

**METROPOLITAN COAL    LONGWALLS 305-307**

**EXTRACTION PLAN**



**ATTACHMENT 3**

**PROGRAM TO COLLECT BASELINE DATA  
FOR FUTURE EXTRACTION PLANS**

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Longwalls 305-307 (the subject of this Extraction Plan) are the fifth, sixth and seventh longwalls within the 300 longwall series. Longwalls 308 to 317 are located to the west of Longwall 307. The program proposed to be undertaken to collect baseline data for the next Extraction Plan (i.e. Longwalls 308 on) is summarised in Table A3-1 and described in detail in Appendices A to F of the Longwalls 305-307 Extraction Plan.

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**Table A3-1**  
**Program to Collect Baseline Data for the Next Extraction Plan (i.e. Longwalls 308 on)**

Aspect of Next Extraction Plan	Proposed Data Collection
Surface Water	<p>Metropolitan Coal will collect surface water baseline data for the next Extraction Plan (i.e. Longwalls 308 on) in accordance with Section 11.1 of the Water Management Plan (WMP) (Appendix A of the Longwalls 305-307 Extraction Plan). In summary:</p> <ul style="list-style-type: none"> <li>• Meteorological data for the next Extraction Plan is available from the existing pluviometers, pan evaporimeter and climate stations (described in Section 8.1 of the WMP).</li> <li>• Streams relevant to the next Extraction Plan include the Waratah Rivulet, Eastern Tributary and the first and second order streams that flow into the Woronora Reservoir (locations shown on Figure 8 in the Extraction Plan Main Text). <ul style="list-style-type: none"> <li>– The baseline visual and photographic surveys of the Waratah Rivulet and Eastern Tributary conducted prior to the commencement of Longwall 20 are provided in Appendices 1 and 2 of the WMP.</li> <li>– Prior to the commencement of Longwall 301, Gilbert &amp; Associates (now Hydro Engineering &amp; Consulting) conducted a visual inspection and photographic survey of streams in the vicinity of Longwalls 301-303 in July 2015.</li> <li>– Hydro Engineering &amp; Consulting (2019) conducted a visual inspection and photographic survey of streams in the vicinity of Longwalls 304-310 (not previously inspected for Longwalls 301-303) in April 2018 (provided in Appendix 5 of the WMP).</li> </ul> </li> <li>• Metropolitan Coal has investigated the potential to install pool water level meters in: <ul style="list-style-type: none"> <li>– the large pool mapped on the lower reaches of the stream that overlies Longwalls 309 to 311, downstream of Swamp 92; and</li> <li>– two of the large pools mapped on the lower reaches of the stream that overlies Longwall 311, downstream of Swamp 77, to monitor predicted impacts on pools/aquatic habitat in advance of future mining.</li> </ul> </li> <li>• The pool water level meters were installed on 23 May 2019 (Pool SR1 and Pool SR2) and 3 June 2019 (Pool SP1), respectively, and will provide baseline data for the next Extraction Plan.</li> <li>• Metropolitan Coal has investigated the potential to install a small flow measuring flume immediately downstream of Swamp 92, Swamp 77 and Swamp 76 (shown on Figure 18 of the Extraction Plan Main Text). Based on the initial site investigations, there is potential to install flow measuring flumes immediately downstream of Swamp 92 and Swamp 76. Further investigations are required to be conducted to assess the feasibility of installing a flow measuring flume downstream of Swamp 77. Further investigation and survey of the sites will be conducted prior to the commencement of Longwall 306.</li> <li>• Consideration of the environmental performance and management of the WMP will also inform the appropriate type and frequency of monitoring of water resources and watercourses relevant to the next Extraction Plan.</li> <li>• Surface water quality data for the Woronora Reservoir (site DW01, measurements taken from 0 to 9 m below the water surface level), Nepean Reservoir and Cataract Reservoir will continue to be sourced from WaterNSW.</li> </ul>

**Table A3-1 (Continued)**  
**Program to Collect Baseline Data for the Next Extraction Plan (i.e. Longwalls 308 on)**

Aspect of Next Extraction Plan	Proposed Data Collection
Groundwater	<p>Metropolitan Coal will collect groundwater baseline data for the next Extraction Plan (i.e. Longwalls 308 on) in accordance with Section 11.1 of the Biodiversity Management Plan (BMP) (Appendix C of the Longwalls 305-307 Extraction Plan) and Section 11.2 of the WMP (Appendix A of the Longwalls 305-307 Extraction Plan). In summary:</p> <ul style="list-style-type: none"> <li>• Metropolitan Coal installed paired piezometers in Swamps 60, 62, 64, 133 and 134 overlying or proximal to the commencing ends of Longwalls 308 and 309 in October 2018, and will assess the logistics/ access and suitability of installing paired piezometers in Swamps 78, 79, 80, 81, 82, 89 and 90 for the installation of piezometers prior to the commencement of Longwall 306.</li> <li>• Metropolitan Coal will also install soil moisture probes at various depth intervals to monitor the vertical profile of soil moisture in the swamp substrate. Soil moisture probes (linked to a datalogger) will be installed in a selection of the abovementioned swamps adjacent to paired piezometers. Soil moisture probes will also be installed in control Swamps 101, 137a and 137b.</li> <li>• In early 2019, Metropolitan Coal installed a soil moisture probe adjacent to the swamp substrate piezometer in Swamp 92 (SWAMP3, Figure 18 of the Extraction Plan Main Text). The data obtained by the soil moisture probe in Swamp 92 will inform selection of the location, depth and type of the soil moisture probes proposed to be installed in the selected swamps.</li> <li>• To inform the water holding capacity of the swamps installed with soil moisture probes, a log of the soil profile will be taken at the location of the piezometers/soil moisture probes, and the depth of the swamp substrate across the swamp will be sampled and recorded.</li> <li>• A program to collect baseline data will be specifically designed for the three larger swamps (Swamps 76, 77 and 92) located further to the west using groundwater piezometers and swamp soil moisture probes by the completion of Longwall 306.</li> <li>• Metropolitan Coal will install a post-mining multi-level bore over Longwall 305. The bore will extend to the fracture zone and will assess permeability below the Bald Hill Claystone.</li> <li>• Metropolitan Coal does not anticipate that any additional groundwater monitoring sites will be required for the next Extraction Plan; however, consideration of the environmental performance and management of this WMP will inform the appropriate type and frequency of groundwater monitoring relevant to the next Extraction Plan, and additional groundwater bores may be installed on the basis of the monitoring and modelling results.</li> </ul>

**Table A3-1 (Continued)**  
**Program to Collect Baseline Data for the Next Extraction Plan (i.e. Longwalls 308 on)**

Aspect of Next Extraction Plan	Proposed Data Collection
Cliffs and Overhangs, Steep Slopes and Land in General	<p>Metropolitan Coal will collect baseline data in relation to cliffs and overhangs, steep slopes and land in general for the next Extraction Plan (i.e. Longwalls 308 on) in accordance with Section 10 of the Land Management Plan (LMP) (Appendix B of the Longwalls 305-307 Extraction Plan). In summary:</p> <ul style="list-style-type: none"> <li>• Cliffs COH9, COH10, COH11, COH12 and COH13 (locations shown on Figure 8 in the Extraction Plan Main Text) have been identified by Mine Subsidence Engineering Consultants (2008) adjacent to the Woronora Reservoir over or adjacent to Longwalls 308 and 309. Baseline data has been obtained for Cliffs COH9, COH10, COH11, COH12 and COH13 (provided in Appendix 1 of the LMP), including: <ul style="list-style-type: none"> <li>- photographic records of each cliff and overhang;</li> <li>- sketches of overhangs; and</li> <li>- mapping of the approximate location of the cliff/overhang face and the rear extent of the overhang/undercut.</li> </ul> </li> <li>• Baseline data collection for the next Extraction Plan will also include a description of steep slopes and land in general and a description of the recorded subsidence impacts (i.e. where mining of Longwalls 304 or Longwalls 305-307 has resulted in subsidence impacts overlying the next Extraction Plan longwall layout [if any] at the time of Extraction Plan preparation).</li> <li>• Consideration of the environmental performance and management measures of the LMP will also inform the appropriate type and frequency of monitoring for land features relevant to the next Extraction Plan.</li> </ul>
Upland Swamps	<p>Metropolitan Coal will collect baseline data in relation to upland swamps for the next Extraction Plan (i.e. Longwalls 308 on) in accordance with Section 11.1 of the BMP (Appendix C of the Longwalls 305-307 Extraction Plan). In summary:</p> <ul style="list-style-type: none"> <li>• The upland swamps situated to the north or north-west of Longwalls 305-307 (Figure 18 of the Extraction Plan Main Text) were inspected by Eco Logical to confirm the extent of the upland swamps and the vegetation communities present in July/August 2015 (Swamps 59, 69, 70, 71a and 71b) or July/August 2016 (Swamps 60, 61, 62, 63, 64, 65, 66, 67, 68a, 68b, 72, 73, 133 and 134). This mapping was included in the Longwalls 301-303 BMP.</li> <li>• Upland swamps situated to the west of the Woronora Reservoir overlying or proximal to Longwalls 307-310 (Swamps 81, 82, 83, 84, 86, 88 and 89, Figure 18 of the Extraction Plan Main Text) were inspected in July 2017 by Eco Logical. This mapping is included in Appendix 2 of the Longwalls 305-307 BMP.</li> <li>• Field surveys of the larger headwater Swamps 76, 77, 92 and 106 located to the west of Longwall 310 (Figure 18 of the Extraction Plan Main Text) were conducted by FloraSearch in February 2016 to confirm the extent of the upland swamps and the vegetation communities present. In June/July 2019 Ecoplanning conducted field surveys to confirm the non-swamp vegetation communities adjacent to the FloraSearch upland swamp vegetation community mapping. This revised mapping will be included in the next Extraction Plan (i.e. the revised mapping is not shown on Figures 9 or 15 of the Longwalls 305-307 BMP, or Figure 9 of the Extraction Plan Main Text).</li> </ul>

**Table A3-1 (Continued)**  
**Program to Collect Baseline Data for the Next Extraction Plan (i.e. Longwalls 308 on)**

Aspect of Next Extraction Plan	Proposed Data Collection
Upland Swamps (Continued)	<ul style="list-style-type: none"> <li>• Additional upland swamps (Swamps 78, 79, 80, 90 and 91) situated to the west of Longwall 310 (Figure 15) were inspected by Ecoplanning in June/July 2019 to confirm the extent of the upland swamps and the vegetation communities present. This revised mapping will also be included in the next Extraction Plan.</li> <li>• The <i>NSW Native Vegetation Interim Type Standard</i> (Sivertsen 2009) requires patches of vegetation to be mapped if the dimensions of the representative polygon on a map sheet are 2 mm x 2 mm or greater (i.e. at a map scale of 1:25,000, patches of vegetation equal to or greater than 0.25 ha). However, the revised swamp vegetation mapping boundaries (including those swamps less than 0.25 ha in area) are shown on Figures 9 and 15 of the Longwalls 305-307 BMP to document the changes to the previous Bangalay Botanical Surveys (2008) vegetation mapping. It is noted that many of the revised swamp boundaries comprising vegetation characteristic of the upland swamp vegetation communities are very small in size and doubtfully represent an upland swamp (Appendix 2 of the Longwalls 305-307 BMP). For example, Swamps 61, 63, 65/66, 67, 68a, 73, 83, 86 and 88 are all less than 0.25 ha in area.</li> <li>• Further to the above, Swamp 84 and Swamp 86 are considered to be marginal upland swamps in that they contain non-swamp vegetation more consistent with sandstone woodland (Figure 15 and Appendix 2 of the Longwalls 305-307 BMP).</li> <li>• Metropolitan Coal will also assess the logistics/access and suitability of Swamps 62, 78, 79, 80, 81, 82, 89 and 90 for vegetation transect/quadrat monitoring for the next Extraction Plan. Consistent with baseline data collected for the Longwalls 20-22, 23-27, 301-303 and 304 BMP's, the timing for the baseline data in relation to the next Extraction Plan (i.e. Longwalls 308 on) is to ensure that at least two years of baseline data is collected before extraction occurs within 600 m of these swamps.</li> <li>• A program will also be developed to collect baseline vegetation data for the three larger swamps (Swamps 76, 77 and 92) located further to the west by the completion of Longwall 306.</li> <li>• A program to collect baseline groundwater information in upland swamps is described in 'Groundwater' above.</li> </ul>
Riparian Vegetation	<p>As described in Section 11.2 of the BMP (Appendix C of the Longwalls 305-307 Extraction Plan), no significant streams (i.e. streams which are third order or higher) are located over or proximal to Longwalls 308-317.</p> <p>Riparian vegetation monitoring data is available for Waratah Rivulet which is located to the south of Longwalls 308-312 (as described in Section 7 of the BMP).</p>
Aquatic Biota and their Habitats	<p>As described in Section 11.4 of the BMP, streams relevant to the next Extraction Plan include the Waratah Rivulet and the first and second order streams that flow into the Woronora Reservoir. In summary:</p> <ul style="list-style-type: none"> <li>• The results of visual and photographic surveys of the Waratah Rivulet prior to the commencement of Longwall 20, and during the mining of Longwalls 20-27 and Longwalls 301-304 provide information on aquatic habitats. Monitoring of macroinvertebrates and macrophytes has been conducted at sites on the Waratah Rivulet (as described in Section 4.3.3 of the BMP).</li> <li>• Hydro Engineering &amp; Consulting (2019) conducted a visual inspection and photographic survey of the first and second order streams in the vicinity of Longwalls 304-310 (not previously inspected for Longwalls 301-303) in April 2018. The visual inspection and photographic survey report provides information on the aquatic habitats available (Appendix 3 of the BMP).</li> </ul>

**Table A3-1 (Continued)**  
**Program to Collect Baseline Data for the Next Extraction Plan (i.e. Longwalls 308 on)**

Aspect of Next Extraction Plan	Proposed Data Collection
Aquatic Biota and their Habitats (Continued)	<ul style="list-style-type: none"> <li>• As described for 'Surface Water' above, Metropolitan Coal has investigated the potential to install pool water level meters in:               <ul style="list-style-type: none"> <li>– the large pool mapped on the lower reaches of the stream that overlies Longwalls 309 to 311, downstream of Swamp 92; and</li> <li>– two of the large pools mapped on the lower reaches of the stream that overlies Longwall 311, downstream of Swamp 77,</li> </ul>               to monitor predicted impacts on pools/aquatic habitat in advance of future mining. The pool water level meters were installed on 23 May 2019 (Pool SR1 and Pool SR2) and 3 June 2019 (Pool SP1), respectively, and will provide baseline data for the next Extraction Plan.             </li> </ul>
Terrestrial Fauna and their Habitats	<p>Metropolitan Coal will collect baseline data for terrestrial fauna and their habitats for the next Extraction Plan (i.e. Longwalls 308 on) in accordance with Section 11.5 of the BMP (Appendix C of the Longwalls 305-307 Extraction Plan). In summary:</p> <ul style="list-style-type: none"> <li>• Baseline data has been, or will be, collected for terrestrial fauna habitats (i.e. upland swamps, riparian vegetation, slopes and ridgetops, and aquatic habitats), as described above.</li> <li>• An additional nine amphibian monitoring sites (sites 31 to 39) have been established proximal to Longwalls 310-317 and monitoring will commence in spring 2019/summer 2020. No additional control sites are required to ensure a continually robust experimental design.</li> <li>• A total of 39 amphibian survey sites have been established to date, including 28 test sites overlying or adjacent to longwalls to monitor amphibian species, with a focus on the habitats of the Giant Burrowing Frog, Red-crowned Toadlet and Littlejohn's Tree Frog.</li> </ul>
Aboriginal Heritage	<p>Metropolitan Coal will collect baseline data for Aboriginal heritage sites for the next Extraction Plan (i.e. Longwalls 308 on) in accordance with Section 12 of the Heritage Management Plan (HMP) (Appendix D of the Longwalls 305-307 Extraction Plan). In summary:</p> <ul style="list-style-type: none"> <li>• Detailed baseline recording for an additional 13 Aboriginal heritage sites overlying or proximal to Longwalls 310-312 not previously subject to baseline recording, namely sites FRC 61, FRC 164, FRC 189, FRC 314, FRC 315, FRC 317, NT 11, NT 33, NT 34, NT 35, NT 78, NT 79 and NEW 2 (locations shown on Figure 10 in the Extraction Plan Main Text). The baseline record for these sites will be provided in the next Extraction Plan.</li> <li>• Prior to the commencement of secondary extraction associated with the next Extraction Plan baseline data will be obtained for Aboriginal heritage sites located within the relevant 35° angle of draw and/or predicted 20 mm subsidence contour of the Extraction Plan longwall layout. The collection of baseline data will include photographic records, detailed scaled plans including physical characteristics and features, and detailed information regarding the dimensions, composition and features.</li> <li>• In addition to the baseline data collection, consideration of the environmental performance and management measures in accordance with the review(s) conducted as part of the HMP will inform the appropriate type and frequency of monitoring of Aboriginal heritage sites relevant to the next Extraction Plan.</li> </ul>

**Table A3-1 (Continued)**  
**Program to Collect Baseline Data for the Next Extraction Plan (i.e. Longwalls 308 on)**

Aspect of Next Extraction Plan	Proposed Data Collection
Built Features	<ul style="list-style-type: none"> <li>• Prior to the commencement of secondary extraction associated with the next Extraction Plan, baseline data (e.g. pre-mining inspections) will be obtained for built features located within the relevant 35° angle of draw and/or predicted 20 mm subsidence contour of the Extraction Plan longwall layout.</li> <li>• Metropolitan Coal will also collect baseline data relevant to built features for the next Extraction Plan in accordance with each component plan of the Built Features Management Plan (BFMP) (Appendix E of the Longwalls 305-307 Extraction Plan). In general, the baseline data that has been collected for Longwalls 301-307 will also be relevant to Longwalls 308 on as longwall mining progressively moves further away from many of the built features.</li> <li>• In addition to baseline data collection, consideration of the environmental performance and management measures in accordance with the review(s) conducted as part of the BFMP will inform the appropriate type and frequency of monitoring of the assets relevant to the next Extraction Plan.</li> </ul>