

AQUIFER INTERFERENCE ASSESSMENT FRAMEWORK

Assessing a proposal against the NSW Aquifer Interference Policy – step by step guide

Note for proponents

This is the basic framework which the NSW Office of Water uses to assess project proposals against the **NSW Aquifer Interference Policy (AIP)**.

The NSW Aquifer Interference Policy can be downloaded from the NSW Office of Water website (www.water.nsw.gov.au under Water management > Law and policy > Key policies > Aquifer interference).

While you are not required to use this framework, you may find it a useful tool to aid the development of a proposal or an **Environmental Impact Statement (EIS)**.

We suggest that you summarise your response to each AIP requirement in the tables following and provide a reference to the section of your EIS that addresses that particular requirement. Using this tool can help to ensure that all necessary factors are considered, and will help you understand the requirements of the AIP.

Table 1. Does the activity require detailed assessment under the AIP?

Consideration		Response
1	Is the activity defined as an aquifer interference activity?	If NO , then no assessment is required under the AIP. If YES , continue to Question 2.
2	Is the activity a defined minimal impact aquifer interference activity according to section 3.3 of the AIP?	If YES , then no further assessment against this policy is required. Volumetric licensing still required for any water taken, unless exempt. If NO , then continue on for a full assessment of the activity.

Note for proponents

Section 3.2 of the AIP defines the framework for assessing impacts. These are addressed here under the following headings:

1. Accounting for or preventing the take of water
2. Addressing the minimal impact considerations
3. Proposed remedial actions where impacts are greater than predicted.

1. Accounting for, or preventing the take of water

Where a proposed activity will take water, adequate arrangements must be in place to account for this water. It is the proponent's responsibility to ensure that the necessary licences are held. These requirements are detailed in Section 2 of the AIP, with the specific considerations in Section 2.1 addressed systematically below.

Where a proponent is unable to demonstrate that they will be able to meet the requirements for the licensing of the take of water, consideration should be given to modification of the proposal to prevent the take of water.

Table 2. Has the proponent:

	AIP requirement	Proponent response	NSW Office of Water comment
1	Described the water source(s) the activity will take water from?		
2	Predicted the total amount of water that will be taken from each connected groundwater or surface water source on an annual basis as a result of the activity?		
3	Predicted the total amount of water that will be taken from each connected groundwater or surface water source after the closure of the activity?		
4	Made these predictions in accordance with Section 3.2.3 of the AIP? (refer to Table 3, below)		
5	Described how and in what proportions this take will be assigned to the affected aquifers and connected surface water sources?		
6	Described how any licence exemptions might apply?		
7	Described the characteristics of the water requirements?		
8	Determined if there are sufficient water entitlements and water allocations that are able to be obtained for the activity?		

	AIP requirement	Proponent response	NSW Office of Water comment
9	Considered the rules of the relevant water sharing plan and if it can meet these rules?		
10	Determined how it will obtain the required water?		
11	Considered the effect that activation of existing entitlement may have on future available water determinations?		
12	Considered actions required both during and post-closure to minimize the risk of inflows to a mine void as a result of flooding?		
13	Developed a strategy to account for any water taken beyond the life of the operation of the project?		
Will uncertainty in the predicted inflows have a significant impact on the environment or other authorised water users? If YES , items 14-16 must be addressed.			
14	Considered any potential for causing or enhancing hydraulic connections, and quantified the risk?		
15	Quantified any other uncertainties in the groundwater or surface water impact modelling conducted for the activity?		
16	Considered strategies for monitoring actual and reassessing any predicted take of water throughout the life of the project, and how these requirements will be accounted for?		

Table 3. Determining water predictions in accordance with Section 3.2.3 (complete one row only – consider both during and following completion of activity)

	AIP requirement	Proponent response	NSW Office of Water comment
1	<p>For the Gateway process, is the estimate based on a simple modelling platform, using suitable baseline data, that is, fit-for-purpose?</p>		
2	<p>For State Significant Development or mining or coal seam gas production, is the estimate based on a complex modelling platform that is:</p> <ul style="list-style-type: none"> • Calibrated against suitable baseline data, and in the case of a reliable water source, over at least two years? • Consistent with the Australian Modelling Guidelines? • Independently reviewed, robust and reliable, and deemed fit-for-purpose? 		
3	<p>In all other processes, estimate based on a desk-top analysis that is:</p> <ul style="list-style-type: none"> • Developed using the available baseline data that has been collected at an appropriate frequency and scale; and • Fit-for-purpose? 		

Other requirements to be reported on under Section 3.2.3

Table 4. Has the proponent provided details on:

	AIP requirement	Proponent response	NSW Office of Water comment
1	Establishment of baseline groundwater conditions?		
2	A strategy for complying with any water access rules?		
3	Potential water level, quality or pressure drawdown impacts on nearby basic landholder rights water users?		
4	Potential water level, quality or pressure drawdown impacts on nearby licensed water users in connected groundwater and surface water sources?		
5	Potential water level, quality or pressure drawdown impacts on groundwater dependent ecosystems?		
6	Potential for increased saline or contaminated water inflows to aquifers and highly connected river systems?		
7	Potential to cause or enhance hydraulic connection between aquifers?		
8	Potential for river bank instability, or high wall instability or failure to occur?		
9	Details of the method for disposing of extracted activities (for coal seam gas activities)?		

2. Addressing the minimal impact considerations

Note for proponents

Section 3.2.1 of the AIP describes how aquifer impact assessment should be undertaken.

1. Identify all water sources that will be impacted, referring to the water sources defined in the relevant water sharing plan(s). Assessment against the minimal impact considerations of the AIP should be undertaken for each ground water source.
2. Determine if each water source is defined as 'highly productive' or 'less productive'. If the water source is named in then it is defined as highly productive, all other water sources are defined as less productive.
3. With reference to pages 13-14 of the Aquifer Interference Policy, determine the sub-grouping of each water source (eg alluvial, porous rock, fractured rock, coastal sands).
4. Determine whether the predicted impacts fall within Level 1 or Level 2 of the minimal impact considerations defined in Table 1 of the AIP, for each water source, for each of water table, water pressure, and water quality attributes. The tables below may assist with the assessment. There is a separate table for each sub-grouping of water source – only use the tables that apply to the water source(s) you are assessing, and delete the others.
5. If unable to determine any of these impacts, identify what further information will be required to make this assessment.
6. Where the assessment determines that the impacts fall within the Level 1 impacts, the assessment should be 'Level 1 – Acceptable'
7. Where the assessment falls outside the Level 1 impacts, the assessment should be 'Level 2'. The assessment should further note the reasons the assessment is Level 2, and any additional requirements that are triggered by falling into Level 2.
8. If water table or water pressure assessment is not applicable due to the nature of the water source, the assessment should be recorded as 'N/A – reason for N/A'.

Table 5. Minimal impact considerations – example tables

Aquifer	Alluvial aquifer	
Category	Highly Productive	
Level 1 Minimal Impact Consideration		Assessment
<p>Water table</p> <p>Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic post-water sharing plan variations, 40 metres from any:</p> <ul style="list-style-type: none"> • high priority groundwater dependent ecosystem or • high priority culturally significant site <p>listed in the schedule of the relevant water sharing plan.</p> <p>OR</p> <p>A maximum of a 2 metre water table decline cumulatively at any water supply work.</p>		
<p>Water pressure</p> <p>A cumulative pressure head decline of not more than 40% of the post-water sharing plan pressure head above the base of the water source to a maximum of a 2 metre decline, at any water supply work.</p> <p>OR, for the Lower Murrumbidgee Deep Groundwater Source:</p> <p>A cumulative pressure head decline of not more than 40% of the post-water sharing plan pressure head above the top of the relevant aquifer to a maximum of a 3 metre decline, at any water supply work.</p>		
<p>Water quality</p> <p>Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres from the activity.</p> <p>No increase of more than 1% per activity in long-term average salinity in a highly connected surface water source at the nearest point to the activity.</p> <p>No mining activity to be below the natural ground surface within 200 metres laterally from the top of high bank or 100 metres vertically beneath (or the three dimensional extent of the alluvial water source - whichever is the lesser distance) of a highly connected surface water source that is defined as a reliable water supply.</p> <p>Not more than 10% cumulatively of the three dimensional extent of the alluvial material in this water source to be excavated by mining activities beyond 200 metres laterally from the top of high bank and 100 metres vertically beneath a highly connected surface water source that is defined as a reliable water supply.</p>		

Aquifer	Coastal sands	
Category	Highly Productive	
Level 1 Minimal Impact Consideration		Assessment
<p>Water table</p> <p>Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic 'post-water sharing plan' variations, 40 metres from any:</p> <ul style="list-style-type: none"> • high priority groundwater dependent ecosystem or • high priority culturally significant site listed in the schedule of the relevant water sharing plan. <p>OR</p> <p>A maximum of a 2 metre water table decline cumulatively at any water supply work.</p>		
<p>Water pressure</p> <p>A cumulative pressure head decline of not more than a 2 metre decline, at any water supply work.</p>		
<p>Water quality</p> <p>Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres from the activity.</p>		

Aquifer	Porous Rock – except Great Artesian Basin	
Category	Highly Productive	
Level 1 Minimal Impact Consideration		Assessment
<p>Water table</p> <p>Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic 'post-water sharing plan' variations, 40 metres from any:</p> <ul style="list-style-type: none"> • high priority groundwater dependent ecosystem or • high priority culturally significant site listed in the schedule of the relevant water sharing plan. <p>OR</p> <p>A maximum of a 2 metre water table decline cumulatively at any water supply work.</p>		
<p>Water pressure</p> <p>A cumulative pressure head decline of not more than a 2 metre decline, at any water supply work.</p>		
<p>Water quality</p> <p>Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres from the activity.</p>		

Aquifer	Porous Rock – Great Artesian Basin – Eastern Recharge and Southern Recharge	
Category	Highly Productive	
Level 1 Minimal Impact Consideration		Assessment
<p>Water table</p> <p>Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic 'post-water sharing plan' variations, 40 metres from any:</p> <ul style="list-style-type: none"> • high priority groundwater dependent ecosystem or • high priority culturally significant site listed in the schedule of the relevant water sharing plan. <p>OR</p> <p>A maximum of a 2 metre water table decline cumulatively at any water supply work.</p>		
<p>Water pressure</p> <p>Less than 0.2 metre cumulative variation in the groundwater pressure, allowing for typical climatic 'post-water sharing plan' variations, 40 metres from any:</p> <ul style="list-style-type: none"> • high priority groundwater dependent ecosystem or • high priority culturally significant site listed in the schedule of the relevant water sharing plan. <p>A cumulative pressure level decline of not more than 15 metres, allowing for typical climatic 'post-water sharing plan' variations.</p> <p>The cumulative pressure level decline of no more than 10% of the 2008 pressure level above ground surface at the NSW State border, as agreed between NSW and Queensland.</p>		
<p>Water quality</p> <p>Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres from the activity.</p>		

Aquifer	Porous Rock – Great Artesian Basin – Surat, Warrego and Central	
Category	Highly Productive	
Level 1 Minimal Impact Consideration		Assessment
Water table NOT APPLICABLE		
Water pressure Less than 0.2 metre cumulative variation in the groundwater pressure, allowing for typical climatic 'post-water sharing plan' variations, 40 metres from any: <ul style="list-style-type: none"> • high priority groundwater dependent ecosystem or • high priority culturally significant site listed in the schedule of the relevant water sharing plan. A cumulative pressure level decline of not more than 30 metres, allowing for typical climatic 'post-water sharing plan' variations. The cumulative pressure level decline of no more than 10% of the 2008 pressure level above ground surface at the NSW State border, as agreed between NSW and Queensland.		
Water quality Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres from the activity.		

Aquifer	Fractured Rock	
Category	Highly Productive	
Level 1 Minimal Impact Consideration		Assessment
<p>Water table</p> <p>Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic 'post-water sharing plan' variations, 40 metres from any:</p> <ul style="list-style-type: none"> • high priority groundwater dependent ecosystem; or • high priority culturally significant site; listed in the schedule of the relevant water sharing plan. <p>OR</p> <p>A maximum of a 2 metre water table decline cumulatively at any water supply work.</p>		
<p>Water pressure</p> <p>A cumulative pressure head decline of not more than a 2 metre decline, at any water supply work.</p>		
<p>Water quality</p> <p>Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres from the activity.</p>		

Aquifer	Alluvial	
Category	Less productive	
Level 1 Minimal Impact Consideration		Assessment
<p>Water table</p> <p>Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic 'post-water sharing plan' variations, 40 metres from any:</p> <ul style="list-style-type: none"> • high priority groundwater dependent ecosystem or • high priority culturally significant site listed in the schedule of the relevant water sharing plan. <p>OR</p> <p>A maximum of a 2 metre water table decline cumulatively at any water supply work unless make good provisions apply</p>		
<p>Water pressure</p> <p>A cumulative pressure head decline of not more than 40% of the 'post-water sharing plan' pressure head above the base of the water source to a maximum of a 2 metre decline, at any water supply work.</p>		
<p>Water quality</p> <p>Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres from the activity.</p> <p>No increase of more than 1% per activity in long-term average salinity in a highly connected surface water source at the nearest point to the activity.</p> <p>No mining activity to be below the natural ground surface within 200 metres laterally from the top of high bank or 100 metres vertically beneath (or the three dimensional extent of the alluvial water source - whichever is the lesser distance) of a highly connected surface water source that is defined as a 'reliable water supply'.</p>		

Aquifer	Porous rock or fractured rock
Category	Less productive
Level 1 Minimal Impact Consideration	
Assessment	
<p>Water table</p> <p>Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic 'post-water sharing plan' variations, 40 metres from any:</p> <ul style="list-style-type: none"> • high priority groundwater dependent ecosystem or • high priority culturally significant site listed in the schedule of the relevant water sharing plan. <p>OR</p> <p>A maximum of a 2 metre water table decline cumulatively at any water supply work.</p>	
<p>Water pressure</p> <p>A cumulative pressure head decline of not more than a 2 metre decline, at any water supply work.</p>	
<p>Water quality</p> <p>Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres from the activity.</p>	

3. Proposed remedial actions where impacts are greater than predicted.

Note for proponents

Point 3 of section 3.2 of the AIP provides a basic framework for considerations to consider when assessing a proponent’s proposed remedial actions.

Table 6. Has the proponent:

AIP requirement	Proponent response	NSW Office of Water comment
1 Considered types, scale, and likelihood of unforeseen impacts <i>during operation</i> ?		
2 Considered types, scale, and likelihood of unforeseen impacts <i>post closure</i> ?		
3 Proposed mitigation, prevention or avoidance strategies for each of these potential impacts?		
4 Proposed remedial actions should the risk minimization strategies fail?		
5 Considered what further mitigation, prevention, avoidance or remedial actions might be required?		
6 Considered what conditions might be appropriate?		

4. Other considerations

Note for proponents

These considerations are not included in the assessment framework outlined within the AIP, however are discussed elsewhere in the document and are useful considerations when assessing a proposal.

Table 7: Has the proponent:

AIP requirement	Proponent response	NSW Office of Water comment
1 Addressed how it will measure and monitor volumetric take? (page 4 of the AIP)		
2 Outlined a reporting framework for volumetric take? (page 4 of the AIP)		

More information

www.water.nsw.gov.au

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Disclaimer:

This is a draft document produced as a guide for discussion, and to aid interpretation and application of the NSW Aquifer Interference Policy (2012). All information in this document is drawn from that policy, and where there is any inconsistency, the policy prevails over anything contained in this document. Any omissions from this framework do not remove the need to meet any other requirements listed under the Policy.

The information contained in this publication is based on knowledge and understanding at the time of writing (August 2018). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the Department of Primary Industries or the users independent adviser.

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