Wodonga Planning Scheme

Review of Settlement ESO Overlay
Developed from VCAT Mediation for
Huon Hill Water Treatment Plant

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THIS REPORT HAS BEEN REQUESTED BY RUSSELL KENNEDY ON BEHALF OF NORTH EAST WATER AND ACCORDINGLY IS SUBJECT TO LEGAL PRIVILEGE
1. BACKGROUND

North East Water (NEW) operates 20 water treatment plants, including the plant at Huon Hill, to provide potable water for supply to residences, commercial premises, industries, for fire fighting and irrigation (schools, sports fields, parks and gardens).

The Huon Hill Water Treatment Plant (WTP) takes water from Wodonga Creek (an anabranch of the Murray River) and treats it to a high standard. The water treatment processes include coagulation/flocculation (to remove solids and algae), flotation, filtration, pH adjustment, chlorination and fluoridation. An average of 18 million litres per day (18 ML/d) of treated water is supplied to Wodonga, Baranduda, Kiewa, Tangambalanga, Barnawatha, Chiltern and Springhurst.

The Huon Hill plant is located on the north-east corner of Bandiana Link Road and Thomas Mitchell Drive. Urban residential areas have been developed to the southeast of the plant and to the west of Bandiana Link Road. There are large commercial sites south of the Murray Valley Highway (Bunnings, a homemaker centre and the Blazing Stump Motel and Hotel).

Although the land surrounding the Huon Hill plant is currently rural, the land use zoning in the Wodonga Planning Scheme shows the plant is bordered to the north, west and south by GRZ1 (general residential) zoning. The hill to the east of the plant is RCZ (rural conservation) and a small area of PCRZ (public conservation and resource). C2Z (commercial) zoning (shown in purple) occurs south of the Murray Valley Highway.

In November 2018, Russell Kennedy Lawyers, on behalf of NEW, engaged Dr Ian Wallis of Consulting Environmental Engineers (CEE) to examine all available evidence and prepare a report defining the size and shape of an Environmental Significance Overlay (ESO) around the Huon Hill water treatment plant.

The CEE report was issued in April 2019. The recommended ESO for the Huon Hill WTP was determined from the combination of the CFA Access Buffer; Noise Buffer; Chlorine Buffer; and Impact Zone for Embankment Failure. These buffers were developed taking into account the specific features of the site and the water treatment plant, local topography (hillside sloping down to the south-west) and wind measurements made at the site.

The ESO extends over the proposed residential development adjacent to the water treatment works and storages and downstream of the storage embankments.

The recommended ESO recognizes and protects the existing water treatment plant, which is critical community infrastructure. From the viewpoint of protecting the community against the risk of noise, chlorine and sudden flooding, and to allow continued protection of the water treatment plant from bushfires, it was recommended by Ian Wallis that no residential development be permitted within the ESO.
2. VCAT REVIEW

NEW submitted the CEE report with the recommended ESO to Wodonga Council with a submission to apply Schedule 7 to Clause 42.01 Environmental Significance Overlay (ESO7) for the Wodonga Water Treatment Plant Buffer Area;

A VCAT Hearing was convened to consider the viewpoints of NEW, the Council and the two adjacent developments that were affected – Alpine Views (Stages 3 and 4) and Meridian Rise (Stages 1 and 2).

A mediation session was arranged and all parties agreed on a compromise settlement. The settlement involved a land transfer between NEW and the developers, to the advantage of both parties, and a revised ESO, termed the “settlement ESO” in this report.

3. REQUEST FOR CEE REVIEW

On 17 March 2020, Russell Kennedy Lawyers requested CEE to review the settlement ESO. The terms of the request are as follows.

The Department of Environment, Land, Water and Planning (Department) and the Wodonga City Council (Council) have requested a supplementary report from you considering the now settled and approved development plans for Alpine Views (Stages 3 and 4) and Meridian Rise (Stages 1 and 2) and the recommended ESO identified in your report of April 2019.

Please note that your substantive report and the supplementary report will become reference documents incorporated into the Wodonga Planning Scheme.

You will note that the development plan for Meridian Rise (Stages 1 and 2) to the north is modified to include a local park and roadway aligning with the chlorine gas buffer extending to the north.

You will also note that the noise buffer extended further into the residential area. This is to be addressed by an acoustic barrier on the boundary of the Water Treatment Plant land holding within Meridian Rise. This was agreed in the terms of settlement before the Victorian Civil and Administrative Tribunal.

In response, this review considers the following matters:
1. Whether the settlement buffer meets EPA requirements;
2. Whether the settlement buffer meets fire protection requirements;
3. Whether the settlement buffer meets chlorine risk requirements;
4. Whether the settlement buffer meets noise requirements; and
5. Whether the settlement buffer meets embankment risk requirements.

Figure 1 shows the original CEE buffer (blue dashed line) and the settlement ESO (purple solid line) around the Huon Hill water treatment plant.
Figure 1. Original ESO and Settlement ESO

Legend
Blue dashed line = original CEE buffer
Purple solid line = settlement ESO
Yellow outline = Huon Hill water treatment plant.
4. SETTLEMENT BUFFER AND EPA REQUIREMENTS

On 26 March 2020, EPA provided a written response on the proposed planning scheme amendment. The EPA response was based on:

- Draft Schedule 7 to Clause 42.01 Environmental Significance Overlay (ESO7) intended to apply to the Wodonga Water Treatment Plant Buffer Area;
- The associated Explanatory Report;
- Report titled ‘Wodonga Planning Scheme -Environmental Significance Overlay for Huon Hill Water Treatment Plant’ prepared by Dr Ian Wallis and dated April 2019; and
- Copy of the development plans for Alpine Views (Stages 3 and 4) and Meridian Rise (Stages 1 and 2).

The map provided to the EPA for comment showed the settlement ESO as depicted by the purple line in Figure 1. The EPA noted that “the extent of the ESO has been determined on the basis of advice from SMEC (water storage failure); CEE (chlorine gas release) and Marshall Day Acoustics (noise); with peer review carried out by Dr Ian Wallis, formerly an EPA appointed auditor”.

The EPA also noted that “the technical documents that provide the basis for the extent of the ESO have not been reviewed by EPA and therefore we cannot attest to their accuracy or relevance regarding the ESO”. The reason behind this statement was that EPA Publication 1518 does not apply to noise, vibration, hazardous air pollutants, or the storage of dangerous goods such as chlorine, and does not include any specific reference to water treatment plants.

Nonetheless, the EPA acknowledged that the ESO can work well in the context of avoiding or managing encroachment of sensitive uses on industrial land and critical infrastructure such as water treatment facilities.

Further, the EPA concluded that “Where there may be a discrepancy between the ESO boundary proposed by Dr Wallis on behalf of North East Water and the extent of the ESO as a result of VCAT proceedings (as shown by the green and purple lines Figure 1), it is unlikely that this would present any unacceptable environmental, amenity or human health risk of concern to EPA”.

This statement could be interpreted as support by the EPA for the original ESO and the settlement ESO.
5. SETTLEMENT BUFFER AND FIRE PROTECTION

The original ESO included a 16 m wide buffer zone around the perimeter of the water treatment plant site to provide access for fire-fighting trucks, based on CFA recommendations. The fire fighting buffer is shown in Figure 2.

Figure 2. Recommended CFA Access Buffer

It is apparent that the settlement ESO complies with the recommended fire-fighting buffer, and therefore is satisfactory for that constraint.
6. SETTLEMENT BUFFER AND CHLORINE RISK

The Huon Hill water treatment plant uses chlorine at a low concentration for effective disinfection of potable water, as do many other water treatment utilities. Chlorine can be a hazard at elevated concentrations.

Chlorine leaks are rare for any particular site (including at water treatment plants), but the occurrence of these events is not zero. For three credible spill scenarios, the AUSTOX model was used to calculate the downwind chlorine concentration, taking into account the rapid lateral spread of the chlorine (as it is a dense gas), the limited vertical dispersion, local topography, local winds and the volatilisation with time. Based on the results of the chlorine modelling, the recommended buffer zone to protect residents from chlorine levels exceeding 0.5 ppm is shown in Figure 2 (as the yellow highlighted area).

Figure 3. Recommended Chlorine Buffer

The chlorine buffer extended further to the south-west than the settlement ESO. However, the strip of land that represents the difference has been designated a park and will not have residences, as was agreed in the terms of settlement before VCAT.

After considering the relative risks of permanent occupation of a residence compared to occasional use of a park, I conclude that the settlement ESO complies with the outcome of the chlorine risk assessment.
7. SETTLEMENT BUFFER AND NOISE REQUIREMENTS

The Huon Hill water treatment plant operates 24 hours per day, 365 days each year. Marshall Day Acoustics was engaged to undertake a noise assessment that involved:

- Measuring existing noise conditions at the site;
- Recommending maximum noise levels determined in accordance with EPA SEPP N-1 Control of Noise from Commerce, Industry, and Trade, EPA Publ. 1411-1413 Noise from Industry in Regional Victoria and sleep disturbance criteria from NSW Road Noise Policy 2011;
- 3-D modelling of noise at the site and surrounding environment.

A 3-D digital noise model of the site and the surrounding environment was developed by Marshall Day Consultants using the noise modelling software SoundPLAN v8.0. Figure 4 shows the recommended noise buffer based on the 40 dB contour north and east of the plant (where there is a low background noise level) and 45 dB near the west and south of the plant (where noise from Bandiana Link Road and the Murray Valley Highway results in higher background noise).

Figure 4. Recommended Noise Buffer

The noise buffer extended further to the north than the settlement ESO. A reduction in that direction can be achieved by constructing an acoustic barrier on the north boundary of the Water Treatment Plant and land within Meridian Rise, as was agreed in the terms of settlement before VCAT. After examining the effect of the acoustic barrier in reducing noise propagation, I conclude that the settlement ESO complies with the noise limits behind the noise buffer.
8. SETTLEMENT BUFFER AND EMBANKMENT RISK

The Huon Hill water treatment plant has two treated water storage tanks and a raw water storage basin. Clear Water Storage No 1 was constructed in 1962 and has a capacity of 14 ML. The storage is rectangular in shape, approximately 60 m by 80 m in area with a 5 m high earthfill embankment that is 150 m long (on two sides). Clear Water Storage No 2 was constructed in 2006 and also has a capacity of 14 ML. The storage is rectangular in shape, approximately 70 m by 100 m in area with an 8 m high earthfill embankment that is 200 m long (on two sides).

The raw water storage basin was constructed in 1976 and has a capacity of 32 ML. The basin is rectangular in shape, approximately 90 m by 90 m in area with a 6 m high earthfill embankment that is 180 m long (on two sides). Inspections of the embankments in recent years have not identified any significant issues. NEW has not noticed any seepage from the embankment.

SMEC assessed 15 failure modes for the embankments of which three related to failures after an earthquake (seismic event), two related to overtopping, five related to piping of water through the embankment from various causes and five related to gradual deterioration of the embankment and lining over time. The likelihood of failure is, of course, very low being 5 in a million for each of the clear water storages and 30 in a million for the raw water storage.

The consequence of failure depends on the number of people downstream of the embankment at the time of failure. A failure is expected to develop from a small piping failure to a flood over an hour or so, and people living or sleeping in houses immediately downstream of the embankments are most at risk.

In addition to inspections and monitoring, the best way to mitigate this risk is to avoid having residences immediately downstream of the embankments. SMEC advised that, in the event of a piping failure, the flood wave could be 0.3 m deep and have a velocity of 1.6 m/s. This would crash through a house wall.

Based on the results of the SMEC risk assessment, the recommended buffer zone to protect residents from embankment failure is shown in Figure 5.

The embankment failure buffer extended further to the south than the settlement ESO. However, the strip of land that represents the difference has been designated a park and will not have residences, as was agreed in the terms of settlement before VCAT.

After considering the relative risks of permanent occupation of a residence compared to occasional use of a park, I conclude that the settlement ESO complies with the outcome of the embankment failure risk assessment.
9. CONCLUSION

The ESO for the Huon Hill water treatment plant was, and is, determined from the combination of the buffer zones as shown in the following figures:

- CFA Access Buffer (Figure 2);
- Noise Buffer (Figure 3);
- Chlorine Buffer (Figure 4); and
- Impact Zone for Embankment Failure (Figure 5).

These buffers were developed taking into account the specific features of the Huon Hill water treatment plant, local topography (hillside sloping down to the south-west) and hourly measurements made at the site.

I have reviewed the settlement buffer that came out of the VCAT mediation procedure to check whether or not it meets the requirements of the recommended buffer zones for the four considerations listed above. It is my opinion that the settlement ESO meets the four requirements and therefore is satisfactory.

Yours faithfully

/ Wallis

Ian Wallis
10. REFERENCES


EPA VIC (2013), Recommended Separation Distances for Industrial Residual Air Emissions, EPA Publ. 1518, March 2013

Marshall Day Acoustics (2019), Wodonga Water Treatment Plant Environmental Noise Assessment, Report 01 20181428 to NEW, Feb 2019

SMEC (2018), Huon Hill Storages Risk Assessment, Report to NEW, Feb 2018

Standards Australia (2001), The Storage and Handling of Liquefied Chlorine Gas Australian/New Zealand Standard No. 2927


Victoria Government (2018), Government Response to the Major Hazard Facilities Advisory Committee, Jan 2018

Victoria Planning Policy, Clause 53.10-1 Threshold Distance (2019-on line)

Wodonga Planning Scheme (2019 – on line)