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Dear Chee,

SEARS COMPLIANCE OF WAREHOUSE 9 SSD (SSD-46516461), ASPECT INDUSTRIAL ESTATE, KEMPS CREEK, NSW

The compliance of the Warehouse 9 SSD (SSD-46516461) located on the Aspect Industrial Estate is assessed as follows.

The proposed Warehouse 9 development comprises:

- A new 64,725 sqm warehouse facility at the intended Lot 9 (facilitated by SSD-10448 MOD3) which is supported by:
 - Ancillary office (1,350 sqm) and two dock offices (total 266 sqm).
 - seventy-four (74) docks.
 - 266 car parking spaces
 - On lot landscaping.
 - On lot stormwater management.
 - Operation of the warehouse & distribution facility 24 hours a day 7 days a week.
 - Construction of Internal truck access driveways vehicular crossovers to Access Road 3 (ingress) and Access Road 4 (egress).

2022 FLOOD RISK ASSESSMENT

The Flood Risk Assessment for the Aspect Industrial Estate prepared by Cardno now Stantec in July 2022¹ provides a high-level understanding of the opportunities and constraints of the site due to flooding and informed the development of a stormwater strategy/management plan for the Aspect Industrial Estate based on an assessment of flooding under Pre-development conditions. The study area included Lot 9.

¹ Cardno now Stantec (2022a) "Flood Risk Assessment, Aspect Industrial Estate (AIE)", Final Report, Version 6C, prepared for Mirvac, 33 pp + Apps

The hydrological and hydraulic modelling, which is described in detail in Cardno now Stantec, 2022a, is overviewed as follows.

A local hydrological model was created to assess runoff under benchmark conditions and to facilitate the assessment of impacts of proposed development. Hydrological assessments were undertaken using both ARR1987 and ARR2019.

A local TUFLOW model of the drainage lines through the site was assembled.

Inflows to the TUFLOW model were exported from the hydrological model and input at the locations of the subcatchment outlets (nodes). For assessment purposes, the Scenario 2 conditions were adopted to maintain compatibility with the 2015 South Creek flooding assessments which were based on ARR1987.

The flood extent in South Creek was overlaid over the results of the local TUFLOW model to identify where mainstream flooding takes over from overland flows.

The TUFLOW floodplain model was run for the critical storm burst durations for the 2 yr ARI, 5 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF events.

Flood levels and extent, depths, velocities and hazards under Benchmark Conditions are plotted for each of these events in Cardno now Stantec, 2022a.

The 200 yr ARI flood is a surrogate for 100 yr ARI floods with climate change rainfall increase under RCP4.5 conditions while the 500 yr ARI flood is a surrogate for 100 yr ARI floods with climate change rainfall increase under RCP8.5 conditions.

2022 FLOOD IMPACT ASSESSMENT

The Flood Impact Assessment for the Aspect Industrial Estate prepared by Cardno now Stantec in July 2022² describes the assessment of the impact of Modification 3 of the approved Stage 1 development for the Aspect Industrial Estate as well as Modification 3 of the approved Final Masterplan.

As described by Cardno now Stantec, 2022b, the following modifications were proposed, relating to Warehouse/Lot 6, 7, 8, 9, 10 and 11 area and Access Road 4, located at the south western portion of the AIE, as set out in the Concept Plan SSD-10448.

- Reconfiguration of the Estate layout south of Access Road 1 and west of Access Road 3 including
 - (i) Reduction in overall lot numbers across AIE from 11 to 9.
 - (ii) Relocation and shortening of Access Road 4.
 - (iii) Reconfiguration of warehouse lots 6-11 into lots 6-9.
 - (iv) New warehouse footprints and heights, hardstand locations, car parking, estate landscaping.
 - (v) Change in boundary condition to the south including orientation of warehouse hardstand for Warehouse 9 to the south rather than the north.

² Cardno now Stantec (2022b) "Flood Impact Assessment, Aspect Industrial Estate (AIE)", Final Report, Version 2B, prepared for Mirvac, 24 pp + Apps

- Reduction in area of Lot 6 Warehouse GFA to 18,925 sqm and Lot 7 Warehouse GFA to 14,480 sqm.
- Increase in area of Lot 8 Warehouse GFA to 44,200 sqm and Lot 9 Warehouse GFA to 64,725 sqm.
- Reconfiguration of Office and Dock Office areas in accordance with the revised warehouse footprints.
- New hardstand areas along the frontages of the reconfigured lots:
 - (i) 36 m wide east of Warehouse 6,
 - (ii) 38 m wide west of Warehouse 7,
 - (iii) 38 m south of Warehouse 8, and
 - (iv) 36 m wide north and 36m south of Warehouse 9.
- Reconfiguration of carpark areas in support of the modified warehouse layout, to be reconfigured as follows:
 - (i) Warehouse 6 - 39 parking spaces across the lot's northern frontage, 34 parking spaces across the lot's southern frontage,
 - (ii) Warehouse 7 - 20 parking spaces northern frontage and 64 parking spaces across the lot's eastern frontage, within the front setback to Access Road 3,
 - (i) Warehouse 8 – 69 parking spaces across the lot's northern frontage (fronting Access Road 1) and 97 parking spaces across the lot's eastern frontage (fronting Access Road 4), and
 - (ii) Warehouse 9 - 266 parking spaces across the lot's north-eastern frontage (fronting Access Road 4).
- Revised vehicular and truck access off Access Road 1, 3 and 4 in accordance with the reconfigured lots and shortened Access Road 4.
- Change in Estate-wide impacts associated with stormwater management, traffic generation, visual impact, noise, earthworks at the boundary and landscaping.

It is proposed to stage the development of the industrial estate. Lot 9 is included in the Stage 1 development.

The Stage 1 development responds to the flooding risks by separating upstream runoff from local internal runoff and implementing the following measures:

- (i) Capturing upstream runoff just inside the southern site boundary and conveying this via the proposed diversion line comprising a 1500 mm diameter conduit with a 1.5 m x 1.5 m RCBC road crossing to convey upstream runoff to the head of the extended riparian corridor which conveys the combined upstream runoff from the southern and eastern drainage lines to the existing Mamre Road crossing in all events up to the 100 yr ARI event; and
- (ii) Directing all runoff from within the Stage 1 development to a dual purpose basin in order to mitigate the impacts on the rate of runoff in all events up to the 100 yr ARI event and to mitigate impacts on stormwater quality. The basin is sized on the masterplan conditions when all stages of development of the industrial estate have been completed ie. it is planned to construct the full basin in Stage 1.

The Masterplan development responds to the flooding risks based on the measures implemented in Stage 1 and by directing all runoff from within the Masterplan development to the basin in order to mitigate the impacts on the rate of runoff in all events up to the 100 yr ARI event and to mitigate impacts on stormwater quality.

The flood impact assessment was informed by the assessment of design flood levels, velocities and hazards under Benchmark Conditions as described in Cardno now Stantec, 2022a.

Hydrology

Stage 1 Conditions with a Basin under Modification 3

The 2021 Stage 1 hydrological model³ was updated to include the additional impervious surfaces associated with Warehouse 9.

Future Masterplan Conditions with a Basin under Modification 3

The 2021 Final Masterplan hydrological model was not updated because it was determined that the overall imperviousness of the Estate under Modification 3 was within 1% of the 2021 Masterplan layout.

Hydraulics

Stage 1 Conditions under Modification 3

The assessment of flooding under Stage 1 Conditions was undertaken by modifying the local TUFLOW model of Benchmark Conditions described in Cardno now Stantec, 2022a to represent the planned Stage 1 earthworks and development under Modification 3.

The TUFLOW floodplain model was run for the critical storm burst durations for the 2 yr ARI, 5 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF events.

Flood levels and extent, depths, velocities and hazards under Stage 1 Conditions are plotted for each of these events in Cardno now Stantec, 2022b.

Final Masterplan Conditions under Modification 3

The assessment of flooding under Final Masterplan Conditions under Modification 3 was undertaken by modifying the local TUFLOW model of Benchmark Conditions described in Cardno, 2020 to represent the planned Final Masterplan earthworks and development.

The Stage 1 modelling approach was also applied to the modelling of the Final Masterplan.

The TUFLOW floodplain model was run for the critical storm burst durations for the 2 yr ARI, 5 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF events.

Flood levels and extent, depths, velocities and hazards under Masterplan Conditions are plotted for each of these events.

³ Cardno (2021) "Flood Impact Assessment, Aspect Industrial Estate (AIE)", Final Report, Version 5, prepared for Mirvac, 20 pp + Apps

Flood Impact Assessment

Under both Stage 1 Conditions and Final Masterplan Conditions under Modification 3, flood level difference plots disclosed that there are negligible adverse impacts on flood level downstream of Mamre Road in the 2 yr ARI, 5 yr ARI, 100 yr ARI, 200 yr ARI and 500 yr ARI events. There is some change in the extent of shallow inundation. In a PMF greater decreases in the flood levels are experienced downstream of Mamre Road. There are some small increases upstream of the southern boundary in an existing farm dam which it is expected would be resolved when a drainage corridor is re-established in this area.

Under both Stage 1 Conditions and Final Masterplan Conditions under Modification 3, flood velocity difference plots disclose that there are minor impacts in the watercourse downstream of Mamre Road and negligible adverse impacts on flood velocities elsewhere downstream of Mamre Road in the 2 yr ARI, 5 yr ARI, 100 yr ARI, 200 yr ARI and 500 yr ARI events. In a PMF there are localised modest increases in the flood velocities are experienced downstream of Mamre Road.

COMPLIANCE ASSESSMENT

The applicable SEARS flooding requirement is as follows:

14. Flooding Risk

- *Identify any flood risk on-site having regard to adopted flood studies, the potential effects of climate change, and any relevant provisions of the NSW Floodplain Development Manual.*

The Flood Risk Assessment for the Aspect Industrial Estate was prepared by Cardno now Stantec in July 2022 identifies the flood risks within the Aspect Industrial Estate including Lot 9 under pre-development conditions.

Flood levels and extent, depths, velocities and hazards under Benchmark Conditions are plotted for each of these events in Cardno now Stantec, 2022a.

The potential effect of climate change is assessed by the 200 yr ARI flood is a surrogate for the 100 yr ARI flood with climate change rainfall increase under RCP4.5 conditions while the 500 yr ARI flood is a surrogate for the 100 yr ARI flood with climate change rainfall increase under RCP8.5 conditions.

The 2022 Flood Risk Assessment satisfies this requirement for the Warehouse 9 SSD (SSD-46516461).

- *Assess the impacts of the development, including any changes to flood risk on-site or off-site, and detail design solutions and operational procedures to mitigate flood risk where required.*

The Stage 1 development, which includes Lot 9, responds to the flooding risks by separating upstream runoff from local internal runoff and implementing the following measures:

- (i) Capturing upstream runoff just inside the southern site boundary and conveying this via the proposed diversion line comprising a 1500 mm diameter conduit with a 1.5 m x 1.5 m RCBC road crossing to convey upstream runoff to the head of the extended riparian corridor which conveys the combined upstream runoff from the southern and eastern drainage lines to the existing Mamre Road crossing in all events up to the 100 yr ARI event; and

- (ii) Directing all runoff from within the Stage 1 development to a dual purpose basin in order to mitigate the impacts on the rate of runoff in all events up to the 100 yr ARI event and to mitigate impacts on stormwater quality. The basin is sized on the masterplan conditions when all stages of development of the industrial estate have been completed ie. it is planned to construct the full basin in Stage 1.

The Masterplan development responds to the flooding risks based on the measures implemented in Stage 1 and by directing all runoff from within the Masterplan development to the basin in order to mitigate the impacts on the rate of runoff in all events up to the 100 yr ARI event and to mitigate impacts on stormwater quality.

The Flood Impact Assessment for the Aspect Industrial Estate prepared by Cardno now Stantec in July 2022 describes the assessment of the impact of Modification 3 of the approved Stage 1 development for the Aspect Industrial Estate as well as Modification 3 of the approved Final Masterplan.

Cardno now Stantec, 2022b provides plots of the flood levels and extent, depths, velocities and hazards in the 2 yr ARI, 5 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF events under both Stage 1 Conditions and Masterplan Conditions.

Under both Stage 1 Conditions and Final Masterplan Conditions under Modification 3 which includes Lot 9, flood level difference plots disclosed that there are negligible adverse impacts on flood levels downstream of Mamre Road in the 2 yr ARI, 5 yr ARI, 100 yr ARI, 200 yr ARI and 500 yr ARI events. There is some change in the extent of shallow inundation. In a PMF greater decreases in the flood levels are experienced downstream of Mamre Road. There are some small increases upstream of the southern boundary in an existing farm dam which it is expected would be resolved when a drainage corridor is re-established in this area.

Under both Stage 1 Conditions and Final Masterplan Conditions under Modification 3 which includes Lot 9, flood velocity difference plots disclose that there are minor impacts in the watercourse downstream of Mamre Road and negligible adverse impacts on flood velocities elsewhere downstream of Mamre Road in the 2 yr ARI, 5 yr ARI, 100 yr ARI, 200 yr ARI and 500 yr ARI events. In a PMF there are localised modest increases in the flood velocities are experienced downstream of Mamre Road.

The 2022 Flood Impact Assessment satisfies this requirement for the Warehouse 9 SSD (SSD-46516461).

Yours faithfully



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Dr Brett C. Phillips
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for Cardno now Stantec