Social Water Assessment Protocol: A step towards connecting mining, water and human rights

Nina Collins [a*] and Alan Woodley [b]

[a] *Centre for Social Responsibility in Mining, Sustainable Minerals Institute, The University of Queensland, Brisbane St Lucia, QLD 4072, Australia*

[b] *Centre for Water in the Minerals Industry, Sustainable Minerals Institute, The University of Queensland, Brisbane St Lucia, QLD 4072, Australia*

[*] Corresponding author: nina.collins@uq.edu.au, Tel: 07 3346 4041, Mob: 0422 650 249, Address: Centre for Social Responsibility in Mining, Sustainable Minerals Institute, Level 4, Sir James Foots Building (47A), Corner College Road and Staff House Road, University of Queensland, St Lucia, QLD 4072

ABSTRACT

The human right to water has recently been recognised by both the United Nations General Assembly and the Human Rights Council. As the mining industry interacts with water on multiple levels, it is important that these interactions respect the human right to water. Currently, a disconnect exists between mine site water management practices and the recognition of water from a human rights perspective. The Minerals Council of Australia (MCA) Water Accounting Framework (WAF) has previously been used to strengthen the connection between water management and human rights. This article extends this connection through the use of a Social Water Assessment Protocol (SWAP). The SWAP is scoping tool consisting of a set of questions classified into taxonomic themes under leading topics with suggested sources of data that enable mine sites to better understand the local water context in which they operate. Three of the themes contained in the SWAP – gender, Indigenous peoples and health – are discussed to demonstrate how the protocol may be useful in assisting mining companies to consider their impacts on the human right to water.

Keywords: human rights and business, social impact assessment, extractive industries, water management, due diligence.

Introduction

The human right to water has recently been recognised by both the United Nations (UN) General Assembly (UNGA 2010) and the Human Rights Council (UNHRC 2010). The mining industry interacts on water on multiple levels, from its operational water use to its corporate water governance. In light of the recent recognition of the human right to water, it is essential that the mining industry ensures that its water interactions do not adversely impact on human rights. This requires mine sites to understand the local socio-environmental context in which they operate and incorporate this information into their operational water management through social and environmental impact assessment processes. While some leading practice companies in the mining industry undertake baseline studies and social profiles and update them at regular intervals, and many companies have processes in place to respond to social impacts, in practice social impact assessment (SIA) is still predominantly used as part of regulatory approval processes, for example, as a component of an Environmental Impact Statement (EIS), rather than in its broader conceptualisation as an ongoing process involving management and monitoring (Esteves et al. 2012; Franks et al. 2009; Franks et al. 2011; Kemp 2011; Vanclay & Esteves 2011). Baseline studies and SIA processes tend to be undertaken at specific stages in a mine's lifecycle, such as prior to the commencement of a project, for proposed expansions, or prior to closure, rather on a continuous basis across the life cycle of the mine (Franks et al. 2009; Franks et al. 2011). Furthermore, water impacts are largely considered as part of an EIS and described in environmental terms which use technical metrics (Esteves et al. 2012), meaning that the social impacts of water interactions are often not adequately considered, particularly in terms of human rights (IHRB 2011). While many mining companies use corporate social responsibility frameworks to set corporate social policy, they are often divorced from the local socio-environmental context that sites operate in (Gilberthorpe & Banks 2012; Kapelus 2002; Kemp et al 2012). The sum of all these factors often results in social impacts, and particularly human rights impacts, not being sufficiently considered in a mine's operational water management.

Kemp et al. (2010) suggest that the Mineral's Council of Australia's Water Accounting Framework (WAF) can be used to connect mine water interactions and human rights. The WAF provides a consistent set of definitions and methodology to represent water interactions on mine sites, and between sites and the surrounding environment. By doing so, the WAF can help to establish a connection between the operational water management of a mine site and the communities and environments that may be impacted by a site's water interactions.

Here we expand this proposition by presenting the Social Water Assessment Protocol (SWAP). The SWAP is a scoping tool that aims to capture the socio-environmental context in which a mine site operates, which is a vital step towards understanding the mine's potential impacts with regard to water and human rights. The SWAP aims to assist sites to identify the value of water beyond purely technical metrics and to connect these values to its operational water management. As the WAF is designed to be carried out at regular intervals, for example annually, incorporating the SWAP into the WAF means that social impacts in relation to water are more likely to be assessed throughout the life of a mine.

This paper is organised as follows. First, it discusses recent developments regarding the human right to water and its links to business and water management. Second, it discusses the current disconnect between mine water interactions and impact assessment processes, which inhibit the consideration of human rights at the operational level. Next, it introduces the SWAP and explains how it can be used to establish a connection between human rights and water management. The final sections discuss three of the themes contained in the SWAP – gender, Indigenous peoples, and health – to exemplify how the SWAP could potentially lead to improved water management in terms of human rights considerations.

Water as a human right

Water is inextricably linked to the most fundamental of human rights: the right to life and the right to an adequate standard of living. Water is essential for human health and wellbeing, food security, environmental protection, income generation and economic development. It is also indirectly linked to a host of other human rights including education, gender equality and cultural rights. While the human right to water was not explicitly included in the 1948 Universal Declaration of Human Rights (UDHR) or the 1966 International Covenant on Economic, Social and Cultural Rights (ICESCR), the UN Special Rapporteur on the right to safe drinking water and sanitation has argued that its omission was based on the assumption that water, like air, was available to all (de Albuquerque 2012). In the era in which the UDHR and the ICESCR were drafted and adopted, concerns around climate change and the impacts of population growth on freshwater availability were not as salient as they have become today, and the availability and quality of the world's water was largely taken for granted at the international level.

Several of the more recent international human rights treaties make explicit reference to the importance of water in realising human rights, for example, the 1979 Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), the 1989 Convention on the Rights of the Child (CRC) and the 2006 Convention on the Rights of Persons with Disabilities (CRPD) (de Albuquerque 2012). In 2008, the Human Rights

Council appointed an Independent Expert on the issue of human rights obligations related to access to safe drinking water and sanitation, and in 2010, both the UN General Assembly and Human Rights Council recognised access to clean water and sanitation as a fundamental human right (de Albuquerque 2012). While not yet legally binding on States, many have already included the rights to water and sanitation in their constitutions and domestic legislation (de Albuquerque 2012; IHRB 2011). These advancements have pushed water from the periphery to the centre of the human rights agenda. Communities, backed by civil society, are also becoming increasingly informed and active in pursuing their rights to water. For example, 40% of cases reviewed by the Compliance Advisor Ombudsman (CAO) – the independent recourse mechanism for the International Finance Corporation (IFC) – have a water dimension (IFC 2011).

The development of the UN Guiding Principles on Business and Human Rights, endorsed by the UN Human Rights Council in June 2011, clarified the role of States and businesses with regard to human rights and set the premise for businesses to take more proactive steps in identifying how their existing and planned activities may negatively impact human rights, including the newly recognised human right to water (Ruggie 2011). The Guiding Principles outline a human rights due diligence process for businesses to uphold their responsibility to respect human rights, which should include "assessing actual and potential human rights impacts, integrating and acting upon the findings, tracking responses, and communicating how impacts are addressed" (Ruggie 2011, p. 16). Human rights due diligence should be "ongoing, recognizing that the human rights risks may change over time as the business enterprise's operations and operating context evolve" (Ruggie 2011, p. 16).

The Institute for Human Rights and Business (IHRB) further clarifies how businesses can apply a human rights due diligence approach in relation to water use in their report, *More Than a Resource: Water, Business and Human Rights* (2011). The report recommends that all businesses apply a rights-based approach in their operations, as well as develop policies that integrate the specific human right to water and sanitation. In terms of impact assessments, whether companies undertake a specific human rights impact assessment (HRIA) or integrate human rights concerns into existing risk and impact assessments – such as social impact assessments – will depend on the human rights content of existing approaches as well as the specific operational context. In undertaking human rights due diligence, the report highlights the importance of companies understanding the 'larger picture' when assessing their human rights impacts, which requires engaging with communities and other stakeholders to define the scope and nature of impacts, and establishing credible baseline studies in order obtain a benchmark for assessing future impacts. Effective water resource management is essential for a human rights-based approach to water use and should incorporate the findings of impact assessments (IHRB 2011).

What is clear from these guidelines is that impact assessment processes are fundamental to the process of human rights due diligence, which underscores the business responsibility to respect the human right to water. Impact assessment requires clarity on the scope and nature of impacts as well as credible data, and should be embedded into water management at the operational level of a business. Human rights due diligence should be an ongoing process which responds to changing operational contexts. With these goals in mind, the following section outlines current approaches to water management in the mining industry, and discusses how they are disconnected from processes of social and human rights impact assessment, which in turn constrains the ability of mining companies to assess and act upon their impacts on the human right to water.

The disconnect between social impact assessment, human rights and mine water management

The interactions between the mining industry and water are complex and multifaceted. From exploration through to closure, water plays a vital role in a mine's lifecycle. Water is involved in cooling, lubricating and washing equipment, transporting and processing ore, separating minerals, suppressing dust, and treating and transporting waste tailings (Weirtz 2009; Barton 2010; Kemp et al. 2010; Oyarzún & Oyarzún 2011). Although most of these activities occur at the onsite operational level, they have impacts that are experienced offsite. For example, mines are often required to withdraw water from local groundwater and surface water sources, which may reduce the availability of water for other users. As ore grades decline and production increases, mining activities will require larger volumes of water to recover minerals, potentially magnifying the impacts of withdrawal (Weirtz 2009). Conversely, sites with an excess of water may discharge to local surface water sources, which could cause pollution or flooding. In addition, water may exit the site as runoff from waste rock, voids, tailings or other disturbed land which could result in negative offsite impacts, particularly if the water is of low quality. For these reasons, mines cannot divorce their offsite water interactions and resulting impacts from their internal operational water interactions (Barrett 2009).

Global initiatives aimed at assisting businesses to address their water interactions include the CEO Water Mandate, a public-private initiative to assist companies to develop policy and practice on sustainable water management; the World Economic Forum's Water Initiative, which provides a platform to support Governments in building public-private partnerships in the water sector and develop water policy; and the World Business Council for Sustainable Development's (WBCSD) Global Water Tool, which is used by corporations worldwide to assess water risks across their portfolio of sites (World Water Assessment Programme 2009; WBCSD 2011). However, when it comes to reporting water performance, most companies tend to do so in an aggregated form representing their corporate water footprint (Barton 2010), which is divorced from local contexts where the impacts are experienced.

Similarly, there are a number of initiatives that are aimed at assisting individual sites to address their water interactions and impacts. For example, many mining companies conduct Environmental Impact Assessment (EIAs) and SIAs as part of regulatory approval processes (Franks et al. 2009; Franks et al. 2011; Esteves et al. 2012). However, water interactions between the site and the surrounding context tend to be considered from an environmental perspective and reported in EISs. Thus, a site's performance in terms of water management is often judged primarily on technical criteria, such as reducing overall water use or increasing reuse, rather than from a social or human rights perspective that considers wider water values (Brereton & Parmenter 2006; Moran 2006; Connor et al. 2008; Barrett 2009). Furthermore, because baseline studies and impact statements are often only undertaken at the beginning of a project or at a significant event such as an expansion, rather than regularly through the life of a mine site, incremental changes to a site's operational-level water management may not be sufficiently assessed.

Another initiative to assist mines with their site level water performance is the Minerals Council of Australia Water Accounting Framework (WAF) which has been applied to over 50 sites in Australia, South America and Africa. The WAF provides a standard set of definitions and a consistent methodology for sites to report their onsite water use and off-site water interactions so that valid comparisons can be made between sites and benchmarks can be established to assist sites to move towards leading practice in water management. Prior to the formation of the WAF, water interactions were captured and recorded by sites, but inconsistencies between the methodologies and definitions meant that comparisons of water use and reuse were invalid.

Figure 1 presents a simple water flow diagram for a coal mine site using the methodology outlined in the WAF. The numbers represent volume of water in megalitres per calendar year.

<< INSERT FIGURE 1 HERE >>

The diagram shows that the site primarily accepts water from an aquifer, a river, a town and rainfall and runoff. Water from the site is primarily lost through evaporation and entrainment in product and waste. Water is used on site for underground mining, dust suppression and in the processing plant. The site also contains a treatment plant.

The following set of reports is generated from the data collected to produce a water account for the site using the WAF:

1. An Efficiency Statement that provides metrics for evaluating the performance of sites, derived from how much water is used, reused and recycled on site.
2. An Input-Output Statement that lists the water entering and exiting the site in terms of quantity and quality. Quality is typically represented as either: high quality water that is near potable; low quality water typical of process water at many sites; or very low quality water, such as hyper-saline water. The Input-Output Statement also contains a Notes Disclosure section listing additional information about each water source and destination that the site interacts with.
3. A Contextual Statement that places the mine site in the wider social, environmental and regulatory context.

These reports connect performance indicators of internal water interactions at the operational level (as outlined in the Efficiency Statement) and external water interactions beyond the site with the surrounding community (as outlined in the Input-Output Statement and Contextual Statement). This connection allows sites to understand how changes to operational-level water management relate to external water interactions. For example, by applying the WAF across a selection of coal mines in the Bowen Basin, Australia and comparing their Efficiency Statements, it was shown that implementing best practice would reduce withdrawals of high quality water by 80% and overall water withdrawals by 40% (Cote et al. 2008).

Kemp et al. (2010) has discussed how the WAF can be used to help establish a connection between mine water management and human rights impacts by providing a consistent technical frame to describe mine water systems which provides a basis for increased understanding about how a mine site may potentially impact human rights through its approach to water management. By capturing the mine site's water interactions, the WAF lays the foundation for dialogue with local communities about the potential human rights impacts of these interactions, which in turn has the potential to lead to informed decision making about how changes at the operational level could address these impacts.

In practice, however, while mine sites use the WAF to report on water entering and exiting the site using technical metrics of quantity and quality, they do not tend to report comprehensively on the site's socio-environmental context, which limits their potential to understand the links between water management and human rights impacts beyond the site's boundary. Both the Contextual Statement and the Notes Disclosure section of the Input-Output Statement would be suitable sections within the WAF to include this information, however neither has predominately discussed the social context of a site due to the lack of a dedicated protocol to capture such information. Here, we present the Social Water

Assessment Protocol (SWAP), an extension to the existing WAF that provides such capability, thereby providing a vital step towards connecting human rights, impact assessment and mine water interactions.

SWAP: Social Water Assessment Protocol

In order for companies to ensure that they respect the human rights of local stakeholders, a mix of both technical and community-focused responses is required (Brereton & Parmenter 2006; Morikawa et al. 2007). The SWAP has been developed to assist mine sites to capture the socio-environmental context in which they operate, providing a method for informing, adapting and optimising water management beyond technical efficiency based metrics. It is primarily a scoping tool aimed at assisting operational-level personnel to integrate baseline information about the local water context into their water reporting which acts as mechanism to encourage the integration of existing impact assessment into water management at the operational level. In doing so, the SWAP is an important step for establishing a connection between operational mine water interactions and the consideration of human rights.

The SWAP consists of 14 broad themes containing approximately 60 topics which are intended to serve as prompts for capturing the socio-environmental context of the site as it relates to water. Within the SWAP, 'context' refers to the surrounding geographical boundary pertinent to the site or its "sphere of influence" (CEO Water Mandate 2010, p.7), which should be established from the beginning of, or prior to, the SWAP's implementation. Each topic contains a set of questions to demonstrate the types of information that should be considered in each area.

The 14 themes investigated within the SWAP are as follows:

(1) A snapshot of the *physical water sources* within the context

(2) A survey of the *climate conditions* of the context

(3) A survey of how water is used for *domestic purposes* within the context

(4) A survey of the *water infrastructure* within the context

(5) A survey of how water is used with the *formal economy* and within *industry*

(6) A survey of the water interactions of and significance of water to *Indigenous peoples* within the context

(7) A survey of the *cultural and spiritual values* that people place upon water in this context

(8) A survey of the *recreational* use of water in this context

(9) A survey of general *human rights* issues related to water in this context

(10) A survey of *gender* issues related to water in this context

(11) A survey of *health* issues related to water in this context

(12) A survey of how *other key stakeholders* in the context interact with water

(13) A survey of the *interaction* that occurs between stakeholders within the context

(14) A survey of the *legislation, policy and politics* related to water within this context.

The SWAP should be used as a guide, rather than a definitive checklist. While each topic contains a set of questions, the questions do not represent an exhaustive list of potential social and environmental water information that a mine site should take into account. Not all questions will be applicable to all sites and additional information may be required in specific contexts. Ideally, implementation of the SWAP would be an iterative process, that is, more topics and questions will be added as needed. This demonstrates the flexibility of the SWAP and addresses some of the criticism that has been levelled at similar 'checklist' approaches

(Eales et al. 2005; van Schooten et al. 2006). In order to respond to each question, it is recommended that a mixture of primary and secondary sources be consulted, for example: data collected as part of an EIS or SIS, newspaper articles, government and NGO reports, academic literature, as well as one-on-one interviews, focus groups, and community meetings. The SWAP provides guidance on potential sources of information, but decisions around which questions to ask, which sources to investigate and further investigation will depend on the specific site context. Ideally, the SWAP would reveal areas where a more in-depth social or human rights impact assessment is required.

While not a human rights or social impact assessment tool per se, the SWAP contains many of the principles that are contained within 'good' social impact assessment (Esteves et al. 2012; Vanclay 2003). Coupling the SWAP with the WAF establishes a connection between the onsite operations and offsite impacts in the following ways. Firstly, the SWAP can be used to augment the Notes Disclosure section of the Input-Output Statement, which would add sophistication to the existing quantitative interactions and may serve as a step in identifying, avoiding and mitigating human rights impacts related to water. Secondly, the SWAP can be used to provide information for the Contextual Statement of the WAF so that mines are able better understand the socio-environmental context in which they operate, potentially inspiring water management strategies that enhance positive impacts (Esteves & Vanclay 2009). Finally, as the WAF is recommended to be undertaken annually, it encourages sites to consider their impacts on water throughout the project, rather than solely during the planning and approvals stage.

Despite its potential benefits, the SWAP has some limitations. Firstly, the SWAP is not a stand-alone tool and will not lead to change at the operational level unless it is coupled with other technologies, frameworks and practices. Secondly, the SWAP has been designed to be incorporated within the WAF, so any limitations of the WAF are replicated in the

SWAP. For example, the WAF is unable to represent a mine site's transformation of water (such as from high to low quality) as it passes through a site. However, as improvements are made to the WAF, these improvements would be replicated in the SWAP, and the SWAP could add additional performance metrics to the WAF. Furthermore, while the SWAP has been designed for use with the WAF, it could be implemented within other water reporting and water management frameworks.

The following sections provide an overview of three themes contained in the SWAP – gender, Indigenous peoples and health – and their connection to human rights, mining and water, to exemplify how the SWAP may assist companies to address their impacts on human rights.

SWAP Theme 1: Gender

Non-discrimination and equality are core principles of human rights and a rights-based approach (IHRB 2011). For mining companies to respect human rights, particular attention needs to be paid to these core principles in relation to gender. A number of authors have discussed the gender-differentiated impacts of mining and many emphasise the negative impacts that tend to disproportionately affect women (Macdonald & Rowland 2002; Hinton et al. 2003; Ahmad & Lahiri-Dutt 2006; Lahiri-Dutt & Maccintyre 2006; Macdonald 2006; Eftimie et al. 2009; Lahiri-Dutt 2011). For example, women working in agriculture, collecting water, doing laundry in rivers, and other tasks can be severely impacted by water pollution associated with mining, including impacts on their reproductive health (Eftimie et al. 2009). Women and female-headed households are overrepresented in the proportion of the world's population living in poverty and women may also hold subordinate status at the household level (Lahiri-Dutt & Ahmad 2011). This makes women and their dependents particularly vulnerable to water scarcity or increased water prices that may result from a mining company's presence.

Roles and activities associated with water are often gender-specific. For example, in some Indigenous cultures, women are considered the holders of 'water knowledge' while men are responsible for supplying water (Anderson et al. 2011). In many societies, women play a primary role in managing household water supply, including supplying and using water for cooking, cleaning, sanitation and health. Numerous reports highlight the importance of water and sanitation in development objectives and gender equality (*e.g.* Fisher 2006; World Bank, FAO, and IFAD. 2009; World Bank 2011; de Albuquerque 2012). In developing countries, women and children may spend many hours walking long distances to collecting water, which inhibits their participation in education, income-producing activities and leisure (de Albuquerque 2012; Fisher 2006). Women are often the main caretakers of children and the infirm, which requires water in order to maintain hygiene. In developing countries, diarrhoea and malaria are among the leading causes of child mortality, and both are directly linked to poor quality water, storage, drainage and sanitation (UNICEF 2003; WHO 2012a). Lack of consultation with women regarding the placement of water points and sanitation facilities may lead to their deterioration and dangers related to accessing them, such as sexual violence (de Albuquerque 2012; Fisher 2006). Despite this, women are under-represented in most community and state-based decision-making mechanisms for water use and management (IHRB 2011).

For all of these reasons, it is important to pay extra attention to gender when compiling baseline data to capture a site's social water context. However, care should be taken not to represent women as 'victims' or as a homogenous group, and consideration should be given to how their requirements with regard to water interrelate to those of men, as well as how differences such as class, race and age come into play (Lahiri-Dutt & Ahmad 2011).

The SWAP's questions in relation to gender are classified into four leading topics, which prompt the mine site to consider:

- the differences between men and women's roles, relationships and responsibilities in terms of water and water resources in the local context, including between different socio-economic and cultural groups;
- women and men's participation and representation in water management at household, community and organisational/governmental levels;
- whether men or women have disproportionate access to clean water and sanitation at the household or community levels; and
- other gender-specific risks related to water and sanitation.

By collecting this information, a mine site can identify any gender-specific issues related to water resources in the context and subsequently incorporate this information into consultation and decision making processes. For example, the mine site represented in Figure 1 extracts 300 megalitres of low quality water from a river per year. The decision to extract water from this source may have been based on the fact that this water is not potable, and therefore assumed to be of low value. However, if this particular river is an important washing point for women from a local community, then the mine site's withdrawals may be forcing them to access a washing point further away from their homes, potentially impacting women disproportionately and contributing to gender inequality. Based on this, drawing water from an alternative source may be the preferred option for the mine site to avoid infringing on human rights.

SWAP Theme 2: Indigenous Peoples

The 2007 Declaration on the Rights of Indigenous Peoples (UN 2007) highlights concerns relating to Indigenous peoples' connection to water. In particular, it highlights the rights of Indigenous peoples to: maintain their spiritual connection with water; own; develop, control and use water; and ensure that they have given free, prior and informed consent (FPIC) before utilising water (refer to Hanna & Vanclay 2013). Although it would be simplistic to classify the many Indigenous peoples of the world as a single homogenous group given their diversity of social, cultural and historical contexts, there are a number of water-related issues that are pertinent to Indigenous rights warranting their specific consideration in the SWAP.

The true value of water to Indigenous peoples is often expressed beyond tangible, technical terms (Barber & Jackson 2012; Jackson et al 2012). In particular, many Indigenous groups place spiritual value upon water and some water sources have special spiritual significance to Indigenous peoples (Blackstock 2001; Rumley & Barber 2004; Brereton & Parmenter 2006; McNiven 2010). Likewise, water can have strong links to culture and identity, with some Indigenous groups specifically identifying themselves as 'water people' (McNiven 2010). The spiritual and cultural values placed upon water help to establish a connection between living Indigenous groups, and between Indigenous peoples and their ancestors (Barber & Jackson 2012). Furthermore, Indigenous peoples often suffer disproportionately from the negative impacts of mining on water resources (Jenkins & Obara 2006; UNDPI 2011). For example, Indigenous peoples in many countries are reliant on land and water resources for their subsistence and livelihoods, and often a lower socio-economic status than the majority of the population where they live. Many Indigenous peoples live in countries that have insufficient formal recognition and protection of Indigenous water rights (ICMM 2010; Haalboom 2012). In addition, Indigenous peoples may not hold the legislative power required to adequately resolve disputes related to water, meaning that alternative methods such as protests may be used in an attempt to gain legitimacy and often result in violence (Barrera-Hernández 2005).

The SWAP prompts sites to consider the current and historical interactions between Indigenous peoples and government, mining companies and other stakeholders. These interactions may influence the level of trust between a site and Indigenous peoples, affecting how negative impacts are perceived and potentially magnifying the consequences of negative impacts experienced by Indigenous peoples (Brereton & Parmenter 2006; Barber & Jackson 2012).

The SWAP also prompts sites to consider:

- the main groups of Indigenous peoples in the context and the level of recognition of their rights and socio-economic status;
- the interactions between Indigenous peoples and local water sources, including consideration of the tangible and non-tangible values of water to Indigenous peoples; and
- Indigenous peoples' interactions with other water users.

Considering the mine site represented in Figure 1 once more, the mine withdraws 1000 megalitres of water from an aquifer. The water is of higher quality than is needed for processing and so a decision might be made that less water will be drawn from the aquifer and will be replaced with water of very low quality withdrawn from a nearby creek, for example. When reported under the WAF, this would appear to be positive decision since high quality water is replaced with lower quality water; however, the SWAP may have captured information signalling that this creek has significant spiritual significance for a local Indigenous community. Based on this information the mine site could enter into further discussions with the local Indigenous community about the significance of this water source, and make a decision about which water source to use based on a human rights-based risk and opportunities assessment.

SWAP Theme 3: Health

Health and wellbeing are fundamental human rights in and of themselves, as well as precursors to a host of other human rights. Access to safe drinking water has been defined by the WHO as an average of 20 litres of clean water per person per day from an improved source located within one kilometre walking distance of the household where it is used, although others have argued that this is the absolute minimum required for human survival and actual requirements are greater (Howard & Bartram 2003; Cote et al. 2008; de Albuquerque 2010; Mirosa & Harris 2011; WHO 2012b). Close to 900 million people in the world lack access to safe drinking water and over 2.5 billion people lack access to improved sanitation facilities (IHRB 2011). Many of these people are living in areas where mining activities are taking place.

The potential negative impacts of water-related mining activities on health may be direct, such as impacts resulting from the pollution of a water source, or indirect, such as the health impacts associated with resettlement linked to water infrastructure, such as a tailings dam or hydropower project. While there is a broad range of potential negative impacts of mining on health, health impact assessments (HIAs) are currently underutilised by the mining industry (Rattle & Kwiatkowski 2003; Birley 2005; Erlanger et al. 2008; Winkler et al. 2011; Snyder et al. 2012).

It is important for mine sites to acknowledge that environmental determinants of health are more significant in developing countries where the livelihoods of large segments of the population are dependent on subsistence activities or agriculture (Rattle & Kwiatkowski 2003; Erlanger et al. 2008). Considering water in terms of human rights also requires taking into account the needs of individuals that may have higher requirements for water, such as pregnant women and those living with HIV/AIDS (de Albuquerque 2010). In remote rural areas in developing countries, local level data on community health may be scarce (Winkler et al. 2011) requiring the collection of primary data.

The Health section of the SWAP prompts sites to consider:

- the status of people in terms of access to water and sanitation; and
- health risks related to water sources, including indirect risks such as those related to water pollution from artisanal mining.

Due to the strong links between health and other human rights, many of the themes in the SWAP contain topics and questions that are relevant to water's role in the fulfilment of the human right to health. The SWAP encourages sites to collect information that is directly related to its operations, as well as more general information related to the population's access to water and sanitation. Questions about the groups that are most likely to be negatively impacted by water scarcity or price increases in water, and questions related to water-related health risks associated with artisanal mining and other issues have also been incorporated into the SWAP. Collecting this information increases the potential for a mine site to be able to consider human rights opportunities as well as risks in its water management strategies.

For example, imagine that the mine site represented in Figure 1 is located downstream from a community that does not have a wastewater treatment plant and discharges its untreated wastewater into the river from which the mine withdraws 300 megalitres a year.

The untreated wastewater discharged in the river could affect both the health of the community and the quality of the water withdrawn by the mine. In this case, the mine may consider building a wastewater treatment facility for the community, which would improve the quality of water it can withdraw and assist the local community's health outcomes. Similarly, if operational-level personnel understood the climate conditions of the context well enough to be able to predict periods of discharge, and combined this information with information about the local community's water requirements for agricultural or subsistence purposes, it could devise water management strategies to ensure that any discharges during periods of high rainfall will benefit the social determinants of health in that context.

Conclusion and Future Directions

The formal recognition of water as a human right, combined with the increasing attention directed towards businesses to respect human rights in policy and practice, means that companies need to act with due diligence by identifying, assessing and mitigating their impacts on the human right to water. A disconnect exists between operational-level mine water management and the consideration of human rights impacts. We have proposed that the Social Water Assessment Protocol (SWAP), a scoping tool aimed at assisting mine sites to gather baseline information about the local water context in which they operate, will assist in bridging this disconnect. The SWAP should be used in conjunction with a technical framework such as the WAF, which provides a regular connection to operational water interactions and management.

As a baseline and scoping tool, the SWAP presents some limitations but offers the potential to further operationalise the concept of SIA as a management process across the lifecycle of mining activities and drive internal change processes. Information derived from the SWAP could be incorporated into wider decision making processes, such as multi criteria analysis and human rights risk assessment. Further research into how these areas could be integrated into the SWAP and WAF is recommended.

The SWAP is still in its development stages and has yet to be piloted and implemented. Ideally, the SWAP would be piloted in different socio-environmental contexts, for example, contexts of water scarcity and water excess, highly populated and scarcely populated contexts and regions with varying sizes of Indigenous communities, leading to the development of additional thematic areas, leading topics and questions. Other future research involving the SWAP may include its implementation to assist in the programmes around participatory water monitoring, increased use of alternative water sources and sharing water with other sectors (Weirtz 2009). While fully integrating human rights considerations into operational mine water interactions is an ambitious target, tools such as the SWAP provide a vital step to establishing a connection between the assessment of human right impacts and water management.

Acknowledgements

The authors would like to thank the Sustainable Minerals Institute for the foundation funding for this work and our colleagues for their valuable feedback, discussions and suggestions during the development of this article.

References

Ahmad N, Lahiri-Dutt K. 2006. Engendering Mining Communities: Examining the Missing Gender Concerns in Coal Mining Displacement and Rehabilitation in India. J Gend Technol Dev. 10(3):313-339.

Anderson K, Clow B, Haworth-Brockman M. 2011. Carriers of water: aboriginal women's experiences, relationships, and reflections. J Clean Prod. DOI: 10.1016/j.jclepro.2011.10.023. Epub 2011 Nov 2.

Barber M, Jackson S. 2012. Indigenous engagement in Australian mine water management: The alignment of corporate strategies with national water reform objectives. Resour Policy. 37(1):48-58.

Barrera-Hernández L. 2005. Indigenous Peoples, Human Rights and Natural Resource Development: Chile's Mapuche Peoples and the Right to Water. Annu Surv Int Comp Law. 11(1):1-28.

Barrett D. 2009. Thinking Outside the Lease - Towards a Strategic View of Regional Water Management by the Mining Industry. In: Water in Mining 2009 Conference Proceedings; 2009 Sep 15-17; Perth. Carlton (Australia): Australasian Institute of Mining and Metallurgy.

Barton B. 2010. Murky Waters? Corporate Reporting on Water Risk A Benchmarking Study of 100 Companies [Internet]. [Boston]: Ceres; [cited 2012 Jun 20]. Available from: http://www.ceres.org/resources/reports/corporate-reporting-on-water-risk-2010

Birley M. 2005. Health impact assessment in multinationals: A case study of the Royal Dutch/Shell Group. Environ Impact Assess Rev. 25(7-8):702-713.

Blackstock M. 2001. Water: a First Nations' spiritual and ecological perspective. BC J Ecosystems Manag. 1(1):54-66.

Brereton DJ, Parmenter JC. 2006. Water, Communities and Mineral Resource Development: Understanding the Risks and Opportunities. In: Water in Mining 2006 Conference Proceedings; 2006 Nov 14-16; Brisbane. Carlton (Australia): Australasian Institute of Mining and Metallurgy.

CEO Water Mandate. 2010. The Human Right to Water: Emerging Corporate Practice and Stakeholder Expectations (White Paper) [Internet]. [Oakland]: UN Global Compact and Pacific Institute; [cited 2012 Oct 30]. Available from: http://www.unglobalcompact.org/docs/issues_doc/Environment/ceo_water_mandate/Water_Mandate_Human_Rights_White_Paper.pdf

Connor L, Higginbotham N, Freeman S, Albrecht G. 2008. Watercourses and discourses: Coalmining in the Upper Hunter Valley, New South Wales. Oceania. 78(1):76-90.

Cote CM, Moran C, Gozzard E, Craven A, Shih J. 2008. Understanding Leading Practice in Water Management: ACARP Report C16035. Brisbane (Australia): Australian Coal Research Programme.

de Albuquerque C. 2010. Water and sanitation as human rights [Internet]. In: Lundqvist J, editor. On the Water Front: Selections from the 2009 World Water Week in Stockholm. Stockholm: Stockholm International Water Institute; p.19-24; [cited 2012 Aug 9]. Available from: http://www.worldwaterweek.org/documents/Resources/Synthesis/On_the_Water_Front_selections_from_WWW.pdf

de Albuquerque C. 2012. On the Right Track: Good practices in realise the rights to water and sanitation; [Internet]. [Lisbon]: Entidade Reguladora dos Serviços de Águas e Resíduos; [cited 2012 Aug 9]. Available from http://www.ohchr.org/Documents/Issues/Water/BookonGoodPractices_en.pdf

Eales R, Smith S, Twigger-Ross C, Sheate W, Özdemiroglu E, Fry C, Tomlinson P, Foan C. 2005. Emerging approaches to integrated appraisal in the UK. Impact Assess Project Appraisal. 23(2):113-123.

Eftimie A, Heller K, Strongman J. 2009. Mainstreaming Gender into Extractive Industries Projects: Guidance Note for Task Team Leaders [Internet]. Washington DC: The World Bank; [cited 2012 Sep 10]. Available from: http://siteresources.worldbank.org/EXTOGMC/Resources/eifd9_gender_guidance.pdf

Erlanger TE, Krieger GR, Singer BH, Utzinger J. 2008. The 6/94 gap in health impact assessment. Environ Impact Assess Rev. 26(4-5):349-358.

Esteves AM, Franks D, Vanclay F. 2012. Social impact assessment: the state of the art. Impact Assess Project Appraisal. 30(1):34-42.

Esteves AM, Vanclay F. 2009. Social Development Needs Analysis as a tool for SIA to guide corporate-community investment: Applications in the minerals industry. Environ Impact Assess Rev. 29(2):137-145.

Fisher J. 2006. For Her It's the Big Issue: Putting women at the centre of water supply, sanitation and hygiene [Internet]. Switzerland: Water Supply and Sanitation Collaborative Council; [cited 2012 October 19]. Available from: http://www.wsscc.org/sites/default/files/publications/wsscc_for_her_its_the_big_issue_evidence_report_2006_en.pdf

Franks D, Fidler C, Brereton D, Vanclay F, Clark P. 2009. Leading Practice Strategies for Addressing the Social Impacts of Resource Developments; [Internet]. Brisbane: Centre for Social

Responsibility in Mining, UQ; [cited 2012 Aug 16]. Available from: http://www.csrm.uq.edu.au/docs/Franks_etal_LeadingPracticeSocialImpacts_2009.pdf

Franks DM, Brereton D, Moran CJ. 2011. Cumulative social impacts. In: Vanclay F, Esteves AM, editors. New Directions in Social Impact Assessment: Conceptual and Methodological Advances. Cheltenham, UK: Edward Elgar; p. 203-220.

Gilberthorpe E, Banks G. 2012. Development on whose terms?: CSR discourse and social realities in Papua New Guinea's extractive industries sector. Resour Policy. 37(2):185-193.

Haalboom B. 2012. The intersection of corporation social responsibility guidelines and indigenous rights: Examining neoliberal governance of a proposed mining project in Suriname. Geoforum. 43(5):969-979.

Hanna P, Vanclay F. 2013. Human rights, Indigenous peoples and the concept of Free, Prior and Informed Consent in the extractive industries in Brazil. Impact Assess Project Appraisal. 31(2): this issue.

Hinton JJ, Veiga MM, Beinhoff C. 2003. Women and Artisanal Mining: Gender Roles and the Road Ahead. In: Hilson GM, editor. Socio-economic Impacts of Artisanal and Small-scale Mining in Developing Countries. Lisse (The Netherlands): Swets & Zeitlinger; p. 149-188.

Howard G, Bartram J. 2003. Domestic Water Quantity, Service Level and Health [Internet]. Geneva: World Health Organization; [cited 2012 Oct 29]. Available from: http://www.who.int/water_sanitation_health/diseases/WSH03.02.pdf

[ICMM] International Council on Mining & Metals. 2010. Good Practice Guide: Indigenous Peoples and Mining [Internet]. London: International Council on Mining & Metals; [cited 2012 Jun 2]. Available from: http://www.icmm.com/content/newsletter/200925/http:/www.icmm.com/document/1221

[IFC] International Finance Corporation. 2011. Water, Mining & Communities Roundtable Summary [Internet]. [Washington, DC]: International Finance Corporation [cited 2012 Jun 23]. Available from: http://www.commdev.org/files/2727_file_Water_Mining_Communities_Summary.doc

[IHRB] Institute for Human Rights and Business. 2011. More Than a Resource: Water, Business and Human Rights [Internet]. London: Institute for Human Rights and Business; [cited 2012 Jul 25]. Available from: http://www.ihrb.org/pdf/More_than_a_resource_Water_business_and_human_rights.pdf

Jackson S, Tan PL, Mooney C, Hoverman S, White I. 2012. Principles and guidelines for good practice in Indigenous engagement in water planning. J Hydrology. 474:57-65.

Jenkins H, Obara L. Corporate Social Responsibility (CSR) in the Mining Industry - the Risk of Community Dependency. Paper presented at: Corporate Responsibility Research Conference 2006; Dublin, Ireland.

Kapelus P. 2002. Mining, corporate social responsibility and the “Community”: the case of Rio Tinto, Richards Bay Minerals and the Mbonambi. J Bus Ethics. 39 (3):279–296.

Kemp D. 2011. Understanding the organizational context. In: Vanclay F, Esteves AM, editors. New Directions in Social Impact Assessment: Conceptual and Methodological Advances. Cheltenham, UK: Edward Elgar; p. 20-37.

Kemp D, Bond C, Franks DM, Cote CM. 2010. Mining, water and human rights: making the connection. J Clean Prod. 18:1553-1562.

Kemp D, Owen JR, van de Graaff, S. 2012. Corporate social responsibility, mining and “audit culture”, J Clean Prod. 24:1-10

Lahiri-Dutt K, editor. 2011. Gendering the Field: Towards Sustainable Livelihoods for Mining Communities [Internet]. Canberra: ANU E Press; [cited 2012 Jun 2]. Available from: http://epress.anu.edu.au/apps/bookworm/download/epub/Gendering+the+Field%3A+Towards+Sustainable+Livelihoods+for+Mining+Communities/5521/

Lahiri-Dutt K, Ahmad N. 2011. Considering gender in social impact assessment In: Vanclay F, Esteves AM, editors. New Directions in Social Impact Assessment: Conceptual and Methodological Advances. Cheltenham, UK: Edward Elgar; p. 117-137.

Lahiri-Dutt K, Maccintyre M, editors. 2006. Women Miners in Developing Countries: Pit Women and Others. Aldershot: Ashgate.

Macdonald I, Rowland C, editors. 2002. Tunnel vision: Women, Mining and Communities [Internet]. Melbourne: Oxfam Community Aid Abroad; [cited 2012 Sept 14]. Available from: https://www.oxfam.org.au/wp-content/uploads/2011/11/oaus-tunnelvisionwomenmining-1102.pdf

Macdonald I. 2006. Women Miners, Human Rights and Poverty. In: Lahiri-Dutt K, Macintyre M, editors. Women Miners in Development Countries: Pit Women and Others. Ashgate: Aldershot; p. 307-325.

McNiven I. 2010. Saltwater People: Spiritscapes, Maritime Rituals and the Archaeology of Australian Indigenous Seascapes. World Archaeology. 53(3):329-349.

Mirosa O, Harris LM. 2011. Human Right to Water: Contemporary Challenges and Contours of a Global Debate. Antipode. 44(3):932-949.

Moran C. 2006. Linking the Values of Water to Sustainability. In: Water in Mining 2006 Conference Proceedings; 2006 Nov 14-16; Brisbane. Carlton (Australia): Australasian Institute of Mining and Metallurgy.

Morikawa M, Morrison J, Gleick P. 2007. Corporate Reporting on Water: A Review of Eleven Global Industries [Internet]. Oakland, California: Pacific Institute; [cited 2012 Jun 1]. Available from: http://www.pacinst.org/reports/water_reporting/corporate_reporting_on_water.pdf

Oyarzún J, Oyarzún R. 2011. Sustainable development threats, inter-sector conflicts and environmental policy requirements in the arid, mining rich, Northern Chile territory. Sustainable Dev. 19(4):263-274.

Rattle R, Kwiatkowski RE. 2003. Integrating health and social impact assessment. In: Becker HA, Vanclay F, editors. The International Handbook of Social Impact Assessment: Conceptual and Methodological Advances. Cheltenham: Edward Elgar; p.92-107.

Ruggie J. 2011. Report of the Special Representative of the UN Secretary General on the issue of human rights and transnational corporations and other business enterprises, John Ruggie. Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework. United Nations Human Rights Council, Seventeenth session, Agenda item 3. 21 March. UN doc. A/HRC/17/31.

Rumley H, Barber K. 2004. "We Used to Get our Water Free…" Identification and Protection of Aboriginal Cultural Values of the Pilbara Region [Internet]. Perth: Water and Rivers Commission of Western Australia [cited 2012 Aug 13]. Available from: http://www.water.wa.gov.au/PublicationStore/first/80735.pdf

Snyder J, Wagler M, Lkhagvasuren O, Laing L, Davison C, Janes C. 2012. An equity tool for health impact assessments: Reflections from Mongolia. Environ Impact Assess Rev. 34: 83-91.

[UNICEF] United Nations Children's Fund. 2003. Water, Sanitation and Hygiene: Common water and sanitation-related diseases [Internet]. [New York]: UNICEF; [cited 2012 Oct 30]. Available from: http://www.unicef.org/wash/index_wes_related.html

[UNDPI] United Nations Department of Public Information. 2011. As with so many other human rights, Indigenous peoples suffer disproportionate violations of right to safe water, sanitation, Permanent Forum told. Media release [Internet]. New York: United Nations Economic and Social Council [cited 2013 Jan 3]. Available from: http://www.un.org/News/Press/docs/2011/hr5061.doc.htm

[UNGA] United Nations General Assembly. 2010. Resolution on the human right to water and sanitation. UN doc. A/RES/64/292.

[UNHRC] United Nations Human Rights Council. 2010. Resolution on Human rights and access to safe drinking water and sanitation. UN doc. A/HRC/RES/15/9.

Vanclay F. 2003. International Principles for Social Impact Assessment. Impact Assessment and Project Appraisal 21(1):5-11.

Vanclay F, Esteves AM. 2011. Current issues and trends in social impact assessment. In: Vanclay F, Esteves AM, editors. New Directions in Social Impact Assessment: Conceptual and Methodological Advances. Cheltenham, UK: Edward Elgar; p. 3-19.

van Schooten M, Vanclay F, Slootweg R. 2006. Conceptualizing social change processes and social impacts. In: Becker HA, Vanclay F, editors. The International Handbook of Social Impact Assessment: Conceptual and Methodological Advances. Cheltenham: Edward Elgar; p. 74-91.

Weirtz JV. 2009. When Best Water Use Efficiency is Not Enough, What Can the Mining Industry Do?. In: Water in Mining 2009 Conference Proceedings; 2009 Sep 15-17; Perth. Carlton (Australia): Australasian Institute of Mining and Metallurgy.

Winkler MS, Divall MJ, Krieger GR, Balge MZ, Singer BH, Utzinger J. 2011. Assessing health impacts in complex eco-epidemiological settings in the humid tropics: The centrality of scoping. Environ Impact Assess Rev. 31(3):310-319.

Woodley A. 2012. A Comparison of Three Models for Mine Water Management. In: Valenzuela F, Wiertz J, editors. Water in Mining 2012. Proceedings of the 3rd International Conference on Water Management in the Mining Industry; Santiago (Chile). Santiago: Gecamin.

World Bank. 2011. World Development Report 2012: Gender Equality and Development. [Internet]. Washington DC: International Bank for Reconstruction and Development and World Bank [cited 2012 30 Dec]. Available from: http://siteresources.worldbank.org/INTWDR2012/Resources/7778105-1299699968583/7786210-1315936222006/Complete-Report.pdf

World Bank, FAO, and IFAD. 2009. Gender in Agriculture Sourcebook [Internet]. Washington, DC: World Bank; [cited 2012 Oct 1]. Available from: http://siteresources.worldbank.org/INTGENAGRLIVSOUBOOK/Resources/CompleteBook.pdf

[WBCSD] World Business Council for Sustainable Development. Global Water Tool [Internet]. 2011. World Business Council for Sustainable Development; [cited 2011 October 20]. Available from: http://www.wbcsd.org/templates/TemplateWBCSD5/layout.asp?type=p&MenuId=MTc1Mg&doOpen=1&ClickMenu=LeftMenu

[WHO] World Health Organization. 2012a. Children: reducing mortality, Fact sheet N°178. [Internet]. [Geneva]: World Health Organization; [cited 2012 October 19].Available from: http://www.who.int/mediacentre/factsheets/fs178/en/index.html

[WHO] World Health Organization. 2012b. Health through safe drinking water and basic sanitation [Internet]. [Geneva]: World Health Organization; [cited 2012 October 19]. Available from: http://www.who.int/water_sanitation_health/mdg1/en/index.html

World Water Assessment Programme. 2009. The United Nations World Water Development Report 3: Water in a Changing World [Internet]. Paris: UNESCO and London: Earthscan; [cited 2011 Sep 1]. Available from: http://unesdoc.unesco.org/images/0018/001819/181993e.pdf

List of Figures

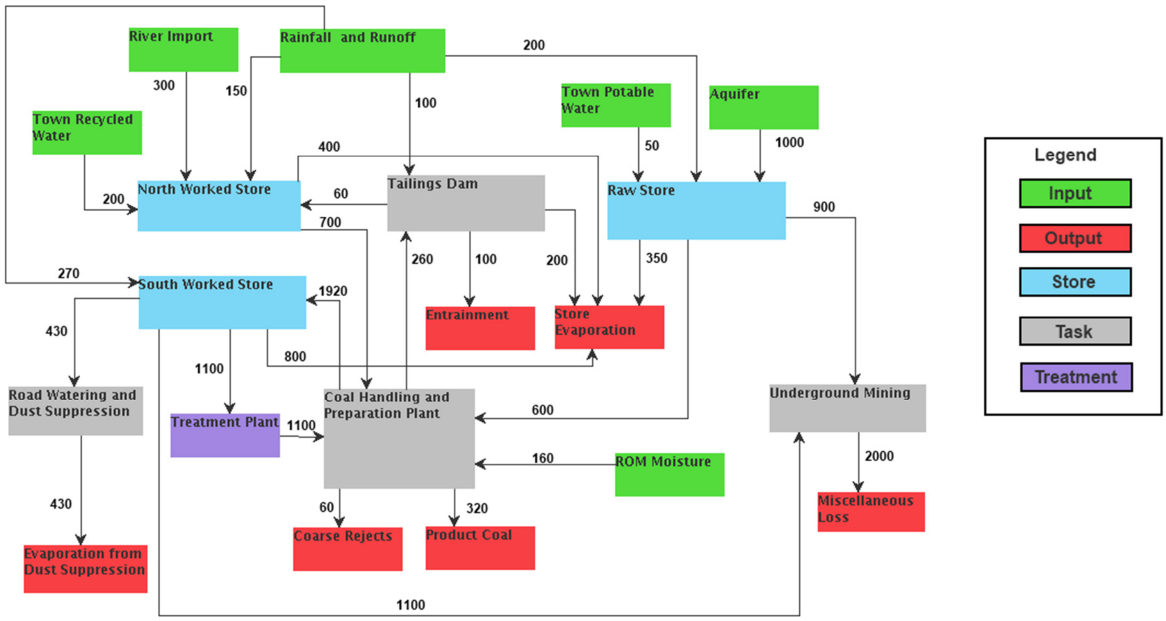

Figure 1: Water flow diagram (Woodley 2012)