

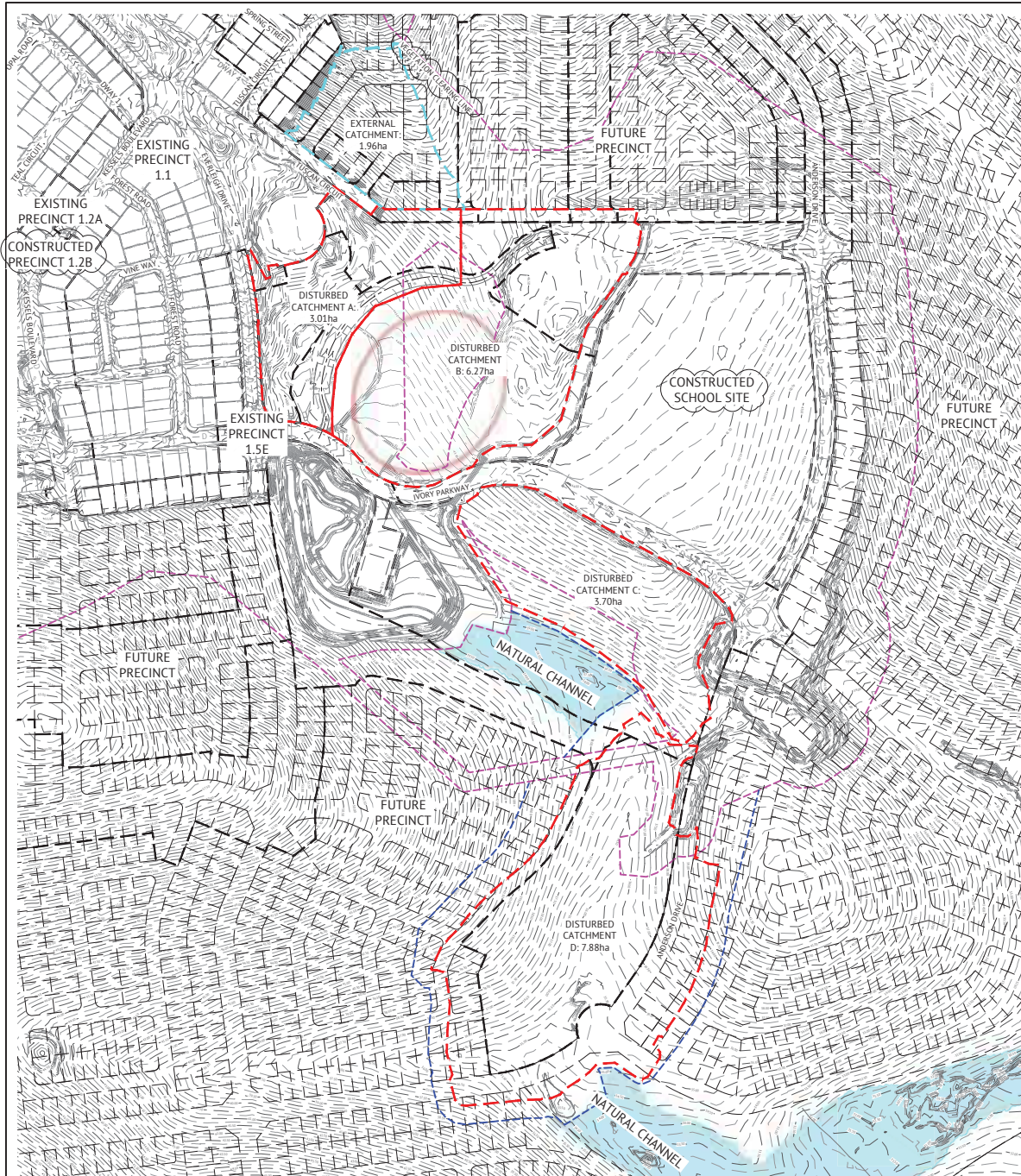
Everleigh



Environmental Pre-Start Checklist

Attachment 9

Erosion and Sediment Control Plan



LEGEND

WATERCOURSE, STRICTLY NO ENTRY, OR RELEASE OF SEDIMENT LADEN WATER INTO THIS AREA.

I CERTIFY THAT THIS EROSION AND SEDIMENT CONTROL DRAWING HAS BEEN DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL EROSION CONTROL ASSOCIATION GUIDELINES.
Chris Hutton
CHRIS HUTTON CPESC NO. 6241

| APPLICABLE AREA ID | SOIL LOSS RATE (t/ha/year) | SEDIMENT CONTROL TECHNIQUE | DEFAULT SEDIMENT CONTROL TREATMENT MEASURE |
|-----------------------|----------------------------|----------------------------|--|
| | 0 TO 75 | TYPE 3 | SEDIMENT FENCE, SEDIMENT TRAP |
| | 75 TO 150 | TYPE 2 | FILTER TUBE DAM, ROCK FILTER DAM, SEDIMENT TRENCH, SEDIMENT WEIR, COMPOST/MULCH BERM |
| CATCHMENT A, B, C & D | > 150 | TYPE 1 | SEDIMENT BASIN (SIZED IN ACCORDANCE WITH DESIGN STANDARD) |

EROSION RISK RATING

BASED ON AVERAGE MONTHLY RAINFALL (SOURCE TABLE 4.4.2 IECA 2008)

| MONTHLY DATA | JAN. | FEB. | MAR. | APR. | MAY | JUN. | JUL. | AUG. | SEPT. | OCT. | NOV. | DEC. |
|---------------|-----------------------------|----------|--------|----------|-------|----------|----------|----------|----------|-------|--------|----------|
| MEAN RAINFALL | 101.00 | 79.50 | 130.90 | 535.50 | 33.50 | 67.80 | 19.80 | 24.50 | 23.40 | 35.80 | 109.10 | 75.500 |
| EROSION RISK | HIGH | MODERATE | HIGH | MODERATE | LOW | MODERATE | VERY LOW | VERY LOW | VERY LOW | LOW | HIGH | MODERATE |
| | VERY LOW RISK: 0 TO 30mm | | | | | | | | | | | |
| | LOW RISK: 30+ TO 45mm | | | | | | | | | | | |
| | MODERATE RISK: 45+ TO 100mm | | | | | | | | | | | |
| | HIGH RISK: 100+ TO 225mm | | | | | | | | | | | |
| | EXTREME RISK: >225mm | | | | | | | | | | | |

SOIL LOSS ESTIMATIONS

$$A = R * K * LS * C * P$$

| where: | |
|--------|---|
| A | ANNUAL SOIL LOSS DUE TO EROSION (t/ha/yr) |
| R | RAINFALL ERODIVITY FACTOR |
| K | SOIL ERODIBILITY FACTOR |
| LS | TOPOGRAPHIC SLOPE/LENGTH FACTOR |
| P | EROSION CONTROL PRACTICE FACTOR |
| C | COVER AND MANAGEMENT FACTOR |

| CONSTRUCTION AREA | EXPOSED AREA (ha) | R | K | EQUAL AREA SLOPE (%) | LS | P | C | A (t/ha/yr) | SOIL LOSS (t/yr) |
|-------------------|-------------------|----------|-------|----------------------|-------|-------|-------|-------------|------------------|
| CATCHMENT A | 3.010 | 3262.000 | 0.043 | 5.000 | 1.470 | 1.300 | 1.000 | 268 | 807 |
| CATCHMENT B | 6.270 | 3262.000 | 0.043 | 3.000 | 0.900 | 1.300 | 1.000 | 164 | 1029 |
| CATCHMENT C | 3.700 | 3262.000 | 0.043 | 5.000 | 1.190 | 1.300 | 1.000 | 217 | 803 |
| CATCHMENT D | 7.880 | 3262.000 | 0.043 | 5.000 | 1.190 | 1.300 | 1.000 | 217 | 1710 |

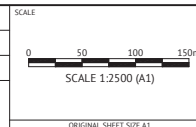
APPROVAL ISSUE – NOT FOR CONSTRUCTION

| DATE | REV | DESCRIPTION | KK | PR |
|------------|-----|----------------|----|----|
| 23/07/2021 | B | AMENDED TEXT | KK | PR |
| 28/05/2021 | A | ORIGINAL ISSUE | KK | PR |

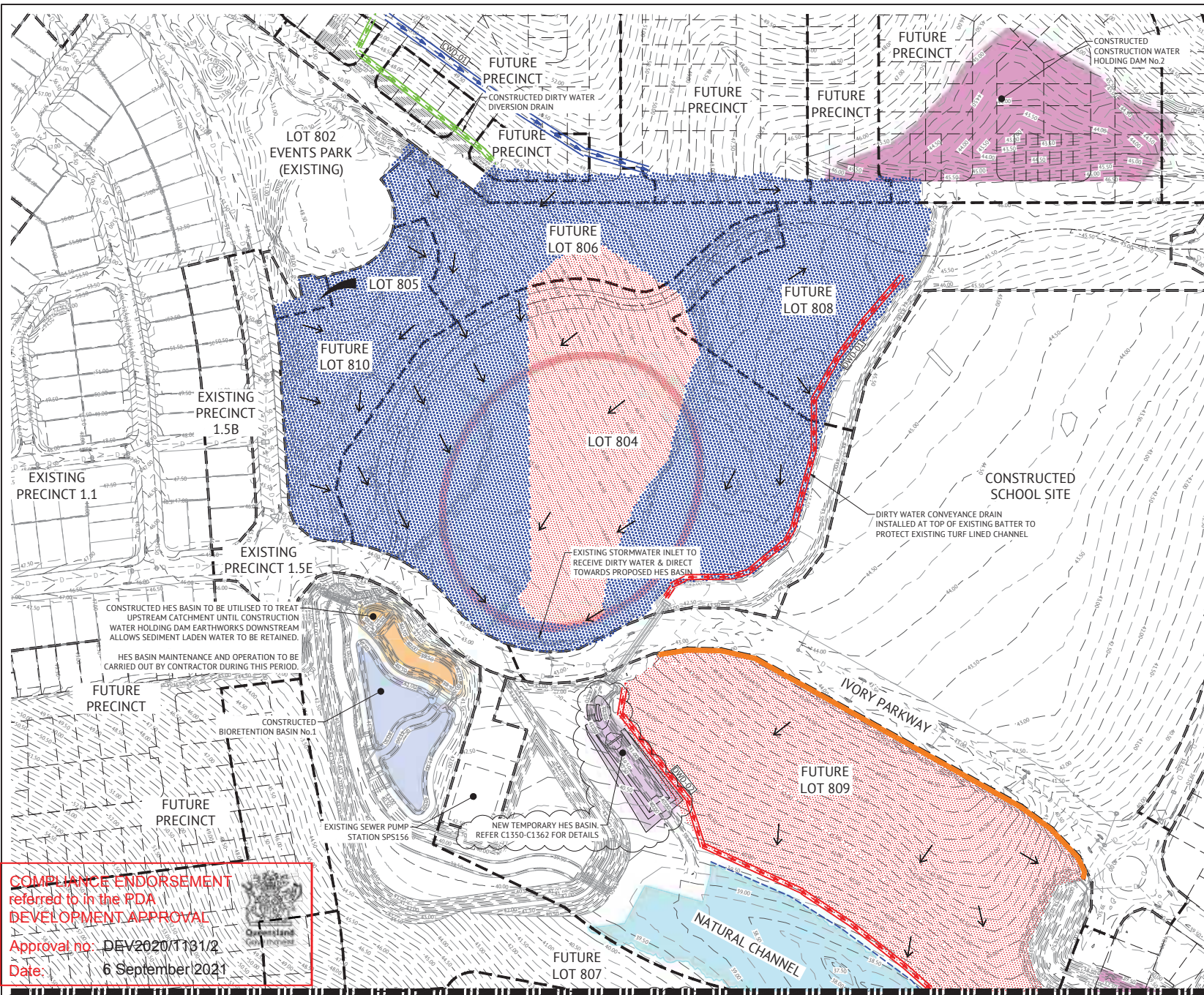


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DESIGNED: **K KIWANG**
CHECKED: **M MAJZNER**
PROJECT MANAGER: **S STEINHOFER**
PROJECT DIRECTOR: **PATRICK BRADY**
RPEQ 7112



| CLIENT | MIRVAC GROUP | JOB CODE | MIRO17-01 |
|-------------|--|--------------|-----------|
| PROJECT | EVERLEIGH SPORTS & REC PARK LOTS 804-805 - DRAWING SET 1 | SHEET NUMBER | C1300 |
| LOCATION | TEVIOT ROAD, GREENBANK | REV | B |
| SHEET TITLE | OVERALL EROSION & SEDIMENT CONTROL KEY PLAN | | |



- LEGEND - PROPOSED**
- PREVIOUSLY CLEARED AREA, DISTURBANCE DUE TO MINOR VEGETATION CLEARING AND GRUBBING
 - DISTURBED AREA, DISTURBANCE DUE TO NEW VEGETATION CLEARING AND GRUBBING
 - PROPOSED TEMPORARY HES BASIN
 - MULCH BERM IN ACCORDANCE WITH IECA STD DRG-MB-01
 - CLEAN WATER CONVEYANCE DRAIN. REFER DETAILS C1340
 - DIRTY WATER CONVEYANCE DRAIN. REFER DETAILS C1340
 - FLOW DIRECTION ARROW
- LEGEND - EXISTING**
- MAJOR CONTOURS (1.00m)
 - MINOR CONTOURS (0.50m)
 - DIRTY WATER DIVERSION BUND
 - CONSTRUCTED HES BASIN
 - CONSTRUCTED BIORETENTION BASIN
 - CONSTRUCTED CONSTRUCTION WATER HOLDING DAM
 - WATERCOURSE, STRICTLY NO ENTRY, OR RELEASE OF SEDIMENT LADEN WATER INTO THIS AREA.

INSTALLATION SEQUENCE PRE-CLEARING AND PRE-BULK EARTHWORKS

- STEP 1**
- INSTALL ALL WEATHER ENTRANCE / EXIT POINT(S).
 - SET UP SITE OFFICE AND WASTE STORAGE AREAS PARKING AREA FOR VEHICLES AND PLANT;
 - ERECT BARRIER FENCING FOR "NO GO" AND VEGETATION PROTECTION AREAS AS DIRECTED BY THE SITE SUPERINTENDENT.
 - MARK OUT THE LIMITS OF DISTURBANCE WITHIN THE SITES BOUNDARIES.
- STEP 2**
- CLEAR AREAS FOR AND CLEAN/DIRTY WATER DIVERSION DRAINS ONLY.
 - CONSTRUCT "DIRTY WATER & CLEAN WATER" CATCH DRAINS AND LINE AS PER DETAILS ON DRAWING C1340.

PHASING NOTES:
 PHASE 1 (PRE-CLEARING AND PRE BULK EARTHWORKS) UNDERTAKE ONLY WORKS RELATED TO THE PHASE 1 ESC INSTALLATION SEQUENCE.

- NOTES**
- REFER EROSION AND SEDIMENT CONTROL NOTES AND DETAILS DRAWINGS.
 - ALL FOOTPATHS RELEVANT TO PROPOSED SUB-PRECINCT ARE TO BE FULLY TURFED AS SOON AS PRACTICAL.
 - ALL CLEAN AND DIRTY WATER CATCH DRAINS ARE TO HAVE ROCK CHECK DAMS PLACED IN ACCORDANCE WITH IECA STD DWG. RCD-01.
 - THE CONSTRUCTION SITE ENTRANCE ROCK SHAKER PAD LOCATION TO BE DETERMINED BY THE SITE FOREMAN AND CONFIRMED BY SITE SUPERINTENDENT. LOCATION TO BE MARKED UP ON ESC PLANS ONCE CONFIRMED.

I CERTIFY THAT THIS EROSION AND SEDIMENT CONTROL DRAWING HAS BEEN DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL EROSION CONTROL ASSOCIATION GUIDELINES.

CHRIS HUTTON CPESC NO. 6241

COMPLIANCE ENDORSEMENT
 referred to in the PDA
DEVELOPMENT APPROVAL
 Approval no: DEV2020/1131/2
 Date: 6 September 2021

APPROVAL ISSUE - NOT FOR CONSTRUCTION

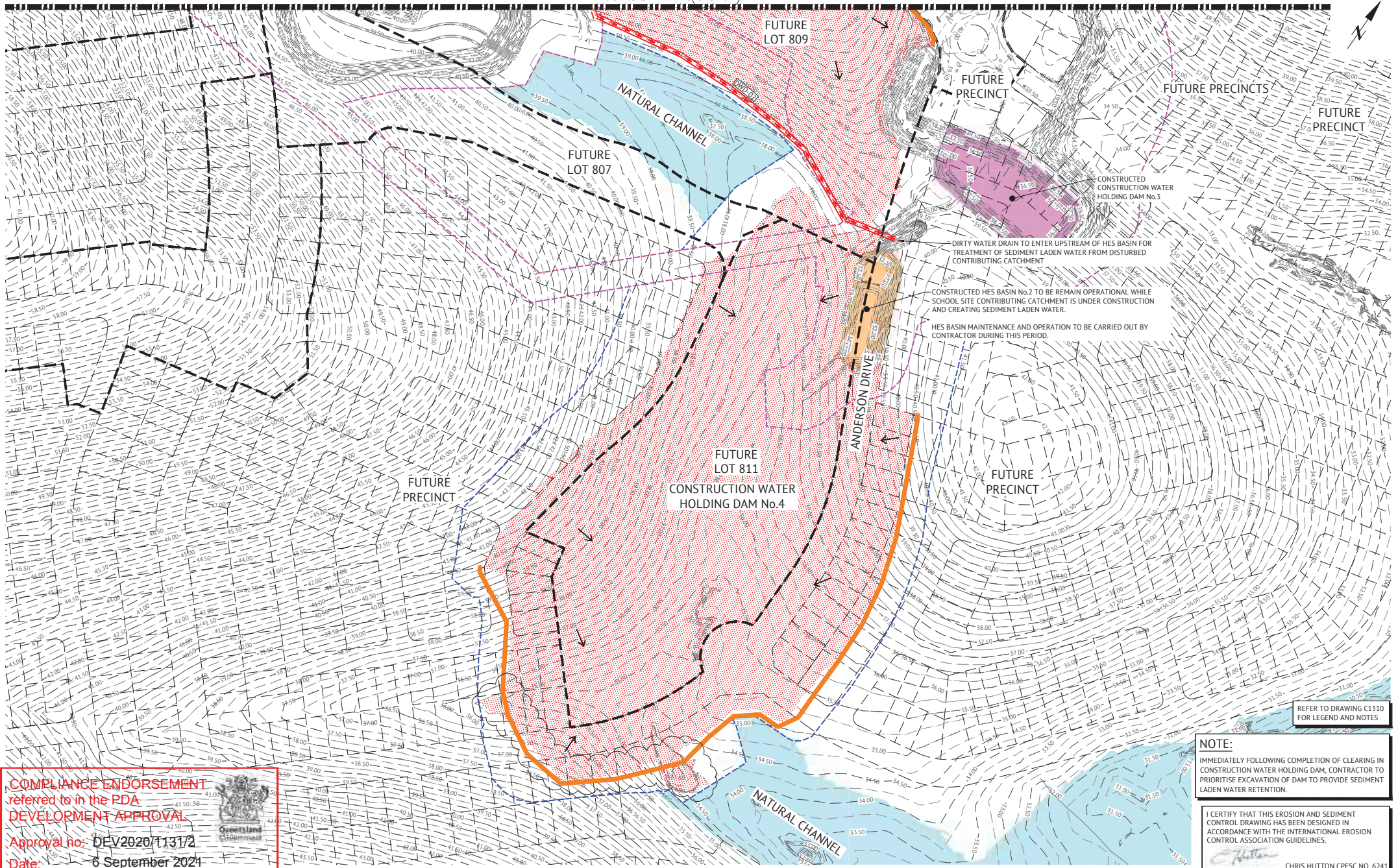
| DATE | REV | DESCRIPTION | REC | APP |
|------------|-----|---|-----|-----|
| 23/07/2021 | B | AMENDED LEGEND AND DRAWING REFERENCE AND ADDED PROPOSED HES BASIN HATCH | KK | PR |
| 28/05/2021 | A | ORIGINAL ISSUE | KK | PR |

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 CHECKED: M MAJZNER
 PROJECT MANAGER: S STEINHOFER
 PROJECT DIRECTOR: PATRICK BRADY
 SCALE: 1:1250 (A1)
 ORIGINAL SHEET SIZE A1


CLIENT: MIRVAC GROUP
 PROJECT: EVERLEIGH SPORTS & REC PARK LOTS 804-805 - DRAWING SET 1
 LOCATION: TEVIOT ROAD, GREENBANK
 SHEET TITLE: EROSION AND SEDIMENT CONTROL LAYOUT-CLEAR AND GRUB PHASE 1 OF 2

JOB CODE: MIR017-01
 SHEET NUMBER: C1310
 REV: B



COMPLIANCE ENDORSEMENT
 referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2020/1131/2
 Date: 6 September 2024



REFER TO DRAWING C1310 FOR LEGEND AND NOTES

NOTE:
 IMMEDIATELY FOLLOWING COMPLETION OF CLEARING IN CONSTRUCTION WATER HOLDING DAM, CONTRACTOR TO PRIORITISE EXCAVATION OF DAM TO PROVIDE SEDIMENT LADEN WATER RETENTION.

I CERTIFY THAT THIS EROSION AND SEDIMENT CONTROL DRAWING HAS BEEN DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL EROSION CONTROL ASSOCIATION GUIDELINES.

Chris Hutton
 CHRIS HUTTON CPESC NO. 6241

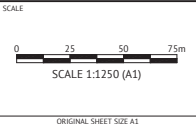
APPROVAL ISSUE – NOT FOR CONSTRUCTION

| DATE | REV | DESCRIPTION | DESIGNER | CHECKED | APP |
|------------|-----|--|----------|---------|-----|
| 25/07/2021 | B | AMENDED DISTURBED AREA, DRAWING REFERENCE AND MULCH BERM TO MATCH EARTHWORKS | KK | PR | |
| 28/05/2021 | A | ORIGINAL ISSUE | KK | PR | |
| | | | REC | APP | |



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DESIGNED: K KIWANG
 CHECKED: M MAJZNER
 PROJECT MANAGER: S STEINHOFER
 PROJECT DIRECTOR: *[Signature]*
 PATRICK BRADY RPEQ 7112

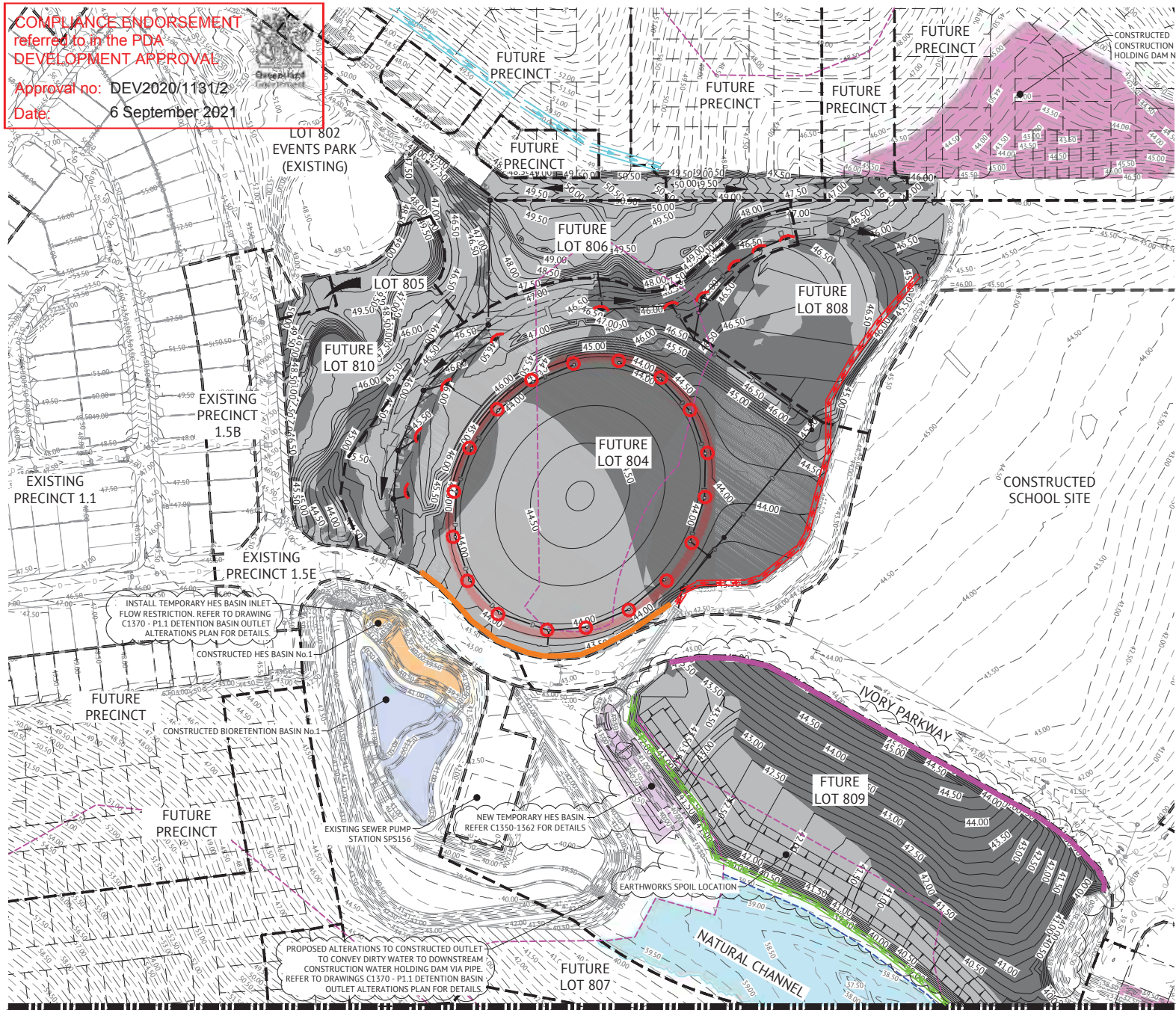


CLIENT: MIRVAC GROUP
 PROJECT: EVERLEIGH SPORTS & REC PARK LOTS 804-805 - DRAWING SET 1
 LOCATION: TEVIOT ROAD, GREENBANK
 SHEET TITLE: EROSION AND SEDIMENT CONTROL LAYOUT-CLEAR AND GRUB PHASE 2 OF 2

JOB CODE: MIR017-01
 SHEET NUMBER: C1311
 REV: B

COMPLIANCE ENDORSEMENT
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2020/113172
Date: 6 September 2021



LEGEND - PROPOSED

- EXTENT OF CUT
- EXTENT OF FILL
- GULLY INLET PROTECTION. REFER DETAIL IECA DRAWING ESC-03 FOR DETAILS.
- FIELD INLET PROTECTION. REFER DETAIL IECA DRAWING ESC-02 FOR DETAILS.
- FLOW DIRECTION OR RUNOFF
- MULCH BERM
- CLEAN WATER DIVERSION BUND
- DIRTY WATER DIVERSION BUND
- FINISHED MAJOR CONTOURS (0.50m)
- FINISHED MINOR CONTOURS (0.25m)
- PROPOSED TEMPORARY HES BASIN

LEGEND - EXISTING

- 12.0 MAJOR CONTOURS (1.00m)
- MINOR CONTOURS (0.50m)
- CONSTRUCTED MULCH BUND. BUILT DURING CLEARING AND GRUBBING PHASE
- CONSTRUCTED DIRTY WATER CONVEYANCE DRAIN. BUILT DURING CLEARING AND GRUBBING PHASE
- CONSTRUCTED CLEAN WATER CONVEYANCE DRAIN. BUILT DURING CLEARING AND GRUBBING PHASE
- CONSTRUCTED HES BASIN
- CONSTRUCTED BIORETENTION BASIN
- CONSTRUCTED CONSTRUCTION WATER HOLDING DAM
- WATERCOURSE. STRICTLY NO ENTRY, OR RELEASE OF SEDIMENT LADEN WATER INTO THIS AREA.

INSTALLATION SEQUENCE CLEARING AND BULK EARTHWORKS

- STEP 1**
ONCE CATCH DRAINS ARE ESTABLISHED, STRIP TOPSOIL FROM SITE AND STOCKPILE AS DIRECTED BY THE SITE SUPERINTENDENT. ENSURE DOWNSTREAM MULCH BUNDS AND UPSTREAM DIVERSION BANKS ARE OPERATIONAL AROUND STOCKPILE AREAS.
- STEP 2**
PERFORM BULK EARTHWORKS ON LEADS CUT TO FILL ON SITE IN ACCORDANCE WITH THE CIVIL BULK EARTHWORKS DRAWINGS.
- STEP 3**
ONCE FINAL CUT AND FILL BATTER LEVELS HAVE BEEN ACHIEVED, REMOVE REQUIRED TOPSOIL FROM STOCKPILED AREAS AND PLACE ON BATTERS AND OTHER DISTURBED AREAS AS DIRECTED BY THE SITE SUPERINTENDENT.
- STEP 4**
AS SOON AS POSSIBLE AFTER TOPSOIL HAS BEEN PLACED ON BATTERS AND OTHER DISTURBED AREAS, THESE AREAS SHOULD BE SEEDED OR HYDROMULCHED TO STABILISE. IF A RAINFALL EVENT IS FORECAST WHICH IS LIKELY TO CAUSE RUNOFF PRIOR TO STRIPPED AREAS BEING STABILISED, A COMBINATION OF MULCH AND BIDUM IS TO BE USED TO COVER EXPOSED AREAS.
- STEP 5**
ALL SEDIMENT AND EROSION CONTROL MEASURES ARE TO REMAIN IN PLACE AND BE MONITORED UNTIL CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED. ADDITIONAL EROSION CONTROLS ARE TO BE DIRECTED AS REQUIRED BY THE SUPERINTENDENT.

NOTES

1. REFER EROSION AND SEDIMENT CONTROL NOTES AND DETAILS DRAWINGS.
2. ALL FOOTPATHS RELEVANT TO PROPOSED SUB-PRECINCT ARE TO BE FULLY TURFED AS SOON AS PRACTICAL.
3. ALL CLEAN AND DIRTY WATER CATCH DRAINS ARE TO HAVE ROCK CHECK DAMS PLACED IN ACCORDANCE WITH IECA STD DWG RCD-01.

CERTIFY THAT THIS EROSION AND SEDIMENT CONTROL DRAWING HAS BEEN DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL EROSION CONTROL ASSOCIATION GUIDELINES.

CHRIS HUTTON CPESC NO. 6241

APPROVAL ISSUE - NOT FOR CONSTRUCTION

| DATE | REV | DESCRIPTION | REC | APP |
|------------|-----|---|-----|-----|
| 23/07/2021 | B | AMENDED EARTHWORKS CONTOURS, DRAWING REFERENCE AND SPOIL LOCATION AND ADDED HES BASIN | KK | PR |
| 28/05/2021 | A | ORIGINAL ISSUE | KK | PR |



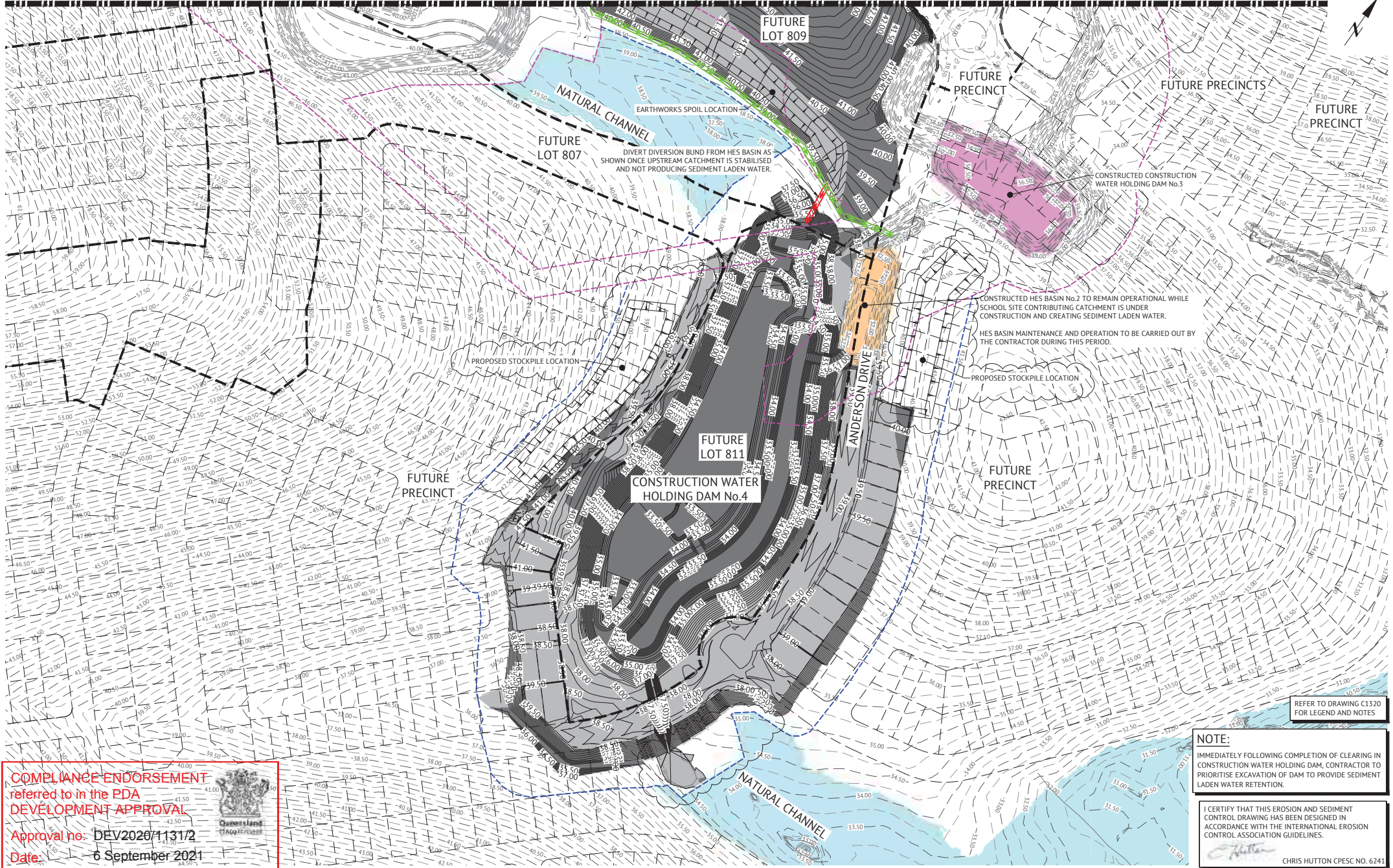
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PROJECT MANAGER: S STEINHOFER
PROJECT DIRECTOR: PATRICK BRADY
RPEQ 7112

SCALE
0 75 50 75m
SCALE 1:1250 (A1)
ORIGINAL SHEET SIZE A1


CLIENT: MIRVAC GROUP
PROJECT: EVERLEIGH SPORTS & REC PARK LOTS 804-805 - DRAWING SET 1
LOCATION: TEVIOT ROAD, GREENBANK
SHEET TITLE: EROSION AND SEDIMENT CONTROL LAYOUT-BULK EARTHWORKS PHASE 1 OF 2

JOB CODE: MIR017-01
SHEET NUMBER: C1320
REV: B



COMPLIANCE ENDORSEMENT
 referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2020/1131/2
 Date: 6 September 2021



REFER TO DRAWING C1320 FOR LEGEND AND NOTES

NOTE:
 IMMEDIATELY FOLLOWING COMPLETION OF CLEARING IN CONSTRUCTION WATER HOLDING DAM, CONTRACTOR TO PRIORITISE EXCAVATION OF DAM TO PROVIDE SEDIMENT LADEN WATER RETENTION.

CERTIFY THAT THIS EROSION AND SEDIMENT CONTROL DRAWING HAS BEEN DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL EROSION CONTROL ASSOCIATION GUIDELINES.

Chris Hutton
 CHRIS HUTTON CPESC NO. 6241

APPROVAL ISSUE – NOT FOR CONSTRUCTION

| DATE | REV | DESCRIPTION | REC | APP |
|------------|-----|--|-----|-----|
| 23/07/2021 | B | AMENDED EARTHWORKS, DRAWING REFERENCE AND CLEARING LINE, ADDED STOCKPILE LOCATIONS | KK | PR |
| 28/05/2021 | A | ORIGINAL ISSUE | KK | PR |



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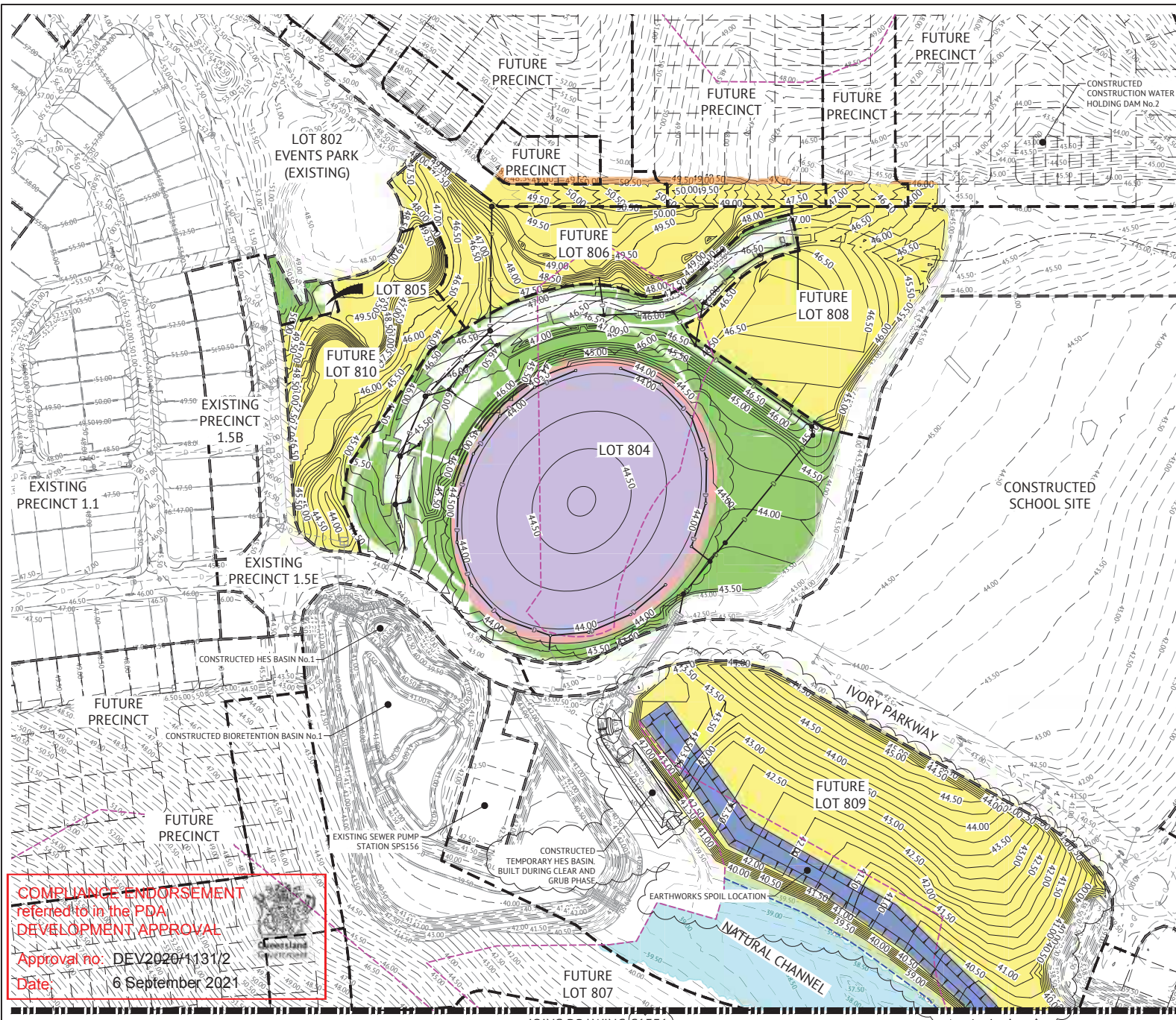
DESIGNED: **K KIWANG**
 CHECKED: **M MAJZNER**
 PROJECT MANAGER: **S STEINHOFER**
 PROJECT DIRECTOR: **PATRICK BRADY**

RPEQ 7112

SCALE
 0 25 50 75m
 SCALE 1:1250 (A1)
 ORIGINAL SHEET SIZE A1

CLIENT: **MIRVAC GROUP**
 PROJECT: **EVERLEIGH SPORTS & REC PARK LOTS 804-805 - DRAWING SET 1**
 LOCATION: **TEVIOT ROAD, GREENBANK**
 SHEET TITLE: **EROSION AND SEDIMENT CONTROL LAYOUT-BULK EARTHWORKS PHASE 2 OF 2**

JOB CODE: **MIRO17-01**
 SHEET NUMBER: **C1321**
 REV: **B**



- LEGEND - PROPOSED**
- TOPSOIL AND STABILISATION BY OTHER. REFER TO LANDSCAPE DRAWINGS FOR DETAILS
 - 300mm AFL SPORTS TOPSOIL. REFER TO LANDSCAPE DRAWINGS FOR DETAILS
 - TOPSOIL TRANSITION ZONE. REFER TO LANDSCAPE DRAWINGS FOR DETAILS
 - 100mm THICK TOPSOIL AND TURF
 - 50mm THICK TOPSOIL DRILL SEEDING
 - NO TOPSOIL AND POLYMER SPRAY
 - 100mm THICK TOPSOIL & DRILL SEED (TO BATTER)
 - HYDROMULCH
- LEGEND - EXISTING**
- TREE CLEARING STABILISATION. CONTRACTOR TO ENSURE THAT THE AREA IS ADEQUATELY STABILISED FOLLOWING DISTURBANCE INCLUDING FILLING OF ROOT BALL DEPRESSIONS TO ELIMINATE PONDING.
 - 12.0 FINISHED MAJOR CONTOURS (0.50m)
 - FINISHED MINOR CONTOURS (0.25m)
 - PROPOSED STORMWATER
 - MAJOR CONTOURS (1.00m)
 - MINOR CONTOURS (0.50m)
 - WATERCOURSE. STRICTLY NO ENTRY, OR RELEASE OF SEDIMENT LADEN WATER INTO THIS AREA.

- SERVICE TRENCH AND ROAD CONSTRUCTION SEQUENCE**
- STEP 6
PAVEMENT CONSTRUCTION
MAINTAIN SILT FENCES, AND CATCH DRAINS WHICH CONTROL SEDIMENTATION AND EROSION DURING PAVEMENT CONSTRUCTION.
- STEP 7
MAINTENANCE PERIOD
MAINTAIN CONTROL AND ESC AND VEGETATIVE TREATMENTS WHICH CONTROL SEDIMENTATION AND EROSION PRIOR TO THE ESTABLISHMENT OF STABILIZED GRASS COVER.
- STEP 8
ONCE STABILIZED GRASS COVER HAS OCCURRED HES SERVICING CATCHMENT CAN BE DECOMMISSIONED (CEASE OPERATION & MAINTENANCE)
- STEP 9
REMOVE CONSTRUCTION ENTRANCES.
- ADDITIONAL EROSION CONTROLS ARE TO BE ERECTED AND MONITORED AS REQUIRED BY THE SUPERINTENDENT

- NOTES**
1. REFER EROSION AND SEDIMENT CONTROL NOTES AND DETAILS DRAWINGS.
 2. ALL FOOTPATHS RELEVANT TO PROPOSED SUB-PRECINCT ARE TO BE FULLY TURRED AS SOON AS PRACTICAL.
 3. CONTRACTOR TO ENSURE THAT GRASS SEEDED AREAS SHOWN ON THIS PLAN ACHIEVE SUFFICIENT STRIKE AND COVERAGE IN ACCORDANCE WITH LOGAN CITY COUNCIL STANDARDS.

I CERTIFY THAT THIS EROSION AND SEDIMENT CONTROL DRAWING HAS BEEN DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL EROSION CONTROL ASSOCIATION GUIDELINES.

Chris Hutton
CHRIS HUTTON CPESC NO. 6241

COMPLIANCE ENDORSEMENT
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2020/131/2
Date: 6 September 2021

APPROVAL ISSUE - NOT FOR CONSTRUCTION

| DATE | REV | DESCRIPTION | DESIGNER | CHECKED | PROJECT MANAGER | PROJECT DIRECTOR |
|------------|-----|--|----------|---------|-----------------|------------------|
| 23/07/2021 | B | AMENDED STABILISATION, CONTOURS, DRAWING REFERENCE, SPOIL LOCATION, ADDED TREE STABILISATION | KK | KK | PK | PK |
| 28/05/2021 | A | ORIGINAL ISSUE | KK | KK | PK | PK |

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PROJECT MANAGER: S STEINHOFER
PROJECT DIRECTOR: *[Signature]*

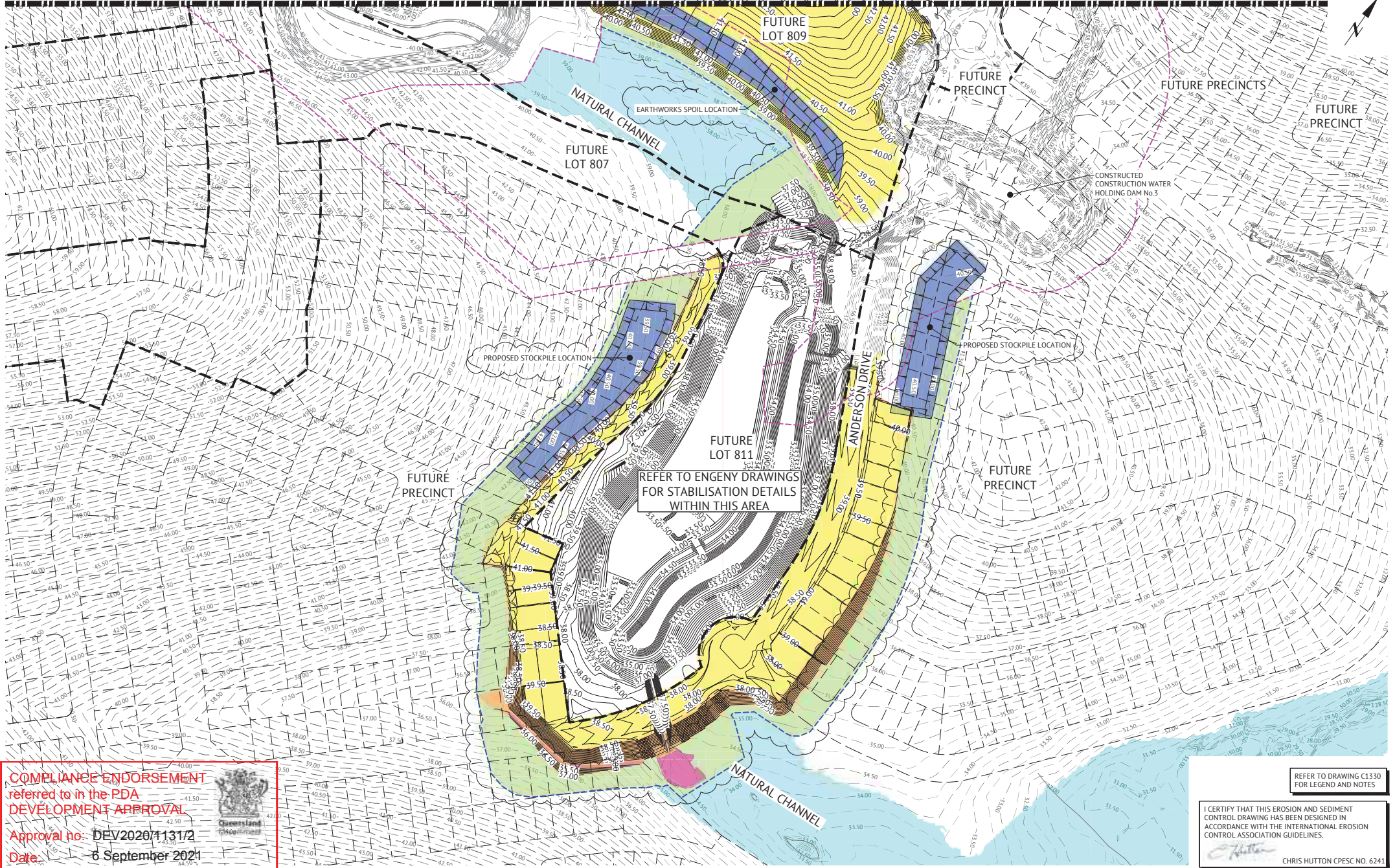
PATRICK BRADY RPEQ 7112

SCALE: 0 25 50 75m
SCALE 1:1250 (A1)
ORIGINAL SHEET SIZE A1

CLIENT: MIRVAC GROUP
PROJECT: EVERLEIGH SPORTS & REC PARK LOTS 804-805 - DRAWING SET 1
LOCATION: TEVIOT ROAD, GREENBANK
SHEET TITLE: EROSION AND SEDIMENT CONTROL LAYOUT - STABILISATION PHASE 1 OF 2


JOB CODE: MIR017-01
SHEET NUMBER: C1330
REV: B

JOINS DRAWING C1331



COMPLIANCE ENDORSEMENT
 referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: **DEV2020/1131/2**
 Date: **6 September 2021**



REFER TO DRAWING C1330
 FOR LEGEND AND NOTES

I CERTIFY THAT THIS EROSION AND SEDIMENT CONTROL DRAWING HAS BEEN DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL EROSION CONTROL ASSOCIATION GUIDELINES.

Chris Hutton
 CHRIS HUTTON CPESC NO. 6241

APPROVAL ISSUE – NOT FOR CONSTRUCTION

| DATE | REV | DESCRIPTION | REC | APP |
|------------|-----|---|-----|-----|
| 23/07/2021 | B | AMENDED CONTOURS AND SPOIL LOCATION; ADDED TREE STABILISATION AND STOCKPILE LOCATIONS | KK | PR |
| 28/05/2021 | A | ORIGINAL ISSUE | KK | PR |

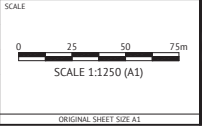
REVISIONS



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 PROJECT MANAGER: **S STEINHOFER**
 PROJECT DIRECTOR: **PATRICK BRADY**

RPEQ 7112



CLIENT: **MIRVAC GROUP**

PROJECT: **EVERLEIGH SPORTS & REC PARK LOTS 804-805 - DRAWING SET 1**

LOCATION: **TEVIOT ROAD, GREENBANK**

SHEET TITLE: **EROSION AND SEDIMENT CONTROL LAYOUT - STABILISATION PHASE 2 OF 2**

JOB CODE: **MIRO17-01**

SHEET NUMBER: **C1331**

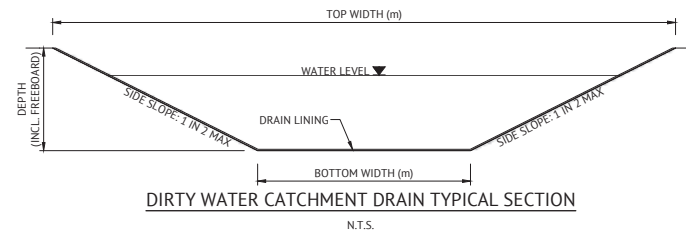
REV: **B**

DIRTY WATER CATCH DRAIN DETAILS

| DRAIN ID | DRAIN TYPE | SLOPE | LINING | BASE WIDTH (m) | TOP WIDTH (m) | DEPTH INCLUDING FREEBOARD (m) | SIDE SLOPE LENGTH |
|----------|------------|--------|-----------|----------------|---------------|-------------------------------|-------------------|
| CWD-01 | TYPE B | 1.00% | GEOFABRIC | 1.000 | 2.600 | 0.400 | 2.000 |
| DWD-01 | TYPE B | 1.00% | GEOFABRIC | 2.000 | 3.200 | 0.300 | 2.000 |
| DWD-02 | TYPE C | 10.00% | COIR TMC7 | 3.000 | 3.800 | 0.200 | 2.000 |

REFER TYPICAL SECTION BELOW FOR DETAILS
NOTE: CATCH DRAINS SIZE FOR Q₂ FLOW

| CATCH DRAIN SIZING | |
|--|---|
| $Q_y = (C_y \cdot I_{tc,y} \cdot A) / 360$ [Equation 1 (IECA 2008)] | |
| where: | |
| Q_y | PEAK FLOW RATE (m ³ /s) OF AVERAGE RECURRENCE INTERVAL (ARI) OF Y YEARS |
| C_y | RUNOFF COEFFICIENT (DIMENSIONLESS) FOR ARI OF Y YEARS |
| $I_{tc,y}$ | AVERAGE RAINFALL INTENSITY (mm/hr) FOR DESIGN DURATION OF TC HOURS AND ARI OF Y YEARS |
| A | AREA OF CATCHMENTS (ha) |
| 360 | CONVERSION FACTOR |
| FLOW HEIGHT IS SOLVED BY TRIAL AND ERROR USING THE THREE EQUATIONS BELOW AS PER IECA 2008. | |
| $Q = 1/n \cdot A \cdot R^{2/3} \cdot S^{1/2}$ [Equation 2 (IECA 2008)] | |
| where: | |
| Q | PEAK FLOW RATE (m ³ /s) OF AVERAGE RECURRENCE INTERVAL (ARI) OF Y YEARS |
| n | MANNING'S COEFFICIENT (UNITLESS) |
| A | CROSS SECTIONAL AREA OF FLOW (m ²), REFER TO EQUATION 3 |
| R | HYDRAULIC RADIUS (m), REFER TO EQUATION 4 |
| S | SLOPE OF ENERGY LINE, EQUAL TO SLOPE OF CHANNEL BED (m/m) |
| $A = (b + xy)y$ [Equation 3 (IECA 2008)] | |
| where: | |
| A | CROSS SECTIONAL AREA OF FLOW (m ²) |
| b | BASE WIDTH OF CHANNEL (m) |
| x | SIDE SLOPE OF CHANNEL |
| y | DEPTH OF FLOW IN CHANNEL (m) + REQUIRED 0.15m FREEBOARD |
| $R = ((b + xy)y) / (b + 2y(1 + x^2)^{1/2})$ [Equation 4 (IECA 2008)] | |
| where: | |
| R | HYDRAULIC RADIUS OF FLOW (m) |
| b | BASE WIDTH OF CHANNEL (m) |
| x | SIDE SLOPE OF CHANNEL |
| y | DEPTH OF FLOW IN CHANNEL (m) + REQUIRED 0.30m FREEBOARD |



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Chris Hutton
CHRIS HUTTON CPESC NO. 6241

APPROVAL ISSUE – NOT FOR CONSTRUCTION

| DATE | REV | DESCRIPTION | KK | PB |
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| 28/05/2021 | A | ORIGINAL ISSUE | | |



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CHECKED: **M MAJZNER**
PROJECT MANAGER: **S STEINHOFER**
PROJECT DIRECTOR: *[Signature]*
PATRICK BRADY RPEQ 7112

SCALE: **NTS**
ORIGINAL SHEET SIZE: **A1**

CLIENT: **MIRVAC GROUP**
PROJECT: **EVERLEIGH SPORTS & REC PARK LOTS 804-805 - DRAWING SET 1**
LOCATION: **TEVIOT ROAD, GREENBANK**
SHEET TITLE: **EROSION AND SEDIMENT CONTROL NOTES AND DETAILS - SHEET 1 OF 3**

JOB CODE: **MIR017-01**
SHEET NUMBER: **C1340**
REV: **A**

EROSION & SEDIMENT CONTROL NOTES

1. LOCATION & LEVELS OF ALL EXISTING SERVICES TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
2. REFER EARTHWORKS DRAWINGS FOR ADDITIONAL NOTES.
3. ALL TRENCHES, FOOTPATH EXCAVATIONS & STOCKPILES TO BE PROTECTED BY TEMPORARY SEDIMENT FENCES UNTIL 80% GRASS COVERAGE IS ACHIEVED TO DISTURBED AREAS.
4. EVERY PRECAUTION IS TO BE TAKEN TO PREVENT THE TRANSPORT OF SILT INTO THE NEWLY LAID STORMWATER PIPES THAT ARE CONNECTED TO THE DOWNSTREAM PIPE SYSTEMS, AND ANY EXISTING OPEN CHANNELS.
5. THESE NOTES SHALL BE READ IN CONJUNCTION WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
6. THE EROSION AND SEDIMENT CONTROL WORKS SHALL COMPLY WITH THE REQUIREMENTS OF THE LOCAL AUTHORITIES EROSION AND SEDIMENT CONTROL STANDARDS.
7. THE CONTRACTOR SHALL TAKE ALL REASONABLE AND PRACTICABLE MEASURES TO:
 - ALLOW STORMWATER TO PASS THROUGH THE SITE IN A CONTROLLED MANNER AND AT NON EROSIIVE FLOW VELOCITIES;
 - MINIMISE SOIL EROSION FROM WATER AND WIND;
 - MINIMISE ADVERSE EFFECTS OF SEDIMENT RUN-OFF;
 - MINIMISE OR PREVENT ENVIRONMENTAL HARM ASSOCIATED WITH DISCHARGES FROM THE SITE (E.G. THE EFFECTS OF SEDIMENTATION ON THE ENVIRONMENTAL VALUES OF RECEIVING WATERS); AND
 - ENSURE THAT THE VALUE AND USE OF RESIDENTIAL PROPERTIES ADJACENT TO THE DEVELOPMENT (SUCH AS DRAINAGE AND ROADS) ARE NOT DIMINISHED AS A RESULT OF THE MIGRATION OF SEDIMENT FROM THE DEVELOPMENT.
4. THE CONTRACTOR SHALL APPOINT AN APPROPRIATELY EXPERIENCED PERSON TO BE MADE RESPONSIBLE FOR IMPLEMENTATION OF THE ESC.
5. ALL ESC MEASURES SHALL BE INSPECTED:
 - AT LEAST DAILY (WHEN WORK IS OCCURRING ON SITE).
 - AT LEAST WEEKLY (WHEN WORK IS NOT OCCURRING ON SITE).
 - WITHIN 24 HOURS OF EXPECTED RAINFALL.
 - WITHIN 18 HOURS OF RAINFALL OCCURRING.
6. MAINTENANCE OF ESC MEASURES SHALL OCCUR TO ENSURE THEY ARE OPERATING EFFICIENTLY AND IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:

| ESC MEASURES | MAINTENANCE TRIGGER | TIME FRAME FOR UNDERTAKING MAINTENANCE |
|--------------|---|--|
| ESC MEASURES | WHEN SETTLED SEDIMENT VOLUME EXCEEDS 25% OF THE CAPACITY OF THE ESC MEASURE | BY THE END OF THE DAY |

7. INSTALL DIVERSION CATCH DRAINS UPSTREAM OF, AND SILT FENCE DOWNSTREAM OF, STOCKPILES.
8. STOCKPILES ARE TO BE LOCATED AWAY FROM EROSION HAZARD AREAS SUCH AS DRAINAGE LINES AND STEEP SLOPES.
9. STOCKPILES ARE TO BE PROTECTED FROM EROSION BY THE WIND.
10. ADEQUATE SUPPLIES OF EMERGENCY MAINTENANCE MATERIALS, INCLUDING (BUT NOT LIMITED TO) TIE WIRE, STAKES, FILTER CLOTH, WIRE MESH AND CLEAN GRAVEL SHOULD BE AVAILABLE ON SITE.
11. ESC MAINTENANCE ACTIVITIES ARE TO BE RECORDED IN AN ON-SITE REGISTER. THE REGISTER IS TO BE MAINTAINED FOR THE DURATION OF THE WORKS AND IS TO BE MADE AVAILABLE TO THE SUPERINTENDENT.
12. DISTURBED AREA ARE TO BE STABILISED AS SOON AS POSSIBLE ON COMPLETION OF BULK EARTHWORKS. LOTS TO BE STABILISED FOLLOWING RESPREADING OF TOPSOIL.
13. SUPPLEMENTARY ESC MEASURES SHALL BE DIRECTED BY THE SUPERINTENDENT.

COMPLIANCE ENDORSEMENT
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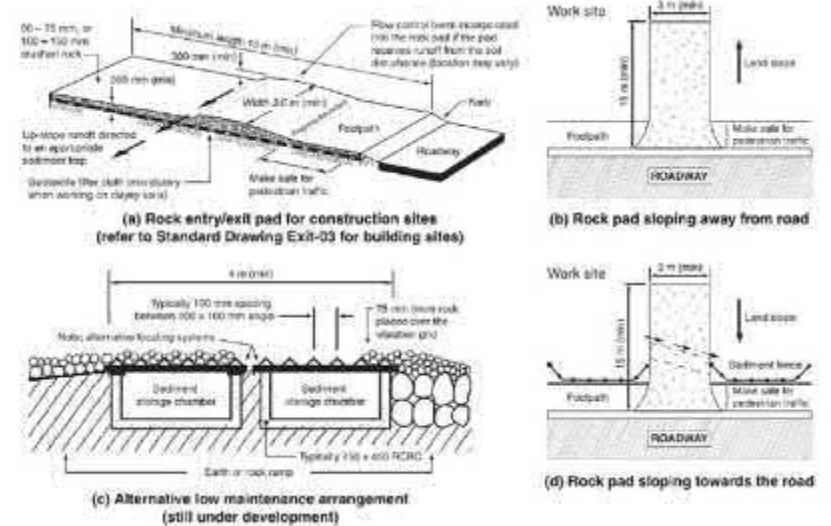


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Date: 6 September 2021

RECOMMENDED DISCHARGE STANDARD FOR DEWATERING OPERATIONS

| SITE CONDITIONS | DISCHARGE WATER QUALITY STANDARD |
|--|--|
| POST-STORM DEWATERING OF WET SEDIMENT BASINS | 90 PERCENTILE TOTAL SUSPENDED SOLIDS (TSS) CONCENTRATION NOT EXCEEDING 50mg/L pH 6.5 TO 8.5 |



CONSTRUCTION ENTRANCE DETAIL

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION AND EXTENT. IF THERE ARE ANY QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, MATERIAL TYPE, OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.
2. WHEN SELECTING THE LOCATION OF A COMPOST FILTER BERM TO THE MAXIMUM OF DESIRE PRACTICABLE, ENSURE THE BERM IS LOCATED:
 - (i) TOTALLY WITHIN THE PROPERTY BOUNDARIES;
 - (ii) BEHIND A LINE OF FORESHORE ALVEATION (PREFERRED) BUT NOT ALWAYS PRACTICAL;
 - (iii) AWAY FROM AREAS OF CONCENTRATED FLOW;
 - (iv) AWAY FROM AREAS OF CONCENTRATED FLOW;
3. ENSURE THE BERM IS INSTALLED IN A MANNER THAT AVOIDS THE:
 - (i) CONCENTRATION OF FLOW ALONG THE BERM OR THE UNDESIRABLE DISCHARGE OF WATER AWAY FROM THE SIDE OF THE BERM;
 - (ii) ENSURE THE BERM HAS BEEN PLACED ALONG THE CONTOUR SUCH THAT WATER WILL FLOW EVENLY ALONG THE LENGTH OF THE BERM;
 - (iii) ENSURE BOTH ENDS OF THE BERM ARE ADEQUATELY TYPED UP THE SLOPE TO PREVENT FLOW BYPASSING PRIOR TO WATER PASSING OVER THE BERM;
 - (iv) ENSURE 100% CONTACT WITH THE SOIL SURFACE;
 - (v) WHERE SPECIFIED, TAKE APPROPRIATE STEPS TO VENTILATE THE BERM;

MAINTENANCE

1. DURING THE CONSTRUCTION PERIOD, SUBJECT TO THE BEST AT LEAST WEEKLY, AND AFTER ANY SIGNIFICANT RAIN, MAINT NECESSARY REPAIRS IMMEDIATELY.
2. REPAIR OR REPLACE ANY DAMAGED SECTIONS.
3. WHEN REPAIRS REQUIRED, ALWAYS RESTORE THE SYSTEM TO ITS ORIGINAL CONFIGURATION UNLESS AN AMENDED PLAN IS REQUIRED OR SPECIFIED.
4. REMOVE ACCUMULATED SEDIMENT IF THE SEDIMENT DEPOSIT EXCEEDS A DEPTH OF 100mm OR TO THE HEIGHT OF THE BERM.
5. DISPOSE OF SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

REMOVAL (IF REQUIRED)

1. WHEN A DISTURBED AREA UP-SLOPE OF THE BERM ARE SIGNIFICANTLY STABILISED TO RESTRAIN EROSION, THE BERM MAY BE REMOVED.
2. REMOVE ANY COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.
3. REHABILITATE/REVEGETATE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.

Figure 1 - Typical profile of a compost filter berm

| Land slope | Max spacing |
|------------|-------------|
| < 2% | 20 m |
| 4% | 20 m |
| 10% | 20 m |
| 20% | 15.0 m |
| 30% | 15.0 m |

MULCH BUND DETAIL

I CERTIFY THAT THIS EROSION AND SEDIMENT CONTROL DRAWING HAS BEEN DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL EROSION CONTROL ASSOCIATION GUIDELINES.

Chris Hutton
CHRIS HUTTON CPES NO. 6241

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PROJECT DIRECTOR: *[Signature]*

PATRICK BRADY RPEQ 7112

SCALE: **NTS**
ORIGINAL SHEET SIZE: **A1**

CLIENT: **MIRVAC GROUP**

PROJECT: **EVERLEIGH SPORTS & REC PARK LOTS 804-805 - DRAWING SET 1**

LOCATION: **TEVIOT ROAD, GREENBANK**

SHEET TITLE: **EROSION AND SEDIMENT CONTROL NOTES AND DETAILS - SHEET 2 OF 3**

JOB CODE: **MIRO17-01**

SHEET NUMBER: **C1341**

REV: **A**

ROLES AND RESPONSIBILITIES

| ROLE | RESPONSIBILITY |
|---------------------------|---|
| PROJECT MANAGER | <ul style="list-style-type: none"> • OVERALL RESPONSIBILITY OF ESC IMPLEMENTATION • NOTIFY THE ENVIRONMENTAL MANAGER IMMEDIATELY OF ANY NON-COMPLIANCE WITH ESCP • ENSURE THE PROMPT IMPLEMENTATION OF MEASURES TO MITIGATE EROSION AND SEDIMENT GENERATION |
| SITE SUPERVISOR / FOREMEN | <ul style="list-style-type: none"> • MONITOR DAILY RAINFALL • NOTIFY ENVIRONMENTAL ADVISOR/CONSULTANT WHEN RUNOFF GENERATING RAINFALL OCCURS IN THE PREVIOUS 24 HOURS • MAINTAIN CURRENT RECORDS OF RAINFALL, STORAGE VOLUMES, WATER QUALITY, TREATMENT PRACTICES, DISCHARGE VOLUMES (AS APPROPRIATE) • INSTALLATION AND MAINTENANCE OF ESC |
| ENVIRONMENTAL MANAGER | <ul style="list-style-type: none"> • PROVIDE DESIGN INFORMATION AS REQUIRED • CONDUCT IN-SITU MONITORING (AS REQUIRED) • COLLECT AND SUBMIT SAMPLES TO LABORATORY (AS REQUIRED) • COLLATE RESULTS AND PREPARE REPORTS (AS REQUIRED) • CONDUCT SITE INSPECTIONS AND AUDITS (AS REQUIRED) • INSPECT ESC INSTALLATION AND MAINTENANCE • INSPECT OFFSITE IMPACTS AND MANAGEMENT • PROVIDE ADVICE REGARDING ESC SITE IMPROVEMENT (AS REQUIRED) |
| ALL PERSONNEL | <ul style="list-style-type: none"> • REPORT ANY DAMAGE TO ESC DEVICES AND ANY POTENTIAL OR ACTUAL ENVIRONMENTAL HARM IN LINE WITH DUTY TO NOTIFY UNDER THE REQUIREMENTS OF THE ENVIRONMENTAL PROTECTION ACT 1994 |

CORRECTIVE AND PREVENTATIVE ACTION

AN ENVIRONMENTAL INCIDENT WITH RESPECT TO THE ESCP IS DEFINED AS ANY OCCURRENCE WHERE SEDIMENT IS RELEASED FROM THE SITE, WHETHER CONTROLLED OR UNCONTROLLED, OR WHERE STORM WATER IS RELEASED (CONTROLLED) FROM SITE WHICH DOES NOT MEET THE WATER QUALITY REQUIREMENTS.

ALL INCIDENTS AND NON-CONFORMANCES ARE TO BE REPORTED, INVESTIGATED AND CORRECTED IN ACCORDANCE WITH THE ESCP TO ENSURE EFFECTIVE SOIL AND WATER QUALITY MANAGEMENT PRACTICES AT ALL TIMES.

BEST PRACTICE SITE MANAGEMENT REQUIRES ALL ESC MEASURES TO BE INSPECTED BY THE CONTRACTORS NOMINATED REPRESENTATIVE AT LEAST DAILY WHEN RAIN IS OCCURRING, WITHIN 24 HOURS PRIOR TO EXPECTED RAINFALL, AND WITHIN 18 HOURS OF A RAINFALL EVENT OF SUFFICIENT INTENSITY AND DURATION TO CAUSE ONSITE RUNOFF (IECA, 2008). SUCH INSPECTIONS MUST CHECK:

- **DAILY SITE INSPECTIONS** (DURING PERIODS OF RUNOFF PRODUCING RAINFALL)
 - ALL DRAINAGE, EROSION AND SEDIMENT CONTROL MEASURES
 - OCCURRENCES OF EXCESSIVE SEDIMENT DEPOSITION (WHETHER ON-SITE OR OFF-SITE)
 - ALL SITE DISCHARGE POINTS (INCLUDING DEWATERING ACTIVITIES AS APPROPRIATE)
- **WEEKLY SITE INSPECTIONS** (EVEN IF WORK IS NOT OCCURRING ON-SITE)
 - ALL DRAINAGE, EROSION AND SEDIMENT CONTROL MEASURES
 - OCCURRENCES OF EXCESSIVE SEDIMENT DEPOSITION (WHETHER ON-SITE OR OFF-SITE)
 - OCCURRENCES OF CONSTRUCTION MATERIALS, LITTER OR SEDIMENT PLACED, DEPOSITED, WASHED OR BLOWN FROM THE SITE, INCLUDING DEPOSITION BY VEHICULAR MOVEMENTS.
 - LITTER AND WASTE RECEPTORS
 - OIL, FUEL AND CHEMICALS STORAGE FACILITIES
- **PRIOR TO ANTICIPATED RUNOFF PRODUCING RAINFALL**
 - ALL DRAINAGE, EROSION AND SEDIMENT CONTROL MEASURES
 - ALL TEMPORARY FLOW DIVERSION AND DRAINAGE WORKS
- **FOLLOWING RUNOFF PRODUCING RAINFALL**
 - ALL DRAINAGE, EROSION AND SEDIMENT CONTROL MEASURES
 - OCCURRENCES OF EXCESSIVE SEDIMENT DEPOSITION (WHETHER ON-SITE OR OFF-SITE)
 - OCCURRENCES OF CONSTRUCTION MATERIALS, LITTER OR SEDIMENT PLACED, DEPOSITED, WASHED OR BLOWN FROM THE SITE, INCLUDING DEPOSITION BY VEHICULAR MOVEMENTS.

COMPLIANCE ENDORSEMENT
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DEVELOPMENT APPROVAL



Approval no: DEV2020/1131/2
Date: 6 September 2021

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Chris Hutton
CHRIS HUTTON CPESC NO. 6241

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PROJECT DIRECTOR
Patrick Brady
PATRICK BRADY RPEQ 7112

SCALE
ORIGINAL SHEET SIZE A1

| | | | |
|-------------|--|--------------|------------------|
| CLIENT | MIRVAC GROUP | JOB CODE | MIR017-01 |
| PROJECT | EVERLEIGH SPORTS & REC PARK LOTS 804-805 - DRAWING SET 1 | SHEET NUMBER | C1342 |
| LOCATION | TEVIOT ROAD, GREENBANK | REV | A |
| SHEET TITLE | EROSION AND SEDIMENT CONTROL NOTES AND DETAILS - SHEET 3 OF 3 | | |

Everleigh



Environmental Pre-Start Checklist

Attachment 10

Site/Project Induction

| | | | |
|----------------------|--|----------------|--|
| Inductee Name | | Project | |
| Position | | | |

| Coronavirus COVID-19 Questions: | Y | N |
|---|--------------------------|--------------------------|
| I declare that I have not returned from any overseas country in the last 14 days. | <input type="checkbox"/> | <input type="checkbox"/> |
| I declare that in the last 14 days I have not been in contact with a confirmed case of Covid-19 and do not have any symptoms related to COVID-19. | <input type="checkbox"/> | <input type="checkbox"/> |
| I agree that Shadforth COVID -19 preventative measures have been explained to me and I will always adhere to these measures. | <input type="checkbox"/> | <input type="checkbox"/> |

| The Following site requirements have been explained to me: | Y | N | NA |
|---|--------------------------|--------------------------|--------------------------|
| Onsite Communication Procedures – UHF Channels on this site - | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Daily Pre-start Meeting, Sign in Requirements, Toolbox Talks and Working Hours | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| VMP, Haul Roads and Parking procedures onsite | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Emergency and First Aid Procedures and Locations | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Incident, Injury and Hazard procedures and reporting requirements | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Site Amenities (Office, Crib room, Toilets, Clean Water) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Site Security Procedures | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Safe Work Method Statements- Reviewing and Understanding prior to works | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| PPE Requirements | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| High Risk Activities – Procedures and Permits (Confined Space, Hot Works, Excavation and Maintenance) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Plant, Vehicles, Equipment and Machinery (VOC, pre-starts, minimum requirements, maintenance procedure, mobile phones, seat-belts, quick-hitches, vehicle recovery) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Site Specific Hazards and No-Go Zones | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Site Specific Environmental Issues, Waste and Stormwater Management and Erosion and Sediment Controls | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Site Specific Cultural Heritage | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| Inductee Acknowledgment | | | |
|---|--|---------------------|--|
| I acknowledge that I have completed the Online General Workplace Induction and HIRAC training paper, along with having participated in the project specific induction and confirm that I understand the requirements, procedures and standards expected of me and agree to work safely and comply with the site's standards and procedures at all times and all information provided is true and correct. | | | |
| Signature | | Date | |
| Employer | | Phone Number | |

Shadforth Representative to Complete this Section

| Shadforth Representative - Verifications | Y | N | NA |
|---|--------------------------|--------------------------|--------------------------|
| Online General Workplace induction and Construction Card- compliant and verified on Rapid | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| High Risk Licences, Tickets and VOC's uploaded and verified on Rapid | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Person has the correct PPE for works being carried out | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Site Specific VOC completed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Shadforth Representative Acknowledgment

I confirm that I am authorised by Shadforth, to provide this induction and I have explained in detail, the items outlined above. I have checked/verified the inductee has completed the induction requirements to enter/work on this project site.

| | | | | | |
|-------------|--|------------------|--|-------------|--|
| Name | | Signature | | Date | |
|-------------|--|------------------|--|-------------|--|

Everleigh



Environmental Pre-Start Checklist

Attachment II

Bushfire Hazard Assessment Management Plan

Bushfire Hazard Assessment and **Fire** Management Plan

Teviot Road, Greenbank

138-168 Teviot Road, 456-520 Greenbank Road & 96-102 Brightwell Street, Greenbank



Prepared for

Mirvac Qld

By

Rob Friend & Associates Pty Ltd

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2016/768

Date: 2 June 2017



November 2016

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| | | | Name | Date |
| 01 | Rob Friend | Draft | Rob Friend, Director, RF&A Pty. Ltd. | 3 November 2016 |
| 02 | Rob Friend | FINAL | Rob Friend, Director, RF&A Pty. Ltd. | 4 November 2016 |
| | | | | |
| | | | | |

This document has been prepared solely for the benefit of Mirvac Qld, its sub-consultants and Economic Development Queensland (EDQ) is issued in confidence for the purpose only for which it is supplied which is to provide information with regard to bushfire hazards, mitigation and management within the properties identified in this document. Unauthorised use of this document in any form whatsoever is prohibited. No liability is accepted by Rob Friend & Associates Pty Ltd or any employee, contractor or sub-consultant of this company with respect to its use by any other person.

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Photograph cover page – Photograph of a typical Acacia regrowth area covering much of the property.



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Introduction

This Bushfire Hazard Assessment and Fire Management Plan has been prepared for Mirvac Qld with respect to the development application over Area 1 and the immediate vicinity as identified in Figure 1 (see Appendix A). The footprint of Area 1 is located within Mirvac's Greenbank land holding as identified below:

- J 96-102 Brightwell Street, Greenbank described as Lot 205 on RP845844 (15.9284 ha.),
- J 138-168 Teviot Road, Greenbank, described as Lot 434 on RP845844 (400.8 ha), and
- J 456-520 Greenbank Road, Greenbank, described as Lot 9 on S312355 (64.75 ha).

This fire management plan seeks to provide a number of bushfire management actions with regard to Area 1 of the development.

Site description

General location

The property is located to the east of Teviot Road, and north of Greenbank Road, Greenbank. To the east is a Council managed bushland park, Wearing Park, along with rural residential allotments primarily accessible from Greenhill Road, Greenbank. To the north are rural and rural residential allotments around Brightwell Street and Campbell Road. Rural properties also abut the site along its southern boundary and to the west is Teviot Road.

The property has had a history of cattle use prior to the settlement and transfer of land to Mirvac Qld. It is noted that balance areas of the property awaiting future development will continue to be managed for rural residential/agricultural purposes including the grazing of cattle.

Area 1 is located in the south-western portion of the site abutting Teviot Road and Greenbank Road and within an area which has been previous cleared for cattle agistment and as such within an area of low bushfire hazard.

Access to the development will be via a new road from the existing Teviot Road / Pub Lane, Greenbank intersection.

Topography

The landform within this area generally slopes from west to east.

Existing Vegetation

Area 1 is located within a portion of the site that is predominantly clear pastoral land. Such pastoral land is defined as the area to the south and west of the EPBC excision boundary as shown on Figure 2 of Appendix A.

The pastoral areas within the EPBC excision boundary can be classed as grassland, however depending on rainfall and the commencement of bulk earth works within the property, this grassland may grow to become a hazard.

The hazards presented by this grassland, if it is permitted to grow, prior to being developed maybe sufficient to involve the adjacent open forests or other bushlands on neighbouring properties as well as produce significant quantities of

smoke which could be a safety hazard for vehicles on the surrounding road network. Notwithstanding the above, the re-stocking of the property with beef grazing cattle supplemented by slashing (where required) will assist in managing the abovementioned hazards.

Development proposal

The proposal is to undertake the development of an area identified on the proposal plans as "Area 1". Area 1 is located in the western portion of 138-168 Teviot Road, Greenbank (Lot 434 on RP845844 covering an area of 400.8 hectares) (see Figure 1 of Appendix A).

Area 1 consists of two types of residential uses, Residential – Standard and Residential – Interface Lots – South. In addition to the two residential areas, Area 1 will also see part of the Regional Open space/Recreation area established in the eastern and lower portions of this area.

It is noted that the proposal will also see the establishment of a 100-metre-wide maintained buffer around the perimeter of the Area 1 footprint and as such no residential lot will be within 100 metres of any area of mapped potential bushfire hazard area.

All hazardous vegetation within the EPBC excision boundary will be cleared on commencement of site works in Area 1. This clearing is addressed in technical reporting by Saunders Havill Group in support of the Area 1 development application.

Bushfire Hazard Assessment

Existing

The Natural Hazards Risks and Resilience - Bushfire hazard area mapping provided by the State Planning Policy of April 2016, maps areas of High and Medium potential bushfire intensity over some of the area over which Area 1 will be developed (see Figure 2).

Post Clearing

The post clearing area within the EPBC excision boundary can be classified as grassland. Therefore, this area is considered to be an area of low bushfire risk.

However, areas of medium and high potential bushfire intensity remain outside the EPBC excision area after the EPBC excision area has been cleared. A 100m potential hazard buffer is required from such medium and high potential bushfire intensity areas. The post clearing medium and high potential bushfire intensity areas and buffers are shown on Figure 3 of Appendix A.

Figure 3 shows that all residential allotments in Area 1 are outside the potential hazard buffer and are therefore classified as having a low bushfire risk, or not in a bushfire prone area.

Bushfire Management Plan

No residential allotments in Area 1 are in a bushfire prone area in the post clearing scenario. Therefore, no residential allotments within Area 1 will be required to be assessed against the Australian Standard Building in a Bushfire Prone Area, AS3959-2009 once such clearing works are complete.

The following land management specifications have been made to ensure the management of the area within the EPBC excision boundary is such that this area remains as an area of low bushfire hazard.

1. The 100-metre-wide buffer is to be maintained by slashing at regular intervals such that the vegetation within the buffer is maintained at all times, less than 200 mm in height.
2. A 6-metre-wide fire trail is to be established along the outer edge of the 100-metre-wide buffer and setback from that edge by a maximum of 10 metres. This space allows for effective zone within which to conduct any bushfire suppression operations by Emergency Services if and when required.
3. The fire trail is to have access for Emergency Service and maintenance contractors from: -
 - a. Teviot Road via a locked gate
 - b. Greenbank Road via a locked gate
 - c. At least four points from the internal road network including from the end of the main boulevard road. This point is to ensure access is directly available to the north and east of this dead end of the boulevard roadway.
4. In the event of a bushfire commencing within the properties owned by Mirvac Qld, the Property Caretaker is to ensure the locked gates which provide access from Teviot and Greenbank Roads are unlocked. However, a key is to be provided to the Greenbank Rural Fire Brigade for their purpose and to enable access at all times for any purpose involving the management of bushfire within the whole property.

Appendix A – Figures

Figure 1 – Overall Land use plan including Area 1



Legend

- SITE BOUNDARY
- CADASTRE BOUNDARIES
- - - AREA 1 BOUNDARY
- - - GREATER FLAGSTONE UDA BOUNDARY
- EXISTING EASEMENTS
- RAIL CORRIDOR
- POTENTIAL TRAIN STATION ¹
- TRUNK CONNECTOR ROAD NETWORK
- NEIGHBOURHOOD CONNECTOR ROAD NETWORK
- RESIDENTIAL ACCESS STREETS

Land Uses

- RESIDENTIAL - STANDARD LOTS
- RESIDENTIAL - INTERFACE LOTS - NORTH
- RESIDENTIAL - INTERFACE LOTS - SOUTH
- NEIGHBOURHOOD CENTRE
- DISTRICT CENTRE (EXTERNAL) ¹
- COMBINED REGIONAL RECREATION AND REGIONAL SPORTS PARK
- INDICATIVE LOCATIONS OF MAJOR LINEAR PARKS
- CONSERVATION PARKLAND
- POTENTIAL ECO LOT PRECINCT (SUBJECT TO FURTHER ASSESSMENT)
- INDICATIVE LOCATIONS OF NEIGHBOURHOOD PARKS
- INDICATIVE LOCATION OF STATE PRIMARY SCHOOL
- ✱ COMMUNITY FACILITY

¹ Location as nominated in the Greater Flagstone PDA Development Scheme. These items are outside the area controlled by the applicant and are subject to approval and delivery by others.

Note: Locations of Context Plan features are indicative and subject to detailed design.

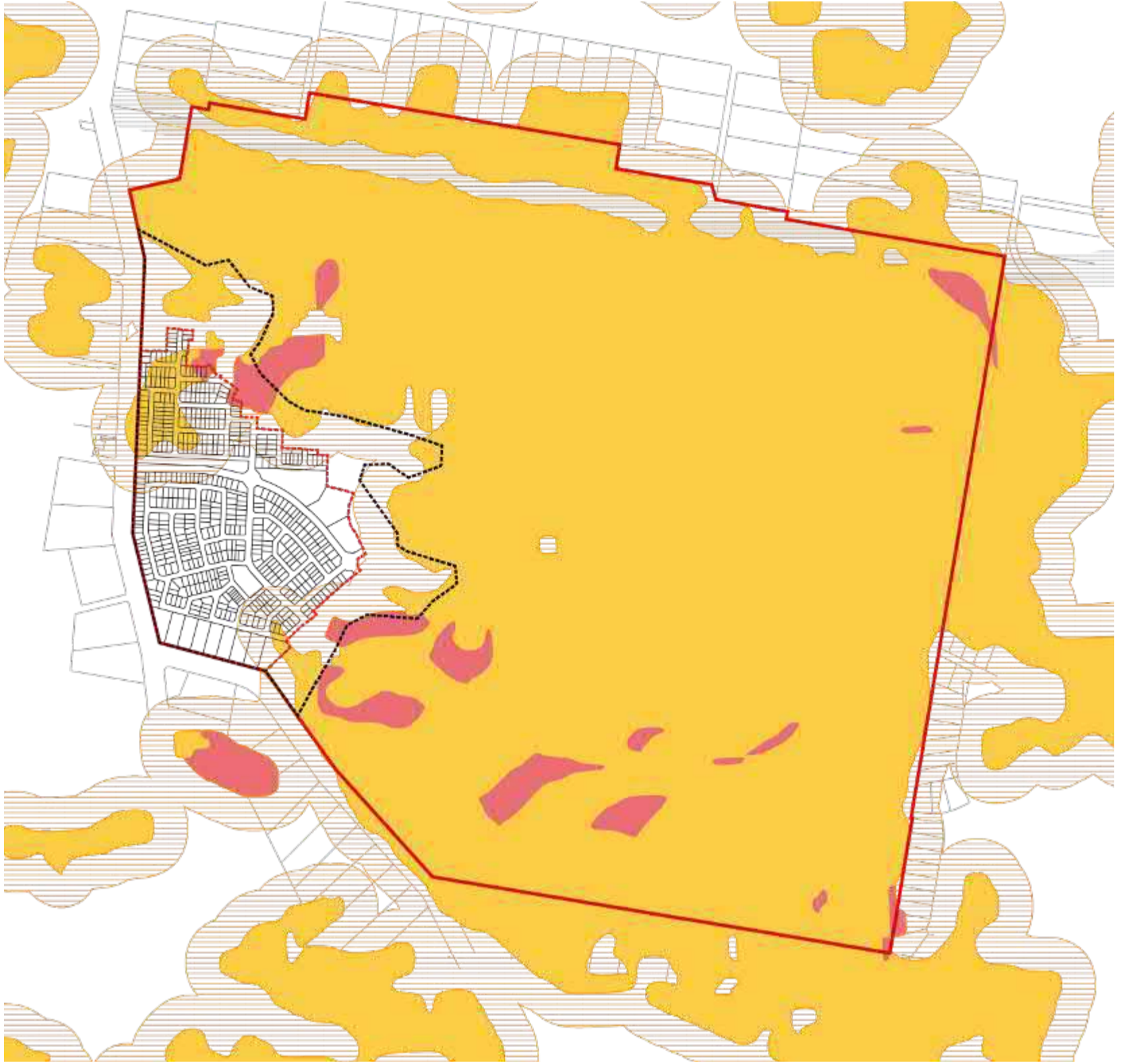


**GREENBANK
LAND USE PLAN WITH AREA 1**



DATE: 02.11.2016
 JOB NO: ND1309
 DWG NO: LU:02
 REV: 5

Figure 2 – Bushfire hazard plan – Area 1 – Pre-clearing



Legend

- SITE BOUNDARY
- CADASTRE BOUNDARIES
- AREA 1 BOUNDARY
- EPBC EXCISION BOUNDARY
- HIGH POTENTIAL BUSHFIRE INTENSITY
- MEDIUM POTENTIAL BUSHFIRE INTENSITY
- POTENTIAL IMPACT BUFFER (100M)



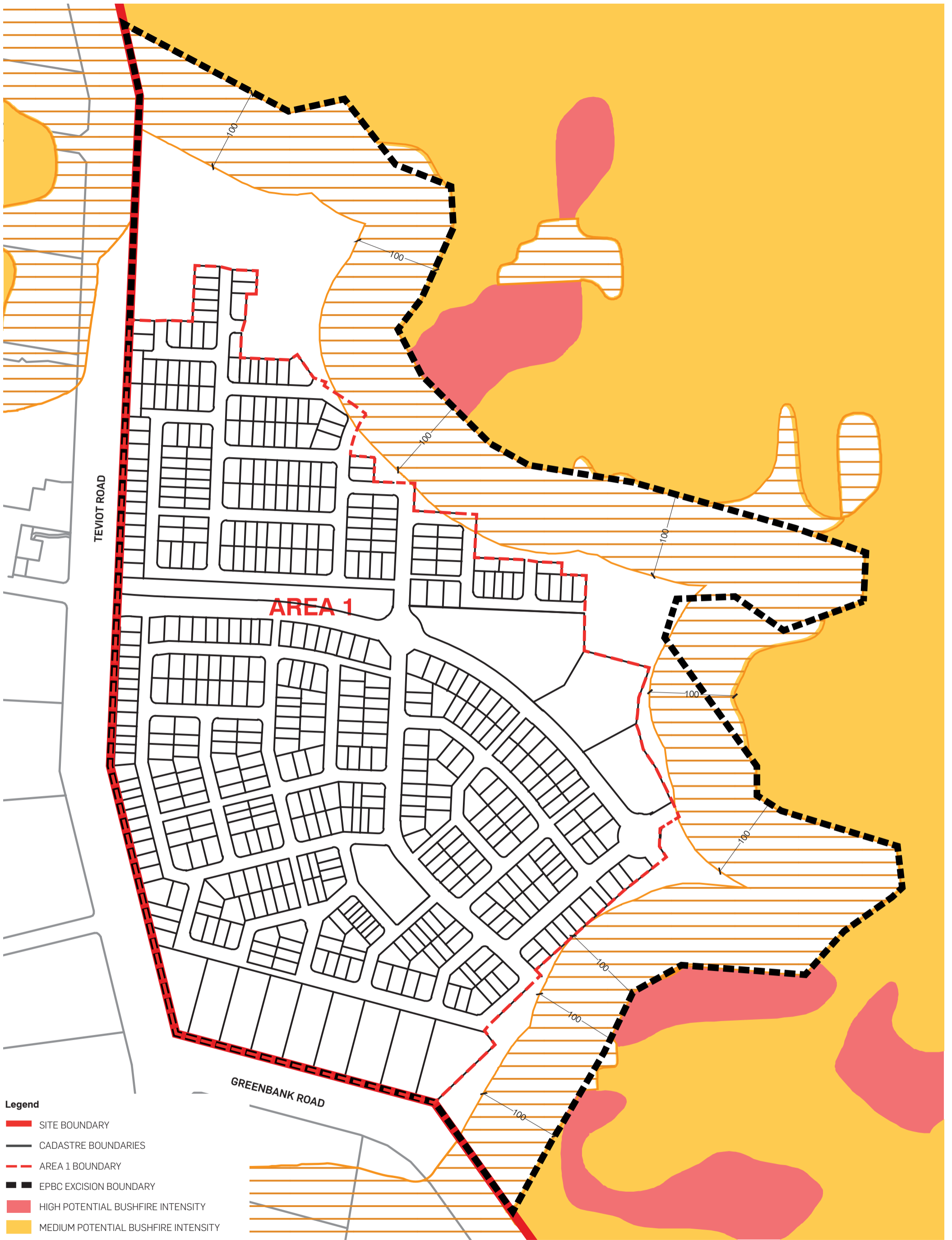
GREENBANK
BUSHFIRE HAZARD PLAN - AREA 1 - EXISTING



1:15,000 @ A3

DATE: 03.11.2016
 JOB NO: ND1309
 DWG NO: BF:01
 REV: -

Figure 3 - Bushfire hazard plan – Area 1 – Post-clearing land within the EPBC excision boundary



Appendix D

Melaleuca irbyana Impact Management Plan (July 2020)



Impact Management Plan

Melaleuca irbyana

Renewal for Permit No. WA0009354

432-520 Greenbank Road, Greenbank
Prepared for Mirvac Queensland Pty Ltd
10 July 2020

Job No. 7598



Document Control

Document: Impact Management Plan for 432-520 Greenbank Road, prepared by Saunders Havill Group for Mirvac Queensland Pty Ltd.

Document Issue

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|-------|------------|-------------|------------|
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Prepared by

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Abbreviations and Acronyms

| | |
|-------|--|
| DAM | Declared Area Map |
| DES | Department of Environment and Science (Qld) |
| DNRME | Department of Natural Resources, Mines and Energy (Qld) |
| EDQ | Economic Development Queensland (Qld) |
| EVNT | Endangered, Vulnerable or Near Threatened (as defined by the NCA) |
| NCA | <i>Nature Conservation Act 1992</i> (Qld) |
| NCWR | Nature Conservation (Wildlife) Regulation 2006 |
| PDA | Priority Development Area (herein referencing the Greater Flagstone Priority Development Area) |
| PMAV | Property Map of Assessable Vegetation |
| SHG | Sunders Havill Group |

1. Introduction

Saunders Havill Group (SHG) was engaged by Mirvac Queensland Pty Ltd (Mircac) to prepare an Impact Management Plan (IMP) for *Melaleuca irbyana* (Swamp Tee Tree) specimens located within the Greenbank project area located at 432-520 Greenbank Road, Greenbank.

As required under the *Protected Plants Assessment Guidelines* (the Guidelines) this IMP has been prepared to support the renewal of the Protected Plants Clearing Permit (Permit No. WA0009354) for the clearing of *Melaleuca irbyana* specimens within the 277 hectare (ha) development area located at 432-520 Greenbank Road, Greenbank (Lot 1/SP297192). A copy of the Protected Plants Clearing Permit is included at **Appendix A**.

1.1. Background

Protected Plants Flora Surveys undertaken over the site in 2018 recorded four isolated patches of *Melaleuca irbyana*; three of which are located within the Clearing Area (refer **Plan 1**). The species is listed as Endangered under the *Nature Conservation Act 1992*.

Subsequently, an Impact Management Plan 'Impact Management Plan *Melaleuca irbyana* 43-520 Greenbank Road, Greenbank prepared for Mirvac QLD Pty Ltd, dated 3 July 2018' (IMP) was prepared to support a Protected Plants Clearing Permit application to the Department of Environment and Science (DES) in accordance with Section 3.2 of the *Nature Conservation (Wildlife Management) Regulation 2006 – Protected Plants Assessment Guidelines*. A copy of the IMP is included at **Appendix B**.

A Protected Plants Clearing Permit (Permit No. WA0009354) was issued by the DES on 24 August 2018 which allows for clearing of all *M. irbyana* over the entire Clearing Impact Area (i.e. 277 ha site). Conditions of the Permit (PPCM01) require all activities relating to the impact of EVNT plant species under the permit to be carried out in accordance with the procedures and actions in the IMP. This included rehabilitation planting of *M. irbyana* within future Conservation land in the eastern portion of the site to ensure no significant residual impact on the species occurs as a result of the development.

In March 2019, rehabilitation planting by land care consultant Evolve commenced at the rehabilitation area in accordance with the IMP. This included weed treatment and tube-stock planting of *M. irbyana* within a 5,000 m² area within the eastern Conservation land.

As the Conservation land (and *M. irbyana* rehabilitation area) will be ultimately handed over to Logan City Council, the proposed *M. irbyana* rehabilitation area was requested to be legally secured as a Declared Area (Category A) under the *Vegetation Management Act 1999* (VMA) to counterbalance the clearing of *M. irbyana* on site and to ensure objectives of the exchange area are fully achieved. The Voluntary Declaration Management Plan was approved by DNRME and the Declared Area was secured on title on 3 March 2020 and is shown as Category A (PMAV 2019/002658). A copy of the Declared Area Map is included at **Appendix C**.

The Protected Plants Clearing Permit (Permit No. WA0009354) expires on 23 August 2020. While clearing within the Permit area has been undertaken, clearing at the locations of the *M. irbyana* patches has not yet occurred. Importantly, rehabilitation works have commenced and subject to legal rehabilitation success, monitoring and reporting benchmarks under the Voluntary Declaration Management Plan. The purpose of this report is to support renewal of the Protected Plants Clearing Permit.

1.2. Site Details

Contextually, the site is located 30 kilometres (km) south of Brisbane and 10 km west of Logan Village, within the western suburb of Greenbank. The site is bound by Greenbank and Teviot Roads to the west and is predominately surrounded by rural residential development. Wearing Park immediately adjoins the site to the east and Greenbank Shopping Centre and Community Centre are located opposite the site, on the western side of Teviot Road. The site is located approximately 1.5 km southeast of Greenbank Military Training Camp and 500 metres east of the Brisbane – Sydney Railway Line. An infrastructure easement traverses the site parallel to the northern boundary. The site remains one of the last large rural properties in the immediate landscape predominately comprised of rural residential development.

The proposed clearing works will be undertaken over 277 ha of the 412 ha site to facilitate a master planned development and will be subject to future operational works approvals from Economic Development Queensland (EDQ) (DEV 2016/768).

Key site details are provided in **Table 1** below.

Table 1: Property Summary

| | |
|-----------------------------------|--|
| Address | 423-520 Greenbank Road, Greenbank |
| RPD | Lot 1 on SP297192 |
| Local Government Area | Logan City |
| Administering Authority | Economic Development Queensland |
| Priority Development Area | Greater Flagstone PDA |
| Planning Scheme | Greater Flagstone PDA Development Scheme |
| Area Classification / Zone | Urban Living |
| Existing Land Use | Rural |

1.3. Protected Plants Flora Survey

In accordance with the regulatory requirements, Protected Plant Flora surveys were conducted where clearing is proposed, including within areas mapped as ‘High risk’ under the Protect Plants Flora Survey Trigger Map High Risk and as per the Guidelines. The 2020 surveys were undertaken in accordance with the Guidelines (i.e. High Risk Areas), but also included survey at the four previously known locations of *M. irbyana* on site recorded by 2018 surveys.

Protected Plants Flora Surveys undertaken in June 2020 confirmed *M. irbyana* in the four previously recorded locations and well as one new location (location 5). Refer **Plan 1** for *M. irbyana* located during 2018 surveys and **Plan 2** for the location for *M. irbyana* located during 2020 surveys and **Table 2** for a summary. It is noted growth categories have changed since 2018 with the classification of “semi-mature” introduced. Growth categories are defined in **Section 2.2**.

A copy of the 2020 Protected Plans Flora Survey Report is provided under a separate cover.

Table 2: *M. irbyana* Locations

| Location | 2018 Survey Results | 2020 Survey Results |
|----------|-----------------------------|---|
| 1 | 3 x mature + 100 juveniles | 3 x mature + 1 x semi mature + 100 juvenile |
| 2 | 3 x mature + 20 x juveniles | 3 x mature + 11 x semi mature + 10 juvenile |
| 3a | 4 x mature + 10 x juveniles | 3 x mature |
| 3b | | 1 x mature + 9 x juvenile |
| 3c | | 2 x mature + 9 x semi mature + 3 x juvenile |
| 3d | | 2 x semi mature + 2 x juvenile |
| 4 | 5 x mature + 100 juveniles | 5 x mature + 107 x semi mature + 8 x juvenile |
| 5 | | x mature + 3 x semi mature + 24 x juvenile |

1.4. IMP Intent

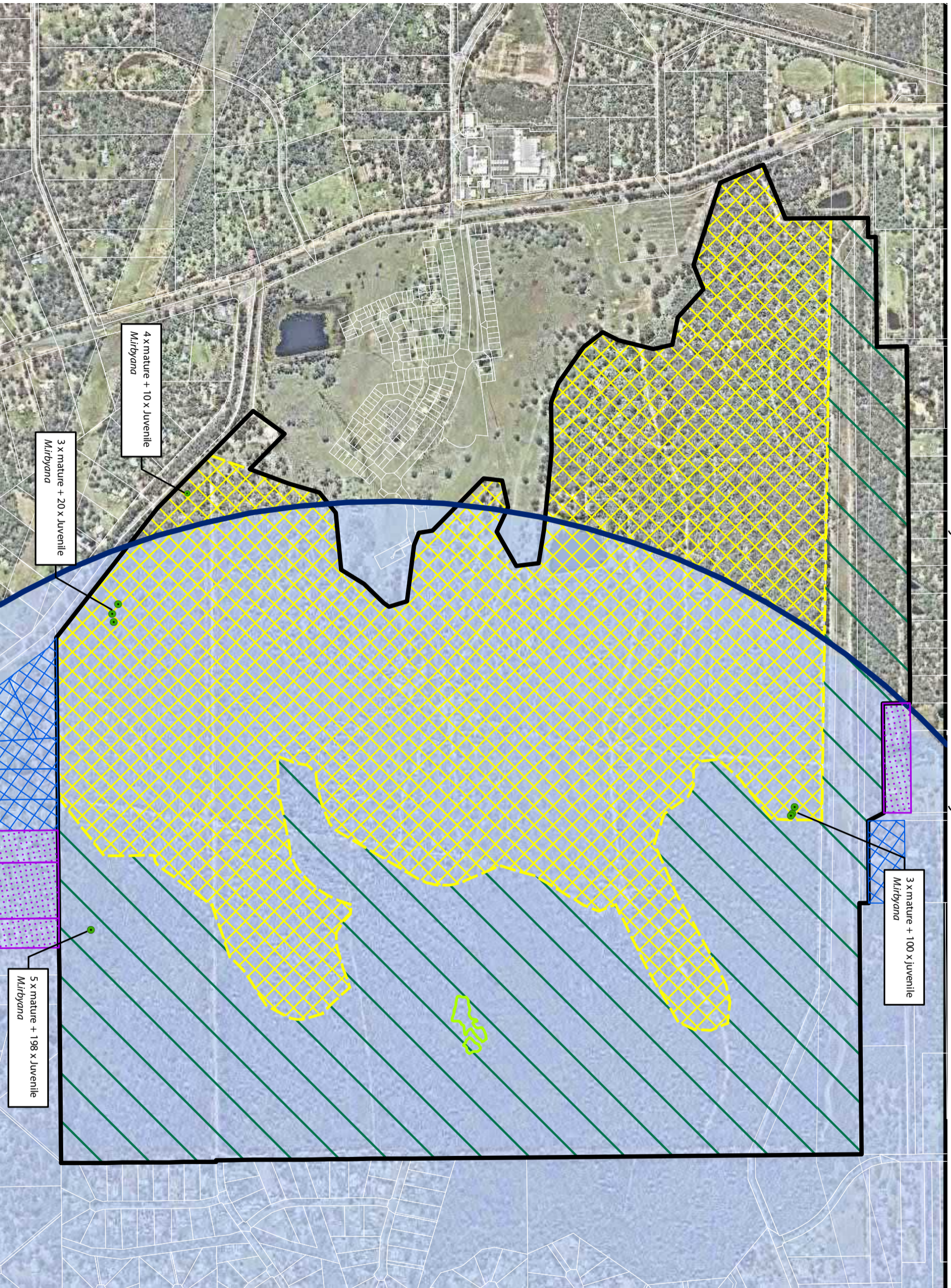
The IMP has been prepared in accordance with Section 3.2.1, as follows:

3.2.1 Impact management plan

An impact management plan must include the following sections:

- attempts to avoid and minimise impact
- nature of impact
- management of impact
- justification of impact management
- survival of plant in the wild

1. 2018 Protected Plants Survey - *Melaleuca irbyana*



NOTES
 This plan was prepared as a desktop assessment tool. The information on this plan is not suitable for any other purpose. Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey. These may need verification if the development application is approved and development proceeds, and may change when a full survey is undertaken in order to comply with development approval conditions. No reliance should be placed on the information on this plan for detailed design or for any financial dealings involving the land. Saunders Havill Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

Layer Sources: QLD GISLayers (QLD Gov. Information Service 2020), Aerial (Aermap 2020)

* This note is an integral part of this plan/data. Reproduction of this plan or any part of it without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.

LEGEND

- Project DCDB
- Qld DCDB
- Development footprint
- Conservation area
- NCA flora survey trigger area
- No Access under NCA
- Exemption (AP0007102)
- Surveyed under NCA Exemption (AP0007102)
- Mature *Melaleuca irbyana* specimen
- Melaleuca irbyana* planting/rehab site (Approx: 5,000m²)

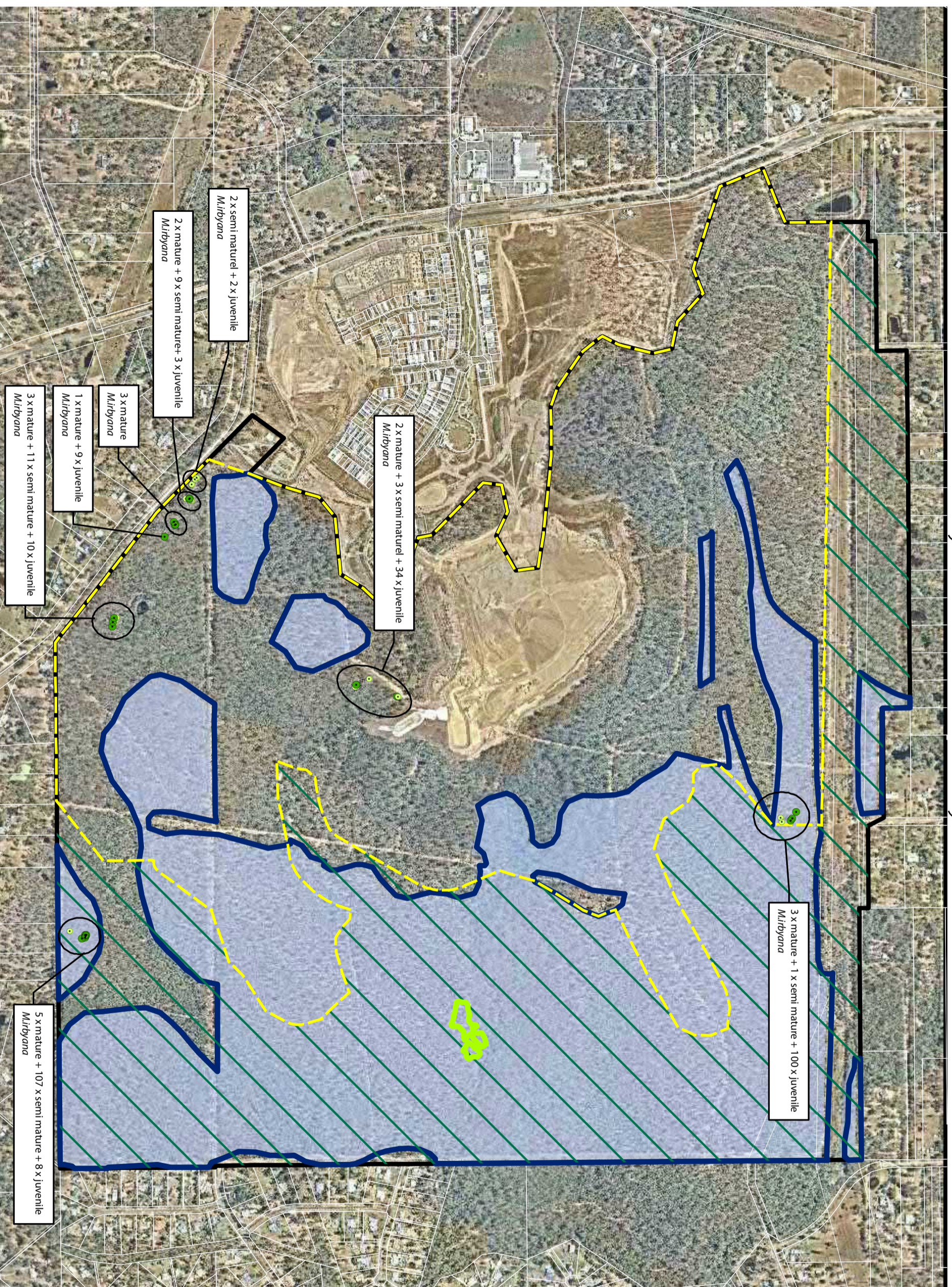
Note: Juvenile *Melaleuca irbyana* are specimens less than 2 metres tall

| Issue | Date | Description | Drawn | Checked |
|-------|------------|-------------|-------|---------|
| A | 13/07/2020 | Preliminary | MP | KG |

Transverse Mercator | GDA 1994 | Zone 56 | 1:10,000 @ A3



2. 2020 Protected Plants Survey - *Melaleuca irbyana*



NOTES
 This plan was prepared as a desktop assessment tool. The information on this plan is not suitable for any other purpose. Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey. These may need verification if the development application is approved and development proceeds, and may change when a full survey is undertaken or in order to comply with development approval conditions. No reliance should be placed on the information on this plan for detailed design or for any financial dealings involving the land. Saunders Havill Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

Layer Sources: QLD GIS Layers (QLD Gov. Information Service 2020), Aerial (Nearmap 2020)

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LEGEND

- Project DCDB
- QLD DCDB
- Development footprint
- Conservation area
- NCA flora survey trigger area
- Mature *Melaleuca irbyana* specimen
- Semi-mature or juvenile *Melaleuca irbyana* specimen
- Melaleuca irbyana* planting/rehab site (Approx. 5,000m²)

Note: Juvenile *Melaleuca irbyana* are specimens less than 2 metres tall

| Issue | Date | Description | Drawn | Checked |
|-------|------------|-------------|-------|---------|
| A | 14/07/2020 | Preliminary | MP | KG |

Transverse Mercator | GDA 1994 | Zone 56 | 1:10,000 @ A3



1.5. Nature Conservation Act 1992

The *Nature Conservation Act 1992* (NCA) classifies and protects significant areas (Protected Areas) and protects threatened plant and animal species. The Nature Conservation (Wildlife) Regulation 2006 (NCWR) lists plant and animal species presumed extinct, endangered, vulnerable, near threatened, least concern, international or prohibited.

The Queensland Government has adopted a regulatory framework that captures activities that pose a high risk to plant biodiversity. Under the framework, when a non-exempt clearing activity is proposed within a 'High Risk' area, the proponent of that activity is required to complete a flora survey prior to commencement of clearing. The Protected Plants Flora Survey Trigger Map shows 'High Risk' areas for protected plants and is used to help determine flora survey and clearing permit requirements for a particular location.

A search of the Protected Plants Flora Survey Trigger Mapping indicated proposed clearing areas within the subject site are overlaid as 'High Risk' and so are subject to flora survey requirements (refer **Plan 2**).

Prior to flora surveys, the schedules of the NCWR were considered in this report using a Wildlife Online Database Search with a 10 km radius from the site. Three (3) flora species listed under the NCWR were identified as having the potential to occur on site and are presented in **Table 3**. Refer to **Appendix D** for full search results.

Table 3: Wildlife Online Search Results–Flora

| Scientific Name | Common Name | NCA Status |
|----------------------------|------------------|------------|
| <i>Marsdenia coronata</i> | Slender Milkvine | Vulnerable |
| <i>Coleus habrophyllus</i> | - | Endangered |
| <i>Melaleuca irbyana</i> | Swamp Tea Tree | Endangered |

2. Nature of the Impact

2.1. Background

The only EVNT species located within the Greenbank project area was *Melaleuca irbyana* (Swamp Tea Tree). This species was the only EVNT species recorded by 2018 surveys. Four (4) patches of *M. irbyana* previously located in 2018 were confirmed on site during contemporary surveys in June 2020 to support renewal of the Protected Plants Clearing Permit (refer **Plan 1**). One additional patch of *M. irbyana* was recorded within the Clearing Area (location 5, refer **Plan 2**).

The existing Permit considered impacts for the entire Clearing Area (i.e. 277 ha). This IMP has been prepared for the same Clearing Area. It is anticipated the clearing of *M. irbyana* will occur within the next 2 years.

The profile of the species is detailed below in **Section 2.2**.

2.2. Protected Plant Profile

Melaleuca irbyana, a member of the Myrtaceae family, is listed as a threatened species under Schedule 2 of the *Nature Conservation (Wildlife) Regulation 2006* (NCWR) and is classified as “endangered”. *Melaleuca irbyana* is also included as part of Endangered Regional Ecosystems (RE) 12.3.18, 12.3.19, 12.9-10.11 and 12.9-10.27 under the *Vegetation Management Act 1999* (VMA). This vegetation community is also listed as a Critically Endangered when present as a Threatened Ecological Community under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC).

M. irbyana forms communities that occur in two (2) structural forms: the more common form consists of a dominant eucalypt canopy with an understorey containing *M. irbyana* thickets 8-12 metres in height; the less common form is an open forest or thicket of *M. irbyana* with emergent eucalypt trees. The understorey is sparse and can comprise of grasses, sedges, and herbs with a few shrubs, vines and possibly orchids present. There are fairly clear descriptions of *M. irbyana* communities, however, there are no clear indications of the point at which an individual tree or small number of trees are considered to be part of a community. An individual tree may still contribute reproductively to a community, or may have the potential to regenerate and in time create a community.

Growth categories for this assessment are defined as juvenile specimens less than two (2) meters in height, semi-mature specimens greater than two (2) meters in height but with a trunk less than 100mm DBH, and mature specimens retaining a trunk diameter of at least 100mm.

Logan City Council defines an *M. irbyana* community as, “where *Melaleuca irbyana* occur in a patch size of 0.25 hectares or greater, or where a patch of *Melaleuca irbyana* less than 0.25 hectares adjoins a second patch and the sum of the patches is greater than 0.25 hectares”. This definition has been determined using methodology from the *Melaleuca irbyana* (Swamp Tea-tree) Community 1:25,000 Scale Mapping Project (Ryan, 2010).

2.3. *Melaleuca irbyana* On-site

The site was traversed as part of previous and contemporary NCA searches. *Melaleuca irbyana* were recorded the species in four (4) separate locations during both 2018 and confirmed again in 2020, with an additional patch also recorded (location 5). Refer to **Plan 1-2** for *Melaleuca irbyana* onsite locations. Four of these locations (locations 1, 2, 3, and 5) occur within the Clearing Area. One patch (location 4) is located outside the Clearing Area and will be retained by the development in Conservation. Refer **Table 4** for a description of the Regional Ecosystems.

2.3.1 Location 1

Location 1 is situated in the northern aspect of the site, adjacent to the power easement. This patch is located within mapped composite 'Of Concern' Regional Ecosystem RE12.9-10.2/12.9-10.7 as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. This patch of *Melaleuca irbyana* (Swamp Tea-tree) consists of three (3) established specimens, one (1) semi-mature specimen and one-hundred (100) juveniles. This patch of *Melaleuca irbyana* was surrounded by vegetation dominated by *Acacia spp.*, *Allocasuarina littoralis* (Black She-oak) and *Alphitonia excelsa* (Soap Tree) regrowth with *Corymbia citriodora* (Spotted Gum) dominated canopy, representing the Least Concern RE12.9-10.2.



Photo Plate 1: Location 1

2.3.2 Location 2

Location 2 is situated towards the south-western property boundary, adjacent to Greenbank Road. This patch is located within mapped non-remnant vegetation as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. This *Melaleuca irbyana* (Swamp Tea-tree) patch consists of three (3) established (mature) specimens, eleven (11) semi-mature specimens and ten (10) juvenile specimens. This patch of *Melaleuca irbyana* was found within a regrowth vegetation community, with surrounding vegetation dominated by *Allocasuarina littoralis* (Black She-oak) and *Acacia spp.* regrowth.



Photo Plate 2: Location 2

2.3.3 Location 3

Location 3 is situated towards the south-western property boundary, adjacent to Greenbank Road and approximately 380 m west of Location 2. This patch is located within mapped non-remnant vegetation as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. This patch of *Melaleuca irbyana* (Swamp Tea-tree) consists of six (6) mature specimens, eleven (11) semi-mature specimens and fourteen (14) juvenile specimens. The overall patch of *Melaleuca irbyana* was found within a regrowth vegetation community, with surrounding vegetation dominated by *Acacia leiocalyx* (Early Flowering Black Wattle), *Allocasuarina littoralis* (Black She-oak) and *Alphitonia excelsa* (Soap Tree) regrowth. The patch is separated into four separate patches.



Photo Plate 3: Location 3

2.3.4 Location 4

Location 4 is situated towards the southern property boundary, approximately 800 m east of Location 3. This patch is located within mapped composite 'Of Concern' Regional Ecosystem RE12.9-10.2/12.9-10.7 as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. This patch consists of five (5) mature specimens, one hundred and seven (107) semi-mature specimens and eight (8) juvenile specimens with a height less than two (2) meters. This patch of *Melaleuca irbyana* was surrounded by vegetation dominated by *Acacia spp.*, *Allocasuarina littoralis* (Black She-oak) and *Alphitonia excelsa* (Soap Tree) regrowth with *Corymbia citriodora* (Spotted Gum) dominated canopy, typically representing the Least Concern RE12.9-10.2.



Photo Plate 4: Location 4

2.3.5 Location 5

Location 5 is situated towards the central portion of the development footprint. This patch is located within mapped non-remnant vegetation or Category X as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. This patch consists of two (2) mature specimens retaining a trunk DBH greater than 100mm, three (3) semi-mature specimens with a trunk less than 100mm and a height greater than two (2) meters, and thirty-four (34) juvenile specimens with a height less than two (2) meters. This patch of *Melaleuca irbyana* was surrounded by vegetation dominated by *Allocasuarina littoralis* (Black She-oak) with scattered *Acacia leiocalyx* (Early Flowering Black Wattle), *Eucalyptus crebra* (Narrow Leaf Ironbark) and *Eucalyptus tereticornis* (Forest Red Gum). These species are typical of the Of Concern Regional Ecosystem community 12.9-10.7.



Photo Plate 5: Location 5

Table 4: Regional Ecosystems Descriptions

| Status | Code | Description |
|----------------------|------------|---|
| Endangered | 12.9-10.12 | Corymbia intermedia, Angophora leiocarpa, Eucalyptus seeana +/- E. siderophloia, E. tereticornis, E. racemosa subsp. racemosa, C. citriodora subsp. variegata woodland to open forest. Lophostemon suaveolens is often present as a sub-canopy or understorey tree. Occasional Melaleuca quinquenervia on lower slopes. Does not include areas dominated by Eucalyptus racemosa subsp. racemosa. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 9g). |
| Of Concern | 12.9-10.7: | Eucalyptus crebra +/- E. tereticornis, Corymbia tessellaris, Angophora leiocarpa, E. melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c). |
| Of Concern | 12.3.11 | Eucalyptus tereticornis +/- E. siderophloia and Corymbia intermedia open forest to woodland. Corymbia tessellaris, Lophostemon suaveolens and Melaleuca quinquenervia frequently occur and often form a low tree layer. Other species present in scattered patches or low densities include Angophora leiocarpa, E. exserta, E. grandis, C. trachyphloia, C. citriodora subsp. variegata, E. latisinensis, E. tindaliae, E. racemosa and Melaleuca sieberi. E. seeana may be present south of Landsborough and Livistona decora may occur in scattered patches or low densities in the Glenbar SF and Wongi SF areas. Occurs on Quaternary alluvial plains and drainage lines along coastal lowlands. Rainfall usually exceeds 1000mm/y. (BVG1M: 16c) |
| Least Concern | 12.3.6: | Melaleuca quinquenervia +/- Eucalyptus tereticornis, Lophostemon suaveolens, Corymbia intermedia open forest to woodland with a grassy ground layer dominated by species such as Imperata cylindrica. Eucalyptus tereticornis may be present as an emergent layer. Occurs on Quaternary floodplains and fringing drainage lines in coastal areas. (BVG1M: 22a) |
| Least Concern | 12.9-10.2: | Corymbia citriodora subsp. variegata open forest or woodland usually with Eucalyptus crebra. Other species such as Eucalyptus tereticornis, E. moluccana, E. acmenoides and E. siderophloia may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of Lophostemon confertus (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 10b). |

Based on the information provided in **Section 2.2**, the specimens located on site are not consistent with a *Melaleuca irbyana* community due to the patches predominately containing juvenile individuals with relatively few fully mature specimens. Importantly, these patches are not associated with Endangered Regional Ecosystems. Locations 1 and 4 were confirmed via a certified PMAV to be located within composite 'Of Concern' Regional Ecosystem RE12.9-10.2/12.9-10.7 while locations 2, 3 and 5 were located within non-remnant areas.

While Location 1 contains a substantial amount of juvenile species, overall, the significance of these patches is considered less than if they formed part of a broader existing community. The habitat value they currently provide is considered relatively limited, with no obvious noteworthy habitat for flora or fauna observed at the time of survey.

3. Management of the Impact

The proposed earthworks to facilitate the development footprint will require the removal of four (4) relatively small patches of predominately juvenile *Melaleuca irbyana* specimens over the next two years as development progresses. A significant residual impact (SRI) assessment was undertaken in accordance with the *Queensland environmental Offsets Policy - Significant Residual Impact Guideline (DES 2014)* as part of the approved IMP (refer **Appendix B**). Prior to the SRI, an assessment survival in the wild and avoidance and mitigation was considered.

3.1. Avoidance and Minimisation of Impact

An assessment for the survival of the plant in the wild was previously made as part of the IMP (refer **Appendix B**) and has been updated as part of this assessment.

The proposed works are for the development of Greenbank master planned development in the Greater Flagstone PDA. Preliminary approval for the context plan and master plan has been issued by EDQ. These plans were informed by detailed analysis of the site by specialist consultants, including a detailed ecological analysis by SHG. Subsequently, areas for development shown are concentrated to areas of least constraint. Areas of highest ecological value have been identified for retention as conservation.

The proposed works will include the creation of residential allotments, a proposed school site, new roads, park and conservation areas and corridors. Minimisation of overall clearing impacts are evident through location of the proposed development, located outside Endangered remnant vegetation and waterway corridors. Rehabilitation of conservation areas and waterways is proposed as part of the development.

The proposed earthworks to facilitate the development footprint will require the removal of four (4) relatively small patches of predominately juvenile *Melaleuca irbyana* specimens over the next two years, and ongoing property boundary maintenance within 100 m of the retained patch (Location 4). These specimens are located within Of Concern and non-remnant regrowth areas (refer **Plan 2**).

As per the EDQ endorsed Natural Environment Site Strategy, extensive conservation of greater than 89 hectares of proposed Conservation Parkland adjoining Norris Creek and Wearing Park is proposed as part of the development. In accordance with best practice management, restoration and rehabilitation works will seek to stabilise and reverse the negative effects of ongoing habitat fragmentation. The intent is for managed areas of rehabilitation and restoration to rectify canopy gaps and restore bare or denuded areas to provide additional habitat and refugia within the lower strata to maintain connectivity with external approval corridors and improve terrestrial corridor viability. Rehabilitation works within the conservation area and waterway corridors will include weed management and replanting with native species consistent with mapped Regional Ecosystems to augment ecological values and enhance connectivity.

Melaleuca irbyana grows in flat areas that are periodically waterlogged, in eucalypt forest, mixed forest and *Melaleuca* woodland with a sparse and grassy understorey. The species prefers poorly draining, heavy clay soils (Byrnes 1984; Barlow 1987). The approved conservation land rehabilitation works include an established *Melaleuca irbyana* thicket within remnant woodland forest to the north of the central waterway (Plans **2 & 3**). This land is relatively low lying and adjoins an ephemeral waterway that contains permanent billabongs. The approved *Melaleuca irbyana* planting site is therefore considered ideal for the species, which is dependent on specific groundwater and / or surface water hydrology. Impacts to *Melaleuca irbyana* have been minimised to the greatest practical extent and include establishing the *Melaleuca irbyana*

community, on the project site, within future conservation land and managing potential impacts from ongoing works that will occur within 100 m of a retained patch.

3.2. Survival of the Plant in the Wild

An assessment for the survival of the plant in the wild was previously made as part of the IMP (refer **Appendix B**) and has been updated as part of this assessment.

Based on the current disturbed nature of the site and the locations of the *Melaleuca irbyana* specimens mostly along property boundaries, it is not anticipated that the removal of four (4) relatively small patches of predominately juvenile *Melaleuca irbyana* specimens will significantly hinder the future success of the species in the area. Importantly, the patch in location 4 is to be preserved within the conservation area and approved and established rehabilitation works provide a *Melaleuca irbyana* community on the site allowing the community to be protected in perpetuity.

3.3. Significant Residual Impact (Justification of the Impact)

A SRI assessment (refer Section 3 of the IMP at **Appendix B**) was made to support the Protected Plants Clearing Permit (Permit No. WA0009354) for the clearing of *Melaleuca irbyana* specimens within the 277 hectare clearing area. The SRI assessment concluded the clearing of three small patches of *M. irbyana* for the development would not result in a SRI due to extensive rehabilitation works proposed within the onsite Conservation land, including the establishment of a 5,000 m² *Melaleuca irbyana* thicket resulting in a net gain in *Melaleuca irbyana* across the site.

While rehabilitation for the 5,000 m² *Melaleuca irbyana* thicket has been undertaken, the permit for clearing within the 277 ha area is about to expire.

Renewal of the Protected Plant Clearing Permit for the same impact (i.e. clearing 277 ha) is requested. While an additional patch of *M. irbyana* has been identified, this falls within the same 277 ha impact area as previously assessed under the Permit No. WA0009354. The below SRI assessment for the clearing of the four patches of mostly juvenile *M. irbyana* proposed under this permit renewal concludes, with the established rehabilitation works, the impact would not result in a SRI.

To demonstrate this mitigation of impact, a response to the four (4) points of consideration within Section 1.2 of the *Significant Residual Impact Guideline* was provided below for ease of reference

- **The extent and duration of impact on the matter and its sensitivity to disturbance.**

The impact on the matter is the removal of four (4) relatively small patches (locations 1, 2, 3 and 5) of predominately juvenile *Melaleuca irbyana* specimens from former paddock areas that have already been subject to high disturbance from cattle grazing and historical clearing. A patch (at location 4) will be retained with ongoing adjoining works within 100 m limited to the maintenance of the nearby property boundary. The sites are described in detail in **Section 2.3**, shown in **Plan 2** and summarised below:

- Location 1: 3 x mature s + 1 x semi mature + 100 juvenile specimens, located within the north-east along a drainage feature
- Location 2: 3 x mature + 11 x semi mature + 10 juvenile specimens, located along the southern boundary
- Location 3: 5 mature + 20 semi mature + 14 juvenile specimens, located along the southern boundary
- Location 4: 5 mature + 107 x semi mature + 8 x juvenile specimens, located along the southern boundary in the south-west

- Location 5: 2 x mature + 3 x semi mature + 34 x juvenile specimens, located within the central portion of the site

- **Timeframe for rehabilitation relative to the impact occurring and the ability of the matter to maintain its viability during this timeframe.**

As required under Permit No. WA0009354 rehabilitation planting of six hundred and twenty-five (625) advanced tube stock specimens of *M. irbyana* occurred within a 5,000m² area within the central waterway corridor of the conservation zone (refer **Plan 2**). Although it is expected that these plantings will take approximately four (4) years to reach maturity they have been planted in a thicket to replicate as close to natural conditions for a *M. irbyana* ecological community as possible and will be maintained as part of the extensive rehabilitation works for the conservation zone. The area of planting of this thicket adjoins the central waterway corridor and is not within 100 m of future development areas. This location has been chosen to avoid human disturbance and as far away as possible from conflicting uses. Importantly, the rehabilitation area has been legally secured on title as a declared area (Category A) under the *Vegetation Management Act 1999* (refer **Appendix C**) and will be handed over to Logan City Council, along with the waterway corridor, following the on-maintenance period. Further, the patch of *M. irbyana* at location 4 will be retained within the Conservation area and will be subject to regular compatible weed suppression and monitored for persistence as part of site maintenance before being handed over to Council.

- **Likely success of rehabilitation works to return the impacted matter to its original condition, and;**

It is important to note that the Regional Ecosystems within and adjoining the creek corridor reflect those where the *M. irbyana* patches are currently located on-site. The rehabilitation area was chosen after detailed ecological survey of site attributes, including the prevailing low-lying topography, proximity to the creek, and canopy gaps with limited existing understorey. Thus, the planting of *M. irbyana* in the creek corridor has a high likelihood of success given the suitable landscape and habitat.

Planting was undertaken by land care experts Evolve Environmental. Given that the impact is the removal predominately juvenile *M. irbyana*, the planting of six hundred and twenty-five (625) specimens of *M. irbyana* as a thicket within the conservation zone will result in rehabilitation outcomes and a consolidated *M. irbyana* thicket which will far exceed the impacted matter.

- **The time-lag effect—between impact and rehabilitation successfully delivering the original condition for the matter—on the matter’s viability.**

As mentioned previously, the removal of four relatively small patches of *M. irbyana* is not considered to significantly impact upon the viability of local populations nor remove significant habitat values. Although there will be a time-lag between the removal of the predominantly juvenile *M. irbyana* specimens and the maturity of the tube stock of *M. irbyana*, planting has already occurred to reduce the potential time lag-effect to the greatest practical extent. Overall, the rehabilitation proposed is considered a far superior ecological outcome for viability of local populations.

The extent and number of *M. irbyana* planted is intended to establish a self-sustaining thicket of *M. irbyana* in a safe and secluded buffer environment that is capable of mitigating the proposed impacts. It is acknowledged that any future unavoidable loss of *M. irbyana* from the development area will be assessed by DES on a case by case basis, however, it is requested that DES consider the approval of Permit No. WA0009354 for the clearing of 277ha on the site consistent with the clearing being proposed.

3.4. Voluntary Declaration

As the Conservation land (and *M. irbyana* rehabilitation area) will be ultimately handed over to Logan City Council, the proposed *M. irbyana* rehabilitation area was requested to be legally secured as a Declared Area (Category A) under the *Vegetation Management Act 1999* (VMA) to counterbalance the clearing of *M. irbyana* on site and to ensure objectives of the exchange area are fully achieved.

The “*Voluntary Declaration Management Plan (Melaleuca irbyana Declared Area), 432-520 Greenbank Road, Greenbank, prepared by Saunders Havill Group for Mirvac (Queensland) Pty Ltd, dated March 2019*” was submitted to the Department of Natural Resources, Mines and Energy (DNRME) as part of the Voluntary Declaration and included the following attachments:

- Appendix A – Protected Plants Clearing Permit (Permit No. WA0009354)
- Appendix B - *Impact Management Plan Melaleuca irbyana 43-520 Greenbank Road, Greenbank prepared for Mirvac QLD Pty Ltd, dated 3 July 2018*
- Appendix C – Declared Area Plan (proposed)
- Appendix D - *Melaleuca irbyana Declared Area Rehabilitation Plan, prepared for Mirvac QLD Pty Ltd, by SHG dated March 2019.*

Importantly, the Rehabilitation Plan in Appendix D of the Voluntary Declaration application, provides detailed rehabilitation, monitoring and reporting procedures in format suitable for tender and expands on the single page plan in Section 3 of the IMP (previously assessed and approved by DES in 2018 (Permit No. WA0009354).

The Voluntary Declaration Management Plan was approved by DNRME and the Declared Area was secured on title on 3 March 2020 and is shown as Category A (PMAV 2019/002658).

A copy of the Rehabilitation Plan has been extracted and included hereafter for ease of reference.

3.5. Rehabilitation

Land care Consultants Evolve were engaged by Mirvac to undertake installation and establishment of the *M. irbyana* rehabilitation area. Rehabilitation works area ongoing in accordance with the Rehabilitation Plan (refer Photos below). It is understood that the *M. irbyana* offset area planting was completed in January 2020 and Evolve are continuing maintenance practices as specified in the approved Rehabilitation Plan. Refer to **Plan 3** for a plan of the rehabilitation area extracted from the VDec.









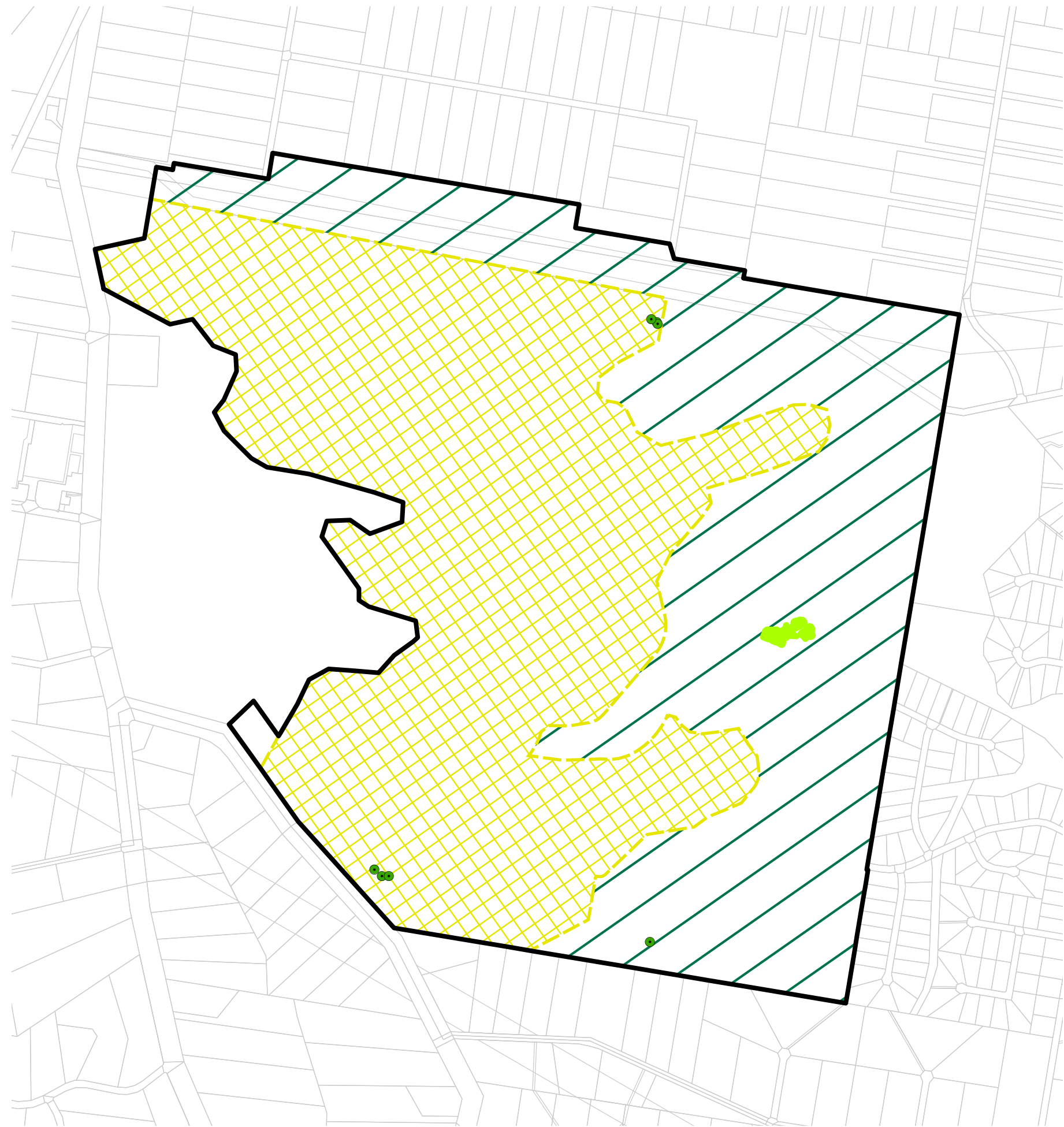
Everleigh, Greenbank

VOLUNTARY DECLARATION REHABILITATION PLAN

| PLAN SET | | | | |
|-----------|----------------------------|---|-------|------------|
| SHEET NO. | TITLE | DESCRIPTION | ISSUE | DATE |
| 1 | 7598 E 01 VDEC RMP B | Cover sheet | B | 23/05/2019 |
| 2 | 7598 E 02 VDEC RMP A | Details sheet | A | 15/04/2019 |
| 3 | 7598 E 03 VDEC RMP B | Introduction / Weed management | B | 23/05/2019 |
| 4 | 7598 E 04 VDEC RMP A | Planting, fauna, responsibilities | A | 15/04/2019 |
| 5 | 7598 E 05 VDEC RMP B | Maintenance and monitoring | B | 23/05/2019 |
| 6 | 7598 E 06 VDEC RMP A | Monitoring photo plan - Pre-works/Maintenance | A | 15/04/2019 |
| 7-9 | 7598 E A01-A03 V-DEC RMP A | Appendix A - Weed treatment & Removal | A | 15/04/2019 |

Legend

-  *Melaleuca irbyana* patch
-  Declared Area
-  Conservation area
-  Urban Area
-  Project site
-  QLD DCDB



CLIENT:



Everleigh

DISCLAIMER:

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 CONFIRM ALL DIMENSIONS ON SITE PRIOR TO CONSTRUCTION AND DO NOT SCALE FROM THE DRAWINGS. ALL DIMENSIONS ARE IN MILLIMETRES. ANY DISCREPANCIES SHOULD BE CLARIFIED IN WRITING WITH SAUNDERS HAVILL GROUP PRIOR TO THE COMMENCEMENT OF WORK.
 PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON SITE, THE RELEVANT AUTHORITY SHOULD BE CONTACTED FOR FURTHER UNDERGROUND SERVICES AND UTILITIES LOCATIONS OF ALL SERVICES.




AMENDMENTS:

| Issue | Date | Description | Checked |
|-------|------------|-------------------|---------|
| B | 24/05/2019 | Client Amendments | AD |

PROJECT:

423 - 520 Greenbank Road,
Greenbank (1/SP297192)

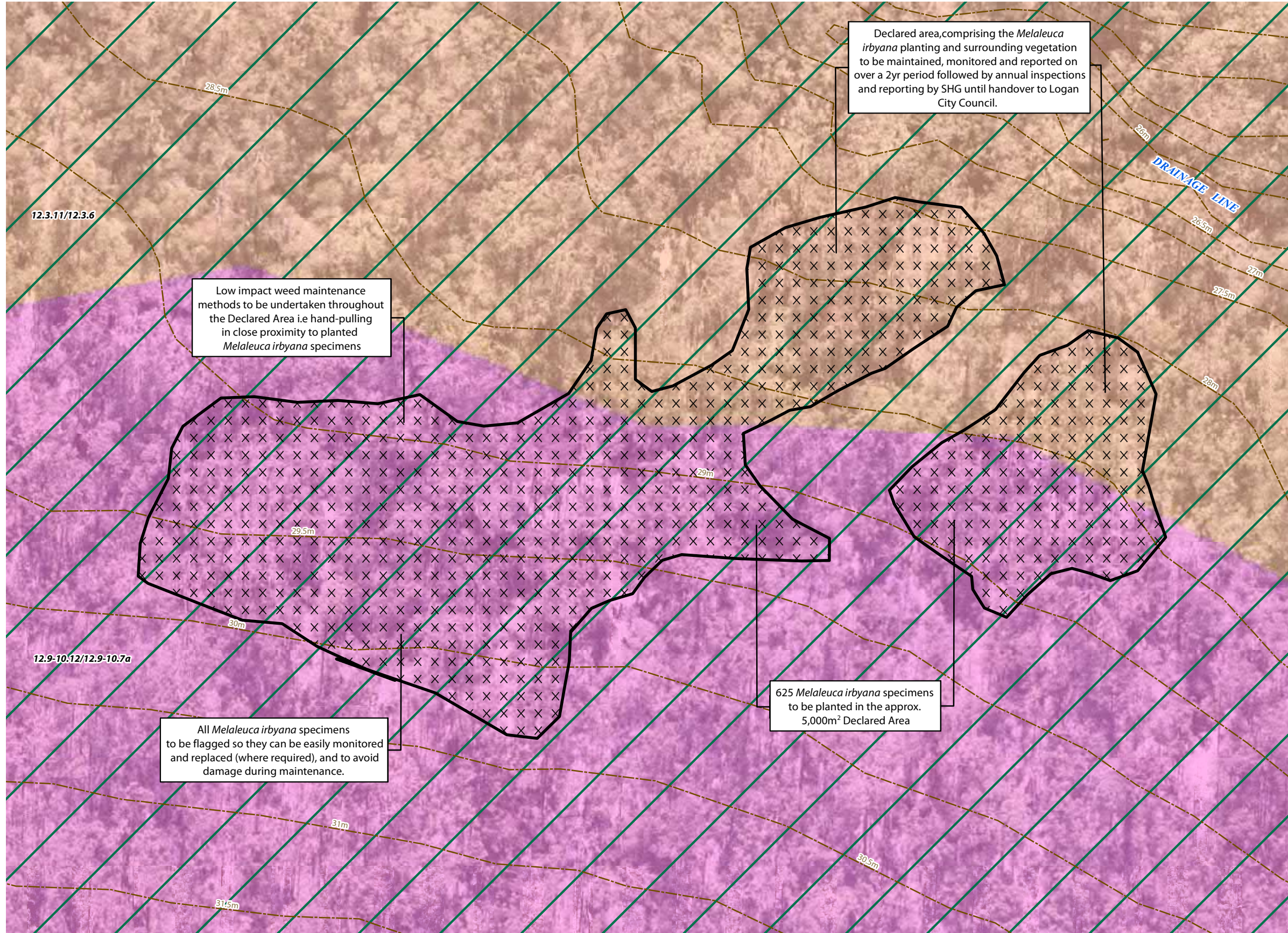
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 environmental management






PLAN OF:
Rehabilitation Plan
Cover Sheet

| | |
|-----------------------------------|-------------|
| DATE: 24/05/2019 | CHECKED: AD |
| CLIENT REF: JOB NO. | DRAWN: MC |
| DRAWING No.: 7598 E 01 VDEC RMP B | |

VOLUNTARY DECLARATION REHABILITATION PLAN - DETAIL SHEET



LEGEND

-  Management Zone 1: *Melaleuca Irbyana* planting and rehabilitation site (Approx. 5,000m²)
 -  Conservation area
 -  Contours (0.5m)
- VM regional ecosystem map - v11**
-  Category A or B area containing endangered regional ecosystems
 -  Category A or B area containing of concern regional ecosystems

Everleigh, Greenbank

VOLUNTARY DECLARATION REHABILITATION PLAN

INTRODUCTION

Saunders Havill Group (SHG) was engaged by MIRVAC to prepare a Voluntary Declaration Rehabilitation Plan (VDRP) for the clearing of 140 *Melaleuca irbyana* (Swamp Tree Tree) specimens. The replacement plants will be located in a Declared Area within the approved conservation area of the Everleigh project. The clearing works, current and future will facilitate the creation of residential lots, a school, and internal roads for the site's ultimate development layout.

The rehabilitation proposal for the clearing of 140 *Melaleuca Irbyana* is the planting of more than four (4) advanced tube stock specimens of *Melaleuca Irbyana* per tree cleared. A total of 625 (560+65 additional) *Melaleuca Irbyana* will be planted as a result. The Declared planting area is proposed within the site's conservation zone (refer Plan 2) and will cover 5,000 m². The specific location of the planting area was determined onsite by Ecologists from SHG. The percentage of existing canopy cover and the land zone features were taken into consideration when determining the optimal location for planting. Although it is expected that these plantings will take approximately four (4) years to reach the size of the impacted matter, they will be planted in a thicket to replicate as close to natural conditions for a *Melaleuca Irbyana* ecological community as possible and maintained as part of the rehabilitation works for the conservation zones. The area of planting of this thicket is centralised within the conservation zone and adjacent the waterway corridor, as stipulated by the EDQ approved NESS, and not within 100m of future development areas.

This Rehabilitation Plan is drafted to identify and manage the site disturbances for the planting of the 625 *Melaleuca Irbyana* specimens within a 5,000m². The planting will involve low impact weed removal and the retention of any existing native vegetation in the immediate area. The planting will be succeeded by a two (2) year period of maintenance, monitoring and reporting, then annual inspections and reporting by SHG until handover to Logan City Council.

REHABILITATION - APPROACHES

Ecologists from SHG have assessed the site's vegetation. Broadly, it was determined that a hybrid of infill planting and minor reconstruction approaches will be used on site. This approach is described below:

| ECOLOGICAL RESTORATION APPROACH | |
|--|---|
| INFILL PLANTING / MINOR RECONSTRUCTION | |
| Applies: | To natural areas where the native plant community is largely healthy and functioning. Where area retains canopy trees, few T2 layer trees but with largely bare shrub and ground cover layers. Where the natural regeneration processes (seedling germination, root suckering, etc.) are being inhibited by external factors, such as weed invasion, soil compaction, cattle grazing, mechanical slashing, etc. When the main management issue is weed infestation and/or historical land use practices is causing ground and shrub layers to be absent from the area. |
| Role of planting: | Infill planting is to assist the existing natural area reach the intended composition through planting specific species. |
| Goal vegetation community: | The re-establishing plant community will be substantially similar in structure, composition and diversity to the original vegetation. |

Note: Table adapted from Gold Coast City Council's Guideline for the preparation of a Rehabilitation Plan'

WEED MANAGEMENT

Rehabilitation treatment is to generally include the following points:

- A number of weeds are recorded for removal within shrub & ground layer
- Weed removal and management will utilise low impact methods to minimise impacts on planted *Melaleuca Irbyana* specimens

Weed management typically comprises a major part of rehabilitation site works. Weed management provides the basis of aiding natural regeneration and assisted natural regeneration. It also forms part of the preliminary work required for reconstruction and fabrication scopes. Weed

Management to be undertaken in accordance with SEQERF Primary, Follow-up and Maintenance works notes (adjacent).

Critical skills for Weed Management include:

- Knowledge of relevant legislation
- Plant Identification skills
- Knowledge of different weed management techniques

Knowledge of Relevant Legislation:

It is expected contractors have a depth of knowledge of relevant legislation to complete site rehabilitation works.

This may include occupational Health and Safety laws as well as environmental and heritage protection legislation. Bush regenerators must comply with the requirements of the Workplace Health and Safety Act 2011 or, when working on Commonwealth lands, the Commonwealth's Occupational Health and Safety (Commonwealth Employment) Act 1991. Contractors should also obtain all relevant permits required under State and Commonwealth legislation (e.g. Nature Conservation Act 1992, Fisheries Act 1994, Vegetation Management Act 1999, Biosecurity Act 2014). Contractors must also be aware of and adhere to cultural heritage protection obligations under the Aboriginal Cultural Heritage Act 2003 and where chemicals are in use, the Agricultural Chemicals Distribution Control Act 1966.

In addition to the above, contractors should also be familiar with local government body requirements (e.g. Pest Management Plans, Local Codes, Policies and Guidelines) and Classifications of weeds. Refer to adjacent schedules for classification of weeds under the Biosecurity Act 2014).

| RESTRICTED MATTERS (BIOSECURITY ACT 2014) | |
|---|---|
| Category | Description |
| 1 | must be reported to an inspector within 24 hours if it is present in, or on, something in your possession or under your control or at a place where you are the occupier, unless an appropriately authorised officer has already been advised or you possess a permit for the restricted matter. Includes red imported fire ants, electric ants, Asian honey bees, and certain animal diseases, aquatic diseases and pathogens. |
| 2 | must be reported to an inspector within 24 hours if it is present in, or on, something in your possession or under your control or at a place where you are the occupier, unless an appropriately authorised officer has already been advised or you possess a permit for the restricted matter. includes certain noxious fish, weeds and pest animals |
| 3 | You must not distribute this restricted matter. It must not be given as a gift, sold, traded or released into the environment unless the distribution or disposal is authorised in a regulation or under a permit. Deliberate human distribution or disposal contrary to the legislation is a key source of spread into other areas. includes weeds, pest animals and noxious fish |
| 4 | You must not move this restricted matter to ensure that it does not spread into other areas of the state. includes specific weeds, pest animals and noxious fish |
| 5 | You must not possess or keep this restricted matter under your control. These pests have a high risk of negatively impacting on the environment. You may only keep this restricted matter under a permit of the <i>Biosecurity Act 2014</i> or another Act. includes weeds, pest animals and noxious fish |
| 6 | You must not feed this category of restricted matter. Feeding this restricted matter may cause their numbers to increase and negatively impact the economy or the environment. Feeding for the purpose of preparing for or undertaking a control program is exempted. Includes invasive animals such as feral deer, foxes, rabbits and wild dogs and noxious fish such as carp, gambusia and tilapia. |
| 7 | If you have these noxious fish in your possession you must kill the restricted matter and dispose of the carcass by burying the whole carcass in the ground above the high tide water mark or placing it in a waste disposal receptacle. Includes noxious fish such as carp, weather loach, climbing perch and gambusia |

Plant Identification Skills:

Both native and weed species should be identified prior to primary weed removal works and ongoing throughout the follow-up and maintenance periods. This is to maximise natural regeneration and reducing likelihood of accidental weed spraying to native vegetation. Regenerating species to be treated and maintained in a similar manner to newly planted revegetation tubestock. If contractor is unsure of species, advise should be sought by botanist,

specialist contractor or confirmed with Queensland Herbarium. Refer to indicative Weed Treatment schedules derived from Queensland Herbarium for an indication of weed species and treatments.





Knowledge of Different Weed Management Techniques:

A range of weed management techniques are available to combat varying weed species and scenarios. Refer to adjacent schedules and Appendix A for an indication of weed management techniques.

| WEED MANAGEMENT TECHNIQUES | |
|----------------------------|--|
| METHOD | DESCRIPTION |
| Herbicide | The herbicide weed control techniques described below provide a range of proven methods that can be used on a restoration site. |
| Cut - Scrape - Paint | Cut the stem of the plant close to the ground (approximately 1-2cm) ensuring that soil does not come in contact with the cut surface. The cut can be made at a slight angle in order to increase the surface area that is exposed to the chemical. Apply herbicide immediately to the cut stump using poison pot and brush or dripper bottle. Using a knife, scrape the sides of the stump thoroughly to expose the green tissue. Apply herbicide to the scraped stump. The chemical must be applied within 10 seconds of the cut or scrape being made in order for it to be fully effective. |
| Cut - Paint | Cut the stem of the plant close to ground level. Apply herbicide to the cut stump using poison pot and brush or dripper bottle. This method is best suited to easy-to-treat weeds such as small-leaved privet (<i>Ligustrum sinense</i>), provided that the diameter of the stem at ground level is less than approximately three centimetres. If a glyphosate-/ metsulfuron methyl herbicide mix is being used in the poison pot, a greater range of weeds can be controlled using this method e.g. Easter cassia. |
| Scrape - Paint | Scrape as much of the stem as possible (one side of the stem) using a knife and apply herbicide to the scrape. Leave a small section of the vine unscraped, and then twist the vine so that the next scrape is made on the opposite side of the stem to the preceding scrape. Continue along the length of the vine, scraping and painting as much of the stem as possible, with scraping to be concentrated along the thicker stems close to the root of the plant. This is the best method to use for madeira vine, as it allows the chemical to translocate to the underground storage organs and aerial tubers which may be hanging in large clusters above head height. This avoids the potential problem of tubers from cut stems left hanging in the trees from dropping to the ground and sprouting. When scraping madeira vine stems a deep scrape is advisable – scrape right through to the fibrous, stringy section of the stem, taking care not to sever the vine. This method is also suitable for treatment of ochna. |
| Over-spraying | Over-spraying involves the use of knapsacks or power sprayers to treat large expanses of weed such as lantana thickets. The foliage must be covered with herbicide but not to the point of running off the plant. The dead plants remain in place and can be cut down at a later stage. Prior to over-spraying, any weeds that are growing closely around established native plants must be hand removed or treated by cut-scrape-paint. |
| oll-hang | Vines such as mile-a-minute (<i>Ipomoea cairica</i>) which produce long stolons extending many metres along the surface of the ground, are suited to the roll-hang method. Locate the base of the plant and carefully pull up the runners and roll them up. The resulting roll of vine is then hung in the fork of a tree to dry out as if it is left on the ground it is likely to re-shoot. Where runners are climbing up into a tree they are cut off at head height prior to the runner being rolled up – there is no need to pull cut vines down from trees as this action is likely to damage the tree. The base of the vine is treated using the cutscape-paint method. |
| Gouge-paint | This method applies to plant species that have a fleshy underground storage organ, such as the large tuber that is often found at the base of madeira vine. It is also particularly appropriate for the treatment of climbing asparagus (<i>Protasparagus plumosus</i>). If using this technique on climbing asparagus, first cut the stems that are growing into the canopy at head height and also at the base. The fleshy rhizome can then be gouged, or alternatively in the case of climbing asparagus, it may be struck several times firmly with the head of a pair of loppers, allowing the brown outer covering of the crown to peel away exposing the white fleshy inner section of the rhizome for application of herbicide. Gouge out sections of the fleshy base with a knife and apply herbicide using a paint pot and brush or dripper bottle within 10 seconds. |

| WEED MANAGEMENT TECHNIQUES | |
|----------------------------|---|
| METHOD | DESCRIPTION |
| Basal Barking | This method involves mixing an oil-soluble herbicide in diesel/kerosene and painting or spraying the full circumference of the trunk or stem of the plant from ground level to a height of approximately 45cm. Basal bark application is suitable for thin-barked woody weeds including saplings, regrowth and multi-stemmed shrubs. The method will usually result in the mortality of difficult-to-control woody weeds at any time of the year, provided the bark is not wet or too thick to enable the herbicide to penetrate. The method should not be used in wet weather, adjacent to waterways or in areas where native trees and shrubs are located. The use should be restricted to situations where a weed is particularly difficult to control e.g. cherry guava and where other methods have been unsuccessful. |
| Splatter Gun | This small gas-powered injector kit is fitted into a knapsack for easy carrying and delivers large droplets in a stream over the weed. The gun is used to deliver a concentrated herbicide (glyphosate or metsulfuron methyl) across large dense expanses of weed. The method is used for species such as lantana (ratio of 1:9 of glyphosate:water). Splatter gun involves spraying strips at one to two metre intervals over the thicket. The herbicide is then translocated throughout the entire plant. The method does not require the whole plant to be covered as in over-spray. |
| Spot-spraying | A knapsack filled with an appropriate herbicide mix is used by the operator to selectively control environmental weeds. A keen eye and an ability to distinguish between the native and weed species likely to be present, especially at seedling stage, is essential. Marker dye is added to the chemical mix to allow the operator to see what has already been sprayed, thus covering the ground weeds comprehensively and thoroughly Glyphosate and metsulfuron methyl are the main herbicides used for spot-spraying in ecological restoration, together with the addition of a penetrant and/or surfactant and marker dye. |
| Stem Injection | Large woody weeds such as camphor laurel, coral trees (<i>Erythrina</i> spp, Privet <i>Ligustrum</i> spp) and umbrella trees are generally treated by stem-injection. Holes are drilled at regular intervals around the base of the tree and exposed roots using a drill. A tree injection syringe attached to a small capacity knapsack is used to fill the holes with the herbicide. Stem-injection of trees can also be undertaken using a hatchet to create cuts in a 'brickwork pattern' in trunks of trees for the application of herbicide (known as tree frilling). Frilling is more labour intensive than drilling. The greatest benefit of steminjection is that the trees can be left standing in situ as they die, provided there is no risk to humans or infrastructure from falling limbs. This creates convenient roosts for birds and other animals, and prevents the formation of large amounts of debris on the ground and damage to understory plants which would result if the trees were to be cut down using a chainsaw. |
| Wick Wiping | Wick wipers can be manually used with a sponge or wick applicator, attached to a container filled with herbicide or as an attachment towed by a tractor. The manual method can be used to selectively apply herbicide to the leaves of weeds growing in sensitive situations. The hand-held container can leak and generally spot spraying would be recommended. The use of a tractor drawn wick wiper is used to control taller growing species such as introduced grasses and to encourage the growth of lower growing species. This method could be used in preparation for planting. |
| Mechanical | Mechanical weed control involves the use of powered and non-powered equipment such as brushcutters, chainsaws, slashers, shovels, pruners, saws, etc. These methods are best used in situations where there is a large, uninterrupted stand of weeds. |
| Dig and Bag | Dig and remove tuberous/ rhizomatous root systems. Remove roots or whole plant in hard/ compacted soils. Place in suitable container and remove from site, dispose of by deep burial, burn or burial at a land fill, must not place declared weed species in recycling (mulch). |
| Hand-Pull | Remove totally from ground by hand (human). Perform when soil is moist. Applicable to small infestations or areas of environmental sensitivity (including sensitive watercourses, when frogs are breeding, or presence of threatened species). |
| General Mechanical | May involve use of machinery (e.g. brushcutter, chainsaw, slasher, dozer, excavator). Suitable for large infestations and weed trees. Initially cost-effective, but requires immediate revegetation of site or matting/ mulch application and extensive maintenance periods. Generates excessive soil and vegetation disturbance. |

Note: Table adapted from a table in SEQERF

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|---|---|---|--|---|-------|------|-------------|---------|---|------------|--------------|----|---|------------|-------------------|----|---|---|-------|------------|----------|----|-------------|------|--------|----|--------------|----------------------|--|--|
| Issue | Date | Description | Checked | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A | 15/04/2019 | Client Draft | AD | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B | 24/05/2019 | Client Amendments | AD | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DATE: | 24/05/2019 | CHECKED: | AD | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CLIENT REF: | 7598 | DRAWN: | MC | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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Everleigh, Greenbank

VOLUNTARY DECLARATION REHABILITATION PLAN

PLANTING

Prior to undertaking planting installation, the following general items should be considered:

- Sourcing plant material
- Timing of planting
- Site preparation
- Planting density
- Planting installation

Sourcing Plant Material:

There are a number of options for sourcing plant material for revegetation purposes. Propagation from site seed is a good outcome however is often limited by required timing of works. Sourcing planting from local nurseries is the commonly chosen option and has the following benefits:

- Awareness of genetic considerations when collecting seed.
- Experience with breaking dormancy mechanisms in hard to germinate seeds.
- Highly successful propagation techniques.
- Ability to provide high quality stock to order
- Draw on industry resources.

For threatened species, it is recommended to source seed from stock of local provenance, as close to the receiving site as possible—to maintain the genetic signature of the local population. Furthermore, seed should be sourced randomly from as many individuals as possible across the population—to ensure a representative range of genetic material is collected and to minimise potential for inbreeding.

Timing of Planting:

The timing of planting should ideally be aligned with the wet season in SEQ (summer and autumn). This minimises the need for intensive watering to establishment planting. Planting between February to May is the most beneficial as it also seeks to avoid intense heat periods of summer. Despite this, it is understood planting may occur at various times within the rehabilitation areas due to development timing needs.

Site Preparation:

Site or planting preparation includes:

- Fencing to exclude grazing animals and people (if required)
- Pre-spraying of exotic grasses and other weeds to planting areas
- Consideration of source of water for new planting (access tracks, temporary irrigation)
- Arranging delivery of mulch, jute netting and treeguards (if required)
- Treatment of heavily compacted soils by ripping and/or application of gypsum
- Soil amelioration as required

Planting Density:

The planting will provide a net benefit of greater than 4 to 1 in an area protected under the NESS. Planting of the 625 specimens will be planted at approximately 1 per 8m² to form a *Melaleuca lrbayana* thicket.

PLANTING INSTALLATION

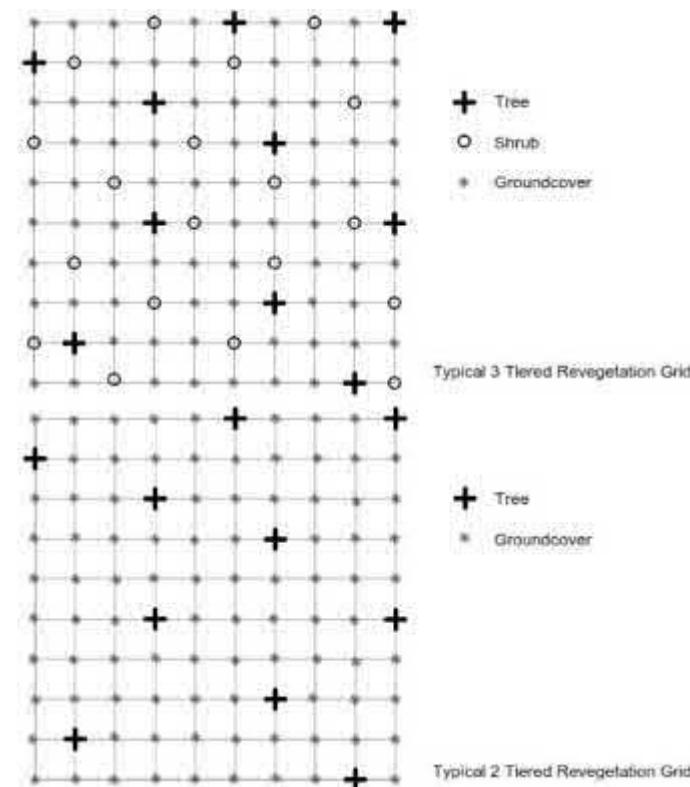
The following outlines the preferred installation methodology for revegetation works within the rehabilitation areas. It has been designed to maximise plant establishment success rates and minimise plant mortality. Revegetation works shall be either undertaken or directly supervised by an experienced and qualified bush regenerator. All works shall be in accordance with the provisions of this sheet, local government policies and Australian Standards. Plant installation methods shall include:

- Plants are to be vigorous, well established, hardened off, consistent with species or variety, free from disease and insect pests, with large root systems and no evidence of having been restricted or damaged.
- Plants are to be planted immediately after delivery to the planting site. If not possible, they should be stored in the shade and watered sufficiently during the day.
- Planting is to be undertaken in accordance with the planting grid contained within this drawing sheet.

- Excavate planting medium to a depth suitable for the installation of tube or pot specimens. In areas where planting substrate is deemed to be very poor (compacted, nutrient depauperate, hydrophobic etc.) and above areas of potential frequent inundation and water flow, topsoil may be used or the ground mechanically ripped where access is feasible.
- Pre-water plant hole, if soil is dry, to decrease root stress upon planting and assess the infiltration of water through the soil
- Incorporate into the planting substrate the appropriate quantity of prepared water crystals or other suitable hydrating product such as Hortex 'Rainsaver' or 'Moisturaid'.
- Place plant into hole and backfill ensuring that the plant is upright and the stem is not covered in any less than 10mm or any more than 20mm of planting medium
- Plants are to be watered thoroughly immediately after planting (ensure deep irrigation) and thereafter as required during the construction phase of the development depending on climatic conditions. Creation of a concave hollow around the base of each plant will aid water infiltration to the plant roots.
- A complete, slow release fertiliser is recommended, and is to be administered appropriately during planting. Top dressing with slow release fertiliser is preferred to avoid toxic levels of fertiliser accumulating in the plant hole around the plant roots.
- To ensure successful establishment, all planting surfaces must be covered in:
 - 100mm layer of high-quality weed-free composted chip mulch (site mulch) - Note: to avoid possible stem rot in some 'drier' species ensure mulch is 'dished' and not covering plant stem by more than 200mm
 - suitable individual anchored natural fibre weed mat; or
 - As presented within other section, where available mulch material will be sourced from cleared vegetation material if adequately seasoned.
- A long-term slow release fertiliser, such as Nutricote or similar product should be used for all plantings after initial plant establishment.
- Seedlings and saplings are to be encouraged and maintained throughout the establishment period.

PLANTING SET OUT

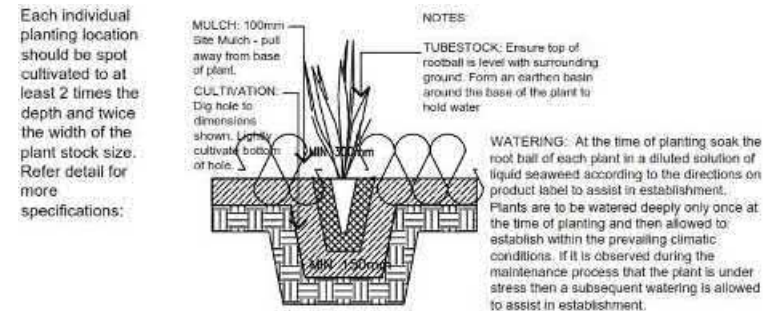
Revegetation planting locations shall be generally set out in accordance with a typical random grid pattern as shown below.



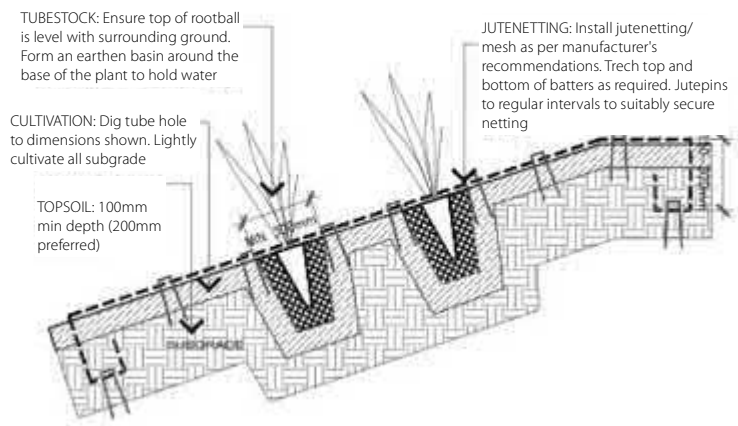
MULCH / JUTE MATTING

Areas to be blanket mulched to a minimum depth of 100mm leaving a 50mm gap surrounding the trunk of planted stock. Areas which are too steep or where overland flows may occur, a combination of mulch and Jute mat and/or suitably anchored natural fibre weed mat installed to manufactures specifications have been specified.

Typical planting details as below for standard medium mulch installation and jute netting. Refer to manufacturer's recommendations for detailed jute netting installation including pinning, etc.



Where evidence of plant damage is occurring i.e. Kangaroo or wallaby grazing, tree guards grow tubes to be installed as required.



Jute netting mesh to be installed as per manufacturer's recommendations. Indicative detail shown only.

FAUNA CONSIDERATIONS

Consideration for fauna habitat and values should be given during rehabilitation site works and should seek to enhance and restore the existing native vegetation areas and promote safe fauna movement throughout the site and into the larger greenspace corridors where possible. It is assumed properties adjacent to the rehabilitation scope of works will undertake individual site analysis, fauna investigations, and implement future measures as required. As part of these rehabilitation works, basic fauna works will be undertaken. These treatments will primarily involve:

- Fauna Habitat Value and Protection
- Increased fauna habitat value within the rehabilitation areas.

Rehabilitation Areas to include reuse of site fallen hollow logs and site rock to create fauna safe havens and cover from predators for small fauna. This approach coupled with additional revegetation works allows greater fauna security and movement within the rehabilitation areas. Consideration for bushfire requirements should be reviewed to confirm no conflict in both the fauna and rehabilitation approaches. Refer indicative images below.



RESPONSIBILITIES

It is also critical for all parties to understand their responsibilities as part of the overall rehabilitation 'team'.

| REHABILITATION TEAM RESPONSIBILITIES | |
|--------------------------------------|--|
| PARTY | DESCRIPTION |
| Proponent | <ul style="list-style-type: none"> Ensure all consultants, contractors, sub-contractors or others utilizing the area are aware of the Rehabilitation Plan. Appoint appropriate consultants and contractors to undertake works as prescribed on the drawings and conditioned by the Assessment Manager. Provide security via an uncompleted works bond and maintenance bond for the cost of works if required. Cover the costs of all necessary resources to ensure works are completed as per the approved documents. |
| Consultants | <ul style="list-style-type: none"> Brief proponent on their requirements in implementing and maintaining works as per the Rehabilitation Plan. Attend pre-start and compliance (on and off maintenance) inspections. Undertake monitoring and reporting to the Assessment Manager as set up by this document. Be available to respond to technical queries to the approved documentation when on-site conditions require changes. Liaise with the Assessment Manager throughout all stages of approval, initial works and maintenance of works. |
| Assessment Manager | <ul style="list-style-type: none"> Provide technical expertise via commentary on the approval of documentation. Attend pre-start and compliance (on and off maintenance) inspections. Reduce and release securities held against works at the completion of successful milestone inspections. Be available to respond to technical queries to the approved documentation when on-site conditions require changes. Accept and review maintenance reports as dictated (if required) in this document. |
| Contractor | <ul style="list-style-type: none"> Complete works in strict accordance with the documentation. Attend pre-start and compliance (on and off maintenance) inspections. Hold relevant licenses in applicable weed management/ revegetation/ fauna management, any required insurances for scope of works and an understanding of required Laws, Act, Policies and Guidelines. Recommend changes to the documentation when specific experience or on-site conditions require so. |

Everleigh, Greenbank

VOLUNTARY DECLARATION REHABILITATION PLAN

MAINTENANCE

The planting will be followed up by a two (2) year period of maintenance, monitoring and reporting to ensure benchmarks for plant survival and weed management are obtained. Further annual inspections and reporting will be undertaken by SHG until handover to Logan City Council.

Maintenance, as with all ecological restoration work, is fundamental in ensuring project success. Maintenance of the planting includes tasks such as:

- Herbicide spraying to control competing weeds.
- Watering while plants are establishing. This is often highly variable and depends on the suite of species planted, weather conditions and time of year when planted. A watering schedule may consist of watering every day for week 1, twice per week for weeks 2-6 and then weekly from weeks 6-12.
- Repair of tree guards if they become damaged.
- Replenishment of mulch.
- Maintaining exclusion fencing; and
- Additional planting may be required to replace plants that do not survive (e.g. to meet survival rate requirements, or to fill gaps).

Maintenance is required following installation of the plants, although if maintenance is regular and thorough during the first year, maintenance requirements are likely to taper off significantly in the following years. The utilisation of benchmark criteria helps to determine rehabilitation

success during the maintenance period and assists in prompting when additional maintenance activities are required. Typically accepted benchmarks or performance indicators for dedicated or open space rehabilitation works include:

- Compliance 'On Maintenance' requirements:
 - All required planting completed.
 - 98% plant survival.
 - 98% kill rate of declared environmental weeds.
- Ongoing 'Off Maintenance' requirements:
 - 98% plant survival.
 - Tree guards, stakes and general rubbish removed.
 - No remaining eroded or degraded areas.
 - 98% kill rate of declared environmental weeds.

The desired end-product is a fully-functioning system that can support itself in perpetuity, with minimal maintenance and input required.

MONITORING

Informal monitoring will occur through ongoing site inspections, note taking and photo-monitoring for the duration of the maintenance / monitoring period (2 years) (Refer to tables below for frequency).

Informal monitoring notes and photos (to address accepted benchmarks above) are to be submitted to SHG and DNRME under the Voluntary Declaration. Notes should also be distributed to the rehabilitation team and rectification works completed against notes.

Monitoring of rehabilitation works is a method of determining ecological restoration success in conjunction with the adjacent benchmarks. Monitoring of the weed management and revegetation works allows for:

- Review of the pre-established performance indicators for measuring the success of the weed removal and control.
- Ensure level of protection for existing identified native vegetation inclusive of that which has naturally regenerated
- Review the rate of spread or contraction of weed infestation within the control program.
- Monitor the rate of assisted regeneration and revegetation of desirable native species promoted in areas where weeds have been removed.
- Identification of new weed threats or other factors that may be effecting areas designated for rehabilitation.

Monitoring timeframes may involve a series of key milestones:

- Prestart Inspection - On site meeting prior to the initial commencement of work. Typically involves Consultant, Contractor and Assessment Manager to work through rehabilitation areas and clarify any adjustments to scope against approved works.

- Compliance Inspections - At the completion of the Primary Site Works, a compliance inspection meeting will be held with the Consultant, Contractor and Assessment Manager to inspect the works on-site in relation to the approved plans and previously agreed benchmarks performance indicators. Should the rehabilitation be a dedicated asset (open space) to the assessment manager, this inspection is commonly referred to as 'on maintenance'. For dedicated assets, a secondary compliance inspection will be required (off maintenance).
- Ongoing Monitoring Inspections- Monitoring to occur on a regular basis as highlighted above. These inspections will generally occur throughout the process, specifically before, during and after relevant compliance inspections.

Photo-monitoring is required for submission over the duration of the monitoring period. Approximate photo-monitoring locations were determined by SHG during the preliminary approval process (refer *Sheet 6*) and are to be utilised for the remainder of the monitoring period

A permanent photo point can be set up using a star picket marked with fluorescent yellow safety cap or painted timber stakes, so that a photograph may be taken of the site at regular intervals as it is being restored. A time series of photographs from a degraded state prior to the commencement of restoration, through the transition stages and into the maintenance stage will assist in assessing the success of the ecological restoration process. Collected site data and photos should be compiled in a 'master' monitoring report for proper record keeping.

INDICATIVE SCHEDULE OF WORK ITEMS AND MAINTENANCE SEQUENCING FOR THE TWO (2) YEAR MAINTENANCE PERIOD

| TIMING | SPRING | | | MILESTONE: COMPLIANCE / 'ON MAINTENANCE' | SUMMER | | | AUTUMN | | | WINTER | | | SPRING | | | SUMMER | | | AUTUMN | | | WINTER | | | SPRING | | | MILESTONE: COMPLIANCE / 'OFF MAINTENANCE' |
|--------|---|-------------------------------------|--|--|--|--|--|---|---|---|--|---|---|---|--|---|---|---|---|---|---|--|---|---|--|-------------------|---------|---------|---|
| | PRIMARY WORKS | | | | FOLLOW-UP WORKS | | | FOLLOW-UP / MAINTENANCE WORKS | | | MAINTENANCE WORKS | | | MAINTENANCE WORKS | | | MAINTENANCE WORKS | | | MAINTENANCE WORKS | | | MAINTENANCE WORKS | | | MAINTENANCE WORKS | | | |
| | Month 1 | Month 2 | Month 3 | | Month 1 | Month 2 | Month 3 | Month 1 | Month 2 | Month 3 | Month 1 | Month 2 | Month 3 | Month 1 | Month 2 | Month 3 | Month 1 | Month 2 | Month 3 | Month 1 | Month 2 | Month 3 | Month 1 | Month 2 | Month 3 | Month 1 | Month 2 | Month 3 | |
| WEEK 1 | Pre-start meeting Council, Contractor and Superintendent | Weed management - "knockdown spray" | Mulch spreading and Jute-mat installation | Watering and Monitoring and reporting (throughout establishment) | Watering and Monitoring and reporting (throughout establishment) | Watering and Monitoring and reporting (throughout establishment) | Monitoring and reporting (watering to replacement plants only) | Monitoring and reporting | Monitoring and reporting | Monitoring and reporting | Monitoring (watering to replacement plants only). Photomonitoring as required. | Informal monitoring and reporting | Informal monitoring and reporting. Photomonitoring as required. | Informal monitoring and reporting | Monitoring (watering to replacement plants only). Photomonitoring as required. | Informal monitoring and reporting | Informal monitoring and reporting. Photomonitoring as required. | Informal monitoring and reporting | Monitoring and reporting | Informal monitoring and reporting. Photomonitoring as required. | Informal monitoring and reporting | Informal monitoring and reporting | Mulch - top up depths to 100mm and replace / repair Jutematting as required | Informal monitoring and reporting. Photomonitoring as required. | Monitoring (watering to replacement plants only) | | | | |
| WEEK 2 | Initial weed management works - wood weed removal / "knockdown" spray | Soil Preparation and cultivation | Natural regeneration plants staking for identification | Weed management - "knockdown spray" in mulched areas | Weed management - "knockdown spray" re-apply woody weeds | Weed management - "knockdown spray" in mulched areas | Weed management - rotation "knockdown spray" in mulched areas | Weed management - rotation "knockdown spray" in mulched areas | Weed management - rotation "knockdown spray" in mulched areas | Weed management - rotation "knockdown spray" in mulched areas | Weed management - rotation "knockdown spray" in mulched areas | Weed management - rotation "knockdown spray" in mulched areas | Weed management - rotation "knockdown spray" in mulched areas | Weed management - rotation "knockdown spray" in mulched areas | Weed management - rotation "knockdown spray" in mulched areas | Weed management - rotation "knockdown spray" in mulched areas | Weed management - rotation "knockdown spray" in mulched areas | Weed management - rotation "knockdown spray" in mulched areas | Weed management - rotation "knockdown spray" in mulched areas | Weed management - rotation "knockdown spray" in mulched areas | Weed management - rotation "knockdown spray" in mulched areas | Natural regeneration plants - weed management | Weed management - "knockdown spray" re-apply woody weeds | Weed management - "knockdown spray" in mulched areas | | | | | |
| WEEK 3 | Weed management works - removal by hand | Soil Preparation and modification | Planting and Watering | Natural regeneration plants - weed management | Replacement of Failed Plants | Replacement of Failed Plants | Natural regeneration plants - weed management | Natural regeneration plants - weed management | Replacement of Failed Plants | Replacement of Failed Plants | Natural regeneration plants - weed management | Trees formative pruning | Replacement of Failed Plants | Replacement of Failed Plants | Natural regeneration plants - weed management | Trees formative pruning | Replacement of Failed Plants | Natural regeneration plants - weed management | Trees formative pruning | Replacement of Failed Plants | Replacement of Failed Plants | Trees formative pruning | Replacement of Failed Plants | Replacement of Failed Plants | Natural regeneration plants - weed management | | | | |
| WEEK 4 | Weed Management - slashing of maintenance access paths | Mulch - stockpiled on site | Planting and Watering | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | Weed Management - slashing of maintenance access paths | | | | |

INDICATIVE SCHEDULE OF MAINTENANCE AND MONITORING SEQUENCING UNTIL HANDOVER TO COUNCIL

| ACTIVITY | INDICATIVE OCCURANCE - YEAR 0-2 | INDICATIVE OCCURANCE - YEAR 2 UNTIL HANDOVER TO COUNCIL |
|---|---------------------------------|---|
| Cleaning Operations | | |
| Litter Collection (general landscape) | "As above" | Annually* |
| Horticultural Environment | | |
| Planting of shrubs and trees (infill planting post initial works) | "As above" | Annually* |
| Care of existing trees and shrubs (inc. formative pruning) | "As above" | Annually* |
| Native bushland maintenance (inc. maintaining access paths, mulch, matting, etc.) | "As above" | Annually* |
| Pest control | "As above" | Annually* |
| Weed treatment | "As above" | Annually* |
| Watering | "As above" | Monitor* |
| Monitoring / Photo location | Quarterly | Annually |
| * Reactionary maintenance as required | | |

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CLIENT:

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REFERENCES:
 South East Queensland Ecological Restoration Framework (2012)

AMENDMENTS:

| Issue | Date | Description | Checked |
|-------|------------|-------------------|---------|
| A | 15/04/2019 | Client Draft | AD |
| B | 24/05/2019 | Client Amendments | AD |

PROJECT:
 423 - 520 Greenbank Road,
 Greenbank (1/SP297192)

environmental management
 PLAN OF: Maintenance & Monitoring
 DATE: 24/05/2019 CHECKED: AD
 CLIENT REF: 7598 DRAWN: MC
 DRAWING No.: 7598 E 05 VDEC RMP B

VOLUNTARY DECLARATION REHABILITATION PLAN - APPROXIMATE PHOTO MONITORING LOCATIONS



1






2



3

LEGEND

-  Photo monitoring location (approximate)
-  Conservation area
-  Melaleuca Irbyana planting/rehab site (Approx. 5,000m²)



4



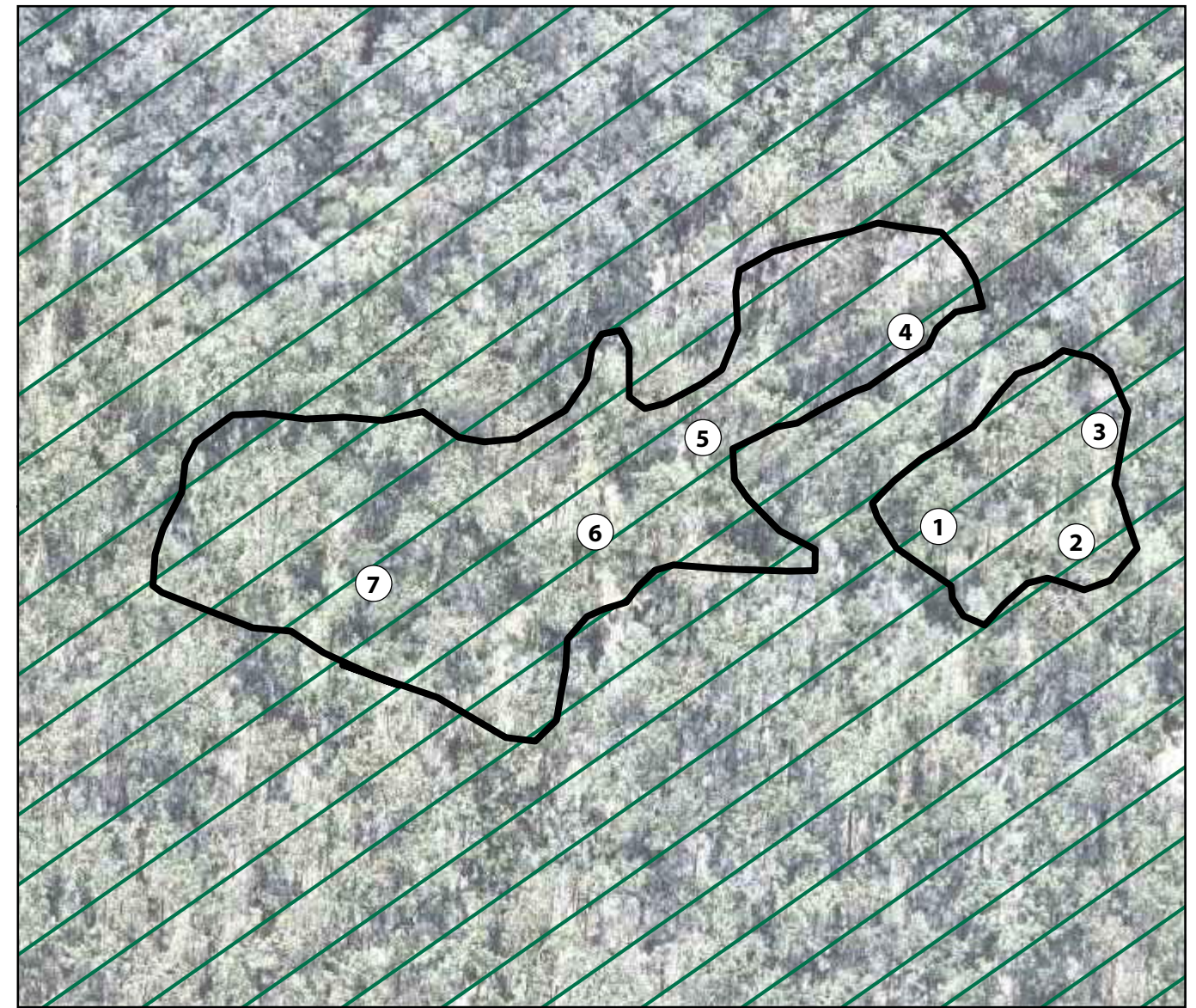
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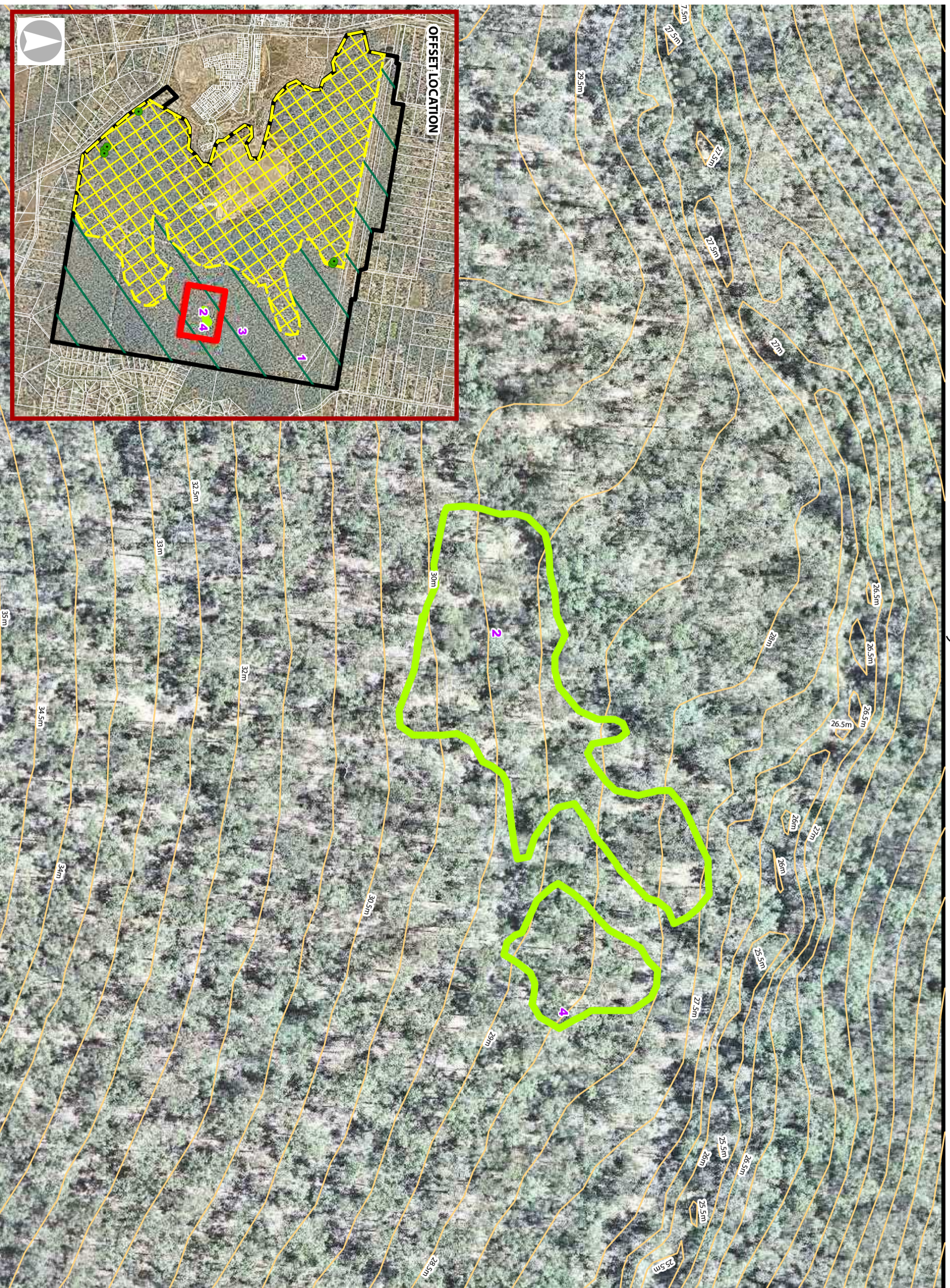
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| Issue | Date | Description | Checked |
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| A | 15/04/2019 | Client Draft | AD |

| | |
|-----------------------------------|-------------|
| PLAN OF: | |
| Photo monitoring locations | |
| DATE: 15/04/2019 | CHECKED: AD |
| CLIENT REF: 7598 | DRAWN: MC |
| DRAWING No.: 7598 E 06 VDEC RMP A | |

3. Rehabilitation Area - *Melaleuca irbyana*










NOTES
 This plan was prepared as a desktop assessment tool. The information on this plan is not suitable for any other purpose. Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey. These may need verification if the development application is approved and development proceeds, and may change when a full survey is undertaken or in order to comply with development approval conditions. No reliance should be placed on the information on this plan for detailed design or for any financial dealings involving the land. Saunders Havill Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

Layer Sources: QLD GIS Layers (QLD Gov. Information Service 2020), Aerial (Nearmap 2020)

* This note is an integral part of this plan/data. Reproduction of this plan or any part of it without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.

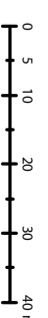
LEGEND

-  Project DCDB
-  Development footprint
-  Conservation area
-  Mature *Melaleuca irbyana* specimens to be impacted by clearing works
-  *Melaleuca irbyana* planting/rehab site (Approx. 5,000m²)
-  Contours (0.5m)
-  Evolve Environmental Solutions photo monitoring points

Note: Juvenile *Melaleuca irbyana* are specimens less than 2 metres tall

| Issue | Date | Description | Drawn | Checked |
|-------|------------|-------------|-------|---------|
| A | 13/07/2020 | Preliminary | MP | KG |

Transverse Mercator | GDA 1994 | Zone 56 | 11.095 @ A3



4. Summary and Conclusion

Saunders Havill Group has been engaged by Mirvac Queensland Pty Ltd to prepare an Impact Management Plan (IMP) for *Melaleuca irbyana* located within the extent of works for the Everleigh Greenbank project. This IMP is intended to support the renewal of the Protected Plants Clearing Permit (Permit No. WA0009354) from Department of Environment and Science (DES). The IMP has been prepared in accordance with the *Nature Conservation (Wildlife Management) Regulation 2006 - Protected Plants Assessment Guidelines*.

A Protected Plants Clearing Permit (Permit No. WA0009354) was issued by the DES on 24 August 2018 which allows for clearing of *M. irbyana* over the entire Clearing Impact Area (i.e. 277 ha site). Conditions of the Permit (PPCM01) require all activities relating to the impact of EVNT plant species under the permit to be carried out in accordance with the procedures and actions in the IMP. This included rehabilitation planting of *M. irbyana* within future Conservation land in the eastern portion of the site to ensure no significant residual impact on the species occurs as a result of the development. Rehabilitation works in accordance with the IMP, including weed removal and advanced tubestock planting commenced in March 2019. Further, a 5,000m² *M. irbyana* rehabilitation area was made a declared area (Category A) under the *Vegetation Management Act 1999* and is subject to legal monitoring and reporting benchmarks set by DNRME.

While clearing within the Permit area has been undertaken, clearing at the locations of the *M. irbyana* patches has not yet occurred. Therefore, this IMP seeks to support renewal of the Protected Plants Clearing Permit (Permit No. WA0009354) which expires on 23 August 2020 for the clearing of protected plants within the 277 ha impact area at the project site.

5. Appendices

Appendix A

Protected Plants Clearing Permit (WA0009354)

Appendix B

Impact Management Plan *Melaleuca irbyana* 43-520 Greenbank Road, Greenbank prepared for Mirvac QLD Pty Ltd,
dated 3 July 2018

Appendix C

Declared Area Map

Appendix D

Wildlife Online Search

Nature Conservation Act 1992

Appendix A

Protected Plants Clearing Permit
(WA0009354)

Permit

Protected Plant Clearing Permit

This wildlife authority is issued under the following legislation: Nature Conservation (Administration) Regulation 2017 Part 2 Division 1.

Permit number: WA0009354

Valid from: 24 August 2018 to 23 August 2020

Activity: Clearing endangered, vulnerable or near threatened plants

| Role | Name | Registered address | |
|--|-------------------------------|---|--|
| Principal Holder: | Saunders Havill Group Pty Ltd | 9 Thompson St BOWEN HILLS QLD 4006 Australia | |
| Person In Charge: | Mark Clancy | Mark Clancy | |
| Business name: | 144972949 | ABN/ACN | Nature Conservation (Wildlife) Regulation 2006 / |
| Activity location/licensed premises | LOT 1/sp297192 | | |

Schedule

| Family or Species or Schedule | Details | Category | Quantity | Unit |
|-------------------------------|---|----------|----------|----------|
| Species | bush house or weeping paperbark or swamp teatree, Melaleuca irbyana | Live | 277 | Hectares |

Jenny Keys
Department of Environment and Science
Delegate of the administering authority
Nature Conservation Act 1992

Enquiries:
Wildlife Assessment Team
Email: wildlife@des.qld.gov.au
WA0009354
Postal Address: PO Box 102, Toowoomba, QLD, 4350

Date issued: 24 August 2018

Legislative Requirements and Conditions of Wildlife Authority

Legislative Requirements

- PPCLR06 Where monitoring by the permit holder of impact management actions with respect to endangered, vulnerable or near threatened species in the clearing area identifies that those actions appear to be unsuccessful or failing, the permittee must notify DES immediately in order to discuss the significant residual impact of the clearing and furthermore discuss any potential implementation of an offset action in accordance with the Queensland Environmental Offset Policy.
This requirement may be found in Section 284(1) Of the Nature Conservation (Wildlife Management) Regulation 2006

Nature Conservation

- PPCLR01 This permit does not exempt the permit holder from obtaining other approvals relevant to the harvest of whole protected plants at the site.
- PPCLR02 Activities carried out under this authority, unless otherwise authorised, apply to non-protected areas only.
This requirement may be found in section 15 of the Nature Conservation (Administration) Regulation 2017
- PPCLR03 This permit includes the clearing of least concern protected plants within the clearing area.

Conditions

- PPCM01 Activities relating to the impact of EVNT plant species under this permit must be in accordance with the procedures and actions outlined in the following documents, except where conditions below indicate otherwise:

'Impact Management Plan *Melaleuca irbyana* 432-520 Greenbank Road, Greenbank prepared for Mirvac QLD Pty Ltd 3 July 2018', and associated appendices and supporting documentation.
- PPCM02 The permit holder is to notify DES in writing at least 48 hours in advance of clearing commencing, for example, via an email to wildlife.management@ehp.qld.gov.au
- PPCM04 Should the project not proceed, in addition to the requirement to rehabilitate the area/s once cleared, the site/s must not be further disturbed and must be maintained to ensure erosion and weed control.
- PPCM08 It is the permit holder's responsibility to ensure that the proposed rehabilitation area with EVNT species *Melaleuca irbyana* is legally secured.

PPCM09 Rehabilitation and/or translocation reporting must be maintained from the commencement date of clearing and continue for a minimum period of 24 months.
The written report (including advice on each monitoring period) must be lodged with the Wildlife Assessment Team, Department of Environment and Heritage Protection, via an email to wildlife@des.qld.gov.au within 10 business days after each annual period.

Appendix B

Impact Management Plan *Melaleuca irbyana* 43-520
Greenbank Road, Greenbank prepared for Mirvac
QLD Pty Ltd, dated 3 July 2018



Impact Management Plan

Melaleuca irbyana

432-520 Greenbank Road, Greenbank
Prepared for Mirvac Queensland Pty Ltd
3 July 2018

Job No. 7598



Document Control

Document: Impact Management Plan for 432-520 Greenbank Road, prepared by Saunders Havill Group for Mirvac Queensland Pty Ltd.

Document Issue

| Issue | Date | Prepared By | Checked By |
|-------|------------|-------------|------------|
| A | 14.02.2018 | KG / JG | AD |
| B | 03.07.2018 | JG | AD |

Prepared by

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| Plan 1: | Impact Assessment |
| Plan 2: | Rehabilitation Area |
| Plan 3: | Rehabilitation Plan |
| Plan 4: | Rehabilitation Area Assessment |

Abbreviations and Acronyms

| | |
|------|--|
| DES | Department of Environment and Science (Qld) (formally EHP) |
| EDQ | Economic Development Queensland (Qld) |
| EHP | Former Department of Environment and Heritage Protection (Qld) (now DES) |
| EVNT | Endangered, Vulnerable or Near Threatened (as defined by the NCA) |
| NCA | <i>Nature Conservation Act 1992</i> (Qld) |
| NCWR | Nature Conservation (Wildlife) Regulation 2006 |
| PDA | Priority Development Area (herein referencing the Greater Flagstone Priority Development Area) |
| SHG | Sunders Havill Group |

1. Introduction

Saunders Havill Group (SHG) was engaged by Mirvac Queensland Pty Ltd (Mircvac) to prepare an Impact Management Plan (IMP) for *Melaleuca irbyana* (Swamp Tee Tree) specimens located within the Greenbank project area located at 432-520 Greenbank Road, Greenbank.

The Greenbank project was referred to the Commonwealth Department of the Environment and Energy (DEE) on behalf of Mirvac by SHG and deemed a Controlled Action for potential impacts on the Koala and Grey-headed Flying-fox under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to be assessed on Preliminary Documentation. Of note, Area 1 was approved by the DEE to be excised from the referral area. The Preliminary Documentation for the assessment of the project is nearing completion.

The Greenbank project has received preliminary approval under the Greater Flagstone Urban Development Area Development Scheme 2011 (PDA Development Scheme) by Economic Development Queensland (EDQ) who are the administering authority for development in the Greater Flagstone Priority Development Area (PDA).

As part of a protected plants flora trigger survey in accordance with the Protected Plants Guidelines, specimens of *M. irbyana*, listed as Endangered under the *Nature Conservation Act 1992* (NCA), were recorded within the Greenbank project area. This IMP has been prepared to support a clearing permit (protected plants) application to the Department of Environment and Science (DES) in accordance with Section 3.2 of the *Nature Conservation (Wildlife Management) Regulation 2006 – Protected Plants Assessment Guidelines*.

The IMP has been prepared in accordance with Section 3.2.1 of the *Protected Plants Assessment Guidelines*, as follows:

3.2.1 Impact management plan

An impact management plan must include the following sections:

- attempts to avoid and minimise impact
- nature of impact
- management of impact
- justification of impact management
- survival of plant in the wild

Contextually, the site is located 30 kilometres (km) south of Brisbane and 10 km west of Logan Village, within the western suburb of Greenbank. The site is bound by Greenbank and Teviot Roads to the west and is predominately surrounded by rural residential development. Wearing Park immediately adjoins the site to the east and Greenbank Shopping Centre and Community Centre are located opposite the site, on the western side of Teviot Road. The site is located approximately 1.5 km southeast of Greenbank Military Training Camp and 500 metres east of the Brisbane – Sydney Railway Line. An infrastructure easement traverses the site parallel to the northern boundary. The site remains one of the last large rural properties in the immediate landscape predominately comprised of rural residential development. Refer to Figure 1 for the site context and Figure 2 for the site aerial.

The proposed clearing works will be undertaken over parts of the 412 hectare (ha) site to facilitate a master planned development and will be subject to future operational works approvals from EDQ. It is noted that a NCA Protected Plants Flora Survey has been undertaken and exemption obtained from the DES, formally the Department of Environment and Heritage Protection (EHP), for clearing over Area 1 to the west (Lot 2 & Lot 3 on SP297192 and along the boundary fence

line to support existing operational works approvals (Ref: APP0007102, APP0007278, respectively). No EVNT species were recorded within these clearing areas.

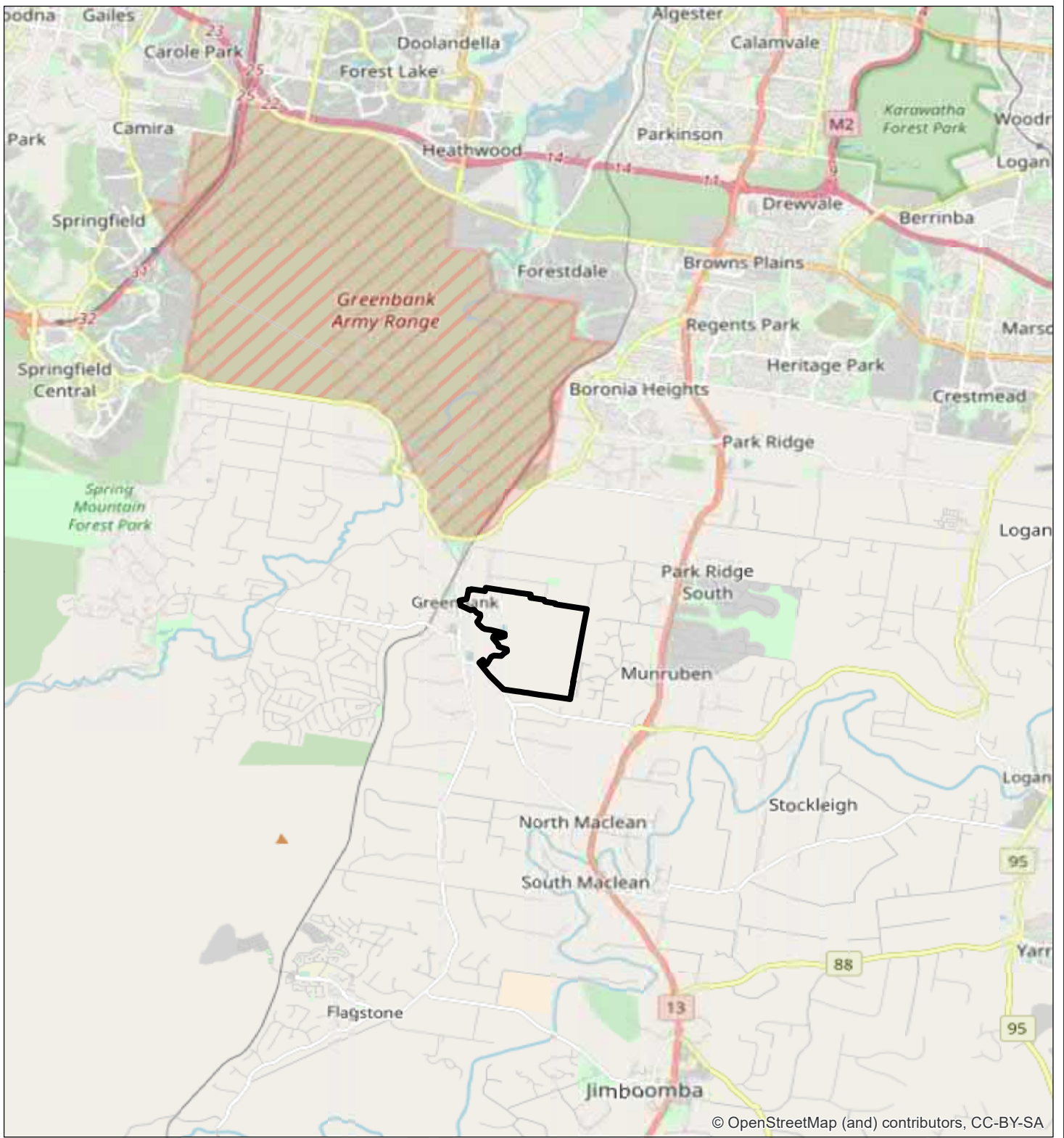
Flora surveys were conducted where clearing is proposed, including within areas mapped as 'High risk' under the Protect Plants Flora Survey Trigger Map High Risk (refer Figure 3) and as per the Flora Survey Guidelines – Protected Plants.

1.1. Property Summary

Key site details are provided in Table 1 below.

Table 1: Property Summary

| | |
|-----------------------------------|--|
| Address | 423-520 Greenbank Road, Greenbank |
| RPD | Lot 1 on SP297192 |
| Local Government Area | Logan City |
| Administering Authority | Economic Development Queensland |
| Priority Development Area | Greater Flagstone PDA |
| Planning Scheme | Greater Flagstone PDA Development Scheme |
| Area Classification / Zone | Urban Living |
| Existing Land Use | Rural |



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Legend

 Site DCDB

Figure 1
Site Context

File ref. 7598 E Figure 1 NCA 2 Site Context B
Date 19/02/2018
Project Greater Flagstone Project, Greenbank (1/SP297192)

0 1,000 2,000 3,000 4,000 m
 Scale (A4): 1:125,000 [GDA 1994 MGA Z56]



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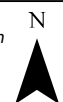
Legend

-  Project Site DCDB
-  Qld DCDB

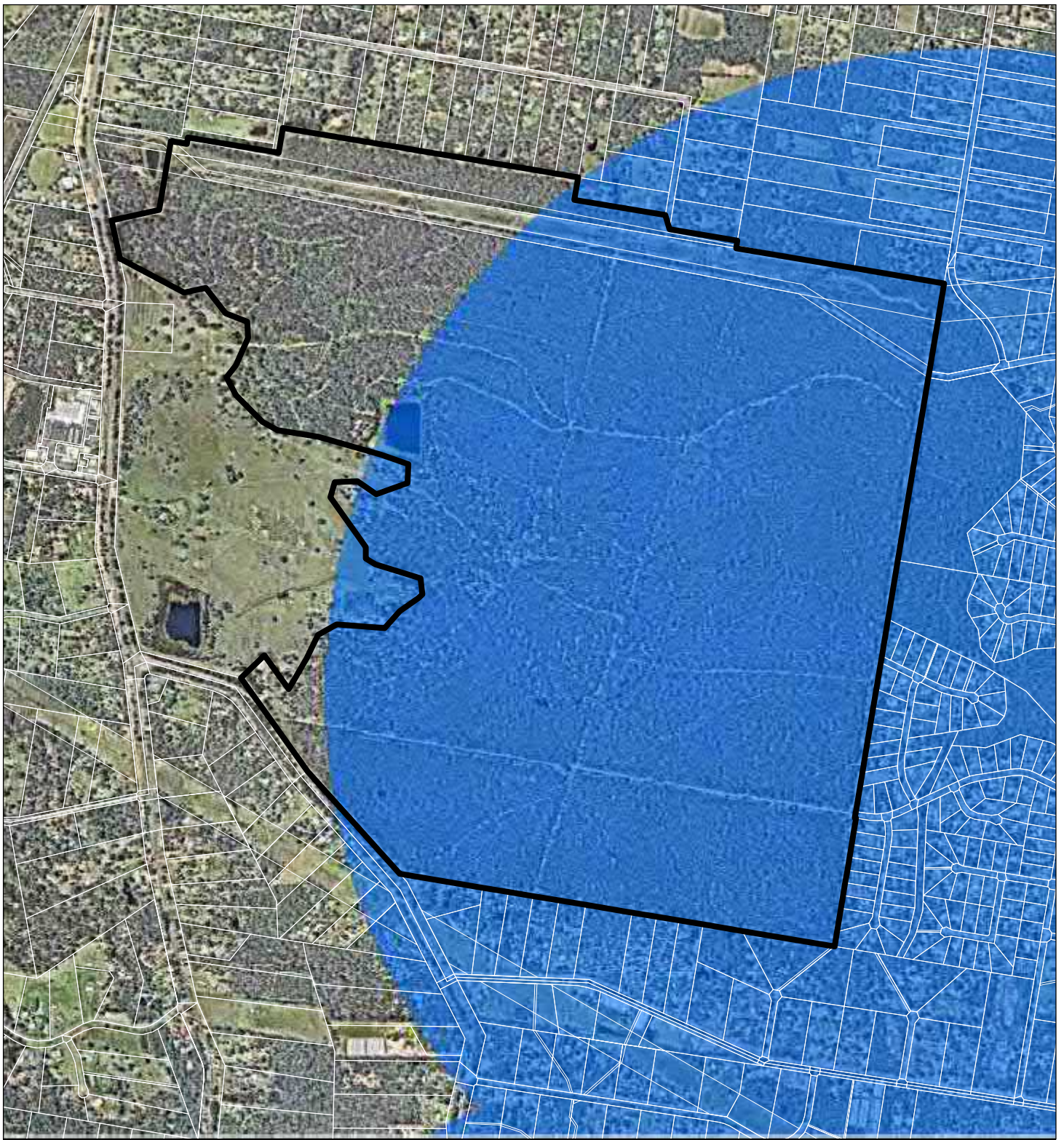
Figure 2
Site Aerial

File ref. 7598 E Figure 2 NCA 2 Site Aerial B
Date 19/02/2018
Project Greater Flagstone Project, Greenbank (1/SP297192)

0 100 200 400 600 800 m
 Scale (A4): 1:17,000 [GDA 1994 MGA Z56]



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Legend




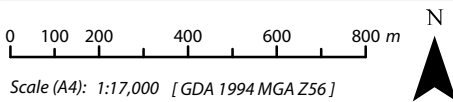
-  Project Site DCDB
-  Qld DCDB
-  Flora survey trigger area

Figure 3
NCA - Protected Plants Flora Survey Trigger Mapping

File ref. 7598 E Figure 3 NCA 2 Protected Plants B
Date 19/02/2018
Project Greater Flagstone Project, Greenbank (1/SP297192)



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1.2. Nature Conservation Act 1992

The *Nature Conservation Act 1992* (NCA) classifies and protects significant areas (Protected Areas) and protects threatened plant and animal species. The Nature Conservation (Wildlife) Regulation 2006 (NCWR) lists plant and animal species presumed extinct, endangered, vulnerable, near threatened, least concern, international or prohibited.

The Queensland Government has adopted a regulatory framework that captures activities that pose a high risk to plant biodiversity. Under the framework, when a non-exempt clearing activity is proposed within a 'High Risk' area, the proponent of that activity is required to complete a flora survey prior to commencement of clearing. The Protected Plants Flora Survey Trigger Map shows 'High Risk' areas for protected plants and is used to help determine flora survey and clearing permit requirements for a particular location.

A search of the Protected Plants Flora Survey Trigger Mapping indicated proposed clearing areas within the subject site are overlaid as 'High Risk' and so are subject to flora survey requirements (refer Figure 3).

Prior to flora surveys, the schedules of the NCWR were considered in this report using a Wildlife Online Database Search with a 10 km radius from the site. Three (3) flora species listed under the NCWR were identified as having the potential to occur on site and are presented in Table 1. Refer to Appendix A for full search results.

Table 2: Wildlife Online Search Results–Flora

| Scientific Name | Common Name | NCA Status |
|----------------------------------|------------------|------------|
| <i>Marsdenia coronata</i> | Slender Milkvine | Vulnerable |
| <i>Plectranthus habrophyllus</i> | - | Endangered |
| <i>Melaleuca irbyana</i> | - | Endangered |

2. Nature of the Impact

2.1. Background

The only EVNT species located within the Greenbank project area was *Melaleuca irbyana* (Swamp Tea Tree). The profile of this species is detailed below in Section 2.2.

2.2. Protected Plant Profile

Melaleuca irbyana, a member of the Myrtaceae family, is listed as a threatened species under Schedule 2 of the *Nature Conservation (Wildlife) Regulation 2006* (NCWR) and is classified as “endangered”. *Melaleuca irbyana* is also included as part of Endangered Regional Ecosystems (RE) 12.3.18, 12.3.19, 12.9-10.11 and 12.9-10.27 under the *Vegetation Management Act 1999* (VMA). This vegetation community is also listed as a Critically Endangered when present as a Threatened Ecological Community under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC).

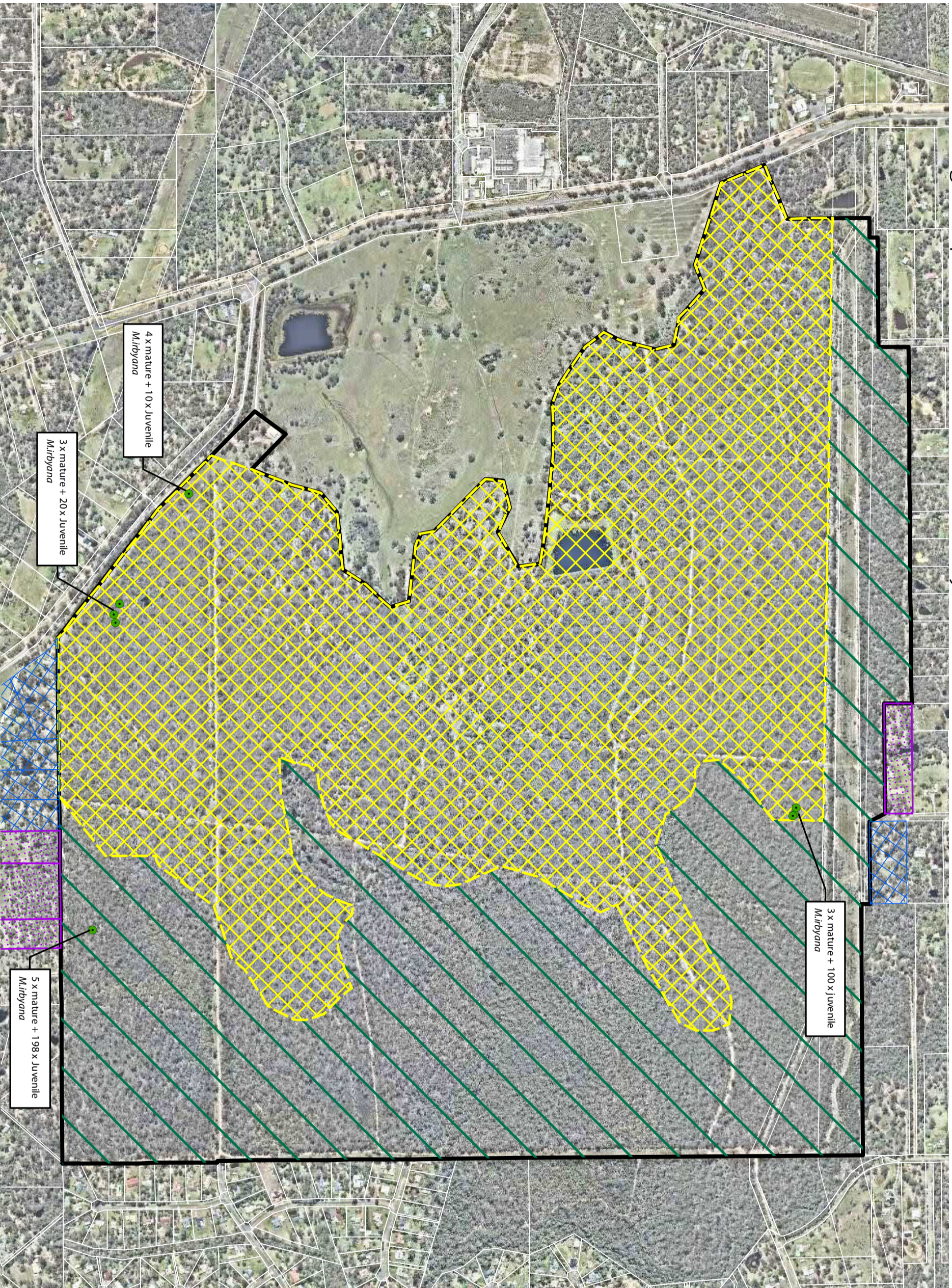
M. irbyana forms communities that occur in two (2) structural forms: the more common form consists of a dominant eucalypt canopy with an understorey containing *M. irbyana* thickets 8-12 metres in height; the less common form is an open forest or thicket of *M. irbyana* with emergent eucalypt trees. The understorey is sparse and can comprise of grasses, sedges, and herbs with a few shrubs, vines and possibly orchids present. There are fairly clear descriptions of *M. irbyana* communities, however, there are no clear indications of the point at which an individual tree or small number of trees are considered to be part of a community. An individual tree may still contribute reproductively to a community, or may have the potential to regenerate and in time create a community.

Logan City Council defines an *M. irbyana* community as, “where *Melaleuca irbyana* occur in a patch size of 0.25 hectares or greater, or where a patch of *Melaleuca irbyana* less than 0.25 hectares adjoins a second patch and the sum of the patches is greater than 0.25 hectares”. This definition has been determined using methodology from the *Melaleuca irbyana* (Swamp Tea-tree) Community 1:25,000 Scale Mapping Project (Ryan, 2010).

2.3. *Melaleuca irbyana* On-site

The entire site was traversed as part of previous and contemporary NCA searches. While *Melaleuca irbyana* were not previously recorded in the Clearing Impact Area associated with Area 1 and the Perimeter Clearing works extents, surveys conducted as part of this reporting, over the balance of the site, recorded the species in four (4) separate locations. Refer to Plan 1 for *Melaleuca irbyana* onsite locations.

1. Clearing Impact - *Melaleuca irbyana*



NOTES
 This plan was prepared as a desktop assessment tool. The information on this plan is not suitable for any other purpose. Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey. These may need verification if the development application is approved and development proceeds, and may change when a full survey is undertaken or in order to comply with development approval conditions. No reliance should be placed on the information on this plan for detailed design or for any financial dealings involving the land. Saunders Havill Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

Layer Source: QD GIS Layers (QD Gov. Information Service 2016), Aerial (Qld Gov. and Google 2016)

* This note is an integral part of this plan. Reproduction of this plan or any part of it without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.

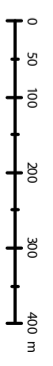
LEGEND

- Project DCDB
- Development footprint
- Conservation area
- NCA flora survey trigger area
- No Access under NCA
- Exemption (AP0007102)
- Surveyed under NCA Exemption (AP0007102)
- Mature *Melaleuca irbyana* specimen

Note: Juvenile *Melaleuca irbyana* are specimens less than 2 metres tall

| Issue | Date | Description | Drawn | Checked |
|-------|------------|---------------------|-------|---------|
| A | 5/03/2018 | Preliminary | TC | AD |
| B | 11/06/2018 | Updated impact area | TC | AD |

Transwaa Member | QDA 1994 | Zone 95 | 1:10,000 @ A3



Location 1:

Location 1 is situated in the northern aspect of the site, adjacent to the power easement. This patch is located within mapped composite 'Of Concern' Regional Ecosystem RE12.9-10.2/12.9-10.7 as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. Refer to Plan 1 for *Melaleuca irbyana* on site locations and Table 3 for a description of the Regional Ecosystems). This patch of *Melaleuca irbyana* (Swamp Tea-tree) consisted of three (3) established specimens and one-hundred (100) juveniles. This patch of *Melaleuca irbyana* was surrounded by vegetation dominated by *Acacia spp.*, *Allocasuarina littoralis* (Black She-oak) and *Alphitonia excelsa* (Soap Tree) regrowth with *Corymbia citriodora* (Spotted Gum) dominated canopy.



Photo Plate 1: Location 1

Location 2:

Location 2 is situated towards the south-western property boundary, adjacent to Greenbank Road. This patch is located within mapped non-remnant vegetation as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. This *Melaleuca irbyana* (Swamp Tea-tree) patch consisted of three (3) established specimens and twenty (20) juveniles. This patch of *Melaleuca irbyana* was found within a regrowth vegetation community, with surrounding vegetation dominated by *Allocasuarina littoralis* (Black She-oak) and *Acacia spp.* regrowth.



Photo Plate 2: Location 2

Location 3:

Location 3 is situated towards the south-western property boundary, adjacent to Greenbank Road and approximately 380 m west of Location 2. This patch is located within mapped non-remnant vegetation as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. This patch of *Melaleuca irbyana* (Swamp Tea-tree) consisted of four (4) established specimens and ten (10) juveniles. The patch of *Melaleuca irbyana* was found within a regrowth vegetation community, with surrounding vegetation dominated by *Acacia spp.*, *Allocasuarina littoralis* (Black She-oak) and *Alphitonia excelsa* (Soap Tree) regrowth.



Photo Plate 3: Location 3

Location 4:

Location 4 is situated towards the southern property boundary, approximately 800 m east of Location 2. This patch is located within mapped composite 'Of Concern' Regional Ecosystem RE12.9-10.2/12.9-10.7 as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. These Regional Ecosystems are described in Table 3 below. This patch consists of five (5) established specimens and one hundred and ninety-eight (198) juveniles. This patch of *Melaleuca irbyana* was surrounded by vegetation dominated by *Acacia spp.*, *Allocasuarina littoralis* (Black She-oak) and *Alphitonia excelsa* (Soap Tree) regrowth with *Corymbia citriodora* (Spotted Gum) dominated canopy.



Photo Plate 4: Location 4

Table 3: Regional Ecosystems Descriptions

| Status | Code | Description |
|----------------------|------------|--|
| Endangered | 12.9-10.12 | <i>Corymbia intermedia</i> , <i>Angophora leiocarpa</i> , <i>Eucalyptus seeana</i> +/- <i>E. siderophloia</i> , <i>E. tereticornis</i> , <i>E. racemosa</i> subsp. <i>racemosa</i> , <i>C. citriodora</i> subsp. <i>variegata</i> woodland to open forest. <i>Lophostemon suaveolens</i> is often present as a sub-canopy or understorey tree. Occasional <i>Melaleuca quinquenervia</i> on lower slopes. Does not include areas dominated by <i>Eucalyptus racemosa</i> subsp. <i>racemosa</i> . Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 9g). |
| Of Concern | 12.9-10.7: | <i>Eucalyptus crebra</i> +/- <i>E. tereticornis</i> , <i>Corymbia tessellaris</i> , <i>Angophora leiocarpa</i> , <i>E. melanophloia</i> woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c). |
| Of Concern | 12.3.11 | <i>Eucalyptus tereticornis</i> +/- <i>E. siderophloia</i> and <i>Corymbia intermedia</i> open forest to woodland. <i>Corymbia tessellaris</i> , <i>Lophostemon suaveolens</i> and <i>Melaleuca quinquenervia</i> frequently occur and often form a low tree layer. Other species present in scattered patches or low densities include <i>Angophora leiocarpa</i> , <i>E. exserta</i> , <i>E. grandis</i> , <i>C. trachyphloia</i> , <i>C. citriodora</i> subsp. <i>variegata</i> , <i>E. latisinensis</i> , <i>E. tindaliae</i> , <i>E. racemosa</i> and <i>Melaleuca sieberi</i> . <i>E. seeana</i> may be present south of Landsborough and <i>Livistona decora</i> may occur in scattered patches or low densities in the Glenbar SF and Wongi SF areas. Occurs on Quaternary alluvial plains and drainage lines along coastal lowlands. Rainfall usually exceeds 1000mm/y. (BVG1M: 16c) |
| Least Concern | 12.3.6: | <i>Melaleuca quinquenervia</i> +/- <i>Eucalyptus tereticornis</i> , <i>Lophostemon suaveolens</i> , <i>Corymbia intermedia</i> open forest to woodland with a grassy ground layer dominated by species such as <i>Imperata cylindrica</i> . <i>Eucalyptus tereticornis</i> may be present as an emergent layer. Occurs on Quaternary floodplains and fringing drainage lines in coastal areas. (BVG1M: 22a) |
| Least Concern | 12.9-10.2: | <i>Corymbia citriodora</i> subsp. <i>variegata</i> open forest or woodland usually with <i>Eucalyptus crebra</i> . Other species such as <i>Eucalyptus tereticornis</i> , <i>E. moluccana</i> , <i>E. acmenoides</i> and <i>E. siderophloia</i> may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of <i>Lophostemon confertus</i> (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 10b). |

Based on the information provided in **Section 2.2**, the specimens located on site are not consistent with a *Melaleuca irbyana* community due to the patches predominately containing juvenile individuals with very few mature specimens. Importantly, these patches are not associated with Endangered Regional Ecosystems. Locations 1 and 4 were confirmed via a certified PMAV to be located within composite 'Of Concern' Regional Ecosystem RE12.9-10.2/12.9-10.7 while locations 2 and 3 were located within non-remnant areas.

While Location 1 contains a substantial amount of juvenile species, overall, the significance of these patches is considered less than if they formed part of a broader existing community. The habitat value they currently provide is considered relatively limited, with no obvious noteworthy habitat for flora or fauna observed at the time of survey.

2.4. Avoidance and Minimisation of Impact

The proposed works are for the development of Greenbank master planned development in the Greater Flagstone PDA. Preliminary approval for the context plan and master plan has been issued by EDQ. These plans were informed by detailed analysis of the site by specialist consultants, including a detailed ecological analysis by SHG. Subsequently, areas for development shown are concentrated to areas of least constraint. Areas of highest ecological value have been identified for retention as conservation.

The proposed works will include the creation of residential allotments, a proposed school site, new roads, park and conservation areas and corridors. Minimisation of overall clearing impacts are evident through location of the proposed development, located outside Endangered remnant vegetation and waterway corridors. Rehabilitation of conservation areas and waterways is proposed as part of the development.

The proposed earthworks to facilitate the development footprint will require the removal of three (3) relatively small patches of predominately juvenile *Melaleuca irbyana* specimens, and ongoing property boundary maintenance within 100 m of a fourth patch. These specimens are located within Of Concern and non-remnant regrowth areas (refer Plan 1).

As per the EDQ endorsed Natural Environment Site Strategy, extensive conservation of greater than 89 hectares of proposed Conservation Parkland adjoining Norris Creek and Wearing Park is proposed as part of the development. In accordance with best practice management, restoration and rehabilitation works will seek to stabilise and reverse the negative effects of ongoing habitat fragmentation. The intent is for managed areas of rehabilitation and restoration to rectify canopy gaps and restore bare or denuded areas to provide additional habitat and refugia within the lower strata to maintain connectivity with external approval corridors and improve terrestrial corridor viability. Rehabilitation works within the conservation area and waterway corridors will include weed management and replanting with native species consistent with mapped Regional Ecosystems to augment ecological values and enhance connectivity.

Melaleuca irbyana grows in flat areas that are periodically waterlogged, in eucalypt forest, mixed forest and *Melaleuca* woodland with a sparse and grassy understorey. The species prefers poorly draining, heavy clay soils (Byrnes 1984; Barlow 1987). The proposed conservation land rehabilitation works will include establishing a *Melaleuca irbyana* thicket within remnant woodland forest to the north of the central waterway. This land is relatively low lying and adjoins an ephemeral waterway that contains permanent billabongs. The proposal *Melaleuca irbyana* planting site is therefore considered ideal for the species, which is dependent on specific groundwater and / or surface water hydrology. Impacts to *Melaleuca irbyana* have been minimised to the greatest practical extent and include establishing a *Melaleuca irbyana* community, on the project site, within future conservation land and managing potential impacts from ongoing works that will occur within 100 m of a retained patch.

2.5. Survival of the Plant in the Wild

Based on the current disturbed nature of the site and the locations of the *Melaleuca irbyana* specimens along property boundaries, it is not anticipated that the removal of three (3) relatively small patches of predominately juvenile *Melaleuca irbyana* specimens will significantly hinder the future success of the species in the area. Importantly, the fourth patch is to be preserved within the conservation area and proposed rehabilitation works seek to establish a *Melaleuca irbyana* community on the site allowing the community to be protected in perpetuity.

3. Offset Assessment

The *Protected Plants Assessment Guideline* states that an offset compensates for residual impacts after impact management requirements of the guideline have been met. The specimens located are not considered to constitute ecological communities (as described in Section 2.2.), and therefore the viability of *Melaleuca irbyana* local populations are not considered to be impacted by this proposal.

The proposed earthworks to facilitate the development footprint will require the removal of three (3) relatively small patches of predominately juvenile *Melaleuca irbyana* specimens. In consideration of the extensive rehabilitation works proposed within the onsite conservation land, including the establishment of an *Melaleuca irbyana* thicket, the proposed rehabilitation works will ensure a net gain in *Melaleuca irbyana* across the site. IN light of rehabilitation efforts, the removal of small patches of *Melaleuca irbyana* specimens is not considered to impose a Significant Residual Impact, as defined under the DES policy, and therefore offsets are not considered applicable in this case.

3.1. Rehabilitation works

It is considered that the proposed rehabilitation works will mitigate the impact to the extent that the impact on the Matter of State Environmental Significance (MSES) would not be considered significant.

To demonstrate this mitigation of impact, a response to the four (4) points of consideration within Section 1.2 of the *Significant Residual Impact Guideline* is provided below.

- **The extent and duration of impact on the matter and its sensitivity to disturbance.**

The impact on the matter is the removal of three (3) relatively small patches of predominately juvenile *Melaleuca irbyana* specimens from former paddock areas that have already been subject to high disturbance from cattle grazing and historical clearing. A fourth patch will be retained with ongoing adjoining works within 100 m limited to the maintenance of the nearby property boundary. The sites are described in detail in Section 2.3, shown in Plan 1 and summarised below:

- Location 1: 3 x mature s + 100 juvenile specimens, located within the north-east along a drainage feature
- Location 2: 4 x mature + 10 juvenile specimens, located along the southern boundary
- Location 3: 3 mature +20 juvenile specimens, located along the southern boundary
- Location 4: 5 mature + 198 juvenile specimens, located along the southern boundary in the south-west

- **Timeframe for rehabilitation relative to the impact occurring and the ability of the matter to maintain its viability during this timeframe.**

The rehabilitation proposed is the planting of six hundred and twenty-five (625, equates to 140 cleared specimens at 4:1 plus an additional 65 specimens over 5,000 m² at 1 per 8 m²) advanced tube stock specimens of *M. irbyana* within a relatively isolated portion of the central waterway corridor of the conservation zone (refer Plans 2 to 4). Although it is expected that these plantings will take approximately four (4) years to reach the size of the impacted matter, they will be planted in a thicket to replicate as close to natural conditions for a *M. irbyana* ecological community as possible and maintained as part of the extensive rehabilitation works for the conservation zone. The area of planting of this thicket adjoins the central waterway corridor and is not within 100 m of future development areas. This location has been chosen to avoid human disturbance and as far away as possible from conflicting uses.

It is noted that the rehabilitated creek corridor will be handed over to Logan City Council following the on-maintenance period. Further, the fourth patch of *M. irbyana* that is to be retained within the conservation area will be subject to regular compatible weed suppression and monitored for persistence as part of site maintenance due to its proximity to ongoing property boundary maintenance works within 100 m.

- **Likely success of rehabilitation works to return the impacted matter to its original condition, and;**

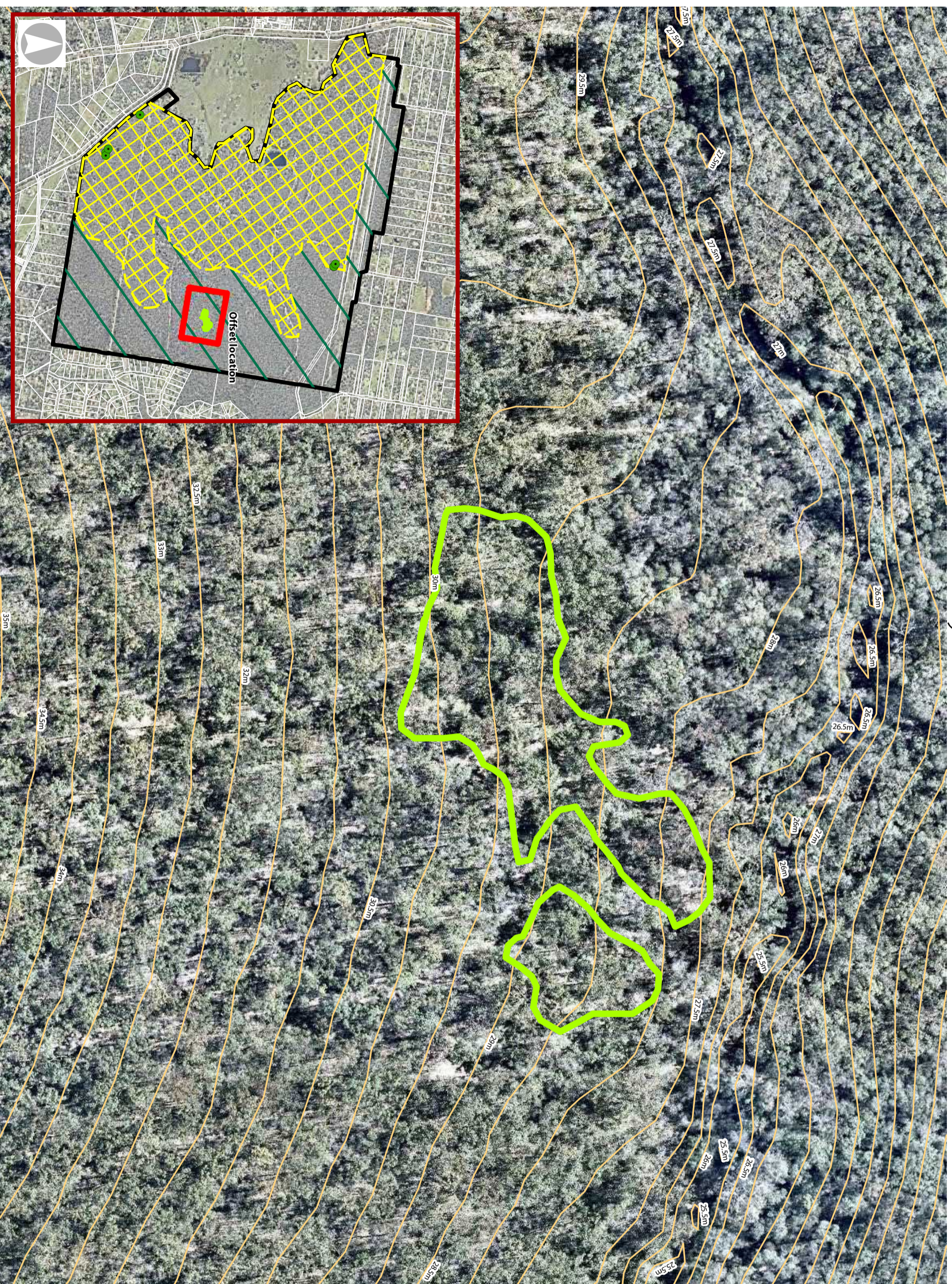
It is important to note that the Regional Ecosystems within and adjoining the creek corridor reflect those where the *M. irbyana* patches are currently located on-site. The proposed rehabilitation area was chosen after detailed ecological survey of site attributes, including the prevailing low-lying topography, proximity to the creek, and canopy gaps with limited existing understorey (refer Plans 2 & 4). Thus, the planting of *M. irbyana* in the creek corridor has a high likelihood of success given the suitable landscape and habitat. Given that the impact is the removal of a 140 single individual specimens of *M. irbyana* which are almost entirely juveniles, the planting of six hundred and twenty-five (625) specimens of *M. irbyana* as a thicket within the conservation zone to be rehabilitated will far exceed the original condition of the impacted matter at an offset ratio of greater than 4:1.

- **The time-lag effect—between impact and rehabilitation successfully delivering the original condition for the matter—on the matter’s viability.**

As mentioned previously, the removal of three small patches of *M. irbyana* is not considered to significantly impact upon the viability of local populations nor remove significant habitat values. Although there will be a time-lag between the removal of the predominantly juvenile *M. irbyana* specimens and the maturity of the tube stock of *M. irbyana* to be planted. Overall, the rehabilitation proposed is considered a far superior ecological outcome for viability of local populations.

The extent and number of *M. irbyana* to be planted is intended to establish a self-sustaining thicket of *M. irbyana* in a safe and secluded buffer environment that is capable of mitigating the proposed impacts. It is acknowledged that any future unavoidable loss of *M. irbyana* from the development area will be assessed by DES on a case by case basis.

2. Offset Assessment - *Melaleuca irbyana*









NOTES
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Layer Source: QD GIS Layers (QLD Gov. Information Service 2016), Aerial (Aeasmap 2018)

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LEGEND

-  Project DCDB
-  Development footprint
-  Conservation area
-  Mature *Melaleuca irbyana* specimens to be impacted by clearing works
-  *Melaleuca irbyana* planting/rehab site (Approx. 5,000m²)
-  Contours (0.5m)

Note: Juvenile *Melaleuca irbyana* are specimens less than 2 metres tall

| Issue | Date | Description | Drawn | Checked |
|-------|------------|-------------|-------|---------|
| A | 11/06/2018 | Preliminary | TC | AD |

Transwain Melder | QDA 1994 | Zone 95 | 11.095 @ A3



3. Melaleuca Irbyana - Rehabilitation/Planting Site Notes

INTRODUCTION

Saunders Havill Group (SHG) was engaged by MIRVAC to prepare an Impact Management Plan (IMP) for the clearing of 140 *Melaleuca irbyana* (Swamp Tree Tree) specimens. The replacement plants will be located within the approved conservation area of the Everleigh project (herein referred to as 'the site'). The clearing works, current and future will facilitate the creation of residential lots, a school and internal roads for the site's ultimate development layout.

The rehabilitation proposal for the clearing of 140 *Melaleuca Irbyana* is the planting of four (4) advanced tube stock specimens of *Melaleuca Irbyana* per tree cleared. A total of 625 (560+65 additional) *Melaleuca Irbyana* will be planted as a result. The planting area is proposed within the site's conservation zone (refer Plan 2) and will cover 5,000 m². The specific location of the planting area was determined onsite by Ecologists from SHG. The percentage of exiting canopy cover and the land zone features were taken into consideration when determining the optimal location for planting. Although it is expected that these plantings will take approximately four (4) years to reach the size of the impacted matter, they will be planted in a thicket to replicate as close to natural conditions for a *Melaleuca Irbyana* ecological community as possible and maintained as part of the rehabilitation works for the conservation zones. The area of planting of this thicket is centralised within the conservation zone and adjacent the waterway corridor, as stipulated by the EDQ approved NESS, and not within 100m of future development areas.

This Rehabilitation Plan is drafted to identify and manage the site disturbances for the planting of the 625 *Melaleuca Irbyana* specimens within a 5,000m². The planting will involve low impact weed removal and the retention of any existing native vegetation in the immediate area.

SITE PREPARATION

Once the planting locations have been determined not to impact existing native vegetation, the location is to be spot sprayed prior to soil cultivation. Herbicides must be applied by appropriately qualified/supervised persons in accordance with the Agricultural Chemicals and Distribution Control Act 1966 at rates identified on registered product labels, or on an Australian Pesticides and Veterinary Medicines Authority (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance.

The planting will provide a net benefit of greater than 4 to 1 in an area protected under the NESS.

Rehabilitation treatment is to generally include the following points:

- A number of weeds are recorded for removal within shrub & ground layer
- Weed removal and management will utilise low impact methods
- Planting of the 625 specimens will be planted at approximately 1 per 8m² to form a *Melaleuca Irbyana* thicket.

Ecologists from SHG have assessed the site's vegetation. Broadly, it was determined that the assisted natural regenerate approach will be used on site. This approach is described below:

ASSISTED NATURAL REGENERATION

Applies:

- To natural areas where the native plant community is largely healthy and functioning
- When native plant seed is still stored in the soil or will be able to reach the site from nearby natural areas, by birds or other animals, wind or water
- Where the natural regeneration processes (seedling germination, root suckering, etc.) are being inhibited by external factors, such as weed invasion, soil compaction, cattle grazing, mechanical slashing, etc.
- When limited human intervention, such as weed control, minor amelioration of soil conditions, erection of fencing, cessation of slashing, etc. will be enough to trigger the recovery processes through natural regeneration
- When the main management issue is weed infestation and/or current land use practices

Role of planting:

- Planting in such areas should be limited to where species cannot return to site without direct intervention.

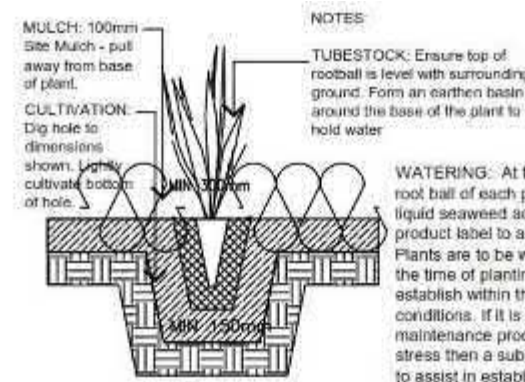
Goal vegetation community:

- The re-establishing plant community will be substantially similar in structure, composition and diversity to the original vegetation

MULCH

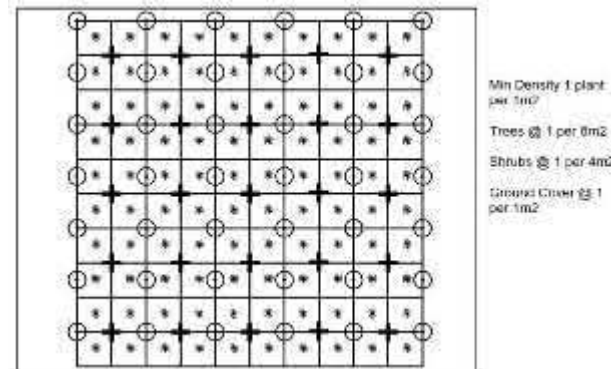
Areas to be blanket mulched to a minimum depth of 100mm leaving a 50mm gap surrounding the trunk of planted stock. Areas which are too steep or where overland flows may occur, a combination of mulch and Jute mat and or suitably anchored natural fibre weed mat installed to manufactures specifications have been specified.

Each individual planting location should be spot cultivated to at least 2 times the depth and twice the width of the plant stock size. Refer detail for more specifications:



PLANTING

Planting locations shall be generally set out in accordance with a typical random grid pattern as shown on this drawing sheet below with the *Melaleuca Irbyana* to be planted at 1 per 8m².



All stock shall be advanced tube stock specimens of *Melaleuca Irbyana*, well formed, and hardened off to suit final revegetation location, nursery stock. The root system should be well formed without being tube bound or large roots extruding from the tube container. The environmental coordinator has the right to inspect and reject stock prior to planting.

INSTALLATION

The following outlines the preferred installation methodology for revegetation works within the rehabilitation areas. It has been designed to maximise plant establishment success rates and minimise plant mortality. Revegetation works shall be either undertaken or directly supervised by an experienced and qualified bush regenerator. All works shall be in accordance with the provisions of this sheet, local government policies and Australian Standards. Plant installation methods shall include:

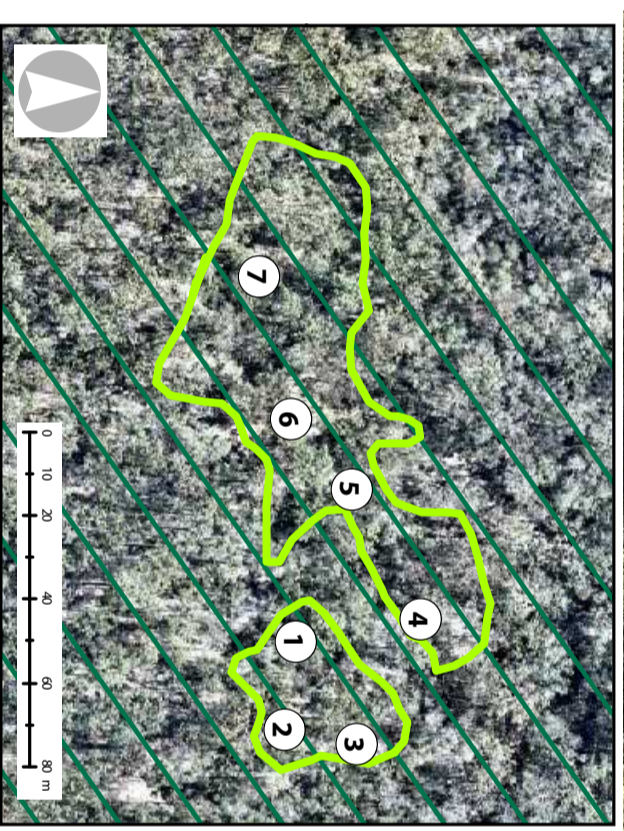
- Plants are to be vigorous, well established, hardened off, consistent with species or variety, free from disease and insect pests, with large root systems and no evidence of having been restricted or damaged.
- Plants are to be planted immediately after delivery to the planting site. If not possible, they should be stored in the shade and watered sufficiently during the day.
- Planting is to be undertaken in accordance with the planting grid contained within this drawing sheet.
- Excavate planting medium to a depth suitable for the installation of tube or pot specimens. In areas where planting substrate is deemed to be very poor (compacted, nutrient depauperate, hydrophobic etc.) and above areas of potential frequent inundation and water flow, topsoil may be used or the ground mechanically ripped where access is feasible.
- Pre-water plant hole, if soil is dry, to decrease root stress upon planting and assess the infiltration of water through the soil
- Incorporate into the planting substrate the appropriate quantity of prepared water crystals or other suitable hydrating product such as Hortex 'Rainsaver' or 'Moisturaid'.
- Place plant into hole and backfill ensuring that the plant is upright and the stem is not covered in any less than 10mm or any more than 20mm of planting medium
- Plants are to be watered thoroughly immediately after planting (ensure deep irrigation) and thereafter as required during the construction phase of the development depending on climatic conditions. Creation of a concave hollow around the base of each plant will aid water infiltration to the plant roots.

- A complete, slow release fertiliser is recommended, and is to be administered appropriately during planting. Top dressing with slow release fertiliser is preferred to avoid toxic levels of fertiliser accumulating in the plant hole around the plant roots.
- To ensure successful establishment, all planting surfaces must be covered in:
 - 100mm layer of high quality weed-free composted chip mulch (site mulch) - Note: to avoid possible stem rot in some 'drier' species ensure mulch is 'dished' and not covering plant stem by more than 200mm
 - suitable individual anchored natural fibre weed mat; or
 - As presented within other section, where available mulch material will be sourced from cleared vegetation material if adequately seasoned.
- A long term slow release fertiliser, such as Nutricote or similar product should be used for all plantings after initial plant establishment.
- Seedlings and saplings are to be encouraged and maintained throughout the establishment period.







MAINTENANCE & MONITORING

| MAINTENANCE SCHEDULE | |
|--|---|
| <i>Maintenance schedule for revegetation areas of the proposed development as specified on the Landscape Plans</i> | |
| ESTABLISHMENT | <i>Establishment is to occur at the completion of the primary and secondary weed removal phases and any rehabilitation planting. During this period any failed stock are to be replaced and/or defects identified then reparations are to be made to site works.</i> |
| 1. Watering | Watering shall be carried out to ensure establishment of revegetation. At the time of planting soak the root ball of each plant in a diluted solution of liquid seaweed according to the directions on product label to assist in establishment. Plants are to be watered deeply only once at the time of planting and then allowed to establish within the prevailing climatic conditions. If it's observed during the maintenance process that the plant is under stress then a subsequent watering is allowed. |
| 2. Weed Removal | Weeds evident during the Establishment period but should be removed as part of a monthly weed management program. Best Practice weed management techniques should be employed for weed removal amongst revegetation areas. Where grass seeding or turf establishes within planted areas it should be treated with approved herbicide for waterways. |
| MAINTENANCE (Weeks 13- 2 years) | |
| 1. Watering | No specified watering regime is provided during the maintenance period. The intent is for the area to become self sufficient in utilising natural rain patterns and run off. Watering should occur during extended dry periods to ensure continued establishment. |
| 2. Weed Removal | Weeds should be tended to on a monthly program. Treatment techniques vary within the landscape planted areas versus revegetation and retention areas. |
| 3. Management | Throughout the establishment and maintenance periods areas where planting stock has not achieved a 90% success survival additional planting shall be installed. |
| 4. Erosion Control | Prior to the commencement of works and to remain throughout the establishment and maintenance period an erosion and sediment control measures shall be employed over the rehabilitation area of the site. |

4. Melaleuca Irbaryana - Rehabilitation/Planting Site Photos



LEGEND

-  Project DCDB
-  Development footprint
-  Conservation area
-  Mature *Melaleuca Irbaryana* specimen to be impacted by clearing works
-  *Melaleuca Irbaryana* planting/rehab site (Approx. 5,000 m²)
-  Contours (0.5m)

Note: Juvenile *Melaleuca Irbaryana* are specimens less than 2 metres tall

NOTES

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Layer Sources: QLD GIS Layers (QLD Gov. Information Service 2016). *Merial (Merialmap 2018)*

* This note is an integral part of this plan/data. Reproduction of this plan or any part of it without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.

| Issue | Date | Description | Drawn | Checked |
|-------|------------|-------------|-------|---------|
| A | 11/06/2018 | Revised | TC | AD |

Tarweasa Macdonell | GDA 1994 | Zone 55 | 11.095 @A3

4. Summary and Conclusion

Saunders Havill Group has been engaged by Mirvac Queensland Pty Ltd to complete an Impact Management Plan (IMP) for *Melaleuca irbyana* located within the extent of works for the Everleigh Greenbank project. This IMP is intended to support a clearing permit (protected plants) application to the Department of Environment and Science (DES) in accordance with the *Nature Conservation (Wildlife Management) Regulation 2006 - Protected Plants Assessment Guidelines*.

Earthworks associated with the development will necessitate the removal of three (3) relatively small patches of predominantly juvenile *M. irbyana* and the retention of a fourth within the conservation area but within 100 m of ongoing property boundary maintenance. The Protected Plants Assessment Guideline states that an offset compensates for residual impacts after impact management requirements of the guideline have been met. Activities are not anticipated to adversely impact on the viability of any localised *M. irbyana* ecological communities, and the removal of three small *M. irbyana* patches is not considered to impose a Significant Residual Impact as defined under the DES policy in consideration of proposed rehabilitation works within the central creek corridor of the conservation zone. Therefore, offsets are not considered applicable in this case. It is important to note that investment in the conservation zone rehabilitation works proposed, i.e. revegetation and weed removal and the establishment of 625 tube stock *M. irbyana* plantings, is considered to provide a superior ecological outcome relative to the removal of a single specimen at an offset ratio greater than 4:1.

5. Appendices

Appendix A

Wildlife Online Search

Nature Conservation Act 1992

Appendix A

Wildlife Online Search

Nature Conservation Act 1992



Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point

Species: All

Type: All

Status: Rare and threatened species

Records: All

Date: All

Latitude: -27.7401

Longitude: 152.9975

Distance: 10

Email: keiragrundy@saundershavill.com

Date submitted: Wednesday 14 Feb 2018 16:50:28

Date extracted: Wednesday 14 Feb 2018 17:00:02

The number of records retrieved = 13

Disclaimer

As the DSITIA is still in a process of collating and vetting data, it is possible the information given is not complete. The information provided should only be used for the project for which it was requested and it should be appropriately acknowledged as being derived from Wildlife Online when it is used.

The State of Queensland does not invite reliance upon, nor accept responsibility for this information. Persons should satisfy themselves through independent means as to the accuracy and completeness of this information.

No statements, representations or warranties are made about the accuracy or completeness of this information. The State of Queensland disclaims all responsibility for this information and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs you may incur as a result of the information being inaccurate or incomplete in any way for any reason.

| Kingdom | Class | Family | Scientific Name | Common Name | I | Q | A | Records |
|---------|---------------|-----------------|---|--|---|---|----|---------|
| animals | amphibians | Limnodynastidae | <i>Adelotus brevis</i> | tusked frog | | V | | 3 |
| animals | amphibians | Myobatrachidae | <i>Crinia tinnula</i> | wallum froglet | | V | | 3/3 |
| animals | birds | Cacatuidae | <i>Calyptrorhynchus lathami lathami</i> | glossy black-cockatoo (eastern) | | V | | 3 |
| animals | birds | Falconidae | <i>Falco hypoleucos</i> | grey falcon | | V | | 1 |
| animals | birds | Psittacidae | <i>Lathamus discolor</i> | swift parrot | | E | CE | 1 |
| animals | birds | Strigidae | <i>Ninox strenua</i> | powerful owl | | V | | 5 |
| animals | mammals | Dasyuridae | <i>Dasyurus maculatus maculatus</i> | spotted-tailed quoll (southern subspecies) | | V | E | 15 |
| animals | mammals | Macropodidae | <i>Petrogale pericillata</i> | brush-tailed rock-wallaby | | V | V | 2 |
| animals | mammals | Phascolarctidae | <i>Phascolarctos cinereus</i> | koala | | V | V | 515 |
| animals | mammals | Pseudocheiridae | <i>Petauroides volans volans</i> | southern greater glider | | V | V | 12/2 |
| plants | higher dicots | Apocynaceae | <i>Marsdenia coronata</i> | slender milkvine | | V | | 2/2 |
| plants | higher dicots | Lamiaceae | <i>Plectranthus habrophyllus</i> | | | E | E | 6/6 |
| plants | higher dicots | Myrtaceae | <i>Melaleuca iibyana</i> | | | E | | 7/6 |

CODES

- I - Y indicates that the taxon is introduced to Queensland and has naturalised.
- Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992*. The codes are Extinct in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ().
- A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999*. The values of EPBC are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V).
- Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens). This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon. This number is output as 999 if it equals or exceeds this value.

Appendix C

Declared Area Map

Derived Reference Points for GPS
 Projection: UTM (MGA Zone 56)
 Datum: GDA94

| Point | Easting | Northing | Point | Easting | Northing |
|-------|---------|----------|-------|---------|----------|
| 1 | 500604 | 6931430 | 54 | 500530 | 6931398 |
| 2 | 500607 | 6931426 | 55 | 500534 | 6931398 |
| 3 | 500609 | 6931423 | 56 | 500538 | 6931398 |
| 4 | 500610 | 6931419 | 57 | 500546 | 6931403 |
| 5 | 500606 | 6931418 | 58 | 500549 | 6931407 |
| 6 | 500603 | 6931415 | 59 | 500550 | 6931409 |
| 7 | 500602 | 6931412 | 60 | 500550 | 6931412 |
| 8 | 500597 | 6931409 | 61 | 500552 | 6931414 |
| 9 | 500593 | 6931406 | 62 | 500554 | 6931415 |
| 10 | 500591 | 6931405 | 63 | 500556 | 6931412 |
| 11 | 500586 | 6931403 | 64 | 500556 | 6931405 |
| 12 | 500582 | 6931401 | 65 | 500558 | 6931403 |
| 13 | 500579 | 6931400 | 66 | 500561 | 6931404 |
| 14 | 500576 | 6931399 | 67 | 500567 | 6931407 |
| 15 | 500572 | 6931397 | 68 | 500570 | 6931409 |
| 16 | 500572 | 6931392 | 69 | 500573 | 6931415 |
| 17 | 500574 | 6931389 | 70 | 500572 | 6931421 |
| 18 | 500579 | 6931384 | 71 | 500573 | 6931424 |
| 19 | 500584 | 6931381 | 72 | 500578 | 6931427 |
| 20 | 500584 | 6931378 | 73 | 500583 | 6931428 |
| 21 | 500580 | 6931378 | 74 | 500590 | 6931430 |
| 22 | 500571 | 6931378 | 75 | 500594 | 6931431 |
| 23 | 500563 | 6931379 | 76 | 500598 | 6931431 |
| 24 | 500560 | 6931378 | 77 | 500623 | 6931412 |
| 25 | 500557 | 6931375 | 78 | 500627 | 6931411 |
| 26 | 500555 | 6931373 | 79 | 500630 | 6931409 |
| 27 | 500552 | 6931372 | 80 | 500633 | 6931402 |
| 28 | 500549 | 6931371 | 81 | 500631 | 6931391 |
| 29 | 500546 | 6931367 | 82 | 500632 | 6931389 |
| 30 | 500546 | 6931363 | 83 | 500632 | 6931386 |
| 31 | 500545 | 6931359 | 84 | 500634 | 6931381 |
| 32 | 500545 | 6931355 | 85 | 500630 | 6931376 |
| 33 | 500541 | 6931352 | 86 | 500626 | 6931375 |
| 34 | 500537 | 6931352 | 87 | 500623 | 6931376 |
| 35 | 500526 | 6931358 | 88 | 500620 | 6931377 |
| 36 | 500516 | 6931362 | 89 | 500617 | 6931376 |
| 37 | 500509 | 6931365 | 90 | 500614 | 6931373 |
| 38 | 500504 | 6931369 | 91 | 500611 | 6931369 |
| 39 | 500498 | 6931369 | 92 | 500607 | 6931371 |
| 40 | 500493 | 6931371 | 93 | 500606 | 6931374 |
| 41 | 500484 | 6931374 | 94 | 500605 | 6931376 |
| 42 | 500483 | 6931376 | 95 | 500601 | 6931379 |
| 43 | 500483 | 6931380 | 96 | 500597 | 6931381 |
| 44 | 500484 | 6931384 | 97 | 500594 | 6931386 |
| 45 | 500487 | 6931390 | 98 | 500593 | 6931388 |
| 46 | 500487 | 6931394 | 99 | 500597 | 6931392 |
| 47 | 500489 | 6931398 | 100 | 500601 | 6931395 |
| 48 | 500495 | 6931402 | 101 | 500604 | 6931397 |
| 49 | 500500 | 6931402 | 102 | 500609 | 6931400 |
| 50 | 500506 | 6931401 | 103 | 500613 | 6931406 |
| 51 | 500512 | 6931401 | 104 | 500616 | 6931408 |
| 52 | 500518 | 6931401 | 105 | 500620 | 6931410 |
| 53 | 500524 | 6931402 | | | |



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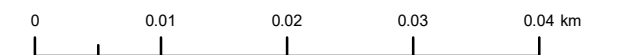
Declared Area Map 2019/002656 - Sheet 2 of 2

Lot on Plan: 1/SP297192
 Local Government: Logan City
 Centre: Toowoomba
 Region: South
 Map Reference: -

Satellite Image: Logan 2017 10cm SISP
 Prepared By: JDC
 Map Date: 9 October 2019
 File Reference: -

Legend

- Derived Reference Points for GPS
- Declared Area
- Property boundary
- QLD DCDB



NON-STANDARD MAP

Disclaimer:
 While every care is taken to ensure the accuracy of this product, the Department of Natural Resources and Mines makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94 MGA Zone 56)
 Cadastral data provided with the permission of the Department of Natural Resources and Mines
 Property boundaries shown on this map are provided as a locational aid only. DCDB boundaries do not represent legal cadastral boundaries.



Appendix D

Wildlife Online Search

Nature Conservation Act 1992



Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point

Species: Plants (including other non-animals such as fungi and protists)

Type: All

Status: Rare and threatened species

Records: All

Date: All

Latitude: -27.737

Longitude: 152.995

Distance: 10

Email: keiragrundy@saundershavill.com

Date submitted: Wednesday 08 Jul 2020 12:17:20

Date extracted: Wednesday 08 Jul 2020 12:20:02

The number of records retrieved = 3

Disclaimer

As the DSITIA is still in a process of collating and vetting data, it is possible the information given is not complete. The information provided should only be used for the project for which it was requested and it should be appropriately acknowledged as being derived from Wildlife Online when it is used.

The State of Queensland does not invite reliance upon, nor accept responsibility for this information. Persons should satisfy themselves through independent means as to the accuracy and completeness of this information.

No statements, representations or warranties are made about the accuracy or completeness of this information. The State of Queensland disclaims all responsibility for this information and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs you may incur as a result of the information being inaccurate or incomplete in any way for any reason.

| Kingdom | Class | Family | Scientific Name | Common Name | I | Q | A | Records |
|---------|-------------|-------------|----------------------------|------------------|---|---|---|---------|
| plants | land plants | Apocynaceae | <i>Marsdenia coronata</i> | slender milkvine | | V | | 6/2 |
| plants | land plants | Lamiaceae | <i>Coleus habrophyllus</i> | | E | E | | 8/8 |
| plants | land plants | Myrtaceae | <i>Melaleuca irbyana</i> | | E | | | 6/4 |

CODES

- I - Y indicates that the taxon is introduced to Queensland and has naturalised.
- Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992*. The codes are Extinct in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ().
- A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999*. The values of EPBC are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V).
- Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).
 This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.
 This number is output as 999 if it equals or exceeds this value.