Application to Mining and Coal Seam Gas Developments in NSW

October 2015

Water Regulation Overview

NSW GOVERNMENT

CONTENTS

Introduction

Water is essential to industry, the community and the environment. It is integral to everything we do. Water regulation is complex because it needs to consider and balance many competing interests. In NSW, multiple government agencies work together under a range of legislation to ensure the impacts of mining and petroleum developments on water resources are properly understood and regulated.

This document provides an overview of the current water regulatory and policy framework applying to mining and petroleum developments in NSW. It is intended to assist proponents and other stakeholders in understanding how government regulates the impacts of these developments on water resources.

The information in this outline document is current as at September 2015. This framework will change over time and require updating.

Proponents should seek their own advice about the application of relevant regulation and policies to their particular projects.

The regulatory framework

The NSW Government requires that responsible agencies ensure that water resources are sustainably managed on behalf of all water users (including the environment). To achieve this, they need to determine:

- the potential impacts of a development on water resources;
- whether those impacts are acceptable or can be mitigated, before approving any activities; and
- that companies are complying with approval conditions, through compliance and enforcement activity.

A range of regulatory tools are used by agencies to achieve these outcomes. These tools and their use by the relevant agencies are described in the following sections of this document.

Relevant legislation

The water and related legislative framework and its application to mining and petroleum activities is outlined in Table 1.

Table 1 – Relevant legislation

Legislation		Agency	Primary regulatory instruments	Comments
NSW *Environmental Planning and Assessment Act 1979* (EP&A Act)	Part 4 (State significant development)	Department of Planning and Environment	Development consent	Consent authority depends on the 'significance' of the development, as defined by the *State Environmental Planning Policy (State and Regional Development) 2011*.
	Part 4 (non-State significant development)	Local Government		
	Part 5 (development permissible without consent)	Division of Resources & Energy (mineral and petroleum exploration)	Part 5 applies to exploration activity approvals under the *Mining Act 1992* and *Petroleum (Onshore) Act 1991*	Part 5 EP&A Act assessment is triggered where an activity requires approval but does not require development consent. The Part 5 assessment is undertaken by the agency issuing the relevant approval.
NSW *Protection of the Environment Operations Act 1997* (POEO Act)		Environment Protection Authority	Environment protection licence (EPL)	An EPL is required for activities identified in Schedule 1 of the POEO Act. Where development consent is required, an EPL cannot be granted until the development consent is issued and must not be inconsistent with the development consent. However, the proponent may apply for an EPL prior to consent being issued.
NSW *Water Management Act 2000* (WMA 2000)		DPI Water	Water access licence Water use approval Water management work approval (for water supply and flood works - scheduled to commence in 2015) Controlled activity approval Aquifer interference activity approval (not yet commenced)	For further information, please see www.water.nsw.gov.au/Water-Licensing/Approvals/default.aspx

Legislation	Agency	Primary regulatory instruments	Comments
NSW *Water Act 1912*	DPI Water	Part 2 (surface water work) licence Part 5 (bore) licence Part 8 (floodplain work) licence	Only applies where equivalent provisions of the WMA 2000 are not yet in force. For further information, please contact the DPI Water.
NSW *Threatened Species Conservation Act 1995*	Office of Environment and Heritage	Under the EP&A Act, the consent/determining authority is required to seek the concurrence of OEH and/or DPI if an activity is on land that is, or is a part of, critical habitat or is likely to significantly impact on threatened species, populations or ecological communities or their habitat for non-SSD projects.	The responsibility for threatened species and their management is shared between the Department of Primary Industries and the Office of Environment and Heritage. The Department of Primary Industries is responsible for all species of fish and marine vegetation. Fish include sharks and rays, aquatic invertebrate animals, such as worms, snails, mussels, corals, sponges, sea urchins, barnacles, crabs, crayfish, aquatic insects and prawns. Marine vegetation includes all seaweeds, sea grasses and marine algae. Other types of animals, including whales, dolphins, seals, water birds and plants, including freshwater plants, are the responsibility of the Office of Environment and Heritage.
NSW *Fisheries Management Act 1994*	Department of Primary Industries		
Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*	Commonwealth Department of Environment	Approval/permits to undertake controlled actions (if the proposed activity is likely to have a significant impact on a matter of national environmental significance, it is known as a controlled action)	Water resources and Commonwealth-listed water dependent threatened species are matters of national environmental significance, in relation to coal seam gas and large coal mining development.
	Commonwealth Independent Expert Scientific Committee	Advice of the Committee is required to be considered under the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*	Water resources and Commonwealth-listed water dependent threatened species are matters of national environmental significance, in relation to coal seam gas and large coal mining development.

Assessment considerations

Government agencies consider a broad range of issues when assessing and approving mining and petroleum activities to ensure that any impacts on water resources are properly understood and appropriately managed. The Department of Planning and Environment issues Secretary's Environmental Assessment Requirements for each project proposal, which define the information required to inform the assessment. These requirements will generally require assessment of the potential impacts of a development on:

- water source integrity;
- water quantity and flows; and
- water quality.

These considerations are outlined in Table 2 and will need to be addressed (where relevant) by the proponent as part of the environmental impact assessment, and will be considered by government during the assessment process.

Table 2 – Assessment considerations

Issue	Aspect	Potential impacts[1] considered as part of the assessment process
Water source integrity	Damage to streams and uplands	Potential direct and/or indirect damage to streams and upland water sources and the consequential effects on dependent uses/users.are considered. These impacts may include: • changes to surface water flow patterns; • realignment of streams; • tilting, fracturing or cracking below streams and upland swamps, • consequential loss of in-stream flows, • alteration of shallow groundwater aquifers that feed stream base flows and provide water to downstream ecosystems and species, or redistribution of water in upland swamps; • stream bank instability; and • stream bed silting or scouring.
	Changes to flood flow dynamics	Local floodplain environmental assets may depend on natural flood flows, and reducing these intermittent flows may threaten their survival. Conversely, other species may be less tolerant to wetting, and may be at risk if a development results in changes to flow dynamics which increase the frequency or duration of flooding. Changing flood flows may also damage economic assets, if areas that were not previously flooded become so. Threatened assets may include crops or infrastructure (e.g. buildings, roads, rail lines, sewers, stormwater systems, electrical infrastructure etc.).

[1] This is not an exhaustive list of potential impacts and is indicative only of common assessment considerations.

Issue	Aspect	Potential impacts[1] considered as part of the assessment process
	Impacts on aquifer integrity	Developments may impact on aquifer integrity through the creation of underground voids, dewatering of aquifers and/or fracturing of geological structures. Groundwater occurs where water seeps into the ground and accumulates within cracks or pores in rock or sediment (aquifers), In unconsolidated or alluvial aquifers (i.e. sands, gravels and clays) water is contained within the pores between grains. If a significant amount of water is removed e.g. due to extraction by mining, industry or irrigation, there is potential for the sediments to compact. This limits the future potential for these systems to hold water. It may also result in surface subsidence. In rock aquifers water is contained within the pore spaces between rock particles such as in between the sand grains in sandstone or within fractures. When coal, rock or mineral ore is removed from an underground mine, the overlying earth can sink, which is called mine subsidence. The extent of mine subsidence depends on the mining method, local geology, depth of mining and amount of material extracted. Mine subsidence can impact on aquifer integrity. For open cut mines, aquifer material above the target mineral resource may be removed in the mining process. If this area is part of a larger groundwater source, the void created by mine workings will change the local groundwater flow, with water flowing preferentially into the void, and consequential impacts on other uses and dependent ecosystems in the area. The voids created by underground mines may result in leakage from overlying surface or groundwater sources, aquifer compaction, or fracturing of overlying groundwater sources. Hydraulic fracturing also has the potential to fracture overlying aquifer structures, changing their flow dynamics and resource potential.
Water quantity and flows	Availability of water for use by mining and petroleum developments	The extent to which mining and petroleum developments require water for their operations differs depending on the nature of the operation, including the degree of processing undertaken on site. Water may be ‘taken’ from surface streams or local groundwater sources, depending on the availability of extraction rights and the reliability of supply from any particular water source. For example, availability of water from smaller local or up-catchment streams is largely dependent on local rainfall and runoff. For coal seam gas, groundwater ‘take’ is necessary to liberate the gas itself, with the associated volumes to a large extent being a function of the amount of water in the target coal seams. Post-extraction, this water becomes a byproduct that must be managed. Similarly for mining, groundwater flows into workings often need to be extracted and managed. All of this ‘take’ must be accounted for.

Issue	Aspect	Potential impacts[1] considered as part of the assessment process
	Impacts on availability of water for other uses	Water 'take' by mining and petroleum developments includes water extracted from surface water (streams and floodplain flows) and groundwater. NSW rivers and groundwater sources have been assigned total 'extraction' limits (as defined in statutory water sharing plans, or by the sum of current total entitlements to take water in non-water sharing plan areas). These extraction 'limits' represent the average annual allowable impact of all water extractions within a specified surface water or groundwater source. Water sources are managed to the extraction limits to ensure that water is available for the environment and other water users, including domestic and stock users, irrigators, town water suppliers and various industries – including mining and coal seam gas. Where there are no 'unassigned' extraction rights in the water source, mining/petroleum companies will need to source these from the water market, so that the total extraction remains within sustainable limits in the longer term. Where the rights in the system are not fully assigned, companies may be able to acquire rights from the Government via open tender (controlled allocation) processes. In addition to the long-term average impacts of water extraction, the location, rate and timing of extraction may also have impacts on existing uses. While the overall extraction from the larger 'water source' discussed above may be sustainable in the long term, if that extraction is very localised, or occurs in large volumes over short timeframes, it may have significant impacts on neighbouring extractive uses (both domestic and stock and commercial), and local dependent ecosystems. Consideration is given to both licensed as well as 'basic rights' water users. Groundwater levels may be drawn down to an extent that extraction from nearby bores and/or dependent ecosystems are affected. Base flows to streams and stream dependent animals and plants (including threatened species with a significant aquatic life stage such as frogs, dragonflies and fish), or deep-rooted vegetation may be impacted. Whether impacts are significant depends on factors such as the depth at which the groundwater is extracted, other 'uses' in that system, and its connectivity to adjacent groundwater sources and streams. Surface water flows from unregulated streams, and therefore flows available to other downstream users and aquatic ecosystems may be significantly impacted if the rate of take from upstream activities is significant. The relevant water sharing plans regulate these impacts by limiting total daily extraction, and if necessary sharing that daily rate amongst licence holders in proportion to their individual entitlements (shares). Subsidence-related impacts (fracturing and cracking of bedrock bases of swamps and streams) may result in sub-surface diversion of shallow groundwater aquifers supporting upland swamps and other water dependent ecosystems. Changes to upland swamp hydrology as a result of these processes can have both local and downstream consequences on ecological communities and catchment water availability. Loss of surface water flows in streams may reduce water availability to downstream users and ecosystems. Hydraulic connectivity between surface waters and deeper storage, including underground mine workings, may result in losses from catchment water budgets, affecting drinking water and other catchments. Where there are baseflow losses from surface water sources, an assessment should address in particular the impacts to basic rights and licensed water users during periods of very low flows, and if there is likely to be increased frequency or duration of any cease to pump events.

Issue	Aspect	Potential impacts[1] considered as part of the assessment process
	Changes in catchment and flood flow dynamics	Developments may change the way water flows across the local catchment. Down gradient areas may receive more or less overland flow as a result. Other users may depend on the harvesting of that flow, usually via farm dams or other licensed storages. Changing the flood flow dynamic may impact on the availability of water for these uses. Changing flood flows may also change the recharge to groundwater sources. Where the change results in less recharge, there is likely to be a consequential impact on existing uses and ecosystems dependent on that groundwater source. Impacts to flood flows also have the potential to increase or alter flood risk, and other flooding impacts.
Water quality	Surface water pollution	Mining and petroleum operations can produce polluted water that requires storage and/or treatment before it can be beneficially reused or discharged to the environment. In mining operations polluted water is produced from a variety of sources, such as the void walls and base, stormwater or process water. In coal seam gas operations, polluted water is produced directly from the target coal seams in the process of gas extraction. The polluted water is of variable quality and will typically contain some form of pollutant (i.e. sediment or other contaminants). The contaminants generally reflect the chemical composition of the formation being mined, local geology or the type of mineral processing carried out. Managing this water to prevent the consequential pollution of surface water and groundwater resources is a key aspect of site water management and may involve the reuse of polluted water where it is fit for purpose. Environment protection licences are used to regulate the activities to avoid and minimise harm caused by water pollution both at the site level, and cumulatively. Management techniques may need to consider surface runoff from catchment areas that do not drain to licensed discharge points. Any impact on receiving surface water will also need to be considered.
	Groundwater pollution	Water management may involve the storage of polluted water for treatment, disposal or reuse in accordance with environment protection licence conditions. Storages must be constructed and used in such a way as to prevent this water leaching into impacts to underlying fresh groundwater systems or discharge through uncontrolled releases. Where groundwater pollution is a consideration, the potential for pollution of any connected surface water resources must also be considered. Chemicals may deliberately be introduced into the subsurface during mining and petroleum operations. The type and use of such chemicals is regulated to prevent the pollution of beneficial water sources.
	Connection of groundwater systems	The quality of groundwater in adjacent aquifers can vary, and is generally a function of the chemistry of the rocks within which the water is contained. Where groundwater systems are largely separated by low-permeability rocks, connectivity is low and the exchange of water between formations is limited under natural conditions. As this may lead to a decrease in water quality in beneficial aquifers, such risks need to be carefully assessed and managed.
	Sub-surface diversion of streams	In some circumstances, subsidence has the potential to cause sub-surface diversion of streams through subsidence effects on stream beds. Impacts to stream water quality include increased metal content (iron and manganese), formation of algal mats and methane bubbles in standing water. These changes to water quality could affect both surface waters in streams and upland swamps, as well as shallow groundwater in the vicinity of those swamps.

Approval requirements

The approvals required for the water-related impacts of mining and petroleum production activities are outlined in Table 3. However, depending on the specific circumstances of a project, some approvals listed in Table 3 may not be applicable. The nature of the approvals and the associated level of assessment is generally a function of the nature, size or extent of the proposed activities, and their location, particularly in relation to other existing activities and/or significant environmental, social, cultural and economic assets.

Table 3 – Approval requirements

Approval		**Comments**
Planning approvals	Development consent	The circumstances in which a mining or petroleum development requires development consent under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) are set out in the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (Mining SEPP).
	State significant development (SSD)	Most mining and petroleum production developments are also classified as 'State significant development' (SSD). The thresholds for State significant development are set out in Schedule 1 to the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP). The Minister for Planning or delegate (e.g. the Planning Assessment Commission) is the consent authority for State significant developments under Part 4 of the EP&A Act. An Environmental Impact Statement (EIS) must accompany any State significant development application under Part 4. Upon application by the proponent, the Secretary of the Department of Planning and Environment (in consultation with other agencies) issues environmental assessment requirements (SEARs, formerly known as DGRs) for the EIS. These will include water assessment requirements. Under the EP&A Act, some approvals for water-related impacts are not required for State significant developments, because these impacts are managed through the development consent and the consent authority seeks the advice of the relevant agency in assessing the proposed development. These include: • water use approvals under s 89, water management work approvals under s 90, or activity approvals (other than aquifer interference approvals) under s 91 of the *Water Management Act 2000*; • concurrence from the Office of Environment and Heritage for significant effect to threatened species, populations and ecological communities; and • permits under ss 201, 205 and 219 of the *Fisheries Management Act 1994*.
	Non-SSD	Some smaller non-coal mines require development consent under Part 4 of the EP&A Act, but are not State significant development. The consent authority for these applications is generally the relevant local council (or the Western Lands Commissioner for development within the Unincorporated Area of the Western Division that is not within a local government area). These projects are generally "integrated" development and the consent authority is required to notify all other agencies from which approvals will be required, and to integrate their conditions of approval into the development consent.
	Gateway process	For projects on strategic agricultural land, a 'Gateway process' must be undertaken prior to applying for development consent. The Gateway process is established through Part 4AA of the Mining SEPP. Gateway applications are referred to the Commonwealth's Independent Expert Scientific Committee (IESC) for advice.

Approval		Comments
	Part 5 – development permissible without consent	Part 5 of the EP&A Act applies to activities that require an approval from, or are carried out by a government agency, but are not subject to Part 4 development consent requirements (and are not an exempt or complying development). Exploration activities on a mineral or petroleum title are subject to Part 5 of the EP&A Act where such activities: • do not require development consent under Part 4 of the EP&A Act, and • are not exempt development (as defined in the Mining SEPP). In these circumstances, the determining authority, (for example, the Division of Resources & Energy (DRE) has a statutory obligation under s 111 of the EP&A Act to "examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment" when determining the application. As with non-State significant development, the concurrence of the Chief Executive of the Office of Environment and Heritage must be sought if the activity is on land that is, or is a part of, critical habitat or is likely to significantly affect threatened species, population or ecological community or their habitat.
	Environment Protection and Biodiversity Conservation Act 1999 approvals	Under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), an action that involves a coal seam gas development or a large coal mining development requires approval from the Commonwealth Government Environment Minister if the action has, will have, or is likely to have a significant impact on a water resource ('the Water Trigger') or other matter of national environmental significance. The Commonwealth processes for the Water Trigger are outlined in Significant impact guidelines 1.3: Coal seam gas and large coal mining developments - impacts on water resources (DoE, 2013), and include referral to the Independent Expert Scientific Committee (IESC) for advice and recommendations on approval conditions. The IESC processes and detailed information and assessment requirements are outlined in Information Guidelines for Independent Expert Scientific Committee advice on coal seam gas and large coal mining development proposals assessment (IESC, 2014).
Water-specific approvals	Water access licence	A water access licence may be required to take water where the *Water Management Act 2000* (WMA 2000) applies. The licensing and approval provisions of the Act apply to all water sources where a statutory water sharing plan (WSP) is in place. In practice this now covers most water sources in the State. Note that the WSPs relate to water sources, and there could be several water sources in a particular area, relating to regulated surface water (i.e. where there are major dams controlling flow), unregulated surface water (uncontrolled flow), or groundwater. There may also be more than one groundwater plan in a single area, with different plans relating to groundwater sources at different depths. The *Water Management (General) Regulation 2011* (cl 18, Sch 5) provides some exemptions from the requirement to obtain a water access licence.
	Water licence	A water licence under the *Water Act 1912* may be required to take water if the water source is not subject to a WMA 2000 water sharing plan.
	Bore licence	A bore licence under Part 5 of the *Water Act 1912* may be required to construct and operate some monitoring bores. Monitoring bores fall under the definition of 'aquifer interference activities' under the WMA 2000. These provisions of the WMA 2000 have not yet been turned on and the *Water Act 1912* is being applied to regulate the location and construction of monitoring bores even in areas where the WMA 2000 otherwise applies.
	Water management work approval	A water management work approval may be required under Part 3 of Chapter 3 of the WMA 2000. This approval to construct and use a water supply work (bore or pump for example) ensures that the infrastructure has minimal impact on local stream flows, natural drainage, and groundwater resources. These approvals are required for exploration on some types of land, or for non-SSD projects. Exemptions may apply (see Part 3, Division 2 of the *Water Management (General) Regulation 2011*).

Approval		Comments
	Water use approval	A water use approval may be required under Part 3 of Chapter 3 of the WMA 2000. This approval controls how any water taken under a water access licence can be used. This will only be required in some circumstances, and where any development consent is in place and considers the use of water, a water use approval will not be required. Exemptions may apply (see Part 3, Division 2 of the *Water Management (General) Regulation 2011*).
	Aquifer interference approval	Aquifer interference approvals under Part 3 of Chapter 3 of the WMA 2000 have not been commenced and are not currently required for any form of development[2].
	Controlled activity approval	A controlled activity approval may be required under Part 3 of Chapter 3 of the WMA 2000 to carry out an activity on or under waterfront land. This may include installation of flow gauging stations, or other structures within 40m of the high bank of any river, lake or estuary. These approvals are required to protect the structural integrity of local streams. Exemptions may apply (see Part 3, Division 2 of the *Water Management (General) Regulation 2011*).
	Controlled works approval / Flood works approvals	A works approval may be required under the *Water Act 1912* for any 'controlled works' on designated floodplains. Until the WMA 2000 provisions relating to floodplain works (a category of water management work – see above), Part 8 of the *Water Act 1912* continues to apply. The conditions of the approvals are designed to manage impacts on flood flow dynamics and on floodplain ecosystems. Flood work approvals under the WMA 2000 will be progressively rolled out under Floodplain Management Plans from mid-2015. SSD projects are exempt from the requirement to hold a flood work approval, however if water is captured from a floodplain a water access licence will be required.
Pollution prevention and management	Environment protection licence	Activities requiring an environment protection licence (EPL) under the POEO Act are defined in Schedule 1 of that Act. This includes most mining and coal seam gas activities. An EPL authorises discharges to both surface waters and groundwater, and to land, and contains conditions relating to the concentration limits of those discharges, operating practices, discharge and ambient monitoring and reporting. The EPL may also specify requirements for pollution reduction programs (e.g. for site stormwater management).
Threatened species approvals		Licences may also be required under the *Fisheries Management Act 1994* and/or the *Threatened Species Conservation Act 1995* for the management of the 'secondary' impacts of changed water regimes.

[2] Aquifer interference is currently assessed under the Aquifer Interference Policy as part of the planning process, as well as under Part 5 of the Water Act 1912.

Policy framework

Table 4 outlines the policies that support NSW's regulatory requirements. These policies are generally specific to a certain aspect of water resource management and articulate the Government's objectives, targets or standards for water resource management. The supporting guidelines serve the purpose of informing industry of the context within which their activities will be assessed, and to assist proponents to plan for or assess specific activities in a 'best practice' manner endorsed by Government.

Table 4 – Policy framework

Activity	Controls[3]	Policies	Supporting guidelines
'Take' (consumption) of surface water[4]	Water Access Licence (WMA 2000) Section 53 Basic landholder rights (WMA 2000) Threatened Species Conservation Act Fisheries Management Act	Relevant Water Sharing Plan Access licence dealing principles Order ACCC Water Market Rules 2009 NSW River Flow Objectives NSW Water Extraction Monitoring Policy (2007) NSW Interim Water Meter Standards NSW Floodplain Harvesting Policy NSW Farm Dams Policy Floodplain Management Plans State Rivers and Estuaries Policy	Harvestable rights: Guidance for landholders and calculator Floodplain Development Manual
Construction and operation of water management and other infrastructure and works (e.g. dams and levees) – includes aquifer interference, but not water treatment systems	***Resource Management*** Water Management Work approvals (WMA 2000) Activity Approvals (WMA 2000) Controlled work approval (Water Act 1912) ***Pollution Control*** Environment Protection Licence (POEO Act)	NSW Algal Management Strategy Rural Floodplain Management Plans Floodplain Development Manual NSW Weirs Policy NSW Salinity Strategy Murray Darling Basin Salinity Management Strategy NSW Acid Sulphate Soils Manual	Guideline and factsheets for completing an application for a Controlled Activity Approval A Rehabilitation Manual for Australian Streams (LWRRDC and CRCCH) Policy and Guidelines for fish habitat conservation and management Environmental Guidelines: Use of Effluent by Irrigation (DECC) Dams Safety Committee Guidance Sheet DSC3E: Flood retarding basins Managing Urban Stormwater: Soils & Construction Volume 1 and Volume 2E (Mines and Quarries) and, where appropriate, Volume 2A (Installation of Services) and Volume 2C (Unsealed Roads) (Landcom 2004)

[3] In addition to development consents and their conditions under Part 4 of the EP&A Act and activity approvals and their conditions under the *Mining Act 1992* and *Petroleum (Onshore) Act 1991*.

[4] Take' includes incidental water take such as water intercepted by mine voids.

Activity	Controls[3]	Policies	Supporting guidelines
Disposal of all incidental water	Environment Protection Licence (POEO Act) POEO Hunter River Salinity Trading Scheme Regulation	NSW Water Quality Objectives National Water Quality Management Strategy/ANZECC guidelines Murray Darling Basin Salinity Management Strategy NSW Salinity Strategy NSW Acid Sulphate Soils Manual	Guide to licensing under the Protection of the Environment Operations Act 1997 Parts A & B Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC & ARMCANZ 2000). NSW Water Quality and River Flow Objectives (DEC 1998) Using the ANZECC Guidelines and Water Quality Objectives in NSW (DECC) Environmental Guidelines: Use of Effluent by Irrigation (DECC) Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (DEC) Using environment protection licensing to control water pollution (EPA 2013) Australian Guidelines for Water Quality Monitoring and Reporting (2000) Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) Managing Urban Stormwater: Volume 2E Mines and Quarries (Landcom, 2004) Acid Sulfate Soils Assessment Guidelines (NSW ASSMAC 1998) Produced Water Management Plan Guideline
'Take' (consumption) of groundwater[5]	Water Access Licence (WMA 2000) Environment Protection Licence (POEO Act) Mining and Petroleum acts - consents	Relevant Water Sharing Plan Aquifer Interference Policy NSW Policy for Managing Access to Buried Groundwater Sources Access licence dealing principles Order ACCC Water Market Rules 2009 NSW State Groundwater Policies: Framework, (draft) Quantity, and Groundwater Dependent Ecosystems	Aquifer Interference Assessment Framework Groundwater Monitoring and Modelling Plans - Information for prospective mining and petroleum exploration activities (DPI, DPI Water, 2014) Australian Groundwater Modelling Guidelines (2012) Risk Assessment Guidelines for Groundwater Dependent Ecosystems (DPI 2012)[6]

[5] Take' includes incidental water take such as water intercepted by mine voids or produced from gas wells.

[6] See also Eamus et al, 2006, A functional methodology for determining the groundwater regime needed to maintain the health of groundwater-dependent vegetation, Australian Journal of Botany, 2006, 54: 97–114, The Groundwater Dependent Ecosystem Atlas (Bureau of Meteorology, 2012) www.bom.gov.au/water/groundwater/gde/, and Australian Groundwater Dependent Ecosystems Toolbox, (Richardson S, et al 2011, Waterlines report, National Water Commission, Canberra)

Key regulatory agencies

The roles and responsibilities of the key regulatory agencies for State significant mining and petroleum developments are summarised in Table 5.

Table 5 – Key agency roles and responsibilities – State significant development

Regulatory issue	Activity	Responsible agency		
		Planning approval	**Licensing**	**Compliance and enforcement**
Water source integrity (including aquifer interference)	Construction and operation of water management and other infrastructure and works	DPE	DPE	EPA: • compliance and enforcement of conditions of approval for gas activities • pollution during construction or operation of infrastructure for non-gas activities DPE: water resource impacts for non-gas activities.
Water quantity and flows	'Take'/consumption/extraction of water	DPE	DPI Water	DPI Water
Water quality	Disposal of waste water	DPE	EPA	EPA

Other guidance material

Relevant water guidelines and operational policies are compiled in Table 6.

Table 6 – Other guidance material

Document	Published by	Current owner	Date	Relevance
Water source				
Coastal groundwater – test pumping groundwater assessment guidelines for bore licence applications	Office of Water	DPI Water	2010	Applying for a bore licence for the purpose of irrigation, industrial, recreation or commercial extraction from a groundwater source in the coastal groundwater area of NSW
NSW Policy for Managing Access to Buried Groundwater Sources	Office of Water	DPI Water	2011	Relevant only to explain basis of water sharing plan development
Minimum Construction Requirements for Water Bores in Australia	NUDLC	NUDLC	2012	Designing or constructing a water bore in NSW
NSW Water Extraction Monitoring Policy	DWE	DPI Water	2007	Policy on monitoring the impacts of water extraction
Water quality				
AS/NZS 5667.11:1998 Water Quality - Sampling - Guidance on sampling of groundwaters	Standards Australia	Standards Australia	1998	General guidance on sampling of groundwaters
Australian Drinking Water Guidelines	NHMRC	NHMRC	2011	Providing and managing safe drinking water supplies. May be used to understand any impacts on drinking water supplies and beneficial use of water
Australian and New Zealand Guidelines for Fresh and Marine Water Quality	ANZECC & ARMCANZ	DoE	2000	Assessing the pollution impact of a discharge - referenced in POEO and the underlying data in the Water Quality Objectives
Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 2) - Managed Aquifer Recharge	NRMMC-EPHC-NHMRC	DoE	2009	Planning or developing a managed aquifer recharge system
Australian Guidelines for Water Quality Monitoring and Reporting	ANZECC & ARMCANZ	DoE	2000	Developing a monitoring program for fresh and marine waters and groundwater
Groundwater Sampling and Analysis: Field Guide	GA	GA	2009	Guidance on the design of a groundwater sampling program
Hunter River Salinity Trading Scheme	EPA	EPA	2006	Discharging saline water to the Hunter River from a premises with an EPL.
Murray Darling Basin Salinity Management Strategy	MDBC	MDBA	2001	Guides the management of water salinity in the Murray Darling Basin system

Document	Published by	Current owner	Date	Relevance
National Water Quality Management Strategy: Policies and guidelines	ANZECC & ARMCANZ	DoE		Understanding the framework for managing water quality in rivers, lakes, estuaries and marine waters.
NSW Salinity Strategy	DLWC	OEH	2000	Understanding, planning for, and reducing salinity impacts
NSW State Groundwater Quality Protection Policy	DLWC	DPI Water	1998	Provides policy principles for groundwater use without impacting water quality
NSW Water Quality Objectives	DECC	OEH	1998	Assessing the pollution impact of a proposal on the community's uses and values of waterways. POEO requires EPA to take into consideration in exercising licencing functions
NSW Wetlands Policy	DECCW	OEH	2010	Understanding the framework for protecting wetland ecosystems and their catchments.
Using the ANZECC Guidelines and Water Quality Objectives in NSW	DECC	OEH	2006	Understanding the framework for managing water quality in waterways
Water pollution and waste				
Approved Methods for the Sampling and Analysis of Water Pollutants in NSW	DECC	EPA	2004	Ensuring statutory requirements for sampling and analysis of water pollutants are met.
Environmental Guidelines: Use of Effluent by Irrigation	DECC	EPA	2004	Considering reuse of effluent by irrigation
Guide to licensing under the POEO Act	DECCW	EPA	2009	Determining if an environment protection licence is needed and understanding the licensing process
Guidelines for the Assessment and Management of Groundwater Contamination	DECC	EPA	2007	Assessing and managing groundwater contamination in accordance with approved guidelines under the *Contaminated Land Management Act 1997*
Liquid Trade Waste Regulations Guidelines	DWE	DPI Water	2009	When seeking to discharge any non-domestic liquid waste into a sewer system
Managing Urban Stormwater: soils and construction, Volume 1 and Volume 2E (Mines and Quarries) and, where appropriate, Volume 2A (Installation of Services) and Volume 2C (Unsealed Roads)	DECC	OEH	2006	Designing and constructing erosion and sediment control measures to prevent pollution (volume 1 is used in conjunction with the Volume 2 series).
National Environmental Protection (Assessment of Site Contamination) Measure 1999 (Cwlth)	NEPC	DoE		Ensuring nationally consistent approach in the assessment of site contamination.
NSW Diffuse Source Water Pollution Strategy	DECC	OEH	2009	Not aimed at regulated sources of pollution
Using environment protection licensing to control water pollution	EPA	EPA	2013	Understand how environment protection licences are used to regulate water discharges

Document	Published by	Current owner	Date	Relevance
Water licencing and trade				
ACCC water market rules	ACCC	DoE	2009	Guidance on the application of the *Water Market Rules 2009* and incorporates amendments to the rules made by the minister.
Access Licence Dealing Principles Order 2004	Office of Water	DPI Water	2004	Seeking to trade water, nominate a work, or carry out any other dealing
Relevant Water Sharing Plan	Office of Water	DPI Water	Various	Understanding the requirements for licensing and trading water. The plans also define each water source under the *Water Management Act 2000*
Water resource impact assessment and management				
NSW Aquifer Interference Policy	Office of Water	DPI Water	2012	Defines the regime for protecting and managing the impacts of aquifer interference activities on NSW's water resources
A rehabilitation manual for Australian Streams	CRCCH	LWA	2000	Designed to assist in returning biological and physical values of Australia's streams
Australian Groundwater Modelling Guidelines	NWC	NWC	2012	Developing a groundwater model
Floodplain Development Manual	DIPNR	OEH	2005	Provides guidance on the management of flood liable land.
Groundwater Monitoring and Modelling Plans - Information for prospective mining and petroleum exploration activities	Office of Water	DPI Water	2014	Developing a groundwater monitoring and modelling plan during exploration
Information Guidelines for Independent Expert Scientific Committee advice on coal seam gas and large coal mining development proposals	IESC	IESC	2014	When preparing an EIS for a project that triggers the "water impacts" MNES under the EPBC Act
NSW Biodiversity Offsets Policy for Major Projects	OEH	OEH	2014	Provides a standard method for assessing biodiversity impacts on proposed development sites and determining the biodiversity offset requirements for those impacts.
NSW Floodplain Harvesting Policy	Office of Water	DPI Water	2013	Policy on the management of floodplain water extractions to effectively protect the environment and reliability of water supply
NSW Guidelines for Controlled Activities on Waterfront Land	Office of Water	DPI Water	2012	Relate to the design and construction of works within a watercourse or on waterfront land
NSW State Groundwater Dependent Ecosystems Policy	DLWC	DPI Water	2002	Provides policy principles for groundwater extraction without impacting dependent ecosystems
NSW State Groundwater Policy Framework Document	DLWC	DPI Water	1997	Provides a policy framework for the management and sustainable use of groundwater in NSW
Policy and Guidelines for fish habitat conservation and management	DPI - Fisheries	DPI - Fisheries	2013	Outlines key considerations for the protection and management of key fish habitats (i.e. rivers, wetlands and estuaries) including fish passage requirements and assessing and managing potential impacts on Threated Species, as defined by Part 7A of the *Fisheries Management Act 1994*.

Document	Published by	Current owner	Date	Relevance
Risk Assessment Guidelines for Groundwater Dependent Ecosystems	Office of Water	DPI Water	2012	Assessing & understanding the risk of activities on GDEs
Rural Floodplain Management Plans	Office of Water	DPI Water	various	Determining what works are appropriate on a rural floodplain.
Significant Impact Guidelines 1.3: Coal seam gas and large coal mining developments - impacts on water resources	DoE	DoE	2014	Understanding if a coal or CSG project is likely to have a significant impact on water resources
Strategic Regional Land Use Policy: Guideline for Gateway Applicants	DP&I	DPE	2013	The Mining and Petroleum Gateway process ('Gateway process') is an independent, scientific and upfront assessment of how a mining or coal seam gas production proposal will impact the agricultural values of the land on which it is proposed to be located. It considers proposals at a very early stage before a development application is lodged. This guideline has been prepared to assist applicants and others understand the information required for a Gateway application.
Water-related infrastructure				
AS 2368-1990 Test Pumping of Water Wells	Standards Australia	Standards Australia	1990	When designing and performing a water well pumping test
Code of Practice for Coal Seam Gas Well Integrity	OCSG	DRE	2012	A practical guide for exploration, extraction or production of coal seam gas safely, while minimising risks to health or the environment
Code of Practice for Coal Seam Gas Fracture Stimulation	OCSG	DRE	2012	Establishes a code of practice for the hydraulic fracturing process, the use of chemicals, sourcing water and the protection of aquifers
Dams Safety Committee 3F Tailing Dam	DSC	DSC	2012	Considers the unique characteristics necessary for tailings dams
Dams Safety Committee Guidance Sheet DSC3E: Flood retarding basins	DSC	DSC	2010	Design, construction and maintenance of flood retarding basins
Form A Explanatory Notes	Office of Water	DPI Water	2009	Drilling a bore and providing construction details ('Form A') to DPI Water
NSW Farm Dams Policy	DLWC	DPI Water	1999	Permits land holders to construct farm dams in certain locations and provides construction requirements
NSW Interim Water Meter Standards for Open Channel Metering	Office of Water	DPI Water	2013	Provides national standards for water meters that are installed after 1 July 2010.
State Environmental Planning Policies				
State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011	NSW Government	DPE	2011	Controls development in the Sydney drinking water catchment to ensure water quality is protected.
State Environmental Planning Policy No 14—Coastal Wetlands	NSW Government	DPE	1985	Controls development to ensure that coastal wetlands are preserved and protected in the environmental and economic interests of the State.

Definitions

ACCC	Australian Competition and Consumer Commission
ANZECC	Australian and New Zealand Environment Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
CRCCH	Cooperative Research Centre for Catchment Hydrology
DPI Water	The Division of Water within the Department of Primary Industries
DECC	Department of Environment and Climate Change
DECCW	Department of Environment, Climate Change and Water
DIPNR	Department of Infrastructure, Planning and Natural Resources
DoE	Department of Environment (Cth)
DLWC	Department of Land and Water Conservation
DPE	Department of Planning and Environment
DP&I	Department of Planning & Infrastructure
DSC	Dams Safety Committee
DWE	Department of Water and Energy
EPA	Environment Protection Authority
EPHC	Environment Protection & Heritage Council
GA	Geoscience Australia
MDBC	Murray Darling Basin Commission
MDBA	Murray Darling Basin Authority
IESC	Independent Expert Scientific Committee (Cth)
LWA	Land and Water Australia
MDBA	Murray Darling Basin Authority
NEPC	National Environment Protection Council
NHMRC	National Health and Medical Research Council
NRMMC	Natural Resource Management Ministerial Council
NUDLC	National Uniform Drillers Licensing Committee
NWC	National Water Commission
OCSG	Office of Coal Seam Gas
OEH	Office of Environment and Heritage
WRC	NSW Water Resources Council