

The Richards Bay Clean Air Association: A Case Study for Success in Participatory Air Quality Management

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Abstract

Increasing population growth and rapid urbanisation in South Africa's major centres have resulted in a race for geographical space. The proximity of residential areas to industries is decreasing, and with this, the concern for air quality impacts on people's health. More stringent regulations and the roll-out of atmospheric emission licenses have attempted to curb this concern, at least from a legislative perspective, by limiting the levels of exposure to potentially harmful pollutants. However, implementation, accountability and active community involvement remain a problem in many areas across the country. Nevertheless, success stories in which public and private entities work together for better air quality management, do exist and offer an opportunity for learning. Established 17 years ago in response to a concern for the health of people living and working in Richards Bay, the Richards Bay Clean Air Association (RBCAA) brings together industry, government and the community with the common goals of improving air quality in the region and encouraging polluters to take responsibility for their actions. The tried and tested formula, and long term success of the RBCAA is a demonstration of the fact that integrated air quality management is not limited to the local authority and is better accomplished as a collective. This paper outlines the strengths and common obstacles faced by the RBCAA, with the goal of showcasing a template for success in unlocking clean air opportunities for all.

Keywords

air quality, industry, government, community, association

Introduction

On 17 October 2013, the International Agency for Research on Cancer (IARC)¹ declared that air pollution in its entirety is a potential carcinogen along with known dangers such as asbestos, tobacco and ultraviolet radiation. Accounting for over 220,000 lung cancer deaths worldwide in 2010, the agency now considers air pollution to be a serious environmental carcinogen. This is not a verified scientific statement. What type of pollutants in the air are we talking about? This is a typical popular (alarmist) statement which should be queried. It is like saying we should stop breathe to live longer!

In South Africa, the air quality is generally considered to be good. However, there are a number of "hotspots" around the country where severe air quality problems are experienced (DEA 2005). High ambient sulphur dioxide (SO₂) and fine particulate (PM₁₀) concentrations are common in these areas and primarily result of fossil fuel burning in the residential, industrial and power generation sectors (Scorgie 2012).

In 2007 an estimated 3.7% of national cardiopulmonary disease

related deaths and 5.1% of trachea, bronchus and lung cancers in adults older than 30 years were attributed to ambient air pollution (CSIR 2012).

As a result of the rising population and rapid urbanisation in South Africa's major centres, the decreasing proximity of residential areas to industries, mine dumps, major traffic routes and other pollution sources is increasing and with this, the concern for people's health. Furthermore, economic development remains a priority and with this, come developments that affect air quality (National Development Plan 2011).

From a legal perspective, effective air pollution control was historically hindered by the absence of enabling legislation and cooperative governance (Scorgie, 2012). The promulgation of the National Environmental Management: Air Quality Act (Act 39 of 2004) represented a major step forward in the evolution of air quality management within South Africa. Many local governments have struggled with the implementation of the Act in light of poor budget allocations and skills shortages, leaving the authorities under-resourced, overwhelmed and unable

¹IARC - Italian Association for Cancer Research - is a cancer agency of the World Health Organization, which is based in Lyon, France.

to cope with the growing demands associated with air quality management.

Richards Bay, the case study area for this paper, is no exception. As a result of concerns regarding the levels of air pollution in the Richards Bay area, the Richards Bay Clean Air Association (RBCAA), a Section 21 company (not for gain) was established in 1997, prior to the promulgation of the Air Quality Act. Yet the Association remains both relevant and desired.

Opportunities exist for associations such as the RBCAA to augment the implementation of regulatory structures through participatory air quality management.

Using the RBCAA as a case study, this paper aims to determine how the Association is able to achieve participatory air quality management.

To answer this, we investigated the benefit of the RBCAA to industry, the community and local government to identify the strengths and common obstacles faced by the Association.

We also examined how different role players (civil society, industry, government and experts) work together for one common purpose, namely to tackle air quality problems within a given air shed and thereby unlocking clean air opportunities for all.

Methodology

Information collected for the purposes of this study comprised of the authors' experience², a literature review and non-random purposive³ formal and informal stakeholder interviews (Patton 1990).

Eight key areas defining the RBCAA were identified for scrutiny. These included:

- Complaints handling and public participation.
- Data collection and reporting.
- Management structures – checks and balances.
- Accountability for pollution sources.
- Research and data usage.
- Air quality expertise within the association.
- Peer review of projects that have a potential air quality impact.
- Opportunities and challenges for collaboration.

Case study area

Richards Bay is located within the City of uMhlatuze, on the East coast of KwaZulu-Natal. The Port of Richards Bay is Africa's largest port with substantial bulk handling capacity and is

home to the largest single coal handling facility in the world. The area incorporates various forms of commercial, light and heavy industrial activities, including two aluminium smelters, a kraft process paper mill, a phosphoric acid fertilizer plant, a ferrochrome plant, a mineral refining plant, sand mining activities and an expanding industrial development zone (IDZ). These industries have been the focus of most air quality concerns in the region (Umoya-Nilu 2014), although sugar cane burning, pesticide usage and dust associated with agricultural processes are also common.

The Association's history in brief

A petition against an emissions incident in 1994 at the Indian Ocean fertilizers (now Foskor) that forced the evacuation of the central business district, became the turning point that galvanized public pressure to resolve air pollution issues in Richards Bay (Savides 2011; Camminga 2014).

The RBCAA was established in the wake of this incident, spearheaded by ordinary concerned local residents.

The organisation gained traction over the three year period subsequent to the incident, and was able to formally register as a Section 21 company in 1997. Ever since, the RBCAA has existed with voluntary membership comprising the founder members as part of the initial public members, the public sector (represented through civil organisations), industry, and government. (Be careful here. The founding members were also "public".)

Operating as a non-profit company, the association system is financed by its members using the 'polluter pays' principle. According to its Memorandum of Incorporation, RBCAA aims to "engage in research, primarily data capturing, monitoring and prediction of air quality in the City of uMhlatuze area, KwaZulu-Natal, South Africa, or such other areas as determined by the company's directors, against national and international air quality standards."

In order to achieve this, the RBCAA draws on four key components to measure, evaluate and report on the air quality in Richards Bay: (i) complaints, (ii) ambient air quality monitoring, (iii) ; emissions inventories and (iv) dispersion simulations.

According to the RBCAA Memorandum of Incorporation, key objectives of the RBCAA include (but, are not limited to):

- Ensuring that the information provided to and derived from the Association is demonstrably of the highest quality that may reasonably be achieved.
- Ensuring that the information so derived is available to all interested and affected parties and that the results will be

² Golder Associates Africa was appointed to manage the operation of the RBCAA monitoring network in May 2013.

Richards Bay Minerals is a member of the RBCAA Management Committee (MANCO)

³ According to Neuman (1997), a researcher may use non-random purposive sampling for interviews in 3 cases: to select unique cases that are specifically informative; to select members of a difficult-to-reach population; and where the researcher wants to identify particular types of cases for in-depth investigation. All these satisfied our criteria.

interpreted in such a way that they are readily understood by all parties.

- Serving as a formal platform for communication between industry and public in relation to air quality.
- Providing industry and government authorities with support in terms of air quality data, statistics and information.
- Highlighting potential risks and impacts related to new developments within the area and assist to maintain a balance between economic growth and a safe social environment.
- Encouraging and supporting improvement initiatives related to industry compliance in relation to air quality.
- Facilitating air emission complaints by all stakeholders and corrective action and responses to such by industry and organisations.
- Recording ambient air monitoring results to assist members in complying with their respective Atmospheric Emission License requirements.
- Modelling and graphically reporting emission dispersion to assist industry to assess impacts and to inform the general public. (Source?)

- Pollution sources are labouring to improve matters in the interest of not only legislative requirements, but also public perception.

The complaints are documented in a complaints log and categorised by emissions source, complaints type, and location of the complainant at the time of the incident. The complaints log is published in a monthly report adapted for the local newspaper and is freely available (where?) to the public for scrutiny.

This complaints procedure is reviewed annually to ensure that the system is effective, practical and easily implemented with a clear definition of the roles and responsibilities of all parties involved.

The RBCAA has received and apportioned over 3000 complaints in the past fourteen years (2000 – 2013) (Figure 1). This number could potentially be more were it not for the low level of access to internet and newspapers which remains a challenge, especially in the informal settlements of the City of uMhlatuze. According to the 2011 census, nearly 65% of households in South Africa do not have access to the internet (StatsSA, 2012), a statistic that should be carefully considered when establishing means of communication.

Investigating the success of the RBCAA

Eight key areas defining the RBCAA were identified. These are discussed in terms of the strengths and common obstacles faced by the Association with the goal of showcasing the RBCAA as template for success.

Complaints handling and public participation

According to RBCAA’s 2013 Annual Report, complaints are predominantly received in response to odour, clinical symptoms, abnormal visible emissions and smoke. The RBCAA has a formal complaints procedure, allowing any concerned party to lodge an air quality complaint via telephone, text message, email, its website, or verbally. Once received, the complaints are distributed to the member industries within 24 hours for resolution and source identification. Member industries in the affected area are then expected to respond within 24 hours to these complaints.

The complaints are followed up, ensuring that the incident is resolved amicably, and crucially, informing the concerned party of the source of the resolution.

As a result:

- Complainants have a sense of closure and empowerment in knowing that their experience/discomfort did not go unnoticed, and the relevant parties have been held responsible.
- Complainants understand what they have been exposed to, dispelling or justifying fears associated with symptoms such as nausea, headaches and difficulty breathing.

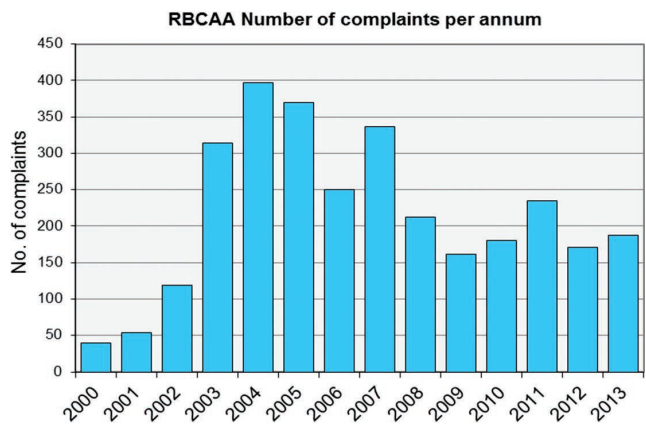


Figure 1: Number of complaints received by the RBCAA from 2000 to 2013.

Data collection and reporting

Since 1997, the association has grown and established a real time monitoring network able to characterise the local ambient air quality by monitoring ground level pollutant concentrations. The monitoring network, operated, maintained and managed by an external service provider, comprises 11 continuous monitoring stations, recording meteorological data, SO₂, PM₁₀ and Total Reduced Sulphide (TRS) concentrations (Figure 2).

The monitoring and data collection network is robust and well maintained, with a system in place that satisfies the South Africa National Accreditation System (SANAS) requirements. (GAA, 2014). Furthermore, the appointment of an external service provider allows the RBCAA to remain objective and independent from the results.

Data collected from the RBCAA stations, together with emissions inventory data supplied by industry, is used in the HAWK real-time air dispersion model to predict pollution concentrations between the monitoring points. While the HAWK model is not a prescribed regulatory model⁴, it allows for near real-time dispersion simulations, with the added benefit of utilising actual recorded meteorological data. It is for this reason the HAWK also used to undertake case studies to determine the source of measured exceedances when a single source cannot be identified or apportioned.

The RBCAA also makes use of the regulatory prescribed CALPUFF air dispersion model on an annual basis to support and provide a comparison for the HAWK results.

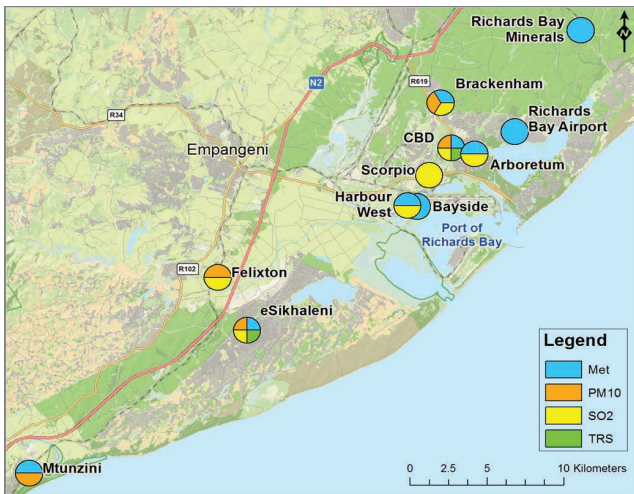


Figure 2: Location of the RBCAA monitoring stations.

The maintenance and operation of the monitoring network accompanied by the cost of service providers and license agreements, makes running an association such as this a costly affair. Furthermore, financial constraints associated with the “polluter pays” mean that as electricity prices increase and industries reduce emissions, the RBCAA must develop sustainable strategies that will ensure the continuation of the association and its network. Common challenges associated with the operation of the network include:

- Power failures.
- Network connection failures.
- Temperamental instruments.

If left unresolved, such incidents can result in data capture falling below the 90% data recover rate required by SANAS for the data to be considered reliable. The RBCAA was able to overcome such obstacles by having a dedicated, responsible person, readily available to ensure that all the instruments are in good working condition. While this ensures an operational network, the costs associated with dedicated, skilled external service providers can be a challenge and needs to be taken into account before attempting to run such a system.

Management structures - checks and balances

There is a certain level of accountability that is required of a Section 21 company⁵. At the outset, due to the complexity of the compilation of the Memorandum of Incorporation, the services of a legal practitioner are recommended to assist in the preparation of the documentation.

A Section 21 company must also meet the following criteria:

- There must be at least 7 members and at least 2 directors.
- Be established for a lawful objective.
- Have as its main objective the promotion of religion, the arts, science, education, charity, social activity or a communal or group interest.
- Only use its income and property to promote the main objective.
- Not distribute its money or property to the members or staff unless they are being paid for work they have done.
- Keep financial and accounting records.
- Hold an annual general meeting (AGM).
- Appoint official, registered auditors.
- Have a registered physical address – not just a post box.

In addition to meeting the above criteria, the RBCAA holds a number of monthly meetings of the Management Committee (MANCO), quarterly meetings of the Board of Directors and AGMs. Progress with regards to the monitoring network, status of air quality, the association’s budget and efficient management of the RBCAA are discussed during these meetings.

Aside from the costs associated with meeting the legal and financial criteria, maintaining the attendance and participation at the meetings can be a challenge and requires continuous attention and follow-up. Similarly, regular changes in industry representatives can affect continuity of the meetings as new representatives require time to familiarise themselves with the proceedings.

Accountability for pollution sources

According to Sandy Camminga, one of the founding members and current MANCO chair, “transparency from industry with regards to air emissions and especially significant process changes has greatly improved from the initial years of the association”. This can be attributed to the trust based collaboration within the association. In fact, for industry members, the RBCAA has been a useful partner in ensuring that air quality abatement is prioritized and given the financial muscle it requires. Industries are requested to investigate and promptly respond to complaints from the public with precise reason of the status of the industry at a specific time when a complaint was made. Complaints that are not related to the member industries are passed on to the City of uMhlatuze and the uThungulu District Municipality air quality management units for resolution and

⁴ According to South Africa Government Notice (GNR) No. 533 (11 July 2014)

⁵ Section 21 companies are governed by the Companies Act 61 of 1973 as amended 2005

report back to a particular entity where the source is determined. While some challenges associated with poor reporting are still present (Camminga 2014), these are rare and the commitment shown by industry representatives in solving air quality issues is a testament to the success of the Association in achieving its objectives.

Research and data use

Students, researchers, experts, consultancy firms, industry and government have made use of the RBCAA's long term data record in support of improving air quality management through research and modelling.

Due to the proximity of the industries to the monitoring stations and each other, industries are able to make use of the continuous, online datasets without each having to install, operate and maintain their own ambient monitoring network. It also allows industry to maintain an independence from the data. This greatly reduces costs for individual industries regarding the running of own air quality stations. Also the shared data ensures that it is easier and more practicable to apportion pollution sources for incidents resolution.

In collaboration with governmental institutions and industries, the RBCAA also undertake research projects. Examples include:

- A study on airborne spores in the Richards Bay area. A temporary pollen monitoring network was established in the area between 2001 and 2004 to monitor seasonal trends and to ascertain the origin and source of actual potential or health hazards from vegetation (Camminga 2014). The study found distinctive trends recorded at four sites over the three year monitoring period (Renaut and Bamford 2004), including:
- Elevated amounts of grass pollen, posing a moderate to high allergenic risk during August and September.
- A smaller increase in grass pollen numbers may pose an allergenic risk to sensitized individuals during mid to late summer: January to March.
- High quantities of fungal spores recorded annually during February and April, with the highest number of spores recorded during March.
- Fungal spore numbers regularly exceeded the high allergenic risk levels during the late autumn peak.

Through the special projects committee, the RBCAA is currently in the process of initiating a monitoring program for Hydrogen Fluoride (GAA 2014).

Air quality expertise within the association

The RBCAA has a wealth of air quality experience and expertise available at its disposal to assist in achieving its objectives by virtue of voluntary membership. Members include: BHP Billiton, Collateral Trading, Foskor, Grindrod, Island View Storage, Lafarge, Mondi Richards Bay, Mpact, Richards Bay Coal Terminal, Richards Bay Minerals, TATA Steel, Tongaat Hulett,

Transnet Ports Terminal, Transnet National Ports Authority, Tronox, the Zululand Fire Protection Association and founder member Sandy Camminga.

Together, as captured in monthly minutes, experts in the Management Committee as well as Directors from member industries encourage new ideas and offer opportunities for collaboration and problem solving ensuring that there is always continuous improvement.

Peer review of projects that have a potential air quality impact

In addition to monitoring and evaluation, the RBCAA adds value to local air quality management by undertaking peer reviews on projects that have a potential to impact negatively on the environment and particularly the local air shed. This is mainly achieved through Environmental Impact Assessment (EIA) reviews by the EIA committee.

The RBCAA EIA committee reviews EIAs specifically related to air quality. These include EIAs for member industries as well as non-member industries. To avoid conflict of interest and maintain objectivity, a member industry/company proposing a development is excluded from reviewing their own EIA.

In 2011, Savides reported in the Zululand Observer newspaper, that: *"the RBCAA is always there when EIAs are in progress, adding its valuable scientific data to the pool of knowledge capital, fearlessly challenging potentially harmful outcomes, and advising on mitigation measures so that industry can expand without compromising the man in the street"*.

Opportunities and challenges for collaboration

The RBCAA meteorological and measured pollutant concentration data is fed directly into the South African Air Quality Information System (SAAQIS), run by the South African Weather Service. In so doing, the information is made freely available to the government, industry and public nationally.

While the Provincial government and City of uMhlatuze played an important role in assisting in the initial establishment of the RBCAA, mandates preclude them from actively participating as a member of the RBCAA. However, observatory opportunities do exist which would allow the local Municipality to draw on the experience and expertise of the RBCAA.

The uThungulu District Municipality Air Quality Management Plan (UDM-AQMP) currently in development, presents an ideal opportunity for collaboration. The RBCAA has already provided valuable input towards the development of the AQMP and continues to do so through the due process (Umoya-Nilu 2014). The success of the Association and years of experience will make the RBCAA a highly beneficial partner in the successful implementation of the local UDM- AQMP.

In addition, as part of their mandate, the uMhlatuze Municipality is currently in the process of installing a monitoring network within Richards Bay area. This initiative presents a further opportunity for collaboration, data sharing and ultimately expansion the existing network coverage.

The RBCAA responded to a need for air quality monitoring at a time when there were no such systems in place in the region. Thus, rather than replicating the new governmental mandate for monitoring, the RBCAA is able to compliment and support this initiative, bringing with it a long term data record, established relationships, technical expertise and the trust of the local community.

Conclusions

It is clear that industry, civil society and local government have an important role to play in good air quality and environmental management.

In the words of Jim Phelps, formerly of the Zululand Environmental Alliance (ZEAL), in (Savides 2011): *“the RBCAA has done its best to work with polluting industries while raising serious concerns about air pollution in Richards Bay for the sake of the community and environmental health.”*

The tried and tested formula and long term success of the RBCAA strengthens the fact that integrated air quality management is not limited to the the local authority.

Three key threads run through the RBCAA; (i) good management structures, (ii) participation and (iii) member commitment, without which the association would not have endured.

In addition, the peer and EIA review mechanism is an important aspect to ensuring quality service delivery and proper environmental control.

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