Catalysing Positive Rural Landholder Practice Change for River and Water Quality Protection

Julian O'Mara[1], Tim Odgers[1], Elise Green[2], Stephanie Pruss[1]

1 Seqwater, Brisbane, Qld, 4000. Email: julian.omara@seqwater.com.au

2 Assent Communications, Landsborough, Qld, 4553. Email elise@assentcommunications.com.au

Key Points

- Influencing private landholder behavior and land management practices for river and water quality protection is challenging and requires bespoke models of engagement.
- This case study provides an example of how place-based co-design can be applied to Potable Water Source Protection. It provides a catchment management perspective model of engagement that improves the effectiveness of landholder engagement and on-ground outcomes.
- This model recognizes that creating and retaining highly skilled project officers, as landholder relationship managers, is a key element of success.
- Building a Community of Practice empowers a group of project officers to share their skills and experiences supporting both skill development and job satisfaction.

Abstract

Seqwater sources drinking water for the population of South East Queensland from 'open catchments'. With agricultural land use making up 70% of the 1.8 million hectares of the region's source water catchments it's important that we find better ways to work with landholders to protect the region's drinking water supply.

Seqwater has designed and is delivering a program for managing risk (primarily pathogen) to water quality posed by highly impacted source water catchments. By engaging with the not-for-profit sector and placing landholders and project officers in the centre of catchment program co-design, Seqwater have created a framework to create an enduring legacy of positive practice change around our water sources.

The Source Protection Partnership Program uses a combination of incentives for agricultural practice change with strategic skills development, co-design, and community awareness. This required a shift away from a financial incentive approach to a co-design model at the local scale between groups of priority landholders, Landcare/Catchment groups and Seqwater.

The case study provided in this paper will serve as an example that may be applied to other similar situations where deeper landholder and community involvement are key in catalysing positive practice change for the benefit of improved waterway and more broadly land health.

Keywords

Landholder practice change; co-design; source water protection; catchment management; water quality improvement

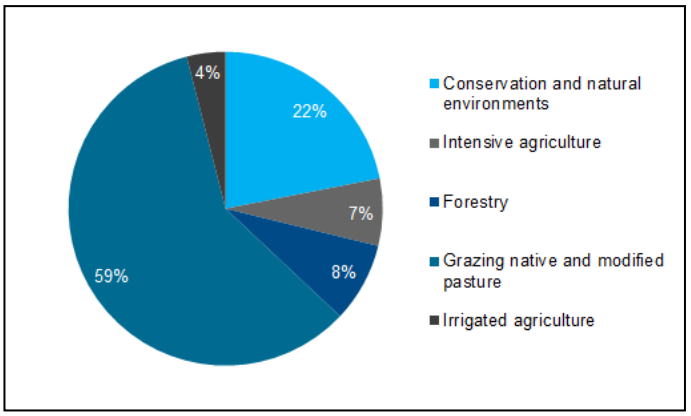
Introduction

Seqwater is the Queensland Bulk Water Supply Authority responsible for delivering safe, secure and cost-effective bulk (treated) water supply for more than 3.5 million people across South East Queensland, making it one of the largest water businesses with the most geographically spread and diverse asset base of any Australian capital city water authority. Seqwater also provides flood mitigation services, works on Source Protection and offers community recreation facilities and provides water for irrigation to approximately 1,200 farmers.

Challenges to water supply

Ensuring a safe and reliable drinking water supply for3.8 million people begins at the source, which for Seqwater is South East Queensland's catchments. Challengingly, Seqwater's source water catchments are 'open catchments' – that is, they support a variety of populated land uses including urban, industrial and rural (Figure 1). Further, only 5% of Seqwater's source water catchments are lands within its control and beyond this, there is a deficit of regulatory mechanisms available to manage hazards to source water quality.

Figure 1: Land use by area in Seqwater catchments



Pressures on South East Queensland's catchments include intensified run-off from modified stream and channel networks, the impacts of pest flora and fauna, and sedimentation and agricultural run-off from grazing and land clearing practices. Approximately 70% of Seqwater's water source area is farmland and the majority of pathogen and sediment loads we receive in raw water at our drinking water treatment plants comes from agricultural land uses, with risk increasing with proximity to the water treatment plant offtake.

The most effective means of assuring drinking water quality and the protection of public health is through adoption of a preventative management approach that encompasses all steps in water production, from catchment to consumer. This is known as the multi-barrier approach to drinking water safety. Investment in the multi-barrier approach to reduce source water risks in drinking water for our communities relies on prioritizing landholdings and then engaging with the high priority rural landholders, via a Source Protection program. The intent of this program is to implement physical interventions to source water quality risk through provision of financial incentives and educational programs. This includes farm management programs such as fencing and off-stream storage points to minimise stock access to waterways and riparian zones, amongst other on-ground interventions.

Without a regulatory driver, the participation in and efficacy of these interventions is entirely reliant on motivations, behaviours and the consequent actions of these landholders to undertake best practice agriculture, land management and to correctly utilise and maintain assets delivered through the Seqwater program.

This context makes source water risk management complex, especially given risk management is currently entirely reliant on the establishment of non-regulatory frameworks (such as incentives) to influence landholder behaviour.

Source Protection in South East Queensland

Seqwater has maintained a Source Protection program for over twenty years, with early models focused on internal resources and processes for project delivery. However, for the last ten years the focus has shifted to a program that directs the majority of Seqwater's Source Protection investment to an external partnership delivery program, the Source Protection Partnership Program (SPPP). The program now works directly with nine not for profit catchment groups (Figure 2) and 25 project officers, delivering twelve programs, across sixteen catchment areas. Another eight smaller groups are also indirectly supported.

We recognise the deep value of empowering the community to manage their natural resources and the role of Landcare and catchment groups in our water supply catchments as landholder-trusted networks embedded in each community, as they hold significant local knowledge and the ability to develop and maintain enduring relationships with priority landholders. The SPPP has moved from annual agreements for specific on-ground programs to the current five-year funding agreements. This established a confirmed

forward budget providing certainty for project officer employment and enabling significant forward planning for an on-ground works program. On average the current investment via this program is approximately $6-7M/yr.

Figure 2: Landcare and Catchment groups involved with the program.

Program prioritisation and partnership management

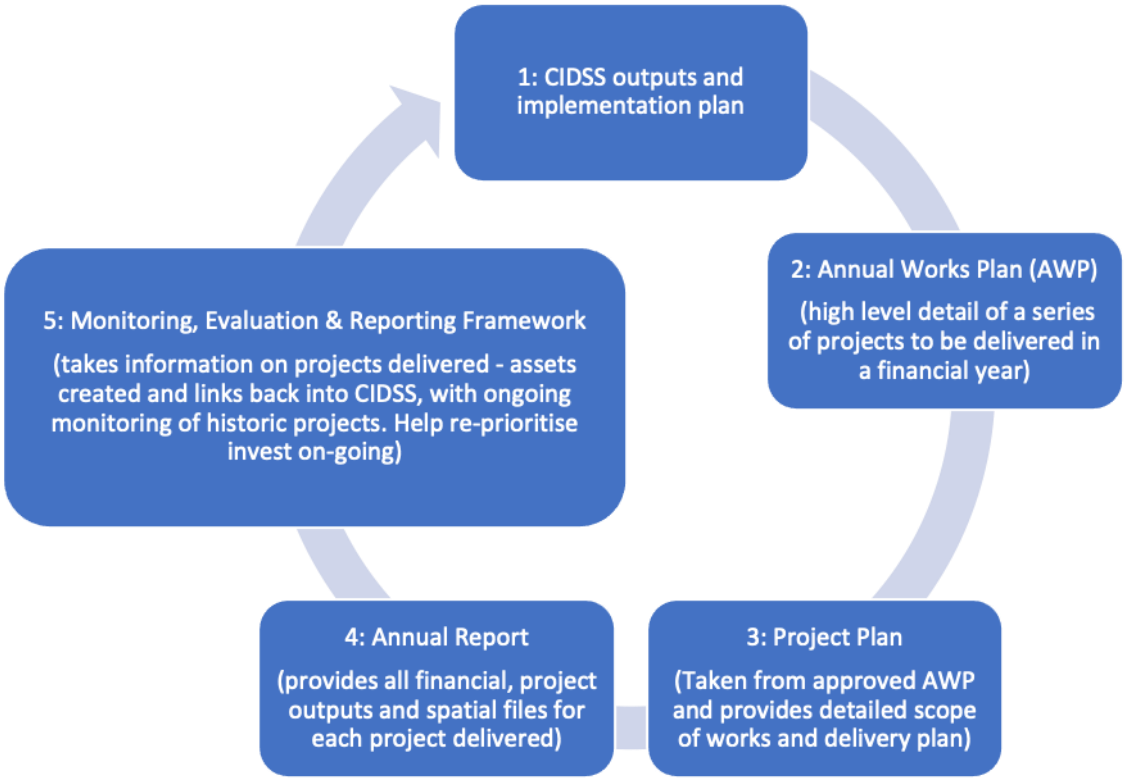
The SPPP uses a custom-built Catchment Investment Decision Support System (CIDSS) to identify catchment-based hazards to water quality, determine opportunities to manage these hazards and develop a prioritised areas for targeting works. The CIDSS is a model ensemble that combines spatial and non-spatial data to produce an optimisation of potential intervention activities across a selected source catchment. The optimisation produces the greatest reduction in risk at the water treatment plant for a given budget. The consideration of risk used by the CIDSS is focused on water quality threats posed by suspended sediment and microbial hazard generating processes and the capacity of the relevant Water Treatment Plant (WTP) to treat these hazards to meet specific Health Based Targets for drinking water safety (Thompson et al, 2021).

The model includes a user platform to engage with the modelled outputs and assess various options for developing a range of on-ground intervention scenarios. The outputs are provided in the form of prioritised investment maps that are used in high level planning for the partnership program in each catchment and also used as a guiding reference for each catchment group in developing a five-year program implementation plan. The implementation plan is developed as a collaboration between Seqwater and each catchment group. Seqwater's modelled outputs are referenced alongside on ground intelligence that each group brings to the table through their understanding of catchment conditions, land management issues and of the landholders.

The five-year implementation plan is the overarching document used in the Source Protection Partnership Management Model which is illustrated in figure 3. The Source Protection Partnership management model establishes the appropriate checks and balances to ensure Seqwater's investment is being allocated to projects that result in meaningful outcomes for drinking water quality.

The model of delivery has been working well with each group planning and delivering a substantial program of work each year for the last ten years. However, it was identified that solely physical interventions alone would not deliver long-term risk reduction and that an engagement model should consider and incorporate the priorities and views of target landholders to ensure the investments achieved a longer term risk reduction outcome. Following landholder surveys and extensive program design with The Mary River Catchment Coordination Committee, Seqwater commenced the application of a place-based co-design approach to improve the program's influence on landholders' land management practices and long-term outcomes for Seqwater's investment.

Figure 3: Seqwater's Source Protection Partnership management model



Source Protection – Future of Engagement (FoE) Program

To maximise the delivery efficiency and ensure continuity of source water risk reduction in the long-term, two key areas of improvement were identified:

1. To develop a method of engagement that enhances landholder understanding of the need to protect drinking water quality and create local community pressure on them to do this. This method also adopts the use of the target industry's best management planning tools to assess farm / land performance and plan a multi-year program of water quality improvement works.

2. The development of a standardised specialist skillset with the SPPP project officers with a particular focus on negotiation and influencing skills, farm planning and project management to assist with the delivery of the engagement program and, more broadly, the on-ground program of works.

Key area 1: Develop a new method of landholder engagement

The Source Protection – Future Model of Engagement (FoE) is founded on the understanding that Seqwater investment in source water quality risk reduction in rural and semi-rural communities will deliver the greatest outcome, over a long period of time and at least cost if underlying landholder behaviour is positively influenced (Seqwater, 2019).

Applying behavioural science extension practice through the program is the key to increase our influence in improved land management practices that reduces hazards to drinking water quality. The aim of the FoE model is to create a permanent, measurable social legacy of positive rural land management behaviours in identified priority source water protection areas.

The shift to a place-based co-design methodology required providing change management support to Source Protection project officers (based in Landcare/Catchment groups) as it was a significant change from the

previous structure where a program was given to them and they were asked to deliver through their business as usual methodology. The acceptance and understanding of place-based co-design is gradual and it is acknowledged this is a shift away from the previous approach where Seqwater provided little direction in this area.

Engagement approach

A place-based co-design approach is taken to designing the engagement framework and program to ensure widespread uptake of the preferred land management behaviours. In the case of this program a place-based co-design approach ensures the relevant stakeholders from a target source catchment are engaged and together define the barriers, challenges, solutions and forward direction for the program together to meet their shared needs. The co-design approach has four key elements plus the use of financial incentives, which is key to a successful program. These elements are:

1: Community engagement – engaging project officers, landholders and industry partners about the design of the program in their catchment and informing them about the benefits of changing their practices at the same time. Collaborative program design allows for a broader understanding of the context the project officers and landholders operate in and builds a strong sense of ownership. Including all members of the community in the change process enables significant change to occur as they collectively learn about the challenge of providing safe drinking water and together come to understand some of the solutions to the identified challenges.

2: Self-regulation – individuals, both project officers and landholders, acquire the skills they need to implement practice change and become independent problem solvers which helps maintain changes in land management practices.

3: Flexibility and tailoring – Using a place-based co-design approach allows program parts to be flexibly applied to different catchments depending on where the catchment groups and the landholders work, live and what they need, want and prefer. The co-design delivery will allow for multiple delivery formats e.g. face-to-face, web, intensive or light touch.

4: Destigmatisation – actively engaging with the community through the local media with a communications strategy which supports the development of the program to shift community attitudes and creates a social context which embraces the desired behaviour. Applying the program across all relevant landholders without singling out a specific sub-group assists the program in being adopted by all landholders in a target area and avoids alienation of any particular group (e.g. particular industry).

5: Financial incentives - funding incentives for landholders, particularly groups of landholders, to undertake natural resource management measures is a key part of a successful behaviour change program.

Application of the engagement approach

The program has five key steps in its delivery, those being:

1: Engagement with the program:

Each partnering catchment group self nominates to get involved in the program and start using the new FoE approach. Seqwater meets with the group ,to describe the engagement framework and plan its delivery through the partnership - with a focus on the co-design process with landholders.

2: Priority landholder direct engagement:

Following an introduction to the program with Seqwater, the catchment group will start targeting direct engagement with priority landholders areas and seek their involvement in the program and following steps in the programs process.

3: Workshop one – Co-design process: The first workshop uses a place-based co-design process to build a shared knowledge and experience about the challenges landholders face and build trust between the project officers and landholders. The workshop is also used to introduce Seqwater's water supply operations in the local area, the Source Protection partnership and discuss the risks of water supply and the critical need to act to protect source water quality and the benefits for farm productivity, biodiversity and ecosystem services. Furthermore the workshops provide an opportunity to discuss the shared benefits of farm Best Management Practice (BMP) and improved water quality outcomes.

The workshop can also include farm visits to build a shared understanding of landholder challenges and foster connections between landholders in an informal setting. The workshop should also facilitate a discussion on the shared experiences, barriers and benefits landholders have when implementing the proposed on-ground interventions that protect source waters under the program.

In addition to the above, a range of detail goes into planning the workshops including promotion, data collection methods and analysis to inform the following stages of the program.

4: Workshop two – Program launch: This workshop is used to present the objective Seqwater seeks (improved water quality for drinking water supply) and work with the landholders to develop solutions/barriers to meeting shared outcomes for improved farm productivity and water quality. The workshop follows an established presentation order with key components required to ensure the right information is exchanged (education) and develop an appropriate forum for receiving feedback.

Upon completion of workshop 2, landholders and project officers will have developed a shared vision for their local program and an understanding of why Seqwater is invested in catchment management for the purpose of drinking water supply. This improved understanding of the linkages between land management practices and source water quality is key in moving the program forward and critical in the long-term success of the program.

Seqwater has named the program 'Rivercare' and as such upon completion of workshop 2, landholders are allocated into two categories for the purpose of the forward program:

i: Active 'RiverCare' participants, who have been involved in the co-design process, attended workshops and now qualify for support in the form of incentives to assist with improved water quality outcomes and on-farm benefits for landholders. These landholders qualify for multi-year locked in funding following approval of their water quality improvement plan.

ii: Entry level 'Rivercare' participants that receive access to small scale financial incentives. The entry level approach to engaging with the program is a good way to ease new landholders into the program, build their confidence and pave the way for extensive engagement with the program in the future.

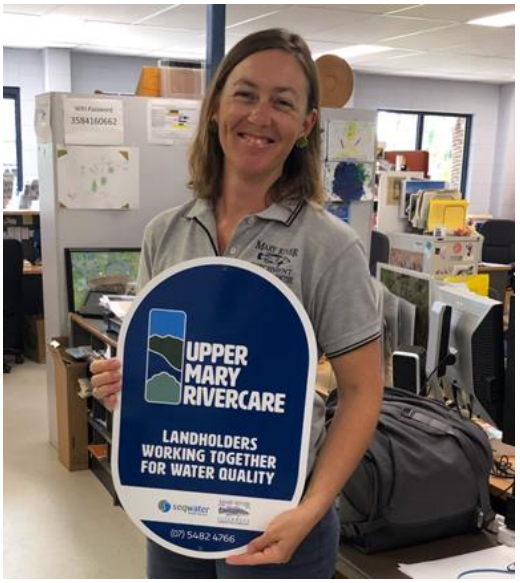
5: Program Rollout: After bringing landholders through the workshop process, the Source Protection project officers engage landholders to develop five-year property management plans that identify a forward program of work to assist in improved land management and water quality outcomes.

These plans are assessed by Seqwater for their alignment with the program and subsequently adopted into the program as per the Source Protection partnership management framework detailed above (Figure 3). These plans must be updated and submitted annually to ensure they remain current and landholders are meeting their agreed level of land management improvements and maintenance of assets created (also assessed using Seqwater's Monitoring, Evaluation and Reporting process). Project officers use industry BMP assessment tools at this stage to assess farm condition and practices to develop a baseline condition to

ensure measurable changes can be assessed as the program progresses. The program is also using 'farm gate' signs to draw attention to landholders working with the program and build a broader brand for the Source Protection program across the region (Figure 4).

Important aspects included in the program rollout also include communications regarding the program (to landholders and broader public) and also developing a series of workshops for landholders to connect and build on their skill set around improved farm management practices. This also links to key area two and improving the skill set of project officers delivering the program.

Figure 4: One of the programs project officers from the Mary River catchment Coordination committee with a Future of Engagement "Upper Mary Rivercare" landholder gate sign



Key Area 2: Establish a Community of Practice (CoP) and up-skill project officers within the Source Protection Partnership Program

In further building the Source Protection program, the upskilling of project officers in the delivery groups (Landcare/Catchment groups) was identified as a key factor in ensuring the new model of engagement was delivered effectively alongside other elements of the program from engagement and on-ground actions, through to monitoring, evaluation and reporting.

Training is a critical part of the success of the program because it increases the confidence of project officers to work with landholders to find solutions. There is a wide range of technical skill and exposure to behavioural science and the theory of extension within the Seqwater partners. A Training Needs Analysis (TNA) was used to quantify this and enabled strategic investment in training to address the identified needs.

The TNA involved all project officers self-identifying their strengths, weaknesses and areas of interest for future training. From this analysis, we built an understanding of skill sets across the partnership program and leveraged these skills to develop a training program. We asked officers from across the partnership to present in a peer-to-peer training program. Where a certain skill-set was absent, we looked to engage external providers outside of the program to fill these gaps. The peer-to-peer training program is set at the start of the year so project officers can schedule it into their diaries. The majority of training takes place online and sessions are short (1-2 hours), to encourage officers to attend the sessions. They are recorded for those that cannot make it. In addition to the online engagement component, we work to establish two in-person gatherings a year so project officers can build networks between groups across the Source Protection Partnership.

To date, 13 online training sessions and 3 face-to-face meetings have been delivered, with 25 project officers, spanning 9 catchment groups. From Seqwater's perspective it is evident a strong community of practice has been built because not only do groups look to Seqwater to provide direction in complex situations, but also contact one another across the region for advice and even arrange opportunities to visit groups from different catchments to learn from the projects being delivered in their catchment.

Program Benefits

The program is now in delivery in 5 catchments and the benefits arising from this program are driven by the combined effect of:

- Increased landholder "buy in" created by the place-based co-design approach to engagement.
- Increased project officer capability gained through the Community of Practice presentations.
- Increased community understanding of local drinking water supply and the need to work together to protect their source water.

These program benefits are measured through a land condition assessment tool and the use of surveys during workshops with landholders and project officers.

While the Future of Engagement program has only been in delivery for 18 months it is anticipated the program will result in:

1. Cost savings/ delivery efficiency, through:

- Increased landholder willingness to undertake projects with the Source Protection program through improved project officer engagement.
- Extended asset (e.g. fence, effluent system etc.) life due to an increase in landholder support for maintenance, leading to a longer duration of risk reduction for less cost.
- Increased financial and in-kind support from landholders throughout the project lifecycle.
- Increased delivery efficiency with partnership project officers being more influential and capable of negotiating greater water quality protection outcomes per unit of effort.

2. Regulatory compliance and strategic objectives:

- Achieving a holistic priority landholder engagement approach that moves beyond "isolated" property to property investments in risk intervention to engagement with target landholders as a collective and working with them to undertake and deliver strategic works based on farm planning.
- Delivering Seqwater's strategic objective to increase stakeholder, customer and community satisfaction and support is at the heart of everything it does.
- Growing engaged and informed rural / semi-rural communities' emotional connection with their land and local environment to increase landholder intention and capability to protect local drinking water sources.
- Establishing projects in every catchment which demonstrate through local media and community conversations Seqwater is committed to working with neighbours, community members and research groups to help protect and improve our catchments and waterway.

3. reputational benefits:

- Seqwater – improves relationships between Seqwater direct neighbours and easements; increases vertical and horizontal lines of trust between Seqwater, project officers, landholders and other industry stakeholders (Local Governments, agricultural industry groups etc); improves community awareness and understanding of the Source Protection water quality risks and the need for multi-stakeholder solutions; creates opportunity to bring in traditional owner engagement and supports environmental compliance at the source water risk point.
- Project Officers – deepens the trusted relationships between project officers and target high priority landholders and further establishes project officers as a trusted authority for water quality improvement support.
- Landholders – facilitates the deepening of trusted relationships between neighbouring landholders while creating positive recognition for involved landholders as local people who care for local water sources, the environment and the community.

Conclusions

While the Future of Engagement program is still in development through delivery of adoption, we have found a place-based co-design approach to positively influence landholders land management practices can be transferred and adapted to the management of source water catchments for the benefit of water quality.

A key component in developing a successful program is the focus on providing time and support for project officers to adapt to a new model of extension and providing training to ensure they have the right skillset to deliver the program effectively. One of the model's major benefits is its flexibility to tailor itself to a range of industries that influence catchment health and the fact it allows adaptation to suit the environmental/social variables found in different catchments.

With regard to Seqwater's broader Source Protection Partner Program, the FoE approach to landholder engagement is emerging as a critical tool as our program continues to grow. Further, understanding well-skilled, locally employed project officers are key to a successful program has enabled Seqwater to focus their efforts on empowering locally based groups, through long-term agreements to deliver a catchment improvement program that will result in generational benefits for landholders and the broader community in general.

Acknowledgements

The authors would like to acknowledge all Source Protection partners who have contributed to the development of this work and the Source Protection program in South East Queensland more broadly. We would like to express our gratitude to the Mary River Catchment Coordinating Committee for the extensive amount of time and effort they have contributed in developing and delivering the pilot program. In addition we like to acknowledge the many landholders who have also been part of the pilot program in the Mary River Catchment and look forward to many years ahead working with them on this program.

We would like to also acknowledge the work of Assent Communications for applying its Communigagement Approach to helping research, co-design and continuing to assist with delivery of the Future of Engagement Framework. Finally we would like to acknowledge and thank the Source Protection team and more broadly Seqwater for their support in developing and rolling this program out.

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