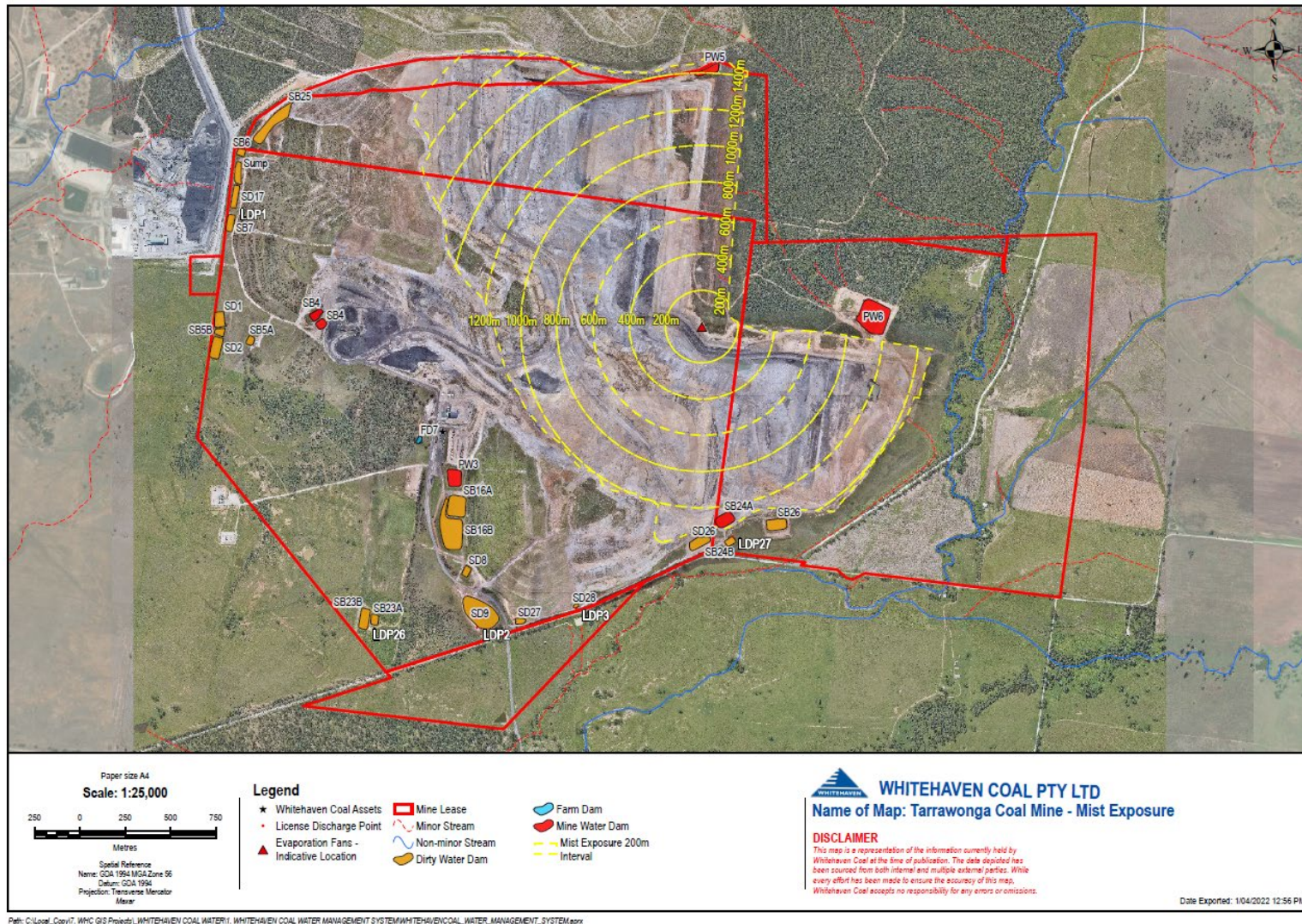


Figure 2: Location of Evaporator Fans and Distance from Boundary



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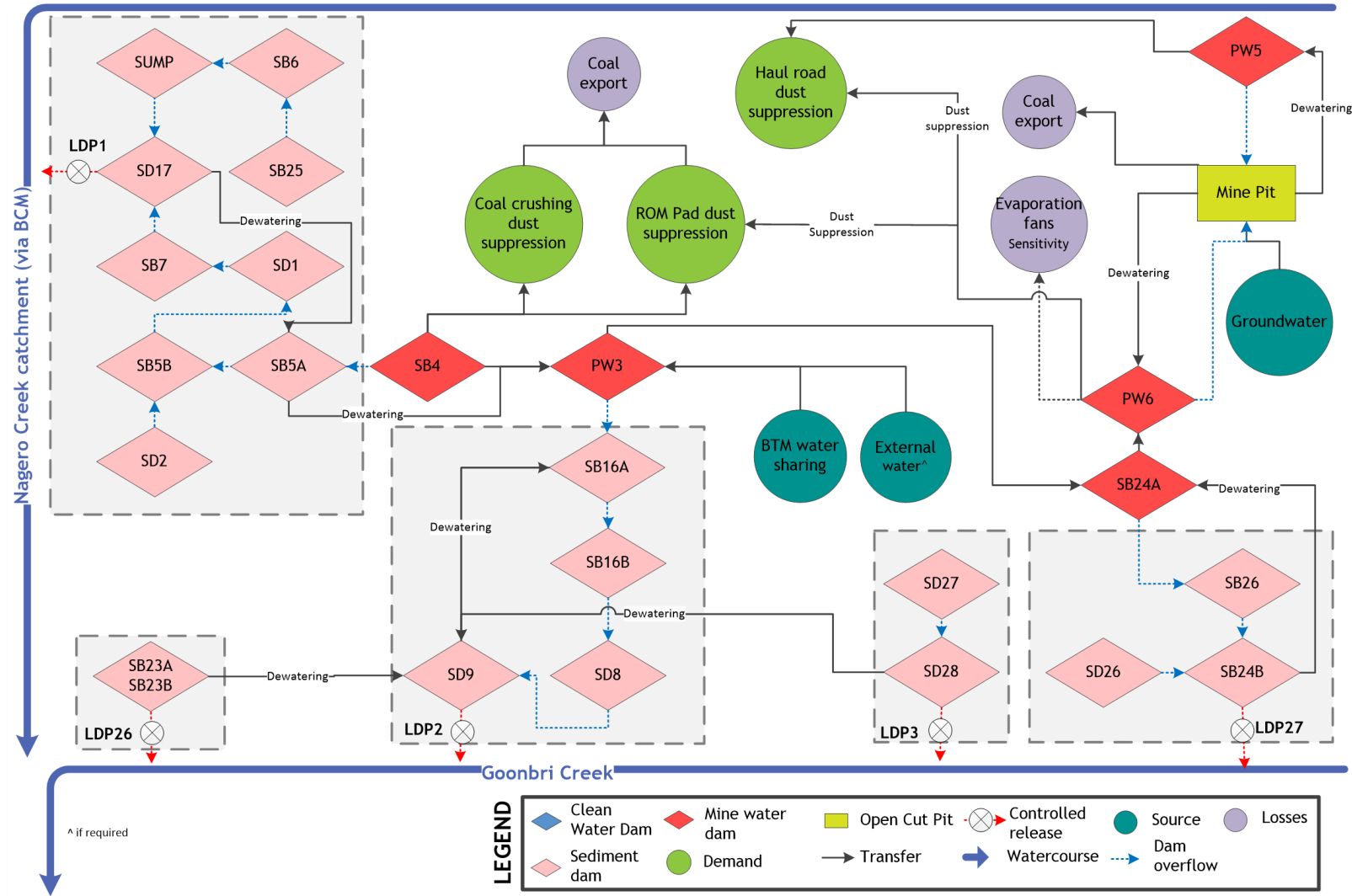



Figure 3: Tarrawonga Water Management System



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### 3 OPERATIONAL PROTOCOL

Mine water stored in PW6 (Figure 1) will be pumped through a surface pipe to the evaporator fans. This pipeline will be positioned so as to ensure that any leaks from the pipe would be securely captured in a bund or the open cut pit/void, and would not spill outside of the approved disturbance boundary. The evaporator fans and associated pipeline will be regularly monitored to ensure that they are properly maintained and operated. As depicted in Figure 2, the indicative location of the evaporator fans is approximately 500m from the project boundary and Mining Lease (ML) extent.

#### 3.1 IMPACT MITIGATION

##### 3.1.1 NOISE

The operation of the evaporator fans is not expected to result in significant noise impacts and the noise impacts of ongoing operations (including the operation of the evaporator fans) would continue to be managed in accordance with the noise conditions of the TCM State significant development consent (PA 11\_0047) and environment protection licence (12365).

TCM engaged RWDI to carry out a noise assessment of the evaporator fans. From this assessment, it is predicted that the received noise level from the use of evaporator fans would be negligible in comparison with the noise emissions from the assessed TCM operations (Modification Year 3), with an incremental change of only 0.1 dB at one receiver (RWDI, 2022). Therefore, the evaporator fans are not expected to impact on the acoustic amenity of the surrounding community. Based on this noise assessment, the use of the evaporator fans is not expected to generate maximum noise level events, and compliance with the LA1, 1min noise criterion at night would be achieved at all surrounding privately-owned receivers (as stated above, the evaporator fans will generally be operated in daylight hours).


The evaporator fans will be included in the annual sound power level testing of all noise generating equipment on site at TCM. Attended noise monitoring and continuous noise monitoring will continue at TCM. In the unlikely event that the evaporator fans impact received noise levels on private land above the predicted levels in the Modification 7 Noise Assessment, this routine noise monitoring would identify this and the noise impacts of the evaporator fans. Any impacts would be mitigated by altering the hours of operation. If any exceedance of the applicable noise criteria eventuated during attended monitoring, the evaporator fans would be turned off until it is assessed that the evaporator fans can continue to be operated without causing any exceedance of the applicable noise criteria. Any exceedances would be reviewed and reported if required in accordance with the Tarrawonga Noise Management Plan.

##### 3.1.2 SPRAY DRIFT

As described in Section 2, the fans will be located and operated from the highwall of the pit. They will be located in a central position between the TC and TN pits where the spray mist will be directed over the void. The evaporator fans will be operated to ensure that spray drift is directed over the void and does not leave the approved disturbance boundary of the project.

Information provided by the manufacturer of the fans indicates that the maximum horizontal distance from the fan that spray could drift is ordinarily 30m (Figure 4). The spray would be directed up to a height of 20m above the fan (Figure 4).



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As wind would affect the spray, the fans will not be operated when wind speeds are above 3.5m/s and emanating from a southerly or south-westerly direction (to ensure that spray does not drift outside the approved disturbance boundary).

Weather forecasts will be utilised to predict which days will be unsuitable for evaporator fan operation. Evaporator fans will not be operated if the forecast predicts predominantly southerly winds (to ensure that spray does not drift outside the approved disturbance boundary). In addition, wind direction and velocity alerts will be added to the SMS and email alert system linked to the weather station for TCM. Winds adverse to fan operation (i.e. above 3.5m/s and emanating from a S or SW direction) will trigger a SMS and email alert to certain personnel that will include the OCE, Environmental personnel, Operations Manager, Mine Services Superintendent and Production Superintendent. When this alert is received, the evaporator fans will be switched off.

In addition to weather monitoring, visual monitoring will be undertaken on the operating evaporator fans by the OCE during their routine inspections. In the unlikely event of any spray being observed consistently drifting in a north or north-easterly direction (that is away from the void) the evaporator fans will be switched off.



Figure 4: Example Spray from Evaporator Fan Operation (Minetek)

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Revisions	Revision Description	Who Consulted	Date
1	Document Developed	WHC Group Water Manager, Tarrawonga Operations Manager, GOC Environment Manager	22/8/22
2	Comments addressed from DPE water	Group Water Manager	8/9/22