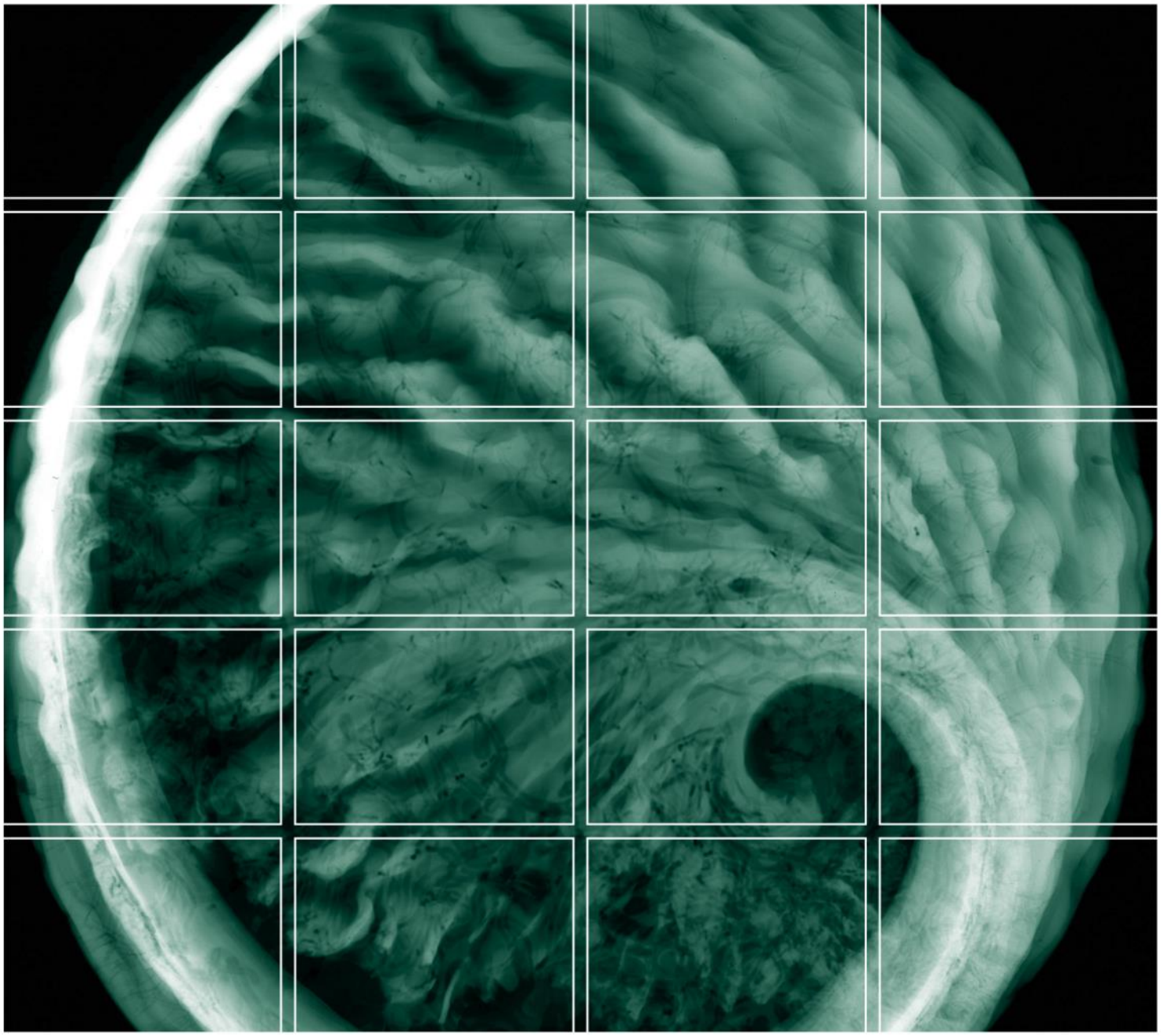

Waste Metal Recovery, Processing and Recycling Facility, 45 and 23- 43 Tattersall Road, Kings Park, Blacktown

Stormwater Management Concept Plan

Sell & Parker Pty Ltd

September 2015

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Waste Metal Recovery, Processing and Recycling Facility, 45 and 23- 43 Tattersall Road, Kings Park, Blacktown

Stormwater Management Concept Plan

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Date:	*3 September 2015*

Environmental Resources Management Australia Pty Ltd Quality System

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CONTENTS

1 INTRODUCTION

1.1 BACKGROUND

Sell & Parker has submitted a Development Application (DA) for expansion of its current site at 45 Tattersall Road (Lot 5 /DP 7086) to include the neighbouring site 23-43 Tattersall Road (Lot 2, DP550 522). The DA is being processed as a State Significant Development (ref. SSD-5041). A Stormwater Management Plan was originally submitted as Annex J of the Environmental Impact Statement. It was amended in response to feedback from NSW Environmental Protection Agency (NSW EPA) and resubmitted. NSW EPA provided a detailed response to NSW Department of Planning and Environment (DPE) in a letter dated 28 July 2015. Sell & Parker attended a meeting with NSW DPE following receipt of the NSW EPA feedback and it was agreed that Sell & Parker would provide a "Concept Plan" detailing how the EPA requirements for stormwater management would be addressed. This report provides that Concept Plan.

1.2 OBJECTIVE OF THE CONCEPT PLAN

ERM understands that the Concept Plan is intended to set out a framework and timescale for addressing the NSW EPA requirements for stormwater management with reference to progressing further works over a period of time. It is understood that NSW DPE will condition some of the requirements, and that some of the others are envisaged to be included in the Sell and Parker Environmental Protection Licence (EPL) for the site.

2 TREATMENT PERFORMANCE OF THE SPECIFIED TREATMENT SYSTEM

2.1 TREATMENT SYSTEM SUMMARY

The proposed treatment system for stormwater comprises a drainage network in two catchments (Sell & Parker existing site 45 Tattersall Road, and Dexion site 23-43 Tattersall Road) that covers operational areas excluding roofs and car parking areas not used by trucks which are drained separately and do not contribute water to the operational drainage catchment.

The drainage network of primarily dish drains leads to a retention basin designed to contain stormwater for reuse on site, and if necessary for discharge to Breakfast Creek following treatment. Before entering the basin, stormwater passes through primary and secondary treatment plant, installed below ground in line with the drains. These remove much of the suspended load and oils before the water enters the basin. Prior to discharge, water from the basin is pumped through a tertiary treatment plant installed above ground on the edge of the basin. It removes fine sediment and trace organics.

The system is illustrated conceptually in *Figures 1* and *2* in *Annex A*.

Primary Treatment – Ecoceptor

The Ecoceptor separates and captures sediment, silt, total suspended solids, nutrients, total petroleum hydrocarbons and oil & grease. Floating hydrocarbons are trapped in the oil capture zone of the treatment chamber and are contained in all flow events. Sediments settle in the treatment chamber, and cannot resuspend or scour in high flow events.

The Ecoceptors specified are designed to treat flow to the 90th percentile flow rate (the treatable flow rate, TFR). At flow rates above this, water passes through a bypass and is directed straight into the stormwater basin.

There are two Ecoceptors specified for the proposed drainage system, installed as the first element of treatment before the water enters the retention basin. There are separate Ecoceptors for the two catchments on the site.

Secondary Treatment – Stormceptor

The Stormceptor is a two chamber horizontally installed system, through which flow already treated in the Ecoceptor will pass. Flow enters the primary chamber where sediment is collected and then passes into a secondary chamber (quiescent zone), and finally through a high-reticulated coalescing media trapping and separating fine particulate suspended solids, nutrients and hydrocarbons. Its design prevents resuspension and scouring during high flow events.

Like the Ecoceptor, the Stormceptor also has a bypass system which under high flow conditions will allow water to pass directly into the stormwater basin where it is detained. The stormceptors are also specified to treat the 90th percentile flow.

Two Stormceptors are specified. They are installed downstream of the Ecoceptors, before the retention basin, and like the Ecoceptors there is one for each catchment.

Tertiary Treatment – Hydrosystem 1500

The Hydrosystem-1500 is designed to remove fine suspended solids and trace organics. It has proven performance for relevant pollutants, and is typically used for high-use traffic areas. The filter operates using upflow, with water entering at the base where further settlement of suspended solids occurs. The water then passes through a filter element designed to remove metals and dissolved phase hydrocarbons and exits through an oil trap providing removal of oil sheen in the event that this occurs in the stormwater basin (which should not occur since removal of visible oil will occur in secondary treatment up gradient of the basin).

In the event that additional removal of trace organics proves necessary (eg, PFC issue), an additional filter containing a proprietary sorbent "Osorb" can be retrofitted. The Hydrosystem is easily maintained using backwashing to clean the filters, and by post-use cleaning of the silt trap.

The Hydrosystem will be located above ground at the edge of the retention basin. A floating pump in the basin will pump water to the Hydrosystem, with the pump operation automatically controlled by the level of water in the basin. It will be operated by a programmable control system set to maintain water levels in the basin within the specified control levels including maintenance of a freeboard to provide storage to contain extreme weather events.

2.2 *OBJECTIVES OF TREATMENT PERFORMANCE TRIAL*

The objectives of the proposed treatment performance trial are as follows:

a) Test the SPEL Hydrosystem tertiary treatment system using representative water that can be obtained from current operation to determine likely performance. This is considered appropriate, since the water quality in the existing stormwater retention dam is likely to be similar to, or worse than, the water quality that will prevail in the proposed new retention basin. The water in the new retention basin, from which the Hydrosystem will pump will have already passed through the primary and secondary treatment before entering the basin.

b) Propose interim compliance criteria for application during the initial stages of operation, during which further performance monitoring and assessment of environmental effects will be carried out through the EPL.

2.3 *OUTLINE OF THE TREATMENT PERFORMANCE TRIAL*

The proposed trial has the advantage of providing Sell & Parker with an improved level of confidence that the technology can achieve discharge criteria that EPA will accept in advance of making the investment, without incurring excessive delay. It also provides flexibility to propose interim compliance criteria pending the results of a longer term commissioning study (Section 4), providing a mechanism to assess the potential environmental effects of the discharge and modify the discharge criteria accordingly. This provides a means to deal with the risk that the interim discharge criteria cannot be reliably achieved, within the scope of the EPL.

SPEL has agreed to conduct the trial at their premises to treat water that will be supplied by Sell & Parker. A detailed methodology for the trial will be developed that aims to demonstrate the performance of the Hydrosystem (the tertiary treatment device that pumps water from the retention basin to Breakfast Creek) under "normal" and "high rate" throughput conditions, for the contaminants identified by EPA. These include: TSS, total N, total P, PFOS/PFOA, metals and BTEX. The methodology will include trial objectives, sampling and analysis of water before and after treatment, transport and storage of the sample water for treatment, and reporting of results. It isbeing developed in consultation with SPEL.

The water to be treated will be selected to represent a nominal "worst case" water quality in the retention basin following redevelopment, and assuming that the water flowing into the new retention basin will have passed through the specified primary and secondary treatment plant

Following the completion of the SPEL treatment trial, a report will be prepared detailing the trial and proposing revised interim compliance criteria in accordance with the EPA's requirements (ie., based on Tables 1 and 2 on p6-7 of the EPA's letter of 28th July). As required by EPA, the interim compliance criteria will be proposed as 100th percentile limits assessed on samples filtered for metals analysis. It is proposed that the commissioning trial (Section 4) will be used to evaluate the system performance against the interim compliance criteria, assess environmental effects and agree final compliance criteria with EPA.

Following the trials, the results will be discussed with the EPA with reference to the likely ability to meet the interim criteria and potential for the commissioning trial and further monitoring (Section 4) to result in acceptable modifications to the interim criteria.

In the event that the treatment trial demonstrates that the proposed system will be incapable of meeting a discharge standard that EPA is likely to find acceptable, alternative methods will be considered. These might for example include carbon filtration for organic compounds and flocculation and/or a sorbent or membrane filtration technology for metals.

2.4 TIMEFRAME

The treatment performance trial will take approximately 2 months and will be carried out during quarter 3 of 2015.

3 DESIGN OF THE RETENTION BASIN

3.1 OVERVIEW OF RETENTION BASIN CONCEPT DESIGN

The retention basin is designed to contain a 1 in 100 year rainfall event for the operational catchment area for return periods up to 72 hours. The proposed basin has a volume of approximately 8064m^3. The system is shown conceptually in Figures 1 and 2.

The concept design volume of the basin was calculated using a spreadsheet model of the retention and treatment system to assess the required holding capacity for different event durations at a 1 in 100 year return frequency. The model also considers the pumping rate of the tertiary plant, and the site requirement for water.

The available capacity of the basin is sufficient to provide for normal operational storage and control, with provision of additional capacity to hold extreme rainfall events. The storage capacity of the basin conceptually achieves the containment using a combination of the freeboard volume and the available volume between the high and low control levels, by operating the pumps to maintain the normal operating level at the low level control. The tertiary treatment plant pumps will be operated by an automated control system responding to water level in the basin to switch pumps on and off. Details of the actual levels, pump rates, and control mechanism will be developed during detailed design and commissioning.

The basin level control system will provide for two level controls, with high and low level triggers starting and stopping the pumps to the treatment plant. Estimated volume between high and low levels is approximately 2000m^3. This permits tertiary treatment to operate at optimum efficiency by controlling the throughput to optimum flow. Pumping will commence at the set optimum treatment rate when the high level is reached, then cease when the low level is reached. There will be storage above the high level trigger providing for extreme weather containment; the high control level will only be exceeded if water continues to flow into the basin once the high level is reached.

If pumping at optimum rate fails to draw the water past the high level trigger within a set period of time, the system will change to maximum rate pumping and will continue at maximum rate until the low level trigger is reached. Pumping would cease until the high level trigger was reached again, with the pumps starting at optimum rate and changing to high rate if the level fails to drop as described above.

The automated control system will be fitted with manual override such that it is possible to maintain high rate pumping below the high level trigger or to cease pumping above the low level trigger. This might be necessary (for example) in order to hold more water during dry periods, or to increase storage volume in anticipation of a high intensity rainfall event.

The set levels for the high and low trigger points will be established during detailed design to optimise plant performance, storage capacity and energy efficiency combined with process water requirements.

3.2 UNCONTROLLED DISCHARGE FREQUENCY

Uncontrolled discharge from the basin (ie "emergency overflow" bypassing the tertiary treatment system) would occur only when the 1 in 100 year event was exceeded, or when a series of extreme events occurred close together in time such that the basin was at its high control level at the beginning of the extreme event. At design condition (starting point of extreme rain event low control level), overflow statistically would happen less frequently than once in 100 years, however it is not possible to guarantee that statistically infrequent events will not happen and overflow must therefore be planned for.

The concept model variables included a low level L at 0.35m (water depth) and high level H at 1m which provides for a freeboard height of 1.8m. The maximum pump rate for the tertiary treatment system is 86.4m^3/hour and the site usage requirement is 100m^3 per day. With these variables, at a start point of L, uncontrolled discharge does not occur for any 1 in 100 year ARI event. With a start point of H, the worst case rainfall event (48hr duration) results in a statistical probability of an uncontrolled discharge once in 50 years and an uncontrolled discharge volume of approximately 500m^3. It is noted that at this level of rainfall, high flow rates in the Creek are likely to provide mitigation of any potential impact as a result of rapid dilution.

3.3 DETAILED DESIGN OF RETENTION BASIN

It is proposed to refine the concept design for the stormwater retention and treatment system to confirm the high and low trigger control levels for the basin and sizing required to result in no uncontrolled discharge in a 1 in 100 year ARI design storm event for up to 72 hours duration. It is proposed to develop a DRAINS model of the system, and incorporate site constraints, the practicable tertiary treatment rate and the site water requirement. Sensitivity testing using a 1 in 200 event intensity, and consideration of historical rainfall patterns (eg, high rainfall months) will be used to provide more detail on the circumstances that could result in uncontrolled discharge, and the frequency with which uncontrolled discharge might occur. This work will provide the information that NSW EPA required in their letter of 28th July. This element of the detailed design can be progressed in advance of the detailed site drainage design work.

As part of the development works, a detailed 'for construction' drainage design will be produced, providing a detailed specification for the site stormwater drainage system including the retention basin and treatment plant.

3.4 TIMEFRAME

Refinement of the retention basin design is proposed to be carried out within quarter 3 of 2015, and will take approximately 2 months to complete.

The full detailed design and preparation of construction drawings timing will be determined by the development program.

4 STORMWATER SYSTEM COMMISSIONING TRIALS

4.1 PURPOSE OF COMMISSIONING TRIALS

The commissioning trials will commence after the development is complete and the new stormwater system installed and operational. It is proposed that the commissioning trial will be included in a revised SWMP which will be part of the site's EPL. The commissioning trials will be designed to provide the following, in accordance with EPA's requirements under "Controlled Discharges" in their letter of 28th July (specifically items 2, 5 and 7 on pages 2 and 3):

a. To commence compliance monitoring in accordance with the interim criteria and initial agreement with EPA on the monitoring regime following the treatment performance trials (Section 2);

b. To establish actual treatment performance of the system over a range of conditions;

c. To monitor Breakfast Creek quality for assessment of the size of the mixing zone of the discharge, and the variability of the contaminant concentrations in Breakfast Creek over a range of conditions;

d. To create a dataset to support an assessment of the environmental effects of the discharge (EPA's Item 2 on p2 of 28th July letter);

e. To provide a basis for agreement of final compliance criteria and monitoring programme with EPA; and

f. To develop a maintenance schedule optimised for site operations (EPA's Item 7 on p3).

4.2 OUTLINE OF COMMISSIONING TRIALS

Monitoring of the installed stormwater retention and treatment system will commence on the basis of a compliance monitoring program that monitors compliance of the discharge (at MP1) with the interim discharge criteria, together with a wider monitoring program addressing the objectives above. Following the performance trial described in Section 2, it may be appropriate to revise the conceptual outline below in consultation with EPA. At this stage it is proposed that the commissioning trials should include the following:

a. Sampling at MP1 and analysis for interim discharge criteria parameters including the first low rate and the first high rate pumping in each month;

b. Monitoring the daily discharge volumes for all controlled discharge;

c. Monitoring the water level in the retention basin daily;

d. Monthly (minimum) sampling and analysis of water in the retention basin, with supplementary sampling and analysis to obtain data on water quality in high and low rainfall conditions;

e. Recording duration (as far as reasonably practicable) of any uncontrolled discharge that occurs, together with sampling and analysis of any uncontrolled discharge and Breakfast Creek sampling points (to the extent practicable and safe);

f. Sampling and analysis of water in Breakfast Creek at nominated sampling points (eg., approximately 20m upgradient of site, immediately downgradient of discharge eg 2-3m, and approximately 20m downgradient of discharge). At least 6 samples per annum at each location are proposed, providing representation of a variety of flow rate and discharge conditions (including no discharge). If more samples are needed to provide this representation then additional samples will be taken;

g. Representative monitoring of the flow rate in Breakfast Creek in a variety of climactic conditions, subject to safety and practicality considerations; and

h. Analysis additional to the compliance criteria parameters if necessary to provide adequate assessment of potential effects on the environmental values of Breakfast Creek (for example metals speciation, consideration of free reactive phosphorus content).

4.3 TIMEFRAME

It is proposed that the commissioning trial period should be for up to 2 years from the date that the stormwater retention and treatment system becomes operational.

Annex A

Figures