

Dr Andrei Woinarski

Senior Principal, PhD, CEnvP SC, EPA-accredited Site Auditor (NSW)

Qualifications

Doctor of Philosophy, Uni. of Melbourne, 2004
 Bachelor of Engineering (Environmental; Hons 1),
 Uni. of Wollongong, 1999



Career Profile

Andrei Woinarski is Senior Principal of Senversa. He is an environmental engineer / hydrogeologist approaching 25 years of experience providing expertise in a range of environmental services including contaminated land management, hydrogeology, pollution prevention, due diligence and environmental auditing. He received his Doctorate from University of Melbourne researching cold climate remediation engineering in Antarctica and the Arctic.

As a NSW EPA-accredited site auditor and/or providing expert advice on audits, third party reviews and expert opinion, he is called on to provide assurance to the public on the health and environmental risks and appropriate management.

In his career, Andrei has been responsible for managing or technical direction of hundreds of projects of varying sizes across market sectors including infrastructure, petrochemical, manufacturing, mining and minerals processing, defence, land development, landfills, water and wastewater. Some high-profile projects have included remediation at Orica Villawood pesticide clean-up, chlorinated solvent impacts for the Orica Botany groundwater clean-up and Lawrence Dry Cleaners remediation, heavy metals at former Port Kembla Copper smelter, several large former gasworks, landfill impacts in St Peters and McCoy Park, and PFAS at various airports and Defence bases.

Andrei often provides his expertise in hydrogeology, including conceptual models, water balances and modelling review, and remediation approaches including water and wastewater treatment, cleaner production, and containment approaches.

Andrei has provided third party expert hydrogeology or contamination advisory services, such as Pasminco Cockle Creek Smelter and Kurri Kurri smelter remediation projects for NSW DPE, Level Crossing Project (VIC), and North South Tunnel Project (SA). Andrei has acted as expert support for site auditors, including on projects with complex water and process issues like Nyrstar Port Pirie assessment, PFAS at RAAF Pearce and Swartz Barracks, and the former Akzo-Nobel site in Camellia, and is the site auditor for the Rosehill-Camellia Rezoning for DCCEE and Bombo quarry rehabilitation and development for TAHE.

Andrei has acted as expert support in environmental compliance audits of Dargues mine and Woodlawn mine.

Expertise

Environmental auditing
 Third party review and expert opinion
 Risk-based land and groundwater contamination assessment, management and remediation
 Contaminant hydrogeology

Key Industry Sectors

Industrial / Manufacturing
 Petrochemical
 Mining and minerals processing
 Waste and wastewater

Employment History

2016 (current): Senversa Pty Ltd
 2014 to 2016: JBS&G Australia Pty Ltd
 2010 to 2014: Golder Associates Pty Ltd
 2004 to 2010: URS (Australia & USA)
 2000 to 2003: Australian Antarctic Division and Queens University

Memberships and Certifications

NSW EPA Accredited Site Auditor (No. 2204)
 Certified Environmental Practitioner Site
 Contamination Specialist (CEnvP SC) (No. SC41082)
 National Ground Water Association (NGWA)
 Australian Contaminated Land Consultants Association (ACLCA) (Senversa)
 Australian Land and Groundwater Association (ALGA)

Recent Professional Training & Development

- Winner - 'Best Regional Remediation Project >\$1M' at the 2021 ALGA Awards.
- Occasional guest lecturer, Contaminated Site Remediation (CVEN4050), UNSW
- Occasional guest lecturer, Groundwater Contamination, CSARM, UTS
- Presented at ALGA groundwater symposium, Nov 2022
- Presenter or attendee at International Conference on Remediation of Chlorinated and Recalcitrant Compounds ('Battelle') in 2008, 2010, 2018.
- Presenter at EcoForum Conference, 2018, Sydney NSW.
- Peer reviewer for various publications, including Cold Regions Science and Technology.



Selected Project Experience

EXPERT OPINION, REVIEWS, AUDITING

- **NSW DCCEEW, Camellia-Rosehill precinct strategy and rezoning (2022-ongoing):** Acting as the site auditor for the contamination assessment and concept remediation planning to support the rezoning and modification of relevant planning instruments.
- **CSR, Site Audit, Villawood (2024-ongoing):** Site auditor for the contamination assessment and remediation to support the development and upgrade of the manufacturing facility.
- **NSW Transport Asset Holding Entity, Bombo quarry precinct rezoning (2023-ongoing):** Site auditor for the contamination assessment and remediation planning to support the rezoning.
- **Transport for NSW, Paramatta Light Rail (2017-ongoing):** Expert support to the site auditor for the remediation of solvents, hexavalent chromium and asbestos at the former Akzo Nobel site. Remediation comprises a containment wall system and integrated capping system with numerous stakeholders and complex approvals and staging.
- **Defence Australia, Swartz Barracks, PFAS Assessment and Remediation (2020-ongoing):** Expert support to Technical Advisor/Auditor in relation to hydrology, contaminant hydrogeology, modelling and remediation of PFAS.
- **Defence Australia, RAAF Base Cairns, PFAS Assessment and Remediation (2020-ongoing):** Expert support to Technical Advisor/Auditor in relation to hydrology, hydrogeology, modelling and CSM development of PFAS.
- **Defence Australia, RAAF Base Pearce, PFAS Assessment and Remediation (2018-ongoing):** Expert support to Technical Advisor/Auditor in relation to hydrology, contaminant hydrogeology, modelling and remediation of PFAS.
- **Water Corporation, Broome South Wastewater Treatment Plant, WA (2018-2022):** Provision of expert advice to the site auditor on contaminant hydrogeology and potential nutrient impacts to the receiving environment.
- **Nyrstar, Port Pirie (2018 – 2021):** Expert support to the audit of contamination assessment and remediation program at the operating smelter in relation to hydrogeology, hydrology, contaminant fate and transport assessment and numerical groundwater solute transport and river modelling. Contaminants included heavy metals, with key issues relating to source behaviour, groundwater migration, geochemistry, assimilative capacity of the aquifer and groundwater fate and transport.
- **SA DIT, North South Tunnel Project, (2019):** Provided independent review on behalf of the Government agency of contamination and hydrogeology documentation to support an initial feasibility planning for the project.
- **NSW Department of Planning and Environment, Pasminco Cockle Creek, NSW (2018-2021):** Assessment of long-term liabilities and associated financial assurance associated with the containment cell to support DPE project approvals and regulation.
- **NSW Department of Planning and Environment, Hydro Aluminium Smelter closure, Kurri Kurri NSW (2018-2019):** Assessment of long-term liabilities and associated financial assurance associated with a proposed containment cell to support NSW DPE approvals and regulation.
- **Environmental Audit, Dargues Mine, NSW (2019):** Expert support of the audit of the gold mine as required under EP&A Act.
- **Level Crossing Removal Project, VIC (2018):** Provided expert opinion on the environmental assessment in relation to the hydrogeology assessment, modelling and mitigation measures for the rail infrastructure project. This included review of numerical groundwater flow and saline intrusion models, with and without mitigation measures, to assess impacts to nearby wetlands and groundwater users.
- **Land and Environment Court, expert opinion, asbestos (2017):** Provided expert evidence to support proceedings involving illegal waste disposal at a site in western Sydney. The waste had principally impacted on Aboriginal heritage and environmental values.
- **Expert support to audits / expert opinion - various matters (2016- ongoing):** Provided contaminant hydrogeology or remediation expert advice supporting auditor reviews for multiple projects. This has included peer review of: nutrient assessment, numerical groundwater modelling, CSM and remediation planning/design at Bis Industries, Kwinana WA; CSM for Alcoa refinery, Kwinana WA; Iluka Narngulu fate and transport model (for B, NH4+, TDS); LNAPL fate and transport at retail petroleum sites in Armadale WA, Caltex Brighton SA, BP Frankston South VIC; hydrogeology, LNAPL recovery and behaviour studies at Veranus Island and Barrow Island, WA; review of background soil and groundwater concentrations and application in assessing ecological risks at Barrow Island, WA.
- **Environmental audit and risk assessment of Kingsgate Chatree goldmine, Thailand (2014-2015):** Independent review of environmental and community health monitoring data, site inspections and an audit of the monitoring program at an operating gold mine in Thailand, which was subject to closure due to public health concerns. Developed a program of works to assess community health, and worked with the client's community consultation team to communicate actual risks. Involved leading technical aspects of collaborative work with the client, Thai universities and health experts, with particular consideration of Thai political frameworks, within a high-pressure work environment.
- **Orica, Kooragang Island, Newcastle NSW (2014-2015):** Third party review, and management and preparation of reports required for PRPs under an EPL for a public/regulatory audience. Involved working with client engineers and management to distil technical process/engineering information from a broad range of process plant cleaner-production projects into a document suitable for the targeted audience.



Selected Project Experience

CONTAMINATION ASSESSMENT AND REMEDIATION / MANAGEMENT

- **NSW RFS, PFAS management program (2022-ongoing):** Directs the assessment and remediation of PFAS impacts at a number of sites for RFS. Surface and groundwater are critical for most projects, which have included water balances and mass discharge elements.
- **Risk management, McCoy Park landfill, NSW (2022-ongoing):** Technical direction for the assessment of landfill gas and leachate risks to the environment, and associated with a high-voltage power cable infrastructure installation.
- **Risk assessment from landfill impact on tunnel infrastructure, NSW (2021-ongoing):** Provided hydrogeological advice and directed development of a CSM and risk assessment in relation to management of potential impacts on a large piece of Sydney tunnel infrastructure from pre-existing contamination associated with a large landfill.
- **New Sydney Fish Markets, NSW (2021-ongoing):** Technical director for contamination assessment and validation, and environmental monitoring during construction. This has included preparation of environmental management plans, assessment of acid sulfate soils, waste and imported material validation, design and implementation of water quality monitoring programs, preparation of an environmental assessment for an approval modification, and community communications.
- **Defence Australia (2017-2023):** Technical direction or lead for hydrology, hydrogeology and remediation planning for PFAS as part of Senversa's role as Lead Consultant for RAAF Amberley and RAAF East Sale. Also provided expert advice or opinion on technical hydrology, hydrogeology, fate and transport, and remediation aspects supporting Senversa's Technical Advisor roles.
- **Former gasworks, Wollongong, NSW (2018-2022):** Technical direction for the project to conduct site investigations, a HHERA, remediation trial (stabilisation), develop a RAP and remediation validation. The site is subject to a site audit. The project was awarded the "Best Regional Remediation Project >\$1M" at the 2021 ALGA Awards.
- **Powering Sydney Future, NSW (2020):** Responsible for preparation of landfill gas and contamination management plans on behalf of Garde for the SSD project, which comprises construction of a high kV transmission cable 15 km through Sydney.
- **Former gasworks, Brompton & Osborne (2018-ongoing):** Technical support for contaminant hydrogeology aspects of the assessment, development of a CSM and remediation planning for the former gasworks. The site is subject to an audit.
- **Dept. of Finance, former liquid waste disposal site, Lucas Heights, NSW (2017-ongoing):** Provision of technical hydrogeological and remediation support via review of documents, participating in workshops to develop remedial and procurement strategies. Documents reviewed have included monitoring plans, responses to Auditor comments, and options assessments.
- **Lawrence Dry Cleaners, NSW (2016-ongoing):** Technical direction for an enhanced *in situ* bioremediation system to remediate chlorinated solvent impacts associated with a former dry-cleaning facility. Responsible for technical aspects of the project including: operation and maintenance of a pump and treat system; surface water, groundwater, soil vapour, ambient air and personnel monitoring; key author for all reports; stakeholder engagement including the client, client's legal team, tenant's and regulators; targeted site investigations; *in situ* bioremediation works and remediation trials; investigations and remediation planning for change in land use. The site is subject to regulation by the EPA.
- **Port Kembla Copper, NSW (2017-ongoing):** Remediation engineer supporting works assessing residual contamination in surface water, stormwater, sediments and shallow groundwater to support closure of the former smelter and associated slag landfills. This has included acting as project manager and developing, in conjunction with the project director: surface water, groundwater and soil assessment work plans and subsequent implementation; monitoring programs; data review; and assessment of remedial/management options. The site is subject to regulation by EPA.
- **Orica Botany clean-up, NSW (2006-ongoing):** Long-term site hydrogeologist and remediation engineer assisting the client to assess and manage various groundwater contamination issues associated with former operations at the Orica Botany chemical manufacturing facility. Roles and works have evolved over time and included: developing and updating the CSM; contaminant mass and flux estimates; investigations and assessments of hydrogeology, DNAPL and groundwater; ongoing hydraulic and contaminant monitoring programs; remedial design; review of numerical modelling; oversight of construction and commissioning of a large (>120 extraction and monitoring wells) hydraulic containment barrier system (subsurface components).
- **Former Akzo Nobel site, Sydney NSW (2012-2015):** Project manager and remediation engineer for various projects managing issues associated with hexavalent chromium and chlorinated hydrocarbon contamination in soil, groundwater and stormwater at a former industrial facility.
- **Multiple Dulux industrial facilities, NSW (2017-ongoing):** Technical director for contamination assessment, wastewater management, and surface water and groundwater monitoring programs at Dulux's NSW sites. Also prepared management plans and monitoring programs.
- **Former RailCorp site, Turrella, NSW (2015-2023):** Assessment to address an EPA-regulated VMP and close out remaining contamination risk issues of a PCE/TCE contaminated site leased as a chemical distribution facility to assist RailCorp with their corporate risk management and meet regulator expectations.
- **Western Sydney Stadium, NSW (2017-2018):** Provided due diligence advice to Lend Lease in relation to contamination liabilities with the site and development for their bid. Provided direction to subsequent remediation validation, which primarily related to containment of asbestos impacts. The site is subject to a site audit.



Selected Project Experience

- **Former fire-fighting training facility, VIC (2016-2017):** Conducted a remedial feasibility assessment for PFAS impacts at a large-scale former fire-fighting training facility at Fiskville following USEPA CERCLA and State guidance to identify a preferred remedial/management approach – this approach has been applied by the client at other sites across Victoria. The site was subject to a site audit and EPA involvement.
- **Former RailCorp site, Turrella, NSW (2015, 2021-2022):** Developed a CSM for a PCE/TCE contaminated site leased as a chemical distribution facility to assist RailCorp with their corporate risk management and meet regulator expectations. Developed and environment monitoring program (soil gas, groundwater, stormwater), including assessment of natural attenuation, to comply with a VMP.
- **Former Orica site, Villawood NSW (2014-2015):** Project director for remediation validation, asbestos clearance and monitoring services for a large-scale DDX, VOC, mercury and asbestos soil remediation (on-site thermal desorption) project at the former pesticide manufacturing facility. Key author for the draft remediation validation report.
- **Orica Kooragang Island, Newcastle, QLD (2010-2014):** Former operations at the facility had resulted in arsenic and ammonium nitrate impacts to groundwater. Acted in various roles either acting as technical lead/peer review on behalf of the client or providing technical direction as a hydrogeologist and remediation engineer. The works included ongoing monitoring, feasibility assessment of *in situ* geochemical fixation and permeable reactive barrier remediation for arsenic impacted groundwater; concept designs of containment systems.
- **Xstrata/Glencore copper refinery, Townsville, QLD (2012-2013):** Project manager / principal investigator in work supporting closure planning of a copper refinery in North Queensland.
- **Former ChlorAlkali Plant, Botany NSW (2011-2013):** Remediation engineer / hydrogeologist and key author for a feasibility assessment of soil and groundwater mercury remediation options, and preparation of RAP for a containment approach for the former ChlorAlkali Plant. The work was subject to peer review by an international expert and Site Auditor.
- **Orica Yarraville, VIC (2011):** Hydrogeologist who was one of two key authors in preparing a CSM for a large chemical/industrial site with DNAPL, soil and dissolved phase pesticides, nitrogenated organics and chlorinated compounds.
- **Trans Bay Cable Project, CA USA (2009):** Provided environmental oversight of construction and hazardous waste management for a construction project at a former gasworks site in San Francisco.
- **Golden Eagle Refinery, CA USA (2008-2009):** Field engineer assisting with management and troubleshooting for the operation and maintenance of a large-scale (>30 pumping wells and 1 km of piping) LNAPL recovery system.
- **Resolution Island / Queens University, Canada (2001):** Provided scientific advice, field analytical services, remediation oversight and health and safety supervision for a large remediation project at a DEW-line site with sediments and groundwater contaminated with PCBs.
- **Antarctica, Sub-Antarctic and Arctic (2000-2004):** PhD related work with University of Melbourne and Australian Antarctic Division included investigation and pilot trial of remediation strategies such as pump-and-treat, PRBs and in-situ chemical oxidation for management of several petroleum, heavy metal and PCB contaminated sites at Casey and Wilkes Stations in Antarctica, Macquarie Island and Resolution Island, Canada. This involved working with a diverse team of scientists, engineers and managers in all aspects of the project from design, planning, laboratory and field studies to implementation.

WATER / WASTEWATER

- **Water management, Dulux, NSW (2017-ongoing):** Directed study of surface water and wastewater management and performance at the Food Organics and Green Organics (FOGO) composting facility in Wyee NSW. Included various groundwater and contamination aspects. Developed a wastewater management strategy and plan in line with regulatory guidance, and conducts ongoing monitoring and review.
 - **Ammonium nitrate and cyanide production facility, Gladstone QLD (2011):** Managed an assessment and remediation feasibility project for cyanide, ammonia and nitrate impacted groundwater and stormwater including: remedial options review, advice for the selection of a preferred approach and design of a hydraulic containment system. Also conducted a review of *ex situ* treatment and reuse options for cyanide impacted soil.
 - **Selenium Water Treatment, Port Kembla Copper, NSW (2011):** Review of performance of water runoff capture systems, a water treatment plant and desktop feasibility study of treatment alternatives for selenium at a former copper smelter being decommissioned.
 - **Groundwater or process water treatment systems, various sites NSW (2010-ongoing):** Project manager or principal engineer for the operation, maintenance and monitoring of groundwater pump and treat or process treatment systems – including: PCE impacted groundwater at Lawrence Dry Cleaners, NSW; chromium (VI) and chlorinated methanes at for AkzoNobel site, Camellia NSW; acidic groundwater at Orica Kooragang Island, NSW; metals and PCE impacted groundwater former Koltex site, NSW; TCE impacted groundwater at a metals manufacturing facility, Penrith NSW.
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