

Checklist: Baseline Assessment of Private Water Bores

STATUTORY OBLIGATION	RESPONSIBILITIES	
	RESPONSIBLE TENURE HOLDER (RTH) <i>The responsible gas company</i>	BORE OWNER (OWNER)
Baseline Assessment Plan (BAP)		
<ul style="list-style-type: none"> <input type="checkbox"/> BAP required prior to production of water on a resource tenure <input type="checkbox"/> Submit to Department of Environment and Science (DES) for approval 	<ul style="list-style-type: none"> <input type="checkbox"/> Prepare a BAP: <ul style="list-style-type: none"> <input type="checkbox"/> identify the bores within the priority tenure area that will be assessed prior to the production of water <input type="checkbox"/> provide a schedule for completion of Baseline Assessments for each bore <input type="checkbox"/> Submit to DES for approval <input type="checkbox"/> Implement BAP <input type="checkbox"/> Publish BAP on website 	<ul style="list-style-type: none"> <input type="checkbox"/> If asked, provide the following information to assist the RTH to prepare the BAP: <ul style="list-style-type: none"> <input type="checkbox"/> the location of any water bores on the land, and <input type="checkbox"/> any other details relating to the bore
Undertake the Baseline Assessment		
<ul style="list-style-type: none"> <input type="checkbox"/> In accordance with the approved BAP <input type="checkbox"/> If directed by DES (section 402 of the Water Act) <input type="checkbox"/> On bores outside the resource tenure area that are published as Long-term Affected Area (LAA) bores in an underground water impact report (UWIR) 	<ul style="list-style-type: none"> <input type="checkbox"/> Follow the BAP to complete Baseline Assessments: <ul style="list-style-type: none"> <input type="checkbox"/> update the BAP if there are any changes to the schedule, and <input type="checkbox"/> report progress and any changes to DES <input type="checkbox"/> Undertake additional Baseline Assessments if: <ul style="list-style-type: none"> <input type="checkbox"/> directed by DES, or <input type="checkbox"/> required under a UWIR <input type="checkbox"/> Comply with the Baseline Assessment Guidelines published by DES 	<ul style="list-style-type: none"> <input type="checkbox"/> Communicate with the RTH <input type="checkbox"/> Enquire about potential for Baseline Assessments and timing <input type="checkbox"/> Provide access to enable the RTH to undertake the Baseline Assessment <p><i>Note: This is an activity under the Water Act 2000 and a CCA and/or compensation are not required</i></p>

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<p>Provide notice to Owner:</p> <ul style="list-style-type: none"> <input type="checkbox"/> State date the Baseline Assessment will be undertaken <input type="checkbox"/> Provide details of who will be undertaking the Baseline Assessment <input type="checkbox"/> At least 10 business days prior to undertaking a Baseline Assessment 	<ul style="list-style-type: none"> <input type="checkbox"/> Contact the Owner in advance of issuing a notice to undertake the Baseline Assessment: <ul style="list-style-type: none"> <input type="checkbox"/> explain what a Baseline Assessment is and why it is necessary <input type="checkbox"/> enquire about: <ul style="list-style-type: none"> <input type="checkbox"/> whether equipment will need to be removed from the bore prior to the assessment <input type="checkbox"/> how long the Owner needs to remove the equipment <input type="checkbox"/> suitable dates to schedule the work <input type="checkbox"/> inform them that a notice will be provided detailing the: <ul style="list-style-type: none"> <input type="checkbox"/> date, time and estimated duration <input type="checkbox"/> who will do the assessment <input type="checkbox"/> how costs of removal of infrastructure will be covered <input type="checkbox"/> Comply with the Baseline Assessment Guidelines published by DES 	<ul style="list-style-type: none"> <input type="checkbox"/> Assist the RTH in planning and scheduling the Baseline Assessment <input type="checkbox"/> If the proposed timing of the Baseline Assessment conflicts with planned activities such as mustering, harvesting etc, work with the RTH to reschedule as soon as practical <input type="checkbox"/> Comply with any reasonable request for information from the RTH if they possess the information. <input type="checkbox"/> Provide a copy of any invoice in relation to the removal of equipment that was requested by the RTH <input type="checkbox"/> If asked, provide: <ul style="list-style-type: none"> <input type="checkbox"/> the location of any water bores on the land; and <input type="checkbox"/> any other information the RTH reasonably requires to undertake a Baseline Assessment of any bores.
<p>Provide information collected during a Baseline Assessment</p> <ul style="list-style-type: none"> <input type="checkbox"/> On the DES form: Outcome of Baseline Assessment (ESR/2016/1918) <input type="checkbox"/> To the Owner and the Office of Groundwater Impact Assessment (OGIA) within 30 business days after undertaking the assessment <input type="checkbox"/> To DES if the Baseline Assessment was undertaken in response to a direction notice 	<ul style="list-style-type: none"> <input type="checkbox"/> Discuss the findings of the Baseline Assessment with the Owner <input type="checkbox"/> Inform the Owner of the date they will receive the Outcome of Baseline Assessment report <input type="checkbox"/> Provide a copy of the Outcome of Baseline Assessment report to the Owner, OGIA (and DES if required) within 30 business days of completing the Baseline Assessment <p><i>Note: 30 business day period commences once laboratory results are received and this information has been analysed</i></p>	NA

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Retain information collected during the Baseline Assessments.	<input type="checkbox"/> Retain information collected by the RTH during a Baseline Assessment	<input type="checkbox"/> Retain information collected during the Baseline Assessments.
Collection of data and qualifications		
<p>Qualifications for persons conducting Baseline Assessments:</p> <p>Ensure that the person/s conducting the field measurements required for a Baseline Assessment possess:</p> <ul style="list-style-type: none"> <input type="checkbox"/> a minimum of two years prior experience in at least one of the following fields: underground water level monitoring programs; the conduct of underground water quality sampling programs; hydrogeology and/or engineering. <input type="checkbox"/> has a practical knowledge of water bore construction and infrastructure <p>Can provide the Owner with evidence of the person(s) skills and expertise, when requested.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Engage appropriately qualified people to conduct the Baseline Assessment <input type="checkbox"/> Inform the Owner about the people who will be conducting the Baseline Assessment <input type="checkbox"/> Provide the Owner with evidence of the skills and expertise of the person(s) conducting the Baseline Assessment if requested 	<ul style="list-style-type: none"> <input type="checkbox"/> Request the RTH to provide evidence of the person(s) skills and expertise if concerned that the person(s) conducting the Baseline Assessment does not possess the appropriate skills and experience

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Quality assurance and quality control <input type="checkbox"/> Comply with the Baseline Assessment Guidelines published by DES regarding quality assurance and control	<input type="checkbox"/> Develop a formal quality assurance program and undertake Baseline Assessments in accordance with the formal quality assurance program. <input type="checkbox"/> Ensure the formal quality assurance program includes quality control procedures consistent with the principles of the following documents: <ul style="list-style-type: none"> ○ AS/NZ 9000 Quality management system series; ○ quality assurance/quality control of AS/NZS 5667.11:1998 Water quality - Sampling - Guidance on sampling of groundwaters (Joint Technical Committee EV/8, 2016), and ○ Monitoring and Sampling Manual 2009— Environmental Protection (Water) Policy 2009 (DES). <input type="checkbox"/> Provided the quality assurance program to DES upon written request within the requested timeframe.	NA

<p>Independent third-party certification</p> <ul style="list-style-type: none"> □ Comply with the Baseline Assessment Guidelines published by DES regarding independent third-party certification □ Baseline Assessment must be completed by an independent third party or be certified by an independent third party. 	<ul style="list-style-type: none"> □ Obtain certification from a qualified independent third-party who: <ul style="list-style-type: none"> ○ Is not an employee ○ Does not have a conflict of interest ○ Has a degree in a relevant science or engineering discipline ○ Has a minimum of five years' experience in at least one of the following fields: <ul style="list-style-type: none"> ▪ groundwater level monitoring programs ▪ groundwater quality sampling programs, or ▪ groundwater hydrogeology and/or engineering, and ▪ has a practical knowledge of water bore construction and infrastructure. □ If certified by an independent third party, the certification must include a statement that: <ul style="list-style-type: none"> ○ quality assurance and quality control procedures are being implemented ○ the Baseline Assessment is compliant with the guideline ○ verifies the minimum qualifications, training and experience of all persons who conducted the Baseline Assessment 	<p>NA</p>
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	RESPONSIBLE TENURE HOLDER (RTH) <i>The responsible gas company</i>	BORE OWNER (OWNER)
ESSENTIAL ELEMENTS OF A BASELINE ASSESSMENT		
A. Document identification and bore site information		
Record: <ul style="list-style-type: none"> <input type="checkbox"/> a unique identifier for the bore (Bore ID). <input type="checkbox"/> a local name for the bore if the Owner has one <input type="checkbox"/> the location of the bore site 	<ul style="list-style-type: none"> <input type="checkbox"/> Obtain all relevant information from the Department of Natural Resources, Mines and Energy’s groundwater database (GWDB) including water authorisation, prior to visiting the site. <input type="checkbox"/> Request and obtain additional information from Owner within reason <input type="checkbox"/> Prior to visiting the bore site obtain all relevant information from GWDB including water authorisation 	<ul style="list-style-type: none"> <input type="checkbox"/> Provide a local name and registration number for the bore if the bore has one for cross-reference <input type="checkbox"/> Provide other information reasonably requested by the RTH
B. Bore construction details		
Request and record bore construction details	<ul style="list-style-type: none"> <input type="checkbox"/> Record: <ul style="list-style-type: none"> o name of drilling contractor o date of construction o type of casing o casing diameter o perforated intervals and/or screens installed o details of any seals and cement grouting installed in the bore annulus, and o bore strata log <p><i>Note: Refer to the Commission’s Bore Assessment Checklist:</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Also record the source aquifer for the bore (where the supply source is uncertain or unknown, analyse and provide reasons for the uncertainty, including confidence level) 	<ul style="list-style-type: none"> <input type="checkbox"/> Provide information on bore construction details (if available) as requested <p><i>Note: Refer to the Commission’s Bore Assessment Checklist</i></p>

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C. Bore equipment and condition details		
<ul style="list-style-type: none"> <input type="checkbox"/> Request and obtain bore equipment and condition details <input type="checkbox"/> Provide photos of the bore and bore equipment 	<ul style="list-style-type: none"> <input type="checkbox"/> Record pumping equipment information including: <ul style="list-style-type: none"> o if the bore is in operating condition or has been decommissioned o the pump type and make o pump setting depth o if the bore is metered o the power source for the bore o details on the riser, and o details on the headworks <p><i>Note: Refer to the Commission's Bore Assessment Checklist</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Take a photo of the bore and bore equipment <input type="checkbox"/> Attach photos to the Bore Assessment Outcome report 	<ul style="list-style-type: none"> <input type="checkbox"/> Provide bore equipment and condition details to the RTH <input type="checkbox"/> Provide details about any repairs or maintenance that has previously been undertaken on the bore e.g. who has carried out the maintenance on the bore, when and what sort of maintenance was undertaken <p><i>Note: Refer to the Commission's Bore Assessment Checklist</i></p>
D. Bore supply information		
Request and obtain bore supply information	<ul style="list-style-type: none"> <input type="checkbox"/> Consult with Owner regarding: <ul style="list-style-type: none"> o Authorised use or purpose o Use of the water extracted from the bore e.g. <ul style="list-style-type: none"> ▪ stock watering (type, head) ▪ domestic use (number of households supplied, area of gardens watered) o Frequency of bore use (hrs/day) o Operating capacity and any associated commentary on the operating capacity, including any seasonal variation in use o Peak usage information (including maximum volumes extracted and period of peak extraction) 	<ul style="list-style-type: none"> <input type="checkbox"/> Provide the RTH: <ul style="list-style-type: none"> o Bore supply information that the RTH reasonably requires to conduct a Baseline Assessment o Historical water use records (if available) <p><i>Note: Refer to the Commission's Bore Assessment Checklist</i></p>

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	<input type="checkbox"/> Request evidence from the Owner to confirm stocking rates to support the estimated volumes <i>Note: Refer to the Commission's Bore Assessment Checklist</i>	
E. Water level measurement		
Record water level details for the bore	<input type="checkbox"/> Record: <ul style="list-style-type: none"> ○ A standing water level (SWL) ○ The height of the datum above ground level <input type="checkbox"/> Where a SWL cannot be recorded, as it is not practical for the Owner to cease pumping, record the following: <ul style="list-style-type: none"> ○ duration of pumping and rest periods, and ○ maximum pumping rates <input type="checkbox"/> Take and attach a photograph of the bore to the Outcome of Baseline Assessment report, clearly showing the following: <ul style="list-style-type: none"> ○ a datum for SWL ○ the unique identification number of the bore and the GWDB registered number if available ○ the Owner's name ○ property name, and ○ the date of the photograph. <input type="checkbox"/> Request and obtain additional information from Owner within reason <i>Note: Refer to the Commission's Bore Assessment Checklist</i>	<i>Note: Refer to the Commission's Bore Assessment Checklist</i>

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F. Water quality assessment		
Collect water quality samples <ul style="list-style-type: none"> <input type="checkbox"/> Obtain water quality samples according to the Baseline Assessment Guidelines <input type="checkbox"/> Sample collection must occur as close to the water bore as possible, and where possible, before any other pipework joins the bore discharge pipework <input type="checkbox"/> Identify and avoid potential sources of contamination when taking samples <input type="checkbox"/> When taking samples, disturbance to the existing infrastructure must be minimised 	<ul style="list-style-type: none"> <input type="checkbox"/> Document the location of the sampling point. <input type="checkbox"/> Where the sampling point is not within 15m of the bore: <ul style="list-style-type: none"> <input type="checkbox"/> Provide a photograph of the sampling point, and <input type="checkbox"/> Record the location <input type="checkbox"/> Prior to sampling a water bore, calculate the volume of stagnant water within the bore casing and discharge piping (upstream of the sampling point) <input type="checkbox"/> Only collect water quality samples: <ul style="list-style-type: none"> <input type="checkbox"/> after three times the volume of stagnant water in the bore casing and the discharge piping (including a sufficient additional volume to account for any error in volume calculations) have been discharged, and <input type="checkbox"/> when the field water quality parameters have stabilised <input type="checkbox"/> Where full purging is not practical, but a meaningful sample can still be collected, record the pumping history of the bore, including when the bore was last used <input type="checkbox"/> Take and attach photographs showing the bore and sampling setup when: <ul style="list-style-type: none"> <input type="checkbox"/> water quality samples are taken, and <input type="checkbox"/> there is no pumping equipment in place in the bore 	<ul style="list-style-type: none"> <input type="checkbox"/> Provide access to obtain water quality samples

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Field parameters and laboratory analytes <ul style="list-style-type: none"> <input type="checkbox"/> Sample the minimum water quality analytes as specified in the Baseline Assessment Guideline <input type="checkbox"/> The limit of detection must be sufficient for assessment against current and relevant guidelines, including but not limited to: <ul style="list-style-type: none"> <input type="checkbox"/> the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ, 2000), and <input type="checkbox"/> the Australian Drinking Water Guidelines (National Health and Medical Research Council, 2011) 	<ul style="list-style-type: none"> <input type="checkbox"/> Record field parameters and analyse water quality samples according to the Baseline Assessment Guidelines <input type="checkbox"/> Analyse all samples for Baseline Assessments at National Association of Testing Authorities (NATA) accredited laboratories 	NA
Presence and analysis of gas <ul style="list-style-type: none"> <input type="checkbox"/> Measure bore for presence of carbon dioxide, methane and hydrogen sulphide using a multi-parameter gas detector in compliance with the latest version of the Code of practice for coal seam gas well head emissions detection and reporting (Department of Natural Resources and Mines, 2011) 	<ul style="list-style-type: none"> <input type="checkbox"/> Collect dissolved gas samples through a flow-through cell where present <input type="checkbox"/> Collect dissolved gas samples using the methods outlined in section 7.2 of Groundwater Sampling and Analysis—A Field Guide (Sundaram, <i>et al.</i>, 2009) if a flow-through cell cannot be used <input type="checkbox"/> Record the pumping regime prior to assessing the presence or absence of gas 	<ul style="list-style-type: none"> <input type="checkbox"/> Advise the RTH if gas is present in the bore <input type="checkbox"/> Provide details of the pumping regime prior to assessing the presence or absence of gas

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Sample identification, preservation and transportation <input type="checkbox"/> Ensure that sample identification, preservation and transport adheres to best practice industry standards	<input type="checkbox"/> Water quality samples must have a unique identification number that can be cross-referenced to the monitoring location and time of sampling <input type="checkbox"/> Document sample preservation measures to comply with the laboratories requirements and relevant standards (e.g. AS/NZS 5667.1:1998) <input type="checkbox"/> Maintain sample integrity - use chain of custody procedures and documentation in accordance with section 3.7 of the Monitoring and Sampling Manual 2009—Environmental Protection (Water) Policy 2009 (DES)	NA
Rescheduling of water sampling <input type="checkbox"/> Should sampling of the water from the water bore not be feasible at the time of the initial field visit, the Owner and RTH may choose to agree on another time for obtaining a sample	<input type="checkbox"/> If water sampling needs to be rescheduled, agree on a timeframe with the Owner and record the details <input type="checkbox"/> The rescheduled timeframe should be within the timetabled date in the relevant approved BAP or if not possible, the BAP should be amended to account for the new agreed timeframe <input type="checkbox"/> If the Owner chooses not to reschedule a time for water quality sampling, record this within the results of the Baseline Assessment	<input type="checkbox"/> If water sampling needs to be rescheduled, agree on a timeframe with the RTH and record the details
G. Assessment field officer details		
<input type="checkbox"/> Record the person responsible for conducting the Baseline Assessment	<input type="checkbox"/> Record details of the person responsible for conducting the Baseline Assessment	NA

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H. Declaration		
<input type="checkbox"/> The RTH declaration must be completed by an officer accountable for “sign off” on the data collected during the Baseline Assessment	<input type="checkbox"/> Ensure a person with the appropriate authority completes the declaration relating to the data collected during the Baseline Assessment	NA
I. Bore owner details		
<input type="checkbox"/> Record the contact details of all persons who provided information for the Baseline Assessment	<input type="checkbox"/> Record the contact details of: <ul style="list-style-type: none"> ○ Owner; and ○ Any other person who has provided information about the bore for the Baseline Assessment 	<input type="checkbox"/> Facilitate provision of details to RTH if necessary