



World Water Congress XV

International Water Resources Association (IWRA)

Edinburgh, Scotland. 25 - 29 May 2015

Managed Aquifer Recharge with Treated Wastewater

OLD LAWS FOR NEW USES?



AIDA

Defining Terms

- * **Managed Aquifer Recharge (MAR):** artificial recharge of groundwater (under controlled conditions) via infiltration or injection of **recycled or natural water** into an aquifer
- * Water banking or enhanced recharge
- * Aquifer Storage (Transfer) & Recovery (AS(T)R)

- * Water treatment technique (mid-1900, e.g. Israel)
- * Soil Aquifer Treatment (SAT), Treated Sewage Wastewater (TSE)

Identifying the issue

- * Purposeful **recharge** of surplus water for later use or for environmental benefit vs **discharge** of wastewater into an aquifer
- * Conventional sources: Surface water (dams)/ urban storm water
- * Non-conventional sources: Treated wastewater/ desalinated water
- * Intended use: irrigation, landscaping, drinking water supply
- * **Legislation & administration**: water quantity & quality aspects

Study Cases

- * Australia (W. Australia)
- * Israel
- * Spain
- * South Africa
- * USA (Arizona)

- * Germany/ the Netherlands/
Hungary/ UAE/ Jordan/
Mexico

Main requirements:

- * Drilling permit
- * Water abstraction permit
- * Recharge facility permit
- * TWW discharge permit
- * TWW reuse permit
- * Assessment and planning

Example: W. Australia

- * 2007 Water Act: GW includes pumped, diverted or released water
- * 2009 National MAR Guidelines + National Guidelines for Water Reuse
- * 2011 Western Australia MAR Policy
- * 1914 Rights in Water & Irrigation Act
- * Licence to take water (incl. ancillary storage) + Licence to construct bores
- * Agreement to take water if recharge & recovery by different operators
- * Case-by-case hydrogeological assessment
- * Approved operating strategy
- * Health-related documentation for drinking water

Water Rights Involved

- * Right to **harvest source water**
 - * Who owns the effluents?
 - * Public : concessions/licensing; Private : negotiated contracts
- * Right to **store and recharge treated wastewater** to an aquifer
 - * Injection or infiltration? What is the required quality?
 - * Excess water storage or recharge of depleted aquifer
- * Right to **recover stored or recharged water** from an aquifer and **put it to final use**
 - * Who recovers the water? MAR licence holder or third person
 - * Inc. in MAR licence or as separate authorization – where, when & how much?

Integrated Licensing

- * Right to **harvest, store and recover** treated wastewater
- * **Prerequisites:** EIA, land use & health clearances, quality stds
- * **Risk management plan** for MAR system's operations
- * Licence **duration & administrative fees**
- * Licence **review, variation, suspension, termination**
- * Water-related **tariffs & recharge costs**
- * **Percentage** of stored water to be recovered (drought plans)

Risk Management Plan

- * Protection of human health and the environment
- * Prevention of hazards
- * Identification, assessment & mitigation of relevant risks
- * Water quality (compatibility, temperature) and quantity (balance)
- * Attached to the MAR licence and enforceable

Institutional Aspects

- * Administration (water, environment, health)
- * Monitoring
- * Enforcement

- * Central and local authorities
- * Consultation of basin organization & WUAs

Findings

- * Licensing system established by unspecific legislation
- * GW abstraction & TWW legislation
- * Policy and guidelines may elaborate a MAR scheme
 - * > Lack of legal certainty
 - * > Gaps in mandatory requirements
- * Special legislation for integrated MAR licensing

AIDA is a non-governmental, non-profit, international association of lawyers and non-lawyers active in the field of fresh water resources. Join us!

Thank you!

Ariella D'Andrea

International Legal Expert, AIDA

ariella.dandrea@gmail.com

www.aida-waterlaw.org

International Association for Water Law

Asociación Internacional de Derecho de Aguas

ASSOCIATION INTERNATIONALE DU DROIT DES EAUX



AIDA