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POLICY AND IMPLEMENTATION CHALLENGES FOR DISTRIBUTED WATER MANAGEMENT SYSTEMS AT STIRLING CITY CENTRE, WESTERN AUSTRALIA

A DISCUSSION PAPER

Prepared for the Stirling Alliance
April 2010

HASSELL

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1 ____ Executive Summary

This paper reviews the policy and implementation challenges associated with implementing distributed water management systems at Stirling. To do this the document reviews available information, mainly in the Western Australian context and presents insights from practitioners (including the author).

1

A key finding of this review is that while the macro policy settings support the notion of alternative or distributed water systems there is no adequate support mechanism to aid in their realisation. The main challenges relate to the fact that the legislative tools and regulations are largely out of date and not designed for reuse of waste water or water harvesting. The experience to date also has highlighted that there is variety of agencies involved in assessment and approval of alternative systems. That groups that have sought to implement alternative systems have been hindered by a lack of coordination across agencies. Further it needs to be highlighted that significant effort and resources will be required to both formulate a design, the approval documentation and to negotiate it through the system.

If the Stirling project is going to successfully demonstrate alternative or distributed water management solutions the following key steps need to be factored into the way forward:

- _Clarify the potential alternative water options and scope the investigation needed to confirm the most viable options
- _Develop a proposal incorporating the most likely options and present a case to the Non Drinking Water Steering Committee that Stirling should be considered as demonstration project that focusing on alternative water systems in an urban renewal context
- _Resource the necessary investigations to firm up demonstration proposal(s)
- _Seek potential partners, operator and clarify potential governance arrangements
- _Identify funding opportunities and potential business case
- _Develop preferred design options and undertake due diligence
- _Commence approval processes

2 ____ Introduction and Purpose of the Paper

This paper has been commissioned by the Stirling Alliance to help inform the process of investigating the potential for distributed water management system within the Stirling City Centre Area. The paper is an input into the wider study process investigating the potential of “green infrastructure” solution within the Stirling City centre area.

2

This paper focuses on the policy and implementation challenges that may be faced in seeking to implement a distributed water management system within the Stirling City Centre area.

The focus of the paper is limited to what might affect or influence decisions related to distributed water systems and provides a syntheses of others work as well as drawing on personal experience.

3 Context

The City of Stirling, Department of Planning and partner agencies including the Main Roads Department, Public Transport Authority and Landcorp have agreed to collaborate on a project to redevelop the Stirling Regional Centre into a compact, mixed use city centre. This partnership is referred to as the Stirling City Centre Alliance.

3

The goal of the Stirling City Centre Alliance is to become “the world’s most sustainable city by 2031”. A key initiative in achieving this objective is to ensure that the Stirling City Centre incorporates cutting edge initiatives in the area of water and energy supply and demand management.

The Stirling City Centre is a unique project. It is seeking to establish a major activity centre within Perth, where ultimately 25,000 people might live in a highly urban environment and 25,000 jobs might be created. The planning phase of the project has used Alliancing principles and practices to deal with the complexity (wickedness) of the challenges that are faced. The Alliance approach has rarely been used for project planning, in that Alliancing has usually been used to deliver infrastructure projects when a clear decision has been made to build something. In this case the project is seeking to clearly work through what can be built. In many ways this project is about a process to help “design sustainability”.

In this context one of the initiatives where preliminary investigation has commenced is in the area of investigating the potential benefit or other wise of integrating “distributed water and energy systems” into the project.

The aim of these investigations is to establish if and in what form alternative water and energy supply options and waste management solutions can be of overall benefit to the development of sustainable city centre at Stirling.

4 ____ What are Distributed Systems?

Berry *et al* (2004) have defined Distributed Infrastructure and Services (DIS) as involving products and services that:

- _increase efficiency and conservation (for example products or services that reduce the need for energy use, water use, or large scale car based infrastructure)
- _provide distributed and decentralised supply (for example smaller scale energy production, localised water capture and/or re-use)
- _involve change to the system as a whole (such as systems to enable a more distributed energy market, small bore and decentralised sewerage, or integrated land-use and transport planning), and
- _The systems maybe complementary to the existing infrastructure industry as well as offering new and very different opportunities

4

In the context of distributed water systems, these may include elements including local harvesting, treating and re-use grey and black water which might involve sewer mining or establishment of local treatment systems.

5 ____ Why Distributed Systems?

The objective of these systems has been to augment existing approached by being “more sustainable, less vulnerable, reduce the parasitic behaviour of cities and make better use of local resources, utilise a range of water resources and reduce the ecological foot print of cities” (De Graff 2008).

5

Some studies (i.e. Retamal, White & Fane 2008) have suggested that up to 90% of mains water can be substituted by alternative water sources in urban renewal projects with the supplementary benefits of significant reductions in waste water flows, reduced energy consumptions and recovery of bio-solids for conversion to biogas.

While design and implementation of distributed water management schemes is still at its infancy in Australia there is a range of both push and pull factors that have lead to more intense investigation of distributed systems (Berry et al 2004).

The “Push” factors involve:

- _Increasing risk – centralised infrastructure involve large capital cost. They are often highly energy intensive and the price of energy (and water) is increasing
- _Reaching limits of systems (demand out-stripping supply) - there is increasing competition for the resource, managing the urban water balance is a major challenge. (In recognition of this in Western Australia there is Government Policy target to achieve 30% recycling)
- _Environmental expectations – increasing community expectation in relation environmental protection, management and provision of environmental flows

The “Pull” factors:

- _The growing market – meeting projected demand through centralised systems – dams, ground water or desalination plants are environmentally constrained and un popular
- _Product and service opportunities – there are new service offerings that are potentially able to provided by thinking about service provision via distributed rather than centralised systems, mainly related to think about the service as retail or service provision rather than a “bulk’ supplier
- _Policy – broader range of policy shifts from carbon reduction initiatives to economic regulation providing in-principle support to encouraging competition with a utility sector, providing specific licence provisions for new facilities and funding programs designed to encourage innovation in these areas

Distributed systems are part of the wider concept of the Water Sensitive City which is a stated goal of the Australian Commonwealth’s National Water Initiative directed at ‘Innovation and Capacity Building to Create Water Sensitive Australian Cities’ (COAG 2004, Clause 92,p20 – as cited in Wong and Brown 2009). Further at a system scale these approaches are argued to aid in enhancing cities resilience to climate change (Wong and Brown 2009).

6 ____ What might a Distributed Water System at Stirling Involve?

The approach being pursued at Stirling is a Water Sensitive Urban Design, a comprehensive approach to integrated urban water cycle management that includes water supply, sewerage and stormwater management. It includes a range of approaches including:

- _Reducing potable water demand through water efficient appliances, rain water and grey water reuse
- _Minimising waste water generation and treatment of wastewater to standard suitable for reuse opportunities and or release to receiving waters
- _Treating urban storm water to meet water quality objectives for reuse and / or discharge to receiving environments
- _Managing hydrological regimes of surface or ground water

The design principles of WSUD include:

- _Detention rather than rapid conveyance of stormwater
- _Capture and use of stormwater as alternative source of water to conserve potable sources
- _Use of bio engineering and vegetation for filtering/ cleansing water
- _Water efficient landscaping
- _Protection of water- related environmental, recreational and cultural values
- _Localised water harvesting for various uses
- _Localised waste water treatment systems¹

The specific set of solutions at Stirling City Centre have yet to be designed, however given the highly modified hydrological systems and aspirations many of these techniques are likely to be proposed (e.g. an aspiration to shift from being a net user of water to becoming net exporter of water).

Key considerations related to the design solutions have been considered as part of the design process to date and exhibited in draft structure plan and are documented in the District Water Management Strategy (DWMS) developed for the area (Essential Environmental Services 2010). Some of the specific considerations include:

- _Catchment scale considerations related to the management of the surface water flows (quality and quantity) in the Osborne Park Main drain (hopefully to be renamed Nookanburra Creek)
- _Receiving water considerations in relation to the ongoing health and or use of Herdsman Lake
- _Developing a strategy to help mitigate (if possible) regional water table lowering (thought to have lowered some 2 m in the last 20 years)
- _Conversion of the drain into an urban stream through the main part of the city centre renewal as part of creating amenity around which the city centre will unfold
- _Capture and treatment of polluted groundwater from the old Hetha Road tip site and the Osborne Park light Industrial area
- _Establishing urban water harvesting and or reuse options

¹ Adapted from de Graff 2008

7 ____ Policy Context

A range of planning, economic regulation and approvals policy applies to the development of WSUD solutions at Stirling. While the documented position does not inhibit distributed water systems the practical experience has been that few if any examples have been achieved in the Perth context. A recent Distributed Systems Workshop (2009) as part of a wider Australian water conference points out that the current regulatory systems are not actually driven by a desire to recycle but more about public health and environment (Flapper 2009).

The various policy and regulatory arrangements are briefly outlined below.

Planning

The planning policy context relates to the requirement to develop district and local urban water management strategies and plans. These aim to ensure that water management and land use and development planning opportunities are integrated. The Stirling Alliance has commissioned these documents including the development of the DWMS and will prepare LWMS in future which establish the framework for more detailed design and development of solutions. (Essential Environmental Service 2010)

Economic regulation (drawn from the ERA web site)

The regulatory framework for the water services industry was established under the Water Services Licensing Act 1995 (the Act). The Economic Regulatory Authority (ERA) is responsible for the functions outlined in the Act which include licensing and monitoring the performance of water industry service providers.

Within the Perth metropolitan region the Water Corporation is the licensed water, waste water and drainage provider.

A specific licence for a localised water system is likely to be required if its operation is to fall outside of the existing Water Corporation.

The licensing function of the ERA includes processing licence applications and amendments and in doing so sets minimum service and performance standards to safeguard the longer term interests of consumers and the management of assets. The Authority assesses whether applicants have the financial and technical ability to operate the service and that the application is not contrary to public interest.

The monitoring function aims to ensure that water service providers meet relevant standards which may include:

- _Drinking water quality standards
- _Drinking water pressure and flow standards
- _Drinking water continuity standards
- _Sewerage service standards
- _Irrigation water quality and delivery standards
- _Drains and drainage standards
- _Customer service and complaint handling standards

Other regulators

The regulatory structure for the water industry separates water service provision from water source allocation and protection.

Regulatory agencies, in addition to the ERA, which play a role in the WA water industry, include the Department of Water (DoW) and the Health Department.

The DoW is responsible for protecting and managing the State's water resources, including management of the licensing system for water source allocation.

The Health Department regulates health standards for drinking water supplied by the service providers.

In accordance with the Act, all organisations providing water, sewerage, drainage or irrigation services in Western Australia must either obtain a licence from the ERA or an exemption from the licence requirement from the Minister. Exemptions can be applied for through the Department of Water. Depending on the type of proposal, it is also possible that the Environmental Protection Authority will have a regulatory approval role that might involve a formal assessment.

7 Policy Context

Approvals processes

While there are a range of initiatives seeking to encourage innovation in this area there has been many examples of frustration in obtaining approvals. For example McGuiness, Zahara and Anda (2010) outline their experience seeking approval for local recycling project in Western Australian for 470 dwelling complex on 25 hectare site context, which includes:

- _Reluctance in appointment of a un known service provider, with questions of competency and capacity to operate the system requiring detailed development operation and maintenance plan, operator training manual, operating sampling plan and asset management plan
- _Outdated legislation / approval instruments
- _The need to liaise with multiple regulatory agencies such as Health, DoW, ERA
- _Considerable overlap in regulatory requirements
- _In consistencies between WA recycled guidelines and national requirements
- _Gaps in regulators knowledge in wastewater and recycled water technology
- _Lengthy approval times (experience ranges from 3 to 12 months)

The study process to overcome the challenges faced in obtaining approval included:

- _Preparation of regulatory approval documentation
- _Preparation of asset management plans
- _Preparation of health risk assessments
- _Preparation of environmental risk assessment
- _Land capability assessments
- _Nutrient and Irrigation management plans
- _Ongoing monitoring program design
- _Water balance modelling
- _Contaminated site assessment
- _Flora and fauna assessment

The core objective of the overall processes related to approval is one of validation: the body of scientific evidence which demonstrates that:

- _The treatment processes are capable of achieving the required water quality objectives
- _The process control and operational monitoring provides ongoing assurances that these water quality objectives are being met continually (Sarkis 2009)

While all of the steps outlined may not be needed in every situation the challenges (and frustrations) documented by McGuiness et al (2010) have been experienced by others seeking to offer innovative water management solutions in urban developments. A number of developers have not proceeded with proposals because of a combination of technical challenges and an apparent lack of supportive environment (*pers. com.* members of the UDIA). The general view is that there is a need for a more centralised and coordinated approach to facilitation and approval of innovate urban water systems.

In response these issues a Non Drinking Water Steering Committee & Working Group² has been specifically established to facilitate and where possible encourage demonstration of innovative urban water management systems. This group is made up of government and industry representation.

The committee has suggested that the overarching objectives³ of Western Australia's regulatory framework for non-drinking water schemes are (ideally) to:

- _protect public health
- _protect the environment
- _optimal water resource management
- _fairness – consistent decisions
- _timeliness – eliminate duplication
- _regulatory certainty – known and uniform standards
- _auditable standards – monitoring and reporting to ensure compliance
- _public confidence – standards enforced and reliable service

² The Non Drinking Water Steering Committee & Working Group is being facilitated by the Department of Water with aim of aiding in clarifying the path way for innovative urban water management projects and facilitating demonstration projects.

³ From workshop invite for Across Government Non- drinking Water Framework workshop 30 march 2010.

7 Policy Context

Any proposals to provide non-drinking water in a new development should⁴:

- _meet required water quality standards to protect public health and the environment
- _reduce demand for drinking water without increasing the total volume of water used – i.e. maintaining the water balance, and
- _deliver sustainable solutions that balance environmental, economic and social considerations

While these points are very valid, one of the first steps in this Groups work has been to identify and clarify the approvals framework for non-drinking water proposals. This has involved the development of an “approvals map”, which identifies the requirements and steps in the approval processes against the scales in the planning process, from regional to project scale. While the approvals map or framework is not a formal or endorsed document it provides some clarity on key requirements. A copy of the draft approvals map is presented in Appendix A.

The process of developing the approvals map or framework, which has involved a workshop (March 2010) with industry and government stakeholders, has highlighted the practical and regulatory challenges. In summary the issues come down to lack of coordinated response or facilitation and approvals & regulatory framework that is not designed for this task.

A key outcome from the workshop was identification and facilitation of demonstration projects and consolidation of a best practice approach drawn from best (and worst) practices approaches in other jurisdictions.

An additional resource available to assist proponents of Non drinking water schemes is document prepared by Water Corporation of WA referred to as Waterwise Developers- H2Options – alternative water supplies in Perth Metropolitan area – a 7 Step guide for developers. A copy of which is at Appendix B. The focus of this guide is helping developers systematically consider alternative water supply options.

Additional considerations – evaluating system benefits

If distributed systems are to become more accepted one of the areas of uncertainty (and often dispute) is the evaluation framework used to assess options and compare to existing system performance. This is an area where a broad based set of consideration that include comparison between existing technologies in relation to capital, operating, energy, CO₂, nutrient balance, water consumptions / savings, water balance modelling life cycle analysis etc. This is a field where in the main a case by case approach is being applied to the evaluation task. To avoid this potentially contested space significant effort should be applied to seeking clarity on the acceptable evaluation framework for the relevant stake holders.

One of the potential benefits of localised distributed systems often ignored is the deferment of system augmentation costs which may have system wide benefits. For example Independent Pricing and Regulatory Tribunal in NSW have developed a set of guidelines that seek to estimate the avoided and deferred costs of implementing a recycling scheme on the wider system⁵.

⁴ From workshop invite for Across Government Non- drinking Water Framework workshop 30 march 2010.

⁵ IPART suggest that this calculation should include “the expected change in the present value of a water agency’s operating costs and capital expenditure resulting from the temporary deferral of water supply augmentation, water or sewage treatment, or augmentation of water or sewerage systems. Where costs are expected to be deferred permanently the costs are said to be ‘avoided’. It also includes costs avoided or deferred due to downsizing of water or sewerage systems as a result of the recycled water scheme.”

8 ____ Socio-technical Barriers to Innovation

A body of investigation have been underway for some time looking at the challenges to implementing the transition to more sustainable urban water systems. A significant contribution to the field has the work led by Associate Professor Rebekah Brown (at Monash University) in the Urban Water Governance Program (<http://www.urbanwatergovernance.com/>).

10

This work has recognised the challenges of implementing innovation within large scale socio- technical systems, such as water systems. For example de Graff (2008) points out to successfully implement new concepts and new technologies in the water sector they must be embedded in the socio – economic systems that considers user practices, perceptions, guidelines, legal frameworks and markets.

In a review of demonstration project across Australia and Holland, de Graff (2008) found that demonstration projects are often showpieces that only significantly contribute to overall transformation of the urban water systems if they:

- _Succeed to influence perception and worldviews of stakeholders
- _Evaluated, improved and learning transferred to other projects
- _Embedded in mainstream professional practice
- _Mange to influence multiple stakeholders, societal perception about how urban water systems ought to functions

In the table below Keath and Brown (2009) outline the socio technical attributes of traditional and sustainable urban water management regimes. This highlights the difference in mid set and approach. Having an appreciation of these differences is valuable when planning and implementing a project like the Stirling Alliance green infrastructure aspirations. Projects like Stirling have the potential provide the “potential to create opportunities for systemic innovation and new (and more sustainable) development trajectories” at a wider scale (Wong & Brown 2009).

Attributes	Traditional Regime	Sustainable Regime
System Boundary	Water supply, sewerage and flood control for economic and population growth and public health protection	Multiple purposes for water considered over long-term timeframes including waterway health and other sectoral needs i.e. transport, recreation/amenity, micro-climate, energy etc
Management Approach	Compartmentalisation and optimisation of single components of the water cycle	Adaptive, integrated, sustainable management of the total water cycle (including land-use)
Expertise	Narrow technical and economic focussed disciplines	Interdisciplinary, multi-stakeholder learning across social, technical, economic, design, ecological spheres, etc
Service delivery	Centralised, linear and predominantly technologically and economically based	Alternative, flexible solutions at multiple scales via a suite of approaches (technical, social, economic, ecological etc)
Role of public	Water managed by government on behalf of communities	Co-management of water between government, business and communities
Risk	Risk regulated and controlled by government	Risk shared and diversified via private and public instruments

Table 1. Attributes of traditional and sustainable urban water management regimes

9 Summary

This brief review has highlighted that there are a range of policy drivers that seemingly encouraging the development and up take of different forms of alternative or distributed water management systems.

11

While this is the case there is still a significant range of challenges, including:

_Design and integration challenge; incorporating innovative design thinking into the process as early as possible into the detailed design and development phase of the project development. While at broad conceptual level the work done to date at the structure plan level has sought to provide for these opportunities the real challenge will be exploration of options in a more detailed design sense as the project moves forward. Critical partnerships with developers such as Westfield are imperative. Adopting a safe fail approach to the design of the systems will be an important part of the program

_Evaluation framework; establishing an agreed evaluation framework for assessing options will require involvement of key stakeholders and should seek to clarify the value positions underlying the alternatives approaches and the inherent biases that can arise

_Navigating the path through the approval maze; although the work of groups like the Non Drinking Water Working Group is helping provide more clarity on the pathway, the 'system' is always (rightly) conservative and significant effort and resources will be required to both formulate the approval documentation and to negotiate it through the system. Establishing the Stirling project as key demonstration project is essential

_Acknowledging that this challenge is more than a technical design challenge; experience and research has highlighted the need to consider the innovation process as more than a technical solution. The value of positioning the innovation and learning potential (at a system level) of the project will help to potentially win support for the project and design solutions developed. This will involve allocating the resources and establishing partnerships. The aim being to create learning opportunities at a number of different levels - such as in the design phase, in agreeing on the evaluation framework, establishing an agreed monitoring program and finding ways to communicate the learning to the users and public that will be involved in living with and using the systems

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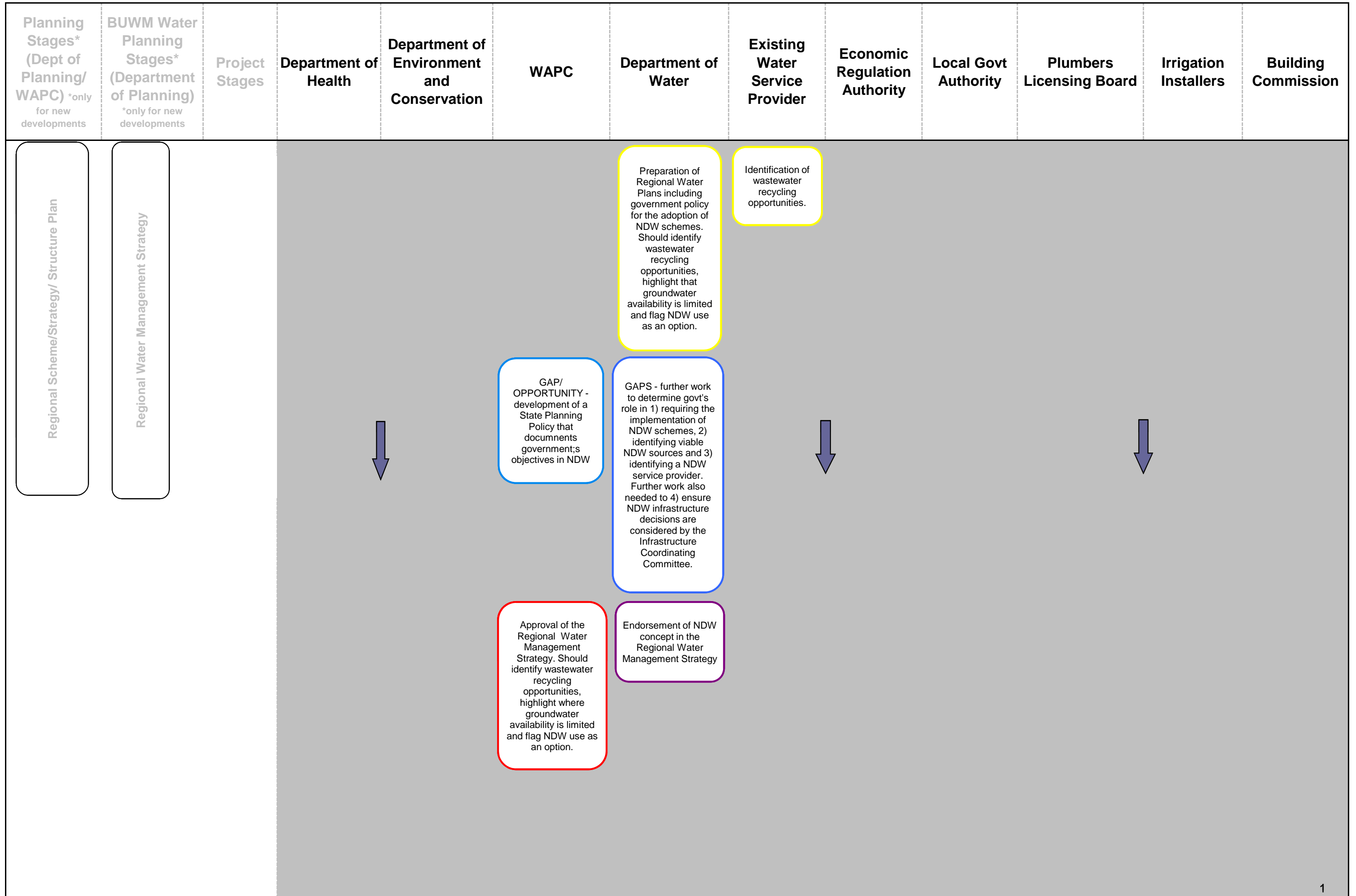
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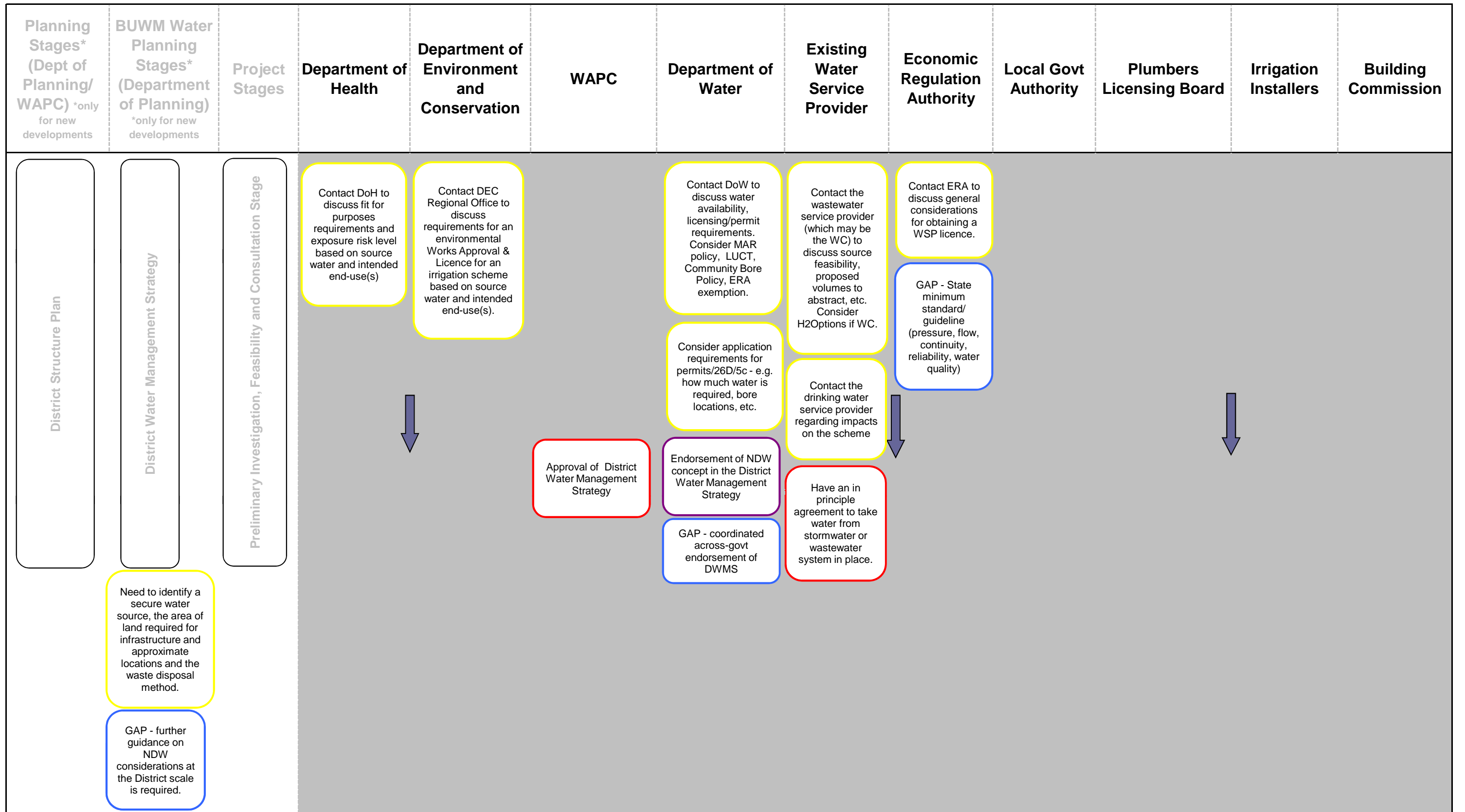
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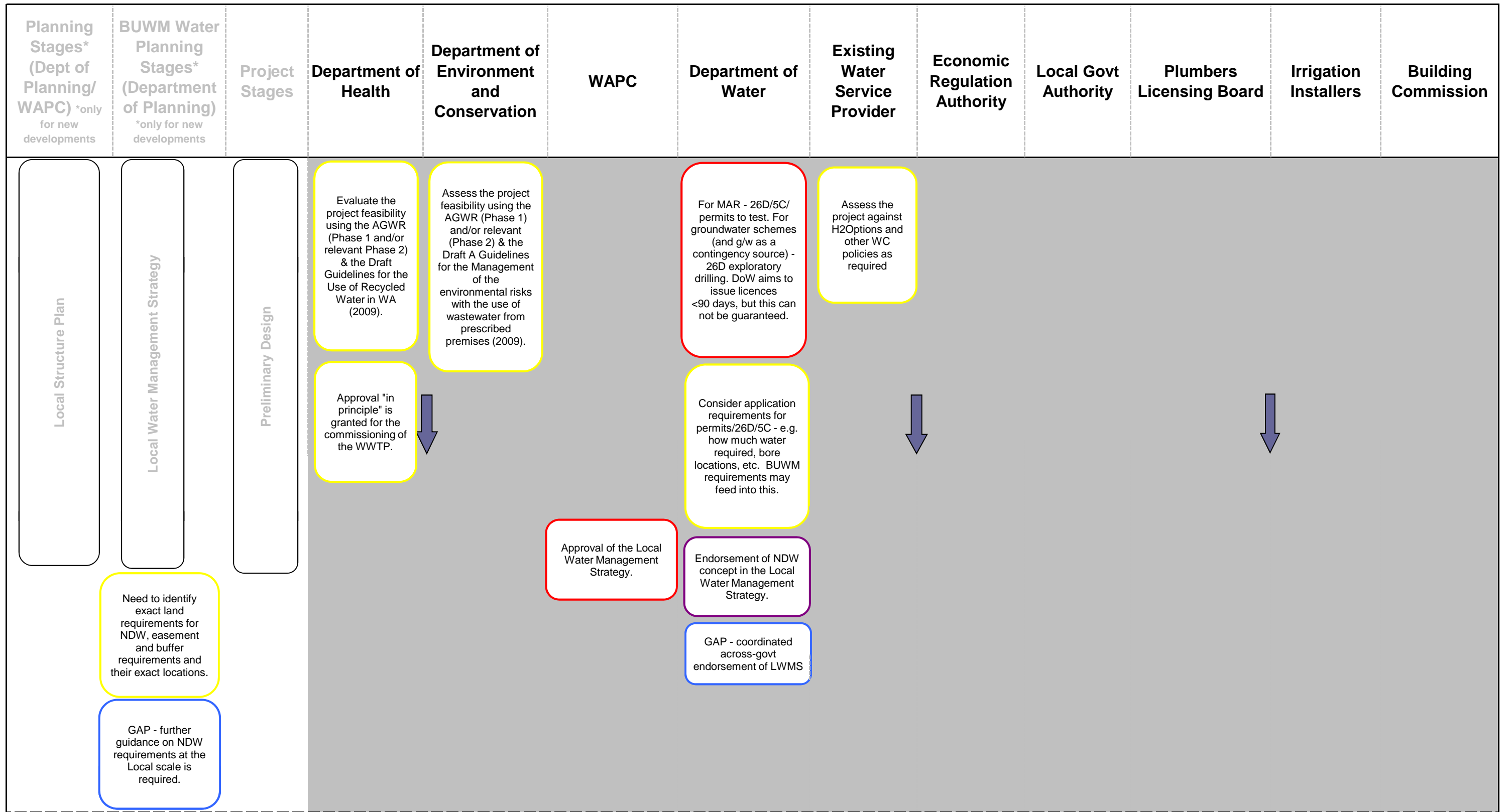
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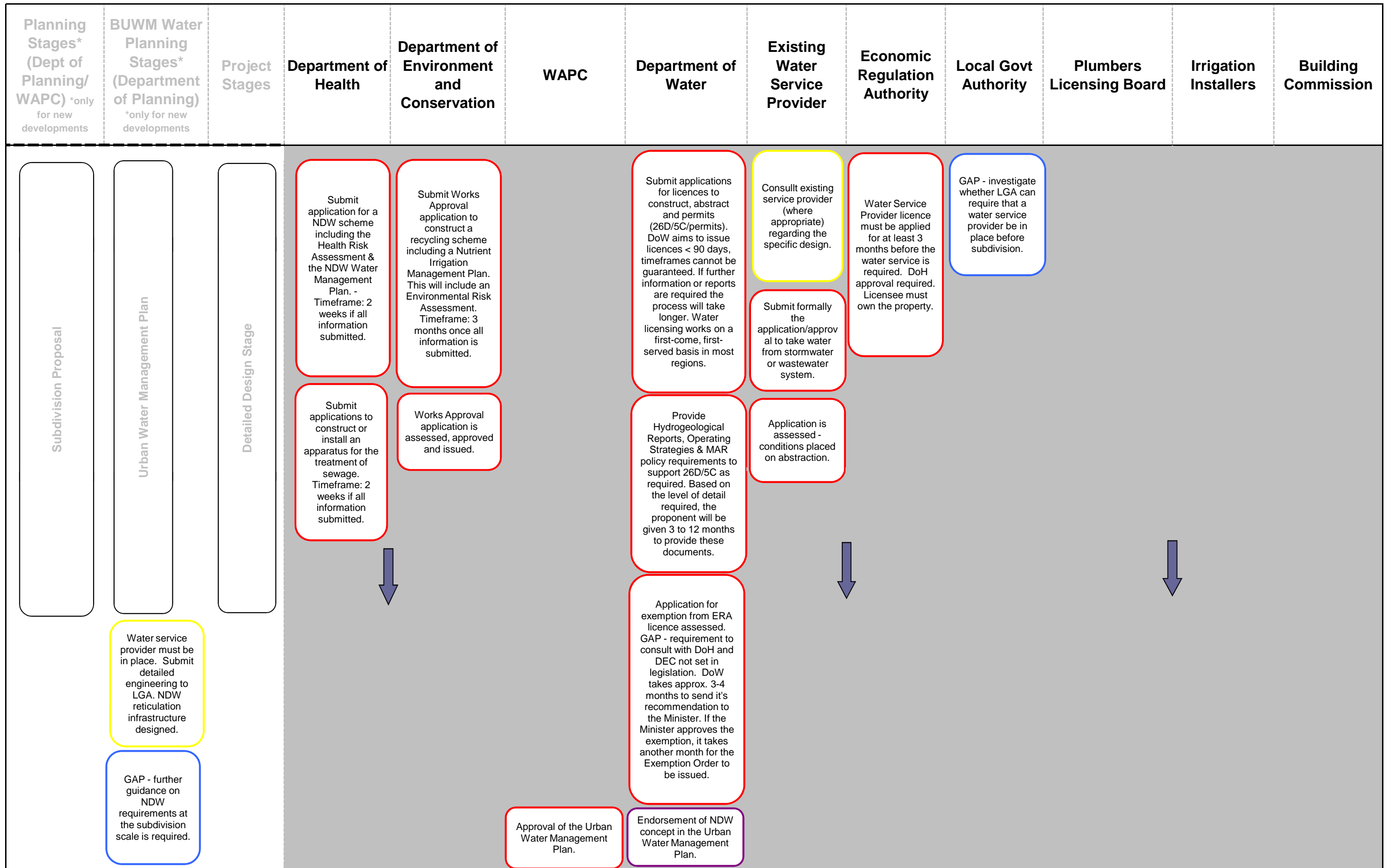


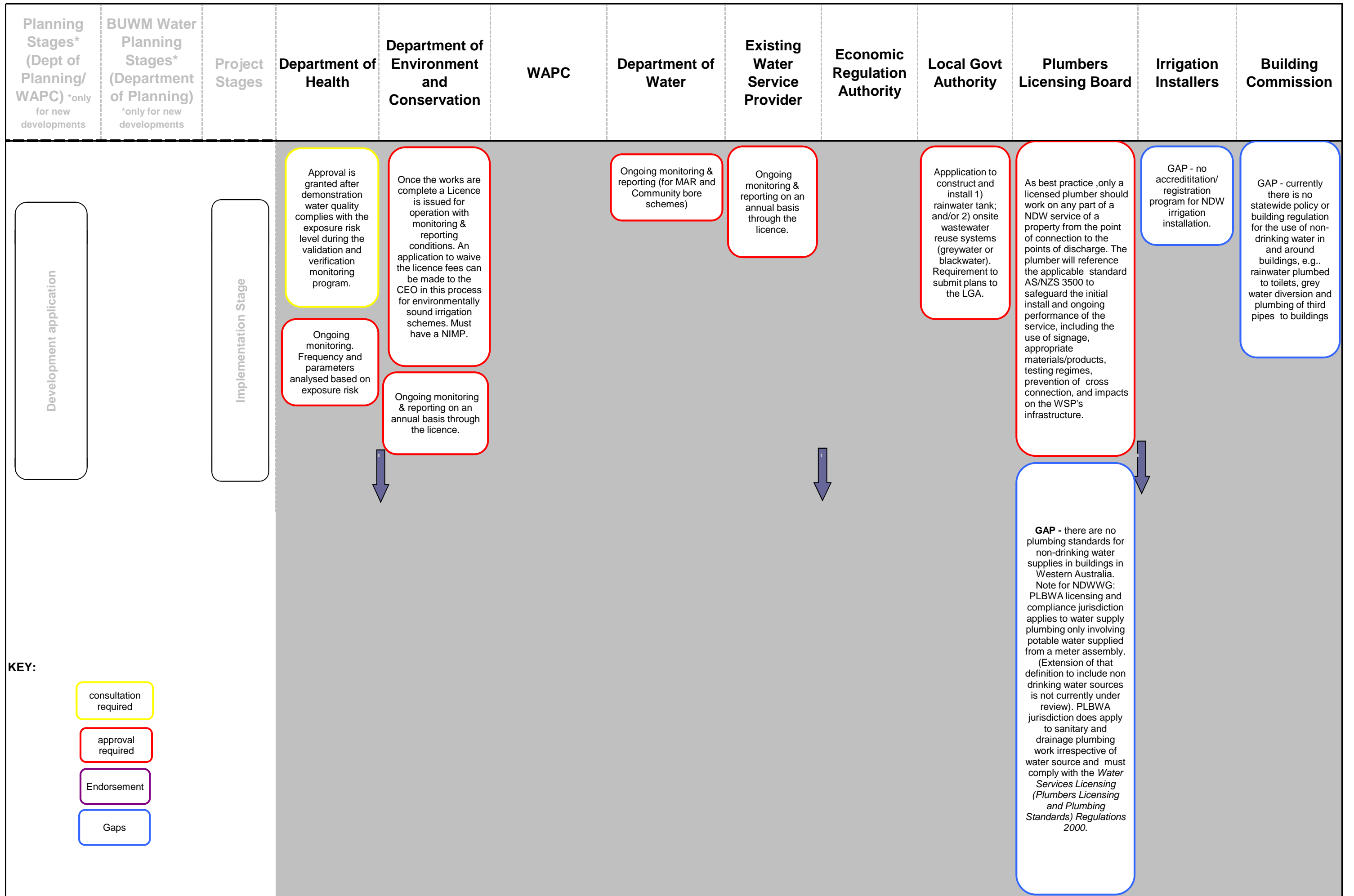
Draft Non-Drinking Water Across Government Approvals Framework











KEY:

- consultation required
- approval required
- Endorsement
- Gaps



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Waterwise Developers

H₂Options

Alternative water supplies in the Perth metropolitan area
A 7-step guide for developers

H₂Options

Alternative water supplies in the Perth metropolitan area
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A 7-Step guide for developers

This guide outlines an easy-to-follow 7 step process when considering alternative water supplies in new developments within the Perth metropolitan area.

It contains tools that will assist developers in determining the most appropriate water source, locating sources, assessing availability and processes to secure the alternative water source.

Annexures A to G explain the process involved with securing an alternative water source. They include details on legislation and planning approvals, approaching a service provider and creating a Health Risk Management Plan.

The 7 steps accompany the existing processes of securing water, wastewater and drainage services within a development.

This guide is also designed to assist in preventing any unnecessary costs or delays within your development, due to the inclusion of alternative water supplies.



Step One: Develop an Alternative Water Supply Plan

An Alternative Water Supply Plan should include consideration of:

- Determining what water is available in the natural and built environment and identifying which alternative water supply you will use for your development. [See Annexure A for definitions of alternative water supply sources.](#)
- The intended use of the water – this will guide the quantity and quality of water required.
- Any existing and planned water services infrastructure.
- Characteristics of your site. For example, soil and geology, depth to groundwater and any other special environmental conditions.
- Water conservation.
- Legislation and planning approvals. [See Annexure B for list of approvals.](#)
- The benefit to the consumer.
- Management implications associated with the scheme. For example, risks, operability, cost implications and governance.
- Greenhouse gas emissions and potential impact from climate change.
- Overall environmental footprint.



Step Two: Determine feasibility of concept

In order to secure an alternative water supply, you need to be able to demonstrate that you have tested the feasibility of the concept. This will allow you to determine if there will be any roadblocks during the approval and implementation phase. It will also identify factors such as unnecessary costs or delays that may prohibit your development from moving forward. To test the feasibility of the development you should contact the following agencies:

Agency	Role	Phone number
Department of Water	Collect and analyse water resources information, issue licences, regulate water use, protect the quality of our water, and prepare policies and plans critical to the future development of Western Australia.	Head office (08) 6364 7600 Contact your local Department of Water Regional Office
Local Councils	Approve the installation, operation and maintenance of applicable alternative water supply sources.	Contact your Local Council
Department of Environment and Conservation	Advise on water quality requirements related to the environment (Environmental Impact statement).	Head office (08) 6467 5000 Contact your local Department of Environment and Conservation Regional Office
Department of Health	Consulted on water quality requirements related to public health.	(08) 9388 4999
Water Corporation	Provide water and wastewater services to households, businesses and farms in towns and communities and also maintain drainage and irrigation services for both residential and commercial properties.	(08) 9420 2099

Example 1:

If you choose to use groundwater as your alternative water supply, contact the Department of Water to confirm that this water source is available in your development area.

Example 2:

Checking if your Local Council permits the project in your development area.

Example 3:

Determining whether the Department of Environment and Conservation will approve the project going ahead in your development area.



Step Three: Develop a business case

Your business case is an overview of why you are seeking to secure an alternative water supply within your development. In your business case you should address the following:

- The project feasibility in terms of the ultimate cost to the consumer.
- Development of a cost benefit analysis (including capital costs, operational costs, etc).
- The benefits to you as a developer.
- The benefits to the consumer and the community.
- The benefits to the environment.
- Management implications.
- Conducting a risk assessment. Visit the Environment Protection and Heritage Council website <http://www.ephc.gov.au/> and click on the Water tab to view the Australian Guidelines for Water Recycling. This information details health and environmental risks for consideration in your risk assessment.



Step Four: Secure a service provider

You should approach your preferred service provider to determine if they are willing to own and operate your alternative water supply.

Together with your chosen service provider, contact the Economic Regulation Authority (ERA) to secure an operating licence.

The ERA can provide details on the application process to secure an operating licence. Visit <http://www.era.wa.gov.au/> and click on the Licensing tab for information about service providers and current operating licenses.

Additional approval is required from the Department of Health if you are requesting that a local government be your service provider.

Where the Water Corporation is not the Service Provider, we will provide:

- Access to infrastructure for sewer mining activities (where this is technically feasible, does not interfere with the normal functioning of the Corporation's assets, and where water is available, i.e. not otherwise needed for other recycling initiatives such as the Kwinana Water Recycling Plant).
- Bulk wastewater that is treated to a level acceptable by the Corporation for disposal, where associated costs to the Corporation are comparable to conventional disposal options.

If you would like to approach the Water Corporation as your service provider, please see **Annexure C**, a 7-point checklist for developing your proposal.



Step Five: Secure appropriate clearances and approvals

Once you have sourced a service provider, the next step is to secure the following:

- Access to the water. This information is available from the Department of Water, Water Corporation or Local Government. Visit <http://www.water.wa.gov.au> and click on managing our water, then water planning for more information on water allocations.
- All environmental clearances required. Contact the Department of Environment and Conservation on (08) 6467 5000 for information about clearances.
- Approval from Local Government (Planning Services Division and Health Services Division).
- Approval for the scheme by completing a Health Risk Management Plan from the Department of Health (08) 9388 4999.

See **Annexure D** for details on how to create a Health Risk Management Plan.

See **Annexure E** for a matrix detailing what approvals are required and where these can be obtained.

H₂Options

Alternative water supplies in the Perth metropolitan area
A 7-step guide for developers



Step Six: Develop your detailed design

Your detailed design should include the following:

- A detailed cost summary.
- A timeline of your proposed development, including the implementation phase.
- What infrastructure will be built.
- Your proposed location.
- Your chosen water source.
- How the alternative water supply scheme will operate.
- Technical details. For example, size of pipes, design and number of bores, holding ponds, etc.



Step Seven: Double check everything and implement

Have one last look at the list below. When you are satisfied you have fulfilled each point you can then proceed to develop with an alternative water supply, in accordance with the agreement with your service provider.

- Have you developed an alternative water supply plan?
- Have you demonstrated that this is a feasible proposition?
- Have you developed your business case?
- Have you secured a service provider?
- Have you secured all appropriate approvals and checks?
- Have you constructed a detailed design plan?

Implementation should follow the normal construct, commission and hand over processes.