

## **WSUD AND PLANNING IN SOUTHERN RIVER – TRYING TO MAKE IT WORK**

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### **The Southern River Demonstration Project**

One of the key demonstration projects for Water Sensitive Urban Design (WSUD) is in Southern River, in the south eastern sector of the Perth metropolitan area. This area is highly constrained for urban development, due to the low-lying nature of the land, the significant environmental features including RAMSAR and EPP wetlands and Bush Forever sites. The Southern River catchment also contributes a significant amount of nutrients to the Canning River, which eventually flow into the Swan River estuary.

The Environmental Protection Authority (EPA) recognised that for this area to be urbanised as planned, it would require significant efforts to manage drainage and nutrients so that development would not significantly impact on the environmentally sensitive areas or the Swan-Canning Estuary (EPA, 2000).

WSUD has been proposed as the most effective way to minimise the potential impact of stormwater drainage and nutrients on the environment. The *Urban Water Management Strategy for the Southern River /Forrestdale /Brookdale /Wungong District Structure Plan area* (2002, prepared by JDA for the Water and Rivers Commission) addresses groundwater and drainage. WSUD requires consideration of all water services relating to urban water resources, including potable water, waste water and shallow groundwater as well as stormwater. Accordingly, it was felt that the recommendations of the JDA Urban Water Management Strategy needed to be taken a step further, to develop a truly integrated process, that addressed the total water cycle while having consideration of land use planning decisions.

A Memorandum of Understanding (MoU) was established at the request of the EPA in 2004 to prepare the Integrated Land and Water Management Plan (ILWMP) for the Southern River /Forrestdale /Brookdale /Wungong District Structure Plan Area. The ILWMP is in its final draft form and will be released by the MoU Group by the end of the year. This project and the implications it raises for the future of WSUD in Perth are the subject of this paper.

### **Practical implementation of the Southern River WSUD strategy**

The MoU Group recognised that a significant amount of work would need to be done to enable development of a strategy to address the concerns of the EPA. These elements were identified early in the process and by all MoU member agencies commenced work towards the identified deliverables.

The critical elements to develop the WSUD strategy and strengthen the linkages between land use planning and water management processes included:

- determination of design principles and objectives;
- integration of WSUD into both land and water planning processes;
- regional environmental and water information (investigations and monitoring);

- environmental assets and issues;
- water related infrastructure;
- water quantity and quality investigations; and
- groundwater and surface water modelling & scenario assessment;
- determination of regional infrastructure requirements, costs and timeframes, focussing on the arterial drainage scheme for the Forrestdale Main Drain;
- determination of appropriate best management practices for implementation at a regional scale; and
- capacity building.

Without addressing all elements, the ILWMP would not be able to propose a total water cycle management approach or achieve WSUD outcomes on the ground.

It has taken a considerable amount of time to prepare the ILWMP. This is a consequence of the nature of the project – it is a demonstration project and so it is trying to achieve a “new way” of doing things. This “new way” requires an adaptive management approach which can respond to changing needs while keeping focussed on the objective of the project.

The Southern River WSUD demonstration project has raised a number of issues associated with its implementation which will need to be addressed in future projects. These include the lack of information at the regional level; the level of information required to support proposals; the lack of clarity around roles and responsibilities and the degree of coordination needed to deliver the process.

Achieving the project objective and delivering the various elements requires a level of integration between and within agencies which was unprecedented. Effective WSUD involves the existing disciplines of planning & urban design, engineering, landscape protection & design and infrastructure & service provision. These functions have traditionally been delivered in isolation of each other, coming together only at the latest stage in the development process – subdivision and detailed design. What the Southern River demonstration project has shown is that it is vital that integration of these activities occur far earlier in the process if an optimal water management solution is to be delivered.

The planing and design process for effective WSUD is iterative. Thus integration of the disciplines must occur at each and every stage of the process. This requires a substantial amount of cooperation within and between the responsible agencies to achieve a coordinated position which is supported by all stakeholders in the process.

These outcomes are further improved where a high level of consultation occurs with the development industry during the project planning process. This need is likely to diminish once WSUD becomes the convention rather than the exception, however.

Achievement of WSUD outcomes is currently resource intensive. This is largely due to the requirements for information, substantiation and assessment, but is also a function of the “newness” of the project and its approach. There is a lack of understanding of the differences between the traditional or conventional ways of doing things and what is required to achieve a WSUD outcome. This is exacerbated by a lack of “whole-of-agency” support for the concept and a corporate culture which supports WSUD. Although there is considerable and effective support from individuals, this is not enough to embed the requirements in current systems or processes, or achieve effective cultural change.

There is a significant gap in the information that is available and needed to support WSUD. There is a lack of regional information about existing conditions and infrastructure and limited guidance on the desired future state of environmentally sensitive areas or infrastructure requirements. The criteria which have been developed for the Swan and Canning rivers are generally not able to be applied in an urban development context, as they cannot be applied to a development independently of the remainder of the catchment. Guidance is also required for the “allowable” impacts on environmental areas that will result from changing the land use.

Although the project produced some guidelines on the information required to support a planning proposal (*Interim Approach for Integrating Urban Water Management with Land Use Planning within the Southern River Area: Guidance for developers*, 2006 EES, 2006), this was quite broad. The trial of the Guidance has shown that further work, both in terms of the specific issues and level of detail, is required to clarify what is actually required at each level. Additional information is also needed to guide modelling (including acceptable methodologies and programs) and monitoring programs.

There is also still a lack of clarity around roles and responsibilities. This lack of clarity results in confusion within both the regulatory agencies and development industry as to who is responsible for various elements of the process. This is translated into delays in obtaining and disseminating information and reduces the effectiveness of any consultative processes. The formation of the Department of Water has added to the confusion as their role is not yet well understood by the development industry or other regulatory agencies.

The Department of Water is very supportive of WSUD but embedding the requirements in existing systems and work programs will take time and effort.

### **Project success factors**

The level of success of the project as perceived by each stakeholder is variable. It is acknowledged that the outcome has not been optimal. Land use planning in the area has mostly preceded water planning and so the outcomes are almost a retrofit. The project has taken a significant amount of time. It has required substantial funding, mostly from the Water Corporation, to undertake the necessary investigations. It has added to the duration and cost of obtaining planning approval. It has complicated the process for determination of development approval without providing certainty of outcome. The likely degree of impact of developing the area on the quality of the receiving waters is still not well understood. These issues, although significant in terms of this project, are likely to be a function of the “demonstration” nature of the project. They are acknowledged and therefore can be addressed prior to application of the strategy/process in other areas.

Although the list of negative elements seems substantial, there are a number of positive aspects to the project. This project has demonstrated that a process can be established to achieve WSUD outcomes and that this process can be accommodated within existing systems. The critical success factor is timing - the earlier WSUD is considered, the better the outcomes will be.

The Southern River project is increasing the level of practical knowledge regarding WSUD in Perth. Working through each stage of development with individual land owners, consultants and regulatory agencies is increasing the level of understanding of how to put WSUD principles into practice. It is also resulting in on-ground WSUD best management practices, which can now be monitored for effectiveness under WA conditions.

The challenge has really been embraced by the development industry. The use of design objectives allows each developer to propose their own water management solution which supports their desired urban form. This fosters innovation and creativity, while ensuring the outcomes are within accepted limits.

A key factor in developing the WSUD implementation strategy is the strength of the partnership between the MoU group agencies. Without the level of cooperation between the agencies involved, it is unlikely that the project would have achieved the outcomes it has.

## **Project learnings**

There are a number of learnings which we can take away from the project. These are:

1. WSUD – the improved management of groundwater, surface water, wastewater and potable water to enhance catchment health within an urban context, is not something that a single agency is responsible for or can achieve. It requires a shared understanding of the principles of WSUD by all stakeholders involved that is translated into a well defined and common goal.
2. Information is critical – both in terms of current and desired future state. Quantification of this information is resource intensive, in terms of time required to collect, cost of collection and skills/knowledge required, but outcomes can be achieved in the interim via design objectives which are not site specific but which encourage improvements to conventional practices.
3. Roles and responsibilities need to be clearly defined. Who is responsible for planning, providing information, assessment, monitoring and review, at each stage in the process?
4. Cooperation and integration within and between agencies is vital to make WSUD work. Formal and informal linkages need to be established and understood within the context of the agreed roles and responsibilities. Effective communication and integration will require an improved level of understanding of the roles and activities of each organisation involved.
5. The presence of WSUD policy does not ensure its implementation. Even producing guidelines is not enough to guarantee outcomes. More effort is needed to turn policy into practice. This is likely to require more multi-agency demonstration projects to produce information on performance and cost of BMPs as well as user friendly and reliable assessment tools and the building of capacity within the land use and water planning fraternities.
6. Champions for WSUD are vital if the philosophy is to be successful. However champions are not enough to ensure the outcomes will be achieved. A strategy is necessary to embed WSUD into existing processes so it becomes part of core business and agency culture. This will require strong support at the top of the organisation, with an understanding of what cultural and procedural changes are required throughout the agency, at all levels.

7. Research and development is essential to demonstrate the effectiveness of WSUD on the ground in Western Australia. The research and development program must be coordinated by a respected body and focussed towards the needs of the WSUD program on the Swan Coastal Plain.

### **Critical elements for effective WSUD outcomes**

The Southern River project has highlighted various elements which are necessary to achieve WSUD outcomes on the ground. These include:

- Agreed governance structures – clear responsibilities for approvals, advice, implementation and monitoring. Although this is broadly known, practical application suggests that there is limited understanding of the detailed requirements and responsibilities;
- Information on existing conditions – necessary to develop the most appropriate WSUD strategy and guide actions to maintain or enhance existing systems;
- Agreed principles (or rules) for planning, design and development, translated into a shared vision for WSUD outcomes;
- Inclusion of requirements within an existing approval system. Although changes to approval systems are possible, these are long-term solutions. An existing system is required to achieve outcomes at the moment;
- Guidelines for performance – “something to design to”. These can be in the form of criteria, quantitative site-specific targets or design objectives;
- Assessment tools which are supported by all stakeholders with well documented assumptions; and
- Monitoring of performance to validate WSUD approaches and feed back into the calibration of assessment tools.

Intangible elements are also important but these are harder to develop. Intangible needs include supporting the champions (including industry), building the knowledge/skills base, fostering innovation, ensuring effective communication and coordination between and within agencies, and embedding necessary cultural and procedural changes within core business.

### **Conclusion**

The level of pressure on the development industry to produce new lots for housing in the south west of Western Australia is immense. Improvements must be made in the way we undertake development to reduce its impact on the land and water which supports it. This will need a concerted effort from the regulatory and service provision agencies to improve the levels of commitment, cooperation and integration required to achieve an efficient process and effective outcomes.

The Southern River Demonstration Project has resulted in clarification of the requirements for information at each level of planning within the land use planning system as well as the

administrative arrangements and resources necessary for timely approvals. This learning will be transferred into future development projects.

The Southern River project has also highlighted some critical success factors which should be considered for future projects. These are to:

- ensure a shared vision between key agencies and stakeholders of the objectives of WSUD and obtain a common understanding of the likely outcomes;
- set the rules (design objectives, performance criteria, regional infrastructure) within the context of assessment and approval;
- make the responsibilities clear – for approval, implementation, funding etc;
- ensure a multidisciplinary approach – this requires substantial integration and coordination within and between agencies;
- help to educate the regulatory system being used – for example, demonstrate how water issues can be addressed via the planning system or identify procedural or cultural changes required to achieve outcomes through infrastructure planning systems etc;
- build capacity within the key disciplines of planning, engineering and landscape design across State and Local Government and the development industry; and
- ensure improvements in approaches and outcomes via a coordinated and focussed research and development program that includes substantial monitoring and reporting of results.

WSUD, by its nature, operates within an urban context. Although the focus of WSUD is generally in terms of development/redevelopment, the broader implications of the application of WSUD on the environment should not be ignored. Although often considered only in the context of drainage, WSUD also offers opportunities for conservation of our drinking water as well as for catchment repair and improvements in the environmental health of our water systems. It is vital that WSUD is supported by all stakeholders through incorporation into existing systems and processes so that it becomes an integral part of their role and function. Achievements need to be disseminated and learnings transferred to future projects. Success breeds success.

## References

- Environmental Protection Authority. 2000, *Bulletin 987: Southern River/ Forrestdale/ Brookdale/ Wungong Draft Structure Plan*.
- Essential Environmental Services. 2006, *Interim Approach for Integrating Urban Water Management with Land Use Planning within the Southern River Area: Guidance for developers*, prepared for the Southern River Steering Committee, February 2006.
- JDA Consultant Hydrologists. 2002, *Southern River/ Forrestdale/ Brookdale/ Wungong Structure Plan Urban Water Management Strategy*. Prepared for the Water and Rivers Commission.