32R – 3033 Final Report

Water harvesting and re-use at the Penguin Parade

August, 2007

Project: Water harvesting and re-use at the Penguin Parade

Executive Summary

This project harvested rain water from the Visitor Centre at the world famous Penguin Parade at Phillip Island in order to re-use for toilet flushing. Approximately 3 million litres of mains water was saved since November 2006. Rain water was captured off the roofs of the visitor centre building, harvested through pipes connected to one large 180,000 litre tank that was then connected to the toilet plumbing system.

This change complemented a switch to low flushing (2.5 litre AAAA rated) toilets to assist the water saving of the Penguin Parade. Strong communication activities associated with this project also raised community awareness and provided a model for other tourist attractions and facilities that host high volumes of people.

Recommendations from the project are that any similar projects ensure that complementary infrastructure such as low flush toilets are installed; that high profile sites installing such a system develop a communication strategy to increase community awareness of what the purpose of the tanks are; and that the current lack of competition in the water tank supply market is considered in government policy, grant and subsidy programs.

In conclusion this project achieved its two main goals of saving significant amounts of water and increasing community awareness of Smart Water messages by leveraging the infrastructure and popularity of the Penguin Parade.

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Introduction

This project harvested rain water from the Visitor Centre at the world famous Penguin Parade at Phillip Island in order to re-use for toilet flushing. 501,677 visitors experienced the penguins each year at this site and this system saved 3.025 million litres of mains water previously used in flushing toilets. Rain water was captured off the roofs of the visitor centre building, harvested through pipes connected to one large 180,000 litre tank that was then connected to the toilet plumbing system.

This change complemented a switch to low flushing (AAAA rated) toilets to assist the water saving of the Penguin Parade. Strong communication activities associated with this project also raised community awareness and provided a model for other tourist attractions and facilities that host high volumes of people.

Methodology/ Project Overview

The project was planned considering the following issues:

- What need will the project meet
- Costs and benefits of the project
- Risks associated with the project
- Ability to measure the performance of the project
- Structured work plan and budget process
- Communication of the project

What need did the project meet?

The project met the following needs:

Economic

By saving approximately 3 million litres of mains water per year, the project saved Phillip Island Nature Park approximately $3,000 in water bills for the year. As a non-profit organisation this financial saving is significant and these resources will be re-directed to other environmental programs.

Environmental

It is important that Phillip Island Nature Park 'walks the walk' and leads by example as an environmental leader in the local and state community. Saving 3 million litres of mains water on Phillip Island which has no fresh water supply is a critical environmental benefit. The concepts of the project can also be directly transferred into private sector uses.

Social

The Penguin Parade received 501,677 visitors last year and offered an excellent opportunity to educate and motivate the general community to water saving practices. Helping raise the awareness and educate the community is a key role for this project.

Organisation

This project also met an internal organisation need as it complements the Nature Park's vision of "international excellence in nature conservation and ecotourism". This water saving project is consistent with this vision and fulfills our own promise to be innovative and pursue best practice in terms of environment management.

What were the costs and benefits of the project?

	Economic	Environment	Social
Benefits **- short term**	Immediate reduction in water usage and bills	Leadership 'Walking the walk' Real demonstration project	Profile created and interest generated Education opportunities
Benefits **- long term**	Savings on water bills for PINP (approx $3000 pa)	Savings on water use (3.025 megalitres)	Increased awareness, leading to behaviour change (500,000 people per annum)
Costs **- short term**	Cost of installation (approx $75,000)	Some noise and earth removal as plumbing and tanks are installed	Some confusion with the integration of water saving messages at a leading tourism attraction
Costs **- long term**	Maintenance ($2500 pa)		

How did we minimize negative impacts?

There were few negative impacts possible with this project; however some community confusion and concern arose in the short term with the placement of water tanks near the entrance of the Penguin Parade Visitor Centre. The confusion was based on why a famous tourist attraction would put this infrastructure in such a prominent location rather than 'hide it around the back'. Some staff were concerned by the possible reduction in penguin habitat and some visitors were confused by the reason the tank was there at all. The link between penguins, the Nature Parks and water conservation needed to be explained and this was done with appropriate use of our communication systems, staff training, and interpretive signage and education programs.

How did we maximize positive ones?

The positive impacts included the increased awareness of the Smart Water message, the action the Nature Parks had taken as a responsible employer and organisation, and of course the actual water saved. We received credit in staff surveys for instigating the program before the drought and water conservation issues were in the mainstream media. These impacts were maximized with similar methods to those mentioned above – an active media strategy, signage, education programs, website updates, newsletter inclusions and collaboration with the local council and water authority.

What risks did the project contain?

There were two possible risk factors associated this project:

- *Potential lack of interpretive relevance when incorporating the smart water themes into the visitor experience*

The Nature Park is very experienced in introducing a variety of environment messages into the Penguin Parade Visitor Centre. Constant Visitor Feedback forms and market research is performed to identify any concerns with particular exhibits or tour components.

- *A shortage of harvested water to service the toilets.*

Rainfall trends for Phillip Island indicated that their would be adequate water to fill the capacity of the tank on a regular basis to service the toilet system. However drought conditions meant that there were shortages over the peak visitor periods of January and the plumbing system reverted to mains as a back up until the tanks were replenished. This reduced the amount of mains water that could be saved.

Ability to measure the performance of the project

There are two key measurements that determined the success of the project:

- *Amount of mains water saved*

  It was expected that 90% of current mains water usage of the toilets would be saved. This equated to 5.5 megalitres based on 2004/05 consumption levels (500,000 visitors x 11 litre flush toilets x 1.1 flushes per person x 90%). These savings will be ongoing as the project will be making permanent changes to the roof rain water harvesting – toilet flushing, plumbing and pipe systems. The project allowed for 10% use of mains water in cases where rainfall isn't sufficient to fill the tanks to meet visitor demand. The lack of rainfall between November 2006 and February 2007 meant that this mains water figure was closer to 45% and 'only' 3,025,000 litres of water were saved.

- *Community awareness of water saving messages*

  The prominent placement of the tank and signage, combined with plasma messages, our web page and a story in the local paper meant that the awareness of the Smart Water message was very clear to all visitors. We are confident that the initial targets expecting 75% of all visitors (375,000) to become aware of the Smart Water project was achieved. This figure was based on known visitor arrival and pedestrian flow patterns at the Visitor Centre. This is a conservative figure based on how many people walk past the tank outside to enter the building; go to the toilet past more Smart Water signs; and the explore the centre and be exposed by further messages on the five plasma screens.

Structured workplan and budget process

Project Work Plan

Key activity	Expense item	Milestone Completion Date	Responsibility	Key performance indicator
Scoping and planning phase	Project Management time	Sept 30 2006	PINP Project Mg't team	Completion and Board approval **ü**
Installation of low flush (AAAA rated) toilets throughout Penguin Parade	Purchase and install toilets	May 31 2006	Plumber	Completion **ü**
Project Management	Designs	Sept 30 2006	Plumbing inspector	Completion **ü** Approval **ü**
Excavate area for tank placement	Contract excavator and equipment	Sept 30 2006	Excavator	Completion and readiness for installation **ü**
Install tank 1 x 180,000 litre Pioneer Tank with Bluescope Water providing: • Davey Pressure Cell • Rainwater Controller (mains backup) • Everpure Treatment UV Stabiliser • 2 x Everpure dual cartridge inline filtration system Float switch with 10 metres cable	Purchase tank and water supply mains back up materials	Oct 30 2006	Bluescope Water/Plumber	Installation and readiness for plumbing **ü**
Complete plumbing	Labour and materials	Nov 5 2006	Plumber	Completion on time and on budget **ü**
Implement communication strategy	Design Sign prod'n Exhibit and display prod'n Reporting	March 31 2007	PINP Director of Marketing/ PINP Project Mg't team	Designs approved by PINP Project Mg't team and sample audience**ü** Installation**ü**
Project monitoring	Quarterly meetings and review	Ongoing	PINP Project Mg't team / Westernport Water/ Bass Coast Shire Council	Level of water savings and community awarensss**ü**

Budget Summary: (Exclusive of GST)

Item	Grant Funds	Applicant Contribution	Other Funds	Total costs
Plant/ Equipment Costs Toilets, Tanks, Plumbing materials	$43,254	$19,000		$62,254
Consultancy/ contract costs Plumber, excavator	$15,000	$5500		$20,500
Salary/ wages costs PINP Project Management		$7500 (in-kind)		$7500
Other materials Communications materials	$11,000	$5000		$16,000
Administrative costs PINP Project Management		$2500 (in-kind)		$2500
Travel costs				N/A
Other Project Costs				N/A
TOTAL	**$69,254**	**$39,500***		**$108,754**

* Please note this amount includes $10,000 of in-kind contribution not included in the Project Milestones and Payment Contributions Plan

Communication of the project

The project was communicated via a range of activities based on the original Communications Plan. Overall the communications have been successful with the intended target audiences all reached. The combination of activities has been a strength of the plan as one action in isolation would not be enough to adequately convey and re-enforce the Smart Water messages. The key communication tools have been the prominent placement of the tank with external signage, internal signs near and in the toilet cubicles, and the regular messages on the networked plasma screens. This combination has been most effective due to the high profile positioning selected and the fact that they are permanent and physical mediums. The web page, media release and story, and stakeholder networks are important but less effective and direct.

The success or otherwise of the communications plan was based on actions and the completion of the activities, rather than by a statistical measure. We felt this was the most practical use of time and resources and is based on our knowledge of our attraction, Visitor Centre traffic flows, and what the most effective marketing tools our sales and marketing team have used previously.

A summary of the communication actions undertaken:

- Installation of interpretive signage at the tanks and within the Visitor Centre
- Provision and use of a plasma screen to communicate water saving results and Smart Water messages to Penguin Parade visitors
- Erection of signs and key messages on each toilet unit and back of all toilet doors
- Inclusion in media releases and media familiarisations initiated by the Nature Park in consultation with its external PR agency (Haystac Public Affairs)
- Project summary being uploaded onto the Nature Parks website www.penguins.org.au
- Inclusion in the regular 'Know your Nature Park' column in the local press
- Continual briefings for all relevant staff and stakeholders on project outcomes
- Emailing staff and inclusion in departmental staff meetings and newsletters
- Inclusion in the community and stakeholder newsletters and communications such as Phillip Island Tourism Association, Landcare, Cowes Traders Association, Westernport Water Authority and Bass Coast Shire Council
- Documentation of water saving outcomes in the Nature Parks Annual Reporting process
- Water saving project and results to be included in the course content and materials of the various education programs such as Coastal Ambassadors

Sign in cubicle

Plasma screen message

Web home page banner

The Communication Plan with Activity Outcomes is included in the Appendices. Also included are examples of other communication activities such as the web page, signage, media release and resultant article.

Findings/Results

At the completion of the project our assessment is that it was successful in terms of meeting its two main goals; substantial water savings and increasing community awareness.

No issues were experienced with the contractors and all materials used are well suited to this site and project. The site needed to be leveled with standard backhoe machines and the tank placed on a sand base with gravel surrounds. This complies with the warranty regulations of the tank supplier and with our own policies regarding minimizing environment impacts. Additional site works included having a pump well dug adjacent to the tank.

Some difficulty was experienced with the supply of the tank, however this is understandable given the high demand for tanks at present and the lack of competition in the market place among suppliers.

Main Water Tank at Penguin Parade

Proximity to Visitor Centre

Pumps and mains back up materials

The tank system is pumped, not gravity fed and connects to all new pipework and lines to two sets of toilet blocks (within the Visitor Centre and near the beach). This work was conducted with a plumbing contractor under the direction of our Ground Services Manager (Drew Smeath) and no problems were experienced. Working with an experienced plumber, having quality on-site meetings prior to any works commencing and open communication between all stakeholders are key recommendations based on our experience.

The location of the tank in a very prominent position supported the communication strategy of raising awareness of water conservation. Consideration was given to nearby penguin habitat, however the chosen location avoided any such environmental issues and maximized public viewing and existing plumbing and pipework.

As mentioned earlier, the drought conditions impacted on the amount of water that could be saved. Initial estimates of 5.5 megalitres had to be revised down to 3.0 megalitres as the tanks could only capture and pump rainwater 55% of the time.

Discussion/Evaluation

Analysis of the project

Overall the project was successful in terms of meeting its two main aims of water savings and raising community awareness. Some initial targets and project plan actions had to be revised based on circumstances as the project progressed and these are identified below. The result means that this project can be used as a reference for other tourist attractions or buildings with high volumes of visitors such as shopping centres or office buildings. The benefits are strong enough to overcome any of the potential issues to justify similar projects being implemented elsewhere.

Benefits/learnings of the project

The project has been an overall success because of it meeting the majority of its stated aims and largely following the project plan. The range of limitations and issues that are identified below illustrate that the project didn't always go smoothly, however the fact that it was completed and now is producing long term benefits is pleasing.

Limitations and issues

The following issues were identified during the project:

- Amount of rainfall – the lack of rainfall over summer meant that the tank didn't fill and mains water had to be used more than planned to continue the flow to the public toilets
- Lack of competition in the water tank market – at the time of purchase Bluescope Water had close to a monopoly in the local water tank market making it difficult to achieve competitive pricing and options on the tank and system
- Security issues with tanks and pumps in public places – there were three reported incidences of people vandalizing or obtaining unauthorized access to the tank and pump area. A fence was erected and closer security monitoring was instigated as a result
- Generating ongoing media interest – the initial media release generated some local coverage (see appendices) however it was difficult achieving follow-up media coverage
- Dependency on power supply for pumps – an issue for the Penguin Parade in general is an unstable power supply. This had an effect on the pump system occasionally that needed attention from both electricians and plumbers
- Communicating to a multi-lingual audience – the Penguin Parade has a mix of international and domestic visitors, with some guests from non-English speaking backgrounds. It was decided for simplicity however to base all signage text in English complemented by strong visual images for all visitors to understand.
- Underestimating the length of time to conduct all works – the project fell behind time due to a number of factors such as working around the

penguin parade peak visitor and penguin breeding seasons; availability of tanks and plumbers; and the availability of information technology components associated with networking plasma screens in the visitor centre

- Overstating the role of other authorities once the project has commenced – the initial plan involved regular meetings with Western Port Water and Bass Coast Shire Council. Although they were kept informed of the project there was limited need or interest to involve them directly once the installation has been completed.
- Need for complementary low flush toilets and infrastructure – the investment Phillip Island Nature Parks made in replacing all of its toilets with dual and low flush cisterns and changing some procedures was crucial in achieving the levels of water savings. Without such a commitment future projects will not be as effective nor achieve the desired benefits.

Conclusion

This project achieved its two main goals of saving significant amounts of water (approximately 3 million litres) and increasing community awareness of Smart Water messages (at least 375,000 visitors) by leveraging the infrastructure and popularity of the Penguin Parade. These two benefits will continue beyond the reporting period of the project as the tank infrastructure and communication methods are in place.

Recommendations

The following recommendations are made based on the above evaluation of the project:

- That any similar project ensure that complementary infrastructure such as low flush toilets are installed with a rain water tank system
- That high profile sites installing such a system develop a communication strategy to increase community awareness of what the purpose of the tanks are and the ongoing benefits being achieved
- That the current lack of competition in the water tank supply market is considered in government policy, grant and subsidy programs.

Acknowledgements

The following stakeholders are acknowledged for their contribution to this project:

- Smart Water Fund – for being the primary funding source
- Drew Smeath – Ground Services Manager for Phillip Island Nature Parks who co-ordinated all the earthworks, plumbing and installation
- Bluescope Water – for supplying the single large tank after initial planning and costing was based around seven smaller ones
- Dr Peter Dann – Research Manager who advised on the location and timing of the tank installation in order to have minimal impact on the penguin colony
- Sally O'Neill and Katrina Knight - Phillip Island Nature Parks staff who co-ordinated the signage and overall communication activities

Appendices

1. Web page www.penguins.org.au

2. Media release

3. News article Phillip Island and San Remo Advertiser
   November 22, 2007

4. Signage

– Inside Visitor Centre wall (Happy Flushing !);
– Outside at tank (We are water savers !);
– Plasma message 1 (Annual savings) and 2 (Monthly savings);
– Cubicle door (Flush and smile !)

5. Communications Plan Action Outcomes