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Our File No. 20035
September 4, 2001

VIA ELECTRONIC MAIL

The Honourable Dennis R. O'Connor
Commissioner
The Walkerton Inquiry
180 Dundas Street West, 22nd Floor
Toronto, Ontario
M5G 1Z8

Dear Commissioner O'Connor:

Re: Walkerton Inquiry - Part II - Ontario Water Works Association ("OWWA") and Ontario Municipal Water Association ("OMWA") - Original Research Report - Issue 11 - Effective Water Utility Management and Organizational Behaviour - prepared by Mr. Allan T. Davies, P. Eng. on behalf of OWWA/OMWA

As you are aware I am counsel to the OWWA/OMWA, two organizations with Party status in Part II of the Inquiry. In this regard, I am attaching the above referred to report and recommendations prepared by Mr. Allan T. Davies, P. Eng. for OWWA/OMWA. We would ask that this review be placed on the Commission website, and that Mr. Davies be given an opportunity to appear before you during the Public Hearings to speak to his report and recommendations.

This report is the ninth of ten submission documents to be filed by OWWA/OMWA in the Part II process. I would ask that if Mr. Davies is permitted to appear before you that I also be permitted to attend with him to assist the Commission, where necessary, in understanding the link between the above document and the other OWWA/OMWA submission documents previously filed and to follow.

I trust the above is satisfactory.

Yours truly,

"Joseph Castrilli"

Joseph F. Castrilli

Encl.
c.c. James Van Loon
c.c. Allan T. Davies, consultant to OWWA/OMWA
c.c. Rod Holme, OWWA
c.c. Jim Craig, OMWA
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EFFECTIVE WATER UTILITY MANAGEMENT

AND

ORGANIZATIONAL BEHAVIOUR

A REPORT ON SELECTED ISSUE 11 MATTERS
FOR THE
WALKERTON INQUIRY

August 2001

Prepared for:

The Honourable Dennis R. O'Connor
Commissioner
The Walkerton Inquiry

Prepared by:

Allan T. Davies, P. Eng., on behalf of the
Ontario Municipal Water Association (OMWA) and the
Ontario Water Works Association (OWWA), a section of the AWWA.

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

The tragic events surrounding the supply of unsafe drinking water in Walkerton have provided Canadians with renewed awareness of how fundamental safe drinking water is to a community's public health. Attention has been focused on a variety of issues such as contamination of source water, how regulations are created then enforced, and the role of the organizations that supply drinking water. This paper builds on material already presented to Part II of the Walkerton Inquiry by offering methods to achieve the recommended continuous improvement and total quality management approaches through practices already being embraced by water utilities in North America.

Water utilities have traditionally been very conservative organizations. Numerous issues are emerging that are requiring the transformation of water utility organizations into a more competitive, customer-focussed, continuous improvement culture.

Water utilities must strive to meet and exceed the regulations and expectations of their consumers. To achieve this goal, a sustainable organization structure based upon a purposeful business-management strategy needs to be created for each water utility. Then a continuous improvement mechanism verified through independent third party accreditation can be adopted. Accreditation will verify that standards of best practice are being used to deliver high quality service. The results of regular accreditation will be shared with the community, who will then judge and require improvements from those organizations that did not achieve acceptable levels of performance. Using the principles presented in this report, all utilities will be capable of continuous improvement and customer satisfaction.

AWWA is continuing to develop and implement a quality improvement program and best practice standards. Ten new standards outlining performance requirements and verification procedures for water utilities are part of this program. AWWA is also working with third party accreditation programs to ensure verification of these performance standards.

This fundamental approach is consistent with the recommendations contained in several other papers produced for the Inquiry. It has the advantage of having been developed by drinking water professionals in conjunction with leading quality improvement organizations, and with the involvement of global leaders such as the Water Environment Federation and the Australian Water Association. It is also applicable to any chosen utility organizational model and has been used in the United States by the full variety of public and private organizations in existence in that country.

II. INTRODUCTION

The E. coli outbreak in Walkerton has provided Canadians with a renewed awareness of the role of safe drinking water and the impact unsafe water can have on a community's public health. Those Ontario individuals and organizations that are intimately involved in the day to day affairs of the water industry have also questioned why the Walkerton event occurred. The circumstances surrounding the supply of unsafe drinking water are contrary to the daily achievements of the water industry in most communities served throughout Ontario and across Canada. The individuals and organizations that daily excel at providing safe drinking water have a rich history upon which to build their traditions.

Public drinking water systems have been in existence for a considerable period of time. In fact the origins of collecting and transporting water, and the provision of the basic services can be traced back to early human settlements. "There are qanats (horizontal walls) in the Iranian desert three thousand years old, some of them still functioning." (Marq de Villiers, 68). One of the first recorded writings on water supply was by Sextus Julius Frontinus, water commissioner of the City of Rome. The Frontinus manuscripts originated in 97 AD and were a handbook for future Roman water commissioners. The significance of water supply was recognized by Frontinus as he wrote "…an emperor has now conferred upon me the duties of water commissioner, (or water works superintendent, curator aquarum), duties contributing partly to the convenience, partly to the health, even to the safety of the city,…". (Clemens Herschel, 27).

The Frontinus manuscripts describe the sources of water, aqueduct construction, measurement of flow, and rights for water extraction. The licence to withdraw water contained the regulations and fines that applied to all Roman citizens, which ensured the overall maintenance of the supply to Rome. "Frontinus was a member of a reform administration. As such he undertook to establish regulations and penalties for their violation. His efforts to maintain the water supply free of pollution is best exemplified by his regulation reading as follows: 'No one shall with malice pollute the waters where they issue publicly. Should anyone pollute them, his fine shall be ten thousand sestertii.' " (Clemens Herschel, 13). In Frontinus' times, the water commissioner was both the operator and the regulator; and the manuscripts include complete ordinances for Rome's water supply system.

Unfortunately for civilization, much of the learning from Roman times was lost, and shorter life spans over the next centuries can be attributed partly to reliance on consumption of polluted waters. While the importance of ample water quantity was apparent, a clear understanding of drinking water quality was not

established. Aesthetic problems (appearance, taste, or smell) were the only guide to the suitability of drinking water.

“In 1855, epidemiologist Dr. John Snow proved that cholera was a waterborne disease by linking an outbreak of illness in London to a public well that was contaminate by sewage.” (USEPA, p.1). Based on this discovery, treatment of water by chlorine disinfection to kill harmful bacteria became a standard practice in the water industry. Canadian Federal guidelines were established in 1916, and initially set standards for the bacteriological quality of drinking water.

Despite the overall progress being made, Walkerton is not an isolated event. “A water system survey conducted by the Public Health Service in 1969 showed that only 60% of the water systems surveyed delivered water that met the U.S.A. Public Health Service standards.” (USEPA, 2) A similar review by Health Canada revealed that between 1974 and 1987, 32 waterborne outbreaks of bacterial origin (1122 cases) were reported. As we look at other Canadian community water systems with numerous boil water advisories, we observe that some of the organizational issues arising in Walkerton are not isolated. In fact, many small and large water systems have faced similar situations, without the same tragic consequences but all related to the failure of individuals and organizations to protect public health. The risks found in Walkerton have focused attention on the water industry and should be treated as an opportunity for all to open up lines of communication and work towards solutions.

Part II of the Walkerton Inquiry includes an examination of what the drinking water system in Ontario should look like in future. Among the areas in which the Commission seeks advice, according to the Commission's original and revised study lists of August and December 2000 respectively, is Issue 11: Management and Organizational Behaviour. The Commission defined the scope of Issue 11 as follows:

> " 'Why do good people do bad things?' What can be done about it through organizational design, separation of functions, leadership, transparency, independence. Are there machinery of government or public-private implications? What lessons can be drawn from well-performing organizations, concerned with analogous areas of public safety? How does one design for resilience in the face of inevitable error and ignorance? Why do essentials get under-funded? Compare theory and best practices elsewhere with the Ontario drinking water reality, at all scales. Where water supply and treatment is privately provided and publicly regulated, describe cases (e.g. France, UK, …Germany, Scandinavia, Canada and US), results/outcomes, best practices in terms of accountability, transparency, regulation, effective enforcement, costs, public input. Note the elements of accountability that need to be in place

> regardless of where the public-private interface lies or whether it exists at all. Suggest principles for structuring the production, regulation, and financing of potable water, plus concrete alternatives for the Ontario reality."

The Ontario Water Works Association and the Ontario Municipal Water Association (OWWA/OMWA) requested that I prepare a report addressing some of the above Commission concerns as they influence water utility performance. Part III of this report examines certain drivers of change that water utilities must be aware of and with which they must contend. Part IV reviews certain water utility success stories that point to possible solutions for application in Ontario. Part V of the report reviews questions of organizational design and structure including issues of water utility vision, sustainability, and programs to ensure continuous improvement in performance. Part VI of the report examines broadly the question of organizational behaviour by looking at key components of management strategy such as leadership, communications, and teamwork as well as the lessons reported by other Commission-sponsored reports on management theory. Part VII of the report examines questions of water utility ownership and control in terms of municipal utility governance, private organizations, and regional cooperation. Part VIII of the report provides recommendations to improve water utility performance and organizational behaviour in Ontario in future.

III. CHANGE DRIVERS

More water organizations are recognizing that traditional behaviors and structures will not allow them to achieve consumer confidence and sustainability goals in their communities. Expectations are changing from consumer, employee and key stakeholder groups. These expectations focus mainly on public health protection and cost efficiency. The trends will influence the future and where organizations need to go. These change drivers will affect the evolution of an organization through many pathways rather than down a chain of command. Those utilities that understand and effectively respond to the drivers of change will be the best positioned to be successful. The following nine change drivers are the most dominant challenges for water utilities.

A. Infrastructure

Infrastructure includes invested assets such as water treatment plants, reservoirs, pumping stations and piping. Many systems have infrastructure that is over 50 years old. Asset improvements through rehabilitation and replacement are required to maintain service levels. This need is likely greatest for pipelines. Many are facing the end of their useful life but, because they are buried underground, their exact condition is often unknown.

A major issue now is how to raise capital to fund infrastructure needs, and to understand the precise magnitude of such needs. There have been many studies undertaken in Canada and in the United States, and the numbers quoted vary considerably. The estimates do, however, have one thing in common – they are all large. The challenge therefore is to determine an equitable and feasible solution, since ultimately the costs will be borne by consumers, who may not receive the news of significant water rate increases favorably unless the situation is adequately explained.

B. Drinking Water Regulations

Standards already exist for numerous contaminants in water. It is expected that standards for additional contaminants will be introduced and existing standards will be further tightened. New man-made chemicals used in industry, agriculture and for pharmaceuticals have found their way into water supplies. We are also developing a better understanding and knowledge of microbial contaminants, including parasites. These contaminants will challenge existing treatment facilities, which will require optimization of existing processes or completely new technology. Such changes will require financial capacity and new employee skills to meet future requirements.

C. Environmental Regulations

Both federal and provincial legislation to monitor and reduce pollution will impact water utilities. Stricter control on the release of chlorine to the environment will immediately impact disinfection practices. Some of the treatment chemicals presently used may no longer be acceptable in the future and more sophisticated, less intrusive treatment technology will be implemented. Organizational change to meet these new paradigms will challenge most water utilities.

D. Sustainable Community Initiatives

As populations continue to grow, water resources may become more constrained. Outside the Great Lakes Basin, some water authorities are restricted in their ability to ensure the quantity of water available to consumers is sufficient. Water restrictions for gardening and irrigation are common practice. Most water authorities provide water conservation material, and others have financial incentives for consumers to replace old water fixtures with new, more efficient devices. Another area for action will be energy efficiency. Water authorities are large consumers of energy, primarily for pumping water and heating. Operational opportunities must be explored to reduce energy demand

while maintaining service levels. This is particularly true in a deregulated energy market.

E. Public Relations and Communications

Confidence in water authorities will diminish with increases in water tariffs and public concerns about (and perceptions of) unsafe water. Water utilities, whether public or private, are no longer unnoticed monopolies. Special interest or advocacy groups will provide different viewpoints and sometimes-conflicting statements. To consumers the Internet has become a powerful tool for rapid access to information. As consumers become better informed, they will demand greater involvement in the decision making process. All these actions will challenge water providers as never before.

Organizations that are perceived as responsive to the needs and interests of their consumers will become benchmarks throughout the water business. Information and knowledge can be leveraged to gain trust and develop new relationships. To achieve this goal, water utilities must reach out and explain their role as guardians of public health. This requires new skills beyond the traditional financial and engineering roles water organizations have held. Proactive community relations will provide new alliances in the future.

F. Watershed Management

Since water authorities use either ground or surface water sources, they have a fundamental requirement to ensure the continued quality and quantity of the water resource. Total watershed management will drive usage patterns, water yields, pollution control and ecosystem enhancement. Significant cooperation opportunities with community interest groups will present themselves to water utilities. This will add value to other relationship issues. Accountability for water supply quantity and quality will afford water utility leadership roles in environmental areas.

G. Application of Information Technology

Technology will allow utilities to become more effective businesses, with improved efficiency and customer service. Technology will allow automation of many traditional labour-intensive activities. These include treatment plant operation, reduction of labour, chemicals and energy; monitoring and control of remote facilities and systems using SCADA; and information technology to improve communications, decision-making, and business transactions. Scheduling and maintenance management systems will enable infrastructure asset management to be optimized. Information technology and automation will

address all areas of the utility business and requires organizational strategies to optimize the benefit of these improvements.

H. Staffing and Employment

A changing work environment will force utilities to be increasingly flexible with their workforce and to reflect the diversity in the communities they serve. New skill sets will be required to manage and operate a utility. There will be a greater influence from non-technical skills - finance, customer relations, communications and legal. The culture of lower employee loyalty will make recruitment easier but retention more difficult. Automation may reduce staffing levels. Unions that exist in many water organizations will become increasingly concerned over job loss and membership reduction.

I. Economic Pressures

Economic pressure will drive utilities to embrace performance improvement initiatives. There is growing pressure to demonstrate that operations are efficient, and a reluctance to commit public resources when operations are not perceived to be efficient. To respond to this, water utilities are moving to demonstrate that they are as cost effective as any competitive business. A fundamental shift will be required from risk avoidance to risk management. Managers will have to routinely quantify risk and make rational, educated decisions. This will also lead to partnerships and knowledge sharing, more entrepreneurial thinking, new service offerings, and competitive actions in the market place.

J. Conclusions

The influences on water utilities are changing rapidly. Changes include new regulations arising from improved science, as well as higher staff and customer expectations. Such changes will continue at an accelerated pace in the future. It is clear that while some water utilities are adapting to the new requirements, many others are not meeting these challenges adequately.

IV. SUCCESS STORIES

A literature review was undertaken to appreciate how progressive organizations are changing to meet current organizational challenges. Authors from many water utilities describe varying processes they have utilized to achieve new levels of superior performance. Different change approaches are being undertaken, depending upon the individual organization and the

community served. No single process was observed from the review, since the needs of each organization are unique and leaders have recognized the value of site-specific approaches. There was a common thread in all papers that traditional management and conservative cultures of water utilities were being challenged by society. The drivers of change, as discussed in Part III, are forcing all water suppliers to understand and meet these changes.

A. The Changing Water Utility

The Changing Water Utility, (Westerhoff et al.) presents thirty-one case studies on water utilities across the USA. The studies examine how the utilities implemented programs to improve efficiency. The programs were categorized into five groups:

- Utility management;
- Internal improvement;
- Contract management;
- Managed competition; and
- Other contracted services.

The conclusions from this body of work are that each utility can achieve improvement with site specific approaches. The program implementation must be based upon individual utility needs and existing level of performance.

B. Developing Self-Renewal Capabilities in a Water Utility

Marlowe and Beaudet used a method to measure areas of organizational culture to identify strategic areas for change. They identified a particular water utility and then compared culture qualities against effective organizations and their ideal states. The three culture measurements were achievement orientation, bureaucratic orientation and task orientation. Bureaucratic and task cultures are security-oriented cultures in which staff is more concerned about jobs and personal security than accomplishing organization goals. “The water utility has a less clear achievement-oriented culture but stronger bureaucratic and task-oriented cultures than the ideal organization. In essence these data paint the picture of an organization with less-than-optimal cultures that wants to change to a more optimal state.”

C. Design and Operation Guidelines for Optimization of High-Rate Filtration Process

Cleasby, Dharmarajah, Sindt, and Baumann undertook a review of the operation of 21 successful high rate filtration treatment plants. The study

objective was to identify design features and operational practices of treatment plants that contributed to successful production of low turbidity water (at levels better than minimum standards). When a plant consistently produces low turbidity water, a higher level of public health can be achieved. Having local water suppliers provide the highest possible quality of water in a reliable and economical manner is the objective of all high performance water organizations.

This study produced a key finding. To achieve low turbidity water, both management and operators had to set an organizational goal directly related to water turbidity. They then had to commit to achieving the goal. Operational practices were more important than design features such as technical processes, chemical feed strategy and adequate facilities in achieving low turbidity water. When an improvement culture sets an objective, then implements a program to achieve it, a successful outcome is most likely to occur.

D. Avoiding the Nut Island Effect: Keeping Good Teams From Going Wrong

Well meaning teams, hard work, and shared visions also must be in symmetry with real world requirements. Paul Levy studied the performance of the Nut Island, Massachusetts utility. The similarities to Walkerton are pronounced. “I have found that each instance of the Nut Island effect features a similar set of antagonists – a dedicated, cohesive team and distracted senior managers – where conflict follows a predictable behaviour pattern through five stages.” (Levy, 2). Members of the team became task-oriented and lost sight of the big picture (Stage 1). They also became isolated and ideas were limited to those members who begin to make up their own rules (Stage 2). “These rules are terribly insidious because they foster in the team and its management the mistaken belief that its operations are running smoothly.” (Levy, 2). This also was demonstrated when laboratory results showed the plant was not performing in accordance with standards. The Nut Island team chose to ignore the results (Stage 3). When the results indicated nonconformance, they found a way to explain the results as incorrect and re-tested until the problem was resolved (Stage 4); but did not report the results to upper management or the regulator (Stage 5). “Part of self-deception involves wishful thinking – the common human tendency to reject information that clashes with the reality one wishes to see.” (Levy, 4). It also was incumbent upon the senior managers to recognize when results were being covered up and to prevent this from continuing. Both parties must share responsibility for poor performance. “I am convinced, though, that when good people are put in a situation in which they inexorably do the wrong things, it is not normal or unavoidable. It is tragic. It is a waste of human passion and energy, and a deep-seated threat to an organization’s mission and bottom line.”

E. The Role of Leadership and Culture in Achieving Goals

A case study of Butler County, Ohio by Tony Parrott outlines the importance of leadership and culture in the organization change process. Parrott states that public organizations do not take risks and certainly do not like to be exposed to scrutiny and public review. How does this style embrace a new culture and overcome inertia? Parrott's approach for a water utility, was strong leadership and clear direction. Permanent improvement required working with key cultural elements to sustain employee enthusiasm. The outcome for Butler County was major cost reductions while sustaining and then increasing effectiveness.

F. Providing Effective Customer Service and Public Information

A paper by Oswald and Lang demonstrates how an investor owned water utility in Connecticut (Bridgeport Hydraulic Company) took on the challenge of cultural change. The company was challenged to shed its monopoly mentality and meet and exceed consumer expectations. These expectations were defined in terms of consistent, high quality water with personal service. B.H.C. achieved the objective through customer feedback models, communications, management of performance, and flexible approaches. Employee compensation is tied to the performance measurement system, by which they become eligible for annual salary increases and bonus payments. Effective customer service and effective public information go hand in hand. They are critical issues facing water utilities, and B.H.C. provides an example of how understanding and managing these issues leads to success.

G. Meeting Drinking Water Requirements: A Small System Example

Thief River Falls is a small community in Minnesota. Lamm, Rude, Foelimi, and Meyer describe how high quality water was an essential requirement, but financial limitations required innovation. For more than a decade satisfying drinking water standards with aging water treatment plant facilities was a challenge. The financial limitations of a small community required the utility to structure an improvement program to resolve equipment deficiencies and meet drinking water standards. The first step was creation of a long-term improvement plan that included the financial impacts. The program allowed for a regulatory compliance agreement and time frame. This demonstrated the commitment to change. The approach allowed the utility to immediately address critical treatment inadequacies with limited finances while planning for long-term improvements to meet new regulations. The findings from this case study demonstrate that a phased approach with a financial plan can achieve a water quality improvement program. It also indicates that flexibility in the program is required since regulatory standards are in constant flux. Continuous

improvement programs are just as successful as short-term capital intensive programs.

H. Achieving Competitiveness Through Cultural Change

Ash and Rettie from the Colorado Springs Utility present a program of becoming and staying competitive. In the past, Colorado Springs was centered totally on ensuring an adequate supply of drinking water for growth. A new vision of competitiveness was required to overcome outdated processes and operations. The change did not happen without difficulties, skeptical employees, and time constraints, but a multitude of strategies overcame these obstacles. Changing the way people think and work together was achieved by moving from a hierarchical structure to an empowered team environment. Creating workforce flexibility, skill-based compensation, and unattended operations resulted in a more competitive utility. Worker safety, reliable customer service and responsiveness, water quality, and training were all preserved or improved in the transition. The result permanently changed the organization's culture to one of excellence, innovation, and continuous improvement.

I. Conclusions

From this literature review and based upon the cumulative experience of the OMWA/OWWA it is concluded that an organization must address actively the following two components to become successful:

- Structure and business strategy; and
- Behavior and management strategy.

This paper will now outline guiding principles to achieve water utility performance that would meet and surpass consumer expectations. The guiding principles apply to all water utilities, large or small.

V. ORGANIZATIONAL DESIGN STRUCTURE

The structure of water utilities reflects the design of formal relationships both internal and external that are key to the successful performance and results achieved. "Structure is an entity (such as an organization) made up of individual elements or parts (such as people, resources, aspirations, market trends, levels of competence, rewards systems, departmental mandates, and so on) that impact each other by the relationship they form. A structural relationship is one in which the various parts act upon each other, and consequently generate particular types of behavior." (Robert Fritz, 103)

For any organization to succeed there must be key structures in position. “Both successful and dysfunctional organizations may have highly intelligent and capable people, well-thought-out strategies, excellent products, and dedicated and caring team players.” (Robert Fritz, 3). Yet some organizations will succeed in changing and permanently increasing their capabilities, while others will move forward for a short period but eventually return to past practices. In “Corporate Tide”, Robert Fritz indicates that the key principle for advancement is understanding the way we structure our organizations. Organizations that take structural laws into account when redesigning themselves are most likely to succeed.

Many water utilities have gone through a process of re-engineering, benchmarking, self-directed teams, downsizing or similar organizational change efforts. “Typically, organizations take a quick look at mission, vision, and strategy, then jump into optimizing their processes without fully considering the impact of other aspects of the organization. The result is that improvements are NOT sustainable and are often derailed by cultural issues.” (Richard Gerstberger, 186). The organization becomes disillusioned when success does not occur and moves on to another process improvement program. This has been called the flavour of the month syndrome. When culture, leadership, process and strategy are not aligned, changes will not occur.

As we have recognized, water utilities tend to be municipal organizations, and change must also occur in this context. Layers of structural conflict will occur from the complexity and various mandates that exist. These layers must be understood so that the organization’s structure moves forward and does not return to past norms. When this understanding occurs and priorities for a new equilibrium result, the established goals can be sustained. The elements of good organizational structure include:

- The organization’s *vision* needs to be understood; and
- The business strategy must be established to describe how it will achieve *sustainability*.

These are discussed below in conjunction with a third element: *improvement programs*.

A. Vision

An organization’s vision must provide a statement of what it wants to achieve. This vision must be clear enough to be understood and be substantial enough to be meaningful. Any water utility organization, be it stand alone or part of a larger structure like a municipality, must have a clear vision, and must include the following principles:

- Providing an adequate water supply in a reliable manner;
- Ensuring high quality drinking water to the end user;
- Including input from and being accountable to the consumer.

This list is not all-inclusive and organizations could and should have a vision beyond the three stated herein; but these are mandatory. If any water organization acted in ways inconsistent with a purpose based upon these concepts, employees would be genuinely frustrated. Employees and individual units within the organization should be able to align their efforts. If deviance from the vision occurs, a self-correction mechanism will be spontaneously evident when the water utility genuinely believes in and follows its purpose.

These three concepts are based upon best management principles presented by the American Water Works Association (AWWA). The AWWA policy on drinking water quality states: “The most important goal of public water suppliers is that of providing an adequate supply of high-quality drinking water to the public.”

By establishing a well-phrased, easily understood organization vision, a water utility has established a conscience. By acting upon the vision with meaningful and consistent practices over a period of time, the culture of the organization will conform to these standards.

When the water utility has a unifying intention, that will be a key influence that guides major decisions. The organization’s vision cannot be taken lightly. It must be more than rhetoric or a plaque on the office wall. A truly meaningful organization vision is the foundation upon which all else will be built.

The vision serves two goals: (1) to unify the organization, and (2) to reinforce acceptable organization results and performance.

B. Sustainability

The World Commission on Environment and Development has defined sustainable development as follows: “Development is sustainable where it meets the needs of the present without compromising the ability of future generations to meet their own needs.” For the continued prosperity of water utilities, they must be able to meet the test of sustainability. The standard of sustainability is set through social, financial and environmental achievements. The water utility must have a business strategy for sustainability and through its reporting practices and verification must be able to consistently demonstrate success. Sustainability requires management tools to evaluate and continuously improve the water utility’s performance and progress.

"The sources of organization success. Whatever the specific changes sought, they are intended to promote success in some definable sense. That means knowing how organizations succeed, and what things help them do it more reliably, because those are the things that should be introduced and reinforced." (Kurt Finsterbusch, 260).

Three key business strategies are important to the achievement of sustainability. These are discussed below.

1. Financial Business Strategy

All water utilities require a financial business strategy. This ensures that water service is a self-sustaining enterprise. The AWWA policy on financing states: "Water utilities should receive sufficient revenues from water service, user charges, and capital charges, such as system development charges, to enable them to finance all operating and maintenance expenses and all capital costs (e.g. debt service payments)." Implementation of this business strategy can be balanced against other policy objectives, but the long-term financial integrity to meet the basic purpose cannot be compromised. Without adequate financial capacity to achieve change, including meeting new regulatory requirements that require capital expenditures, water utilities will not achieve the business strategy.

When confronted with these types of challenges, many water utilities traditionally demand grants from provincial or federal governments to provide capital to assist in financing these projects. With limited government money available, the required capital may not be forthcoming. Consequently, the risk of not achieving regulatory requirements increases. This also may demonstrate that consumers do not have a full appreciation of the value of water. The business strategy is then compromised from a social perspective.

2. Environmental Business Strategy

The second business strategy involves environmental stewardship. Natural water sources are recognized as an essential element of the environment. The AWWA Policy on Quality of Water Supply Sources states: "The quality of existing and potential sources of drinking water supply, including ground-water and surface water, shall be actively and aggressively protected and enhanced." To provide drinking water, water utilities should secure the water from the highest-quality source. Next, the organization must take an active role along with other stakeholders in understanding and protecting the watershed from existing and future contamination.

The water organization's source of water is the lifeblood for business success. The organization must have intimate knowledge of both the quality and

quantity of water that it will use. Therefore to be successful, it must have a business strategy to understand the variability of water quality, other competing uses of the supply, extraction versus long term supply needs, and sources of natural and man-made contamination.

3. Social Responsibility Business Strategy

The final business strategy concerns the social responsibilities of the water organization. Drinking water is essential for the well-being of the community it services. Many communities owe their existence to historical availability of a clean, ample source of water.

It is proposed, therefore, that a social principle within the business strategy of water supply utilities be formulated in accordance with the following:

- utilities have a duty to supply within their service territory;
- all customers should pay based upon cost of service with no cross subsidy;
- water suppliers should keep customers and stakeholders informed and involved in the decision-making process;
- water organizations should be involved in the community beyond water business concerns.

The duty to supply is a long-standing principle with regulated water monopolies. All customers within the service territory must be supplied with water. Water should not be used as a planning tool, with the implication that water is withheld from individuals or new developments on a discriminatory basis. The duty to supply produces some interesting challenges to the water supplier. An example is when new development and community growth exceed the availability of the existing natural supply source. Similarly, definition of the service territory or new leapfrog growth beyond existing pipes will stress a water utility. All these extremes have precedents and solutions are usually negotiated satisfactorily. Failing this, a court or utility board may arbitrate a solution.

The concept of user pay for water services has already been defined in the financial business strategy. From a social policy context, pricing that discriminates against the economically disadvantaged must also be discouraged. Cost of service models, such as AWWA Manual 22, outline how each customer class can be fairly allocated its appropriate share of drinking water supply requirements. The strict application of the full cost of service also excludes such concepts as subsidized water to various socio-economic classes and the right to turn off water for nonpayment. Canada’s social security services should be used to meet these social responsibilities to ensure that public health requirements for a secure water supply are met. All utilities (gas, electric, telephone, cable, etc.) face identical challenges as to social responsibilities versus business strategies.

OWWA/OMWA support the need to identify and ensure this need is met, but this must be accomplished within the context of provincial and federal social policy instruments. Redistribution of wealth through taxes is a more appropriate policy than utility cross-subsidization.

Water utilities must be actively involved in the communities they serve. A business strategy for public consultation and relations are paramount to the success of the organization. The AWWA Policy on Public Involvement states that:

> "Water suppliers have a distinctly public role by virtue of their providing a service essential to public health and well being and their managing a sustainable natural resource. Involving the public in decision making is integral to fulfilling that public role. It is also important because many drinking water issues, including adequacy of supply, water quality, rates, and conservation, are not only technical issues; they are also social, political, personal health, and economic issues. As such, they are best resolved through a process of meaningful dialogue with concerned parties and the public".

Public involvement incorporates a wide range of communication processes. Depending on the situation, any or all of the following techniques may be necessary:

- research;
- information dissemination;
- advisory groups;
- facilitated workshops and meetings;
- conflict resolution.

In any event, public involvement must be implemented early and public input must be linked to decisions to be effective. However, the type of involvement appropriate for individual water suppliers and their communities will vary according to the issues, public expectations, and the circumstances.

Only with a meaningful business strategy around social issues can the water organization be truly successful in the community. Without articulating these concepts, the organization will not have the support and understanding regarding the value they bring into the community.

C. Improvement Programs

Utilities recognize the need for health and environmental regulations to protect the public. However, often they are best equipped and experienced to decide how best to achieve these levels of quality. Accreditation is the program

that has the ability to verify that industry best practices are being employed to produce water of the highest quality (which will usually exceed the minimum established by law). By accrediting their operations, utilities will be able to assure customers and regulators that they are conforming to best practices and minimize the need for additional regulation.

Setting regulations and then monitoring for compliance has evolved, but we must be realistic about the outcomes achieved. Of all water utilities with compliance difficulties, those that serve smaller populations account for a large proportion of the effort involving corrective actions.

A fundamental shift in approach to this issue must be seriously considered.

1. AWWA QualServe Program

The AWWA QualServe utility quality improvement program is a suite of integrated services designed to assist utilities in their quest for excellence. The QualServe program is built upon the following concepts:

- *Self-Assessment* – water utilities administer a survey to their employees and obtain their opinions regarding conformance with best practices. This inward looking process helps management/leadership compare their strategic gap analysis with the rest of the organization. It helps identify relatively weak areas for self-improvement.

- *Peer Review* – a team of trained utility professionals visits the water organization and evaluates the operation in the best practice areas. Areas of strength and opportunities for improvement are identified. This again allows the water utility to set strategies for improvement.

- *Benchmarking* – this service provides utilities an opportunity to compare performance on both a metric and process basis. Water utilities and other organizations pool information in a database, which will assist in identifying best practices. The individual water utility can identify specific weakness and set objectives for improvement.

- *Accreditation* – a separate and complementary program that relies upon an independent audit process to verify conformance with recognized best practices. It is discussed further below.

The QualServe program also proposes that it be subject to continuous review and refinement that includes input from consultants, utility leaders, and technical experts. In this way the program is constantly being revised and improved to meet the contemporary and foreseeable needs of water utilities.

The heart of the QualServe program as it presently exists is the twenty areas of business process categories. They are arranged into four systems typical to water utilities. The self-assessment and peer review components of the program use these categories to decide where utilities should focus their attention first:

- *Organization Development*
    - leadership and organization
    - continuous improvement
    - human resource management
    - health and safety management
    - emergency planning and response
- *Water Operations*
    - water resource management
    - water treatment plant operations and management
    - water distribution/reservoir operations and management
    - water quality management
- *Customer Relations*
    - customer service
    - customer strategy and satisfaction
    - customer accounts management
    - government, business and community relations
- *Business Operations*
    - capital improvement program
    - strategic planning
    - financial and fiscal management
    - engineering
    - information management systems
    - plant and real property management
    - purchasing

The QualServe program also has been adapted for use by small water utilities. The AWWA capacity development initiative for smaller utilities highlights a number of specific tools. These tools can be used to improve utility technical,

financial and behavioral capabilities. Key practices of highly effective water utilities (Beecher, 6) include:

- Manage information
- Follow a budget
- Practice self-improvement
- Prepare regular reports on various activities
- Conduct audits
- Perform analytical studies
- Seek revenue enhancements
- Accept peer review
- Plan strategically
- Explore restructuring

2. AWWA Accreditation Program

As noted above, to complement QualServe the AWWA also is developing an accreditation program that relies upon an independent audit process to verify conformance with recognized best practices. The audit process must be focused and rigorous and be recognized by all stakeholders for its value. An accredited utility can then use the seal of approval as a demonstration of its delivery of efficient and high quality service.

Governments, financial institutions, owners, consumers and environmental groups will recognize the value of accreditation. Accreditation is not a one step process but must be regularly reviewed and updated. In this regard, AWWA is working on development of best practice standards. Ten standards outlining performance requirements and verification procedures for water utilities are in preparation. Accreditation programs from third party agencies will then complement these standards.

3. Continuous Improvement and Quality Standards

The American Productivity and Quality Centre (APQC) was the first non-profit organization in the United States whose basic objective, expertise and efforts were devoted specifically to improve organizational effectiveness. APQC has been in existence since 1977 and is the foremost expert in this area. APQC provides guidance to water utilities on a variety of improvement tools.

A crucial step in any performance improvement exercise is to identify the appropriate tools for assessing and improving performance. APQC presents the following tools for achieving overall performance excellence. A water utility striving for excellence should be utilizing all the tools:

- *Benchmarking* – identifying, studying, analyzing and adapting best practices and implementing the results. It encompasses metric (numerical) standards and process benchmarks.

- *Performance Measures* – are vital measures used by organizations to assess the health of an organization and to provide focused direction.

- *Process Improvement* – is the continuous assessment of workflow to identify opportunities for enhancement. The functions include process mapping and gap analysis.

- *Best Practices* – both internal and external practices are studied.

- *Quality Improvement* – is the quality assurance, quality control program. Teams are created to plan, test and implement new methods for new levels of performance. Quality assurance provides for the regular review of performance to provide confidence the relevant quality standards are satisfied. Quality control monitors results to determine if they comply with relevant quality standards and identifies ways to eliminate causes of unsatisfactory performance.

- *People Systems* – involve the three areas of leadership, teams and knowledge management. Teams look at changing traditional organization structure and hierarchy into empowerment and sharing of employee skill sets. Knowledge management turns data and information into understanding and forum sharing.

- *Strategy* – competitive analysis, continuous planning and budgeting, and implementation are encompassed in this tool.

- *Organizational Assessment* – involves reviewing the company's performance at a high, overall level, considering those factors most important to business success. This envisions that accreditation will be undertaken by a third party.

AWWA and APQC are not an inclusive listing of third party organizations that can be used to review and determine optimum water utility improvement tools. The Walkerton Inquiry commissioned reports "Total Quality Management System for Ontario" by CH2M Hill and Diamond Management Institute and the "Framework for Management of Drinking Water Quality" by NHMRC/ARMCANZ Co-ordinating Group both present models for improved drinking water quality. Some of the concepts identified in the models deal with organizational issues.

Risk assessment of water supply systems followed by hazard identification and risk assessment, are sound approaches for priority setting. These techniques would be very beneficial to smaller utilities. OMWA/OWWA support the models, and recommend adoption of an improvement plan building on the proven foundation of the AWWA QualServe program.

An improvement plan must have some key ingredients that any water utility (large or small) must incorporate. First, the improvement program needs to have both inward and outward processes to insure that organizational buy-in and industry best practices are achieved. Second, they must complement the company's purpose and business/management strategies. Finally, the end results must be regular third party accreditation, which is recognized for transparency and impartial judgment on performance.

How will the new paradigm of utility accreditation address the issue of deviations from accepted water utility performance? Under the existing regulatory framework, poor performance usually results in a boil-water advisory, legal enforcement of standards or other requirements through judicial or administrative remedy (e.g. generally fines, orders, action plans under provincial legislation), and a public health emergency in a community due to unsafe drinking water. All these mechanisms are reactive and further reinforce the image of poor performance by the water utility industry as a whole.

The water utility improvement program is a proactive approach that regularly tells the community how well the water utility is performing. Water utilities would receive their annual accreditation from an independent auditor. This scorecard will assure consumers in the community that the safety of drinking water, along with all the other requirements of water utility performance, are being met. If the utility receives a failing grade, then the community must be involved in a corrective plan. For both private and government operated systems the same principle will apply. Through democratic fundamentals, the community will have the knowledge to correct the issues. If correctly administered, the failure to meet accreditation status should occur prior to regulatory standards NOT being achieved. The solutions for the water supplier can range from new leadership, increased water rates, new or improved infrastructure or alternative service delivery. In any event, the public can be properly informed and involved.

D. Conclusions

A reasonable level of new regulation and enforcement over a sustainable period would certainly be one direction the water industry could move. However, it is proposed that we look at a new paradigm in which water utilities set some principles in terms of sustainability, vision, and business strategy. They must continually refine these principles and regularly measure their performance. We support independent accreditation for all water utilities. Consumers can then

judge and require improvements from those organizations that do not achieve acceptable standards of performance.

VI. ORGANIZATIONAL BEHAVIOUR

Organizational behavior dictates how the work gets done in an organization and requires coordination of the various resources (people, processes, equipment) available to the organization structure. Understanding the relationship among the interpersonal attributes of attitudes, culture, and behavior are the management strategies employed to most effectively achieve the values of the organization.

"Business and management strategies are distinct disciplines that require different sets of skills and abilities. When this distinction is not made, the function of each discipline becomes obscure, and policies are often designed with built-in structural conflicts between competing forces." (Robert Fritz, 96).

A. Management Strategy

Today's water managers find themselves in a transitional environment. In the past, a risk-averse climate was prevalent. Because of political governance, many water organizations are still firmly entrenched in this environment. Because of changing driving forces, this is a less acceptable method of operation. Changes will occur and management practice will provide managers with the skills needed to motivate and organize their staff and achieve maximum excellence in performance.

Organizations must have appropriate organizational behavior to ensure the challenge of change is prevailing. The water utility must understand the real cause for current behaviour before moving with needed change. They must also avoid trendy management tools or processes, since they may not expose the root concerns and issues. What counts is for the utility to succeed regularly and reliably over an extended period. "In the transition from the old way of thinking to the new way, it is absolutely essential that the core of the utility's mission be preserved intact… What is changing are the ways and means through which we provide that service: the organizational and technical processes and systems, the fiscal strategies and mechanisms, and the managerial skills and creativity we employ." (Garret Westerhoff, 5).

The following are some of the key organizational behaviors required for water utilities:

- Leadership
- Communications

- Teamwork (i.e. employee learning, ethical behaviour, fair treatment)
- Consumer focus
- Creative learning organization
- Continuing alignment of people.

1. Leadership

With clear leadership an organization can set clear strategies and tactics, focus its efforts toward a common direction and align its actions. During implementation, leadership ensures decisions are made and conflicts of interest are resolved. The leader must also have skill to lead in both technically sound and motivational ways. When a water utility has true leadership, the leader will instill values needed to achieve a highly successful organization. This is a large menu of skills and qualifications, and when we consider that great leaders are rare, how is a water utility going to succeed if the leadership ingredient is missing? As well, considering the thousands of water utilities in Canada, how do we ensure they all have a basic minimum standard of leadership quality? When placed in the context of real world situations, there will be a large variance in leadership performance. By far the majority of water utilities will have a competent manager/certified operator with authority and responsibility for leading the organization, while some will have true leaders. Under these situations, the water utility will be able to meet or exceed its purpose, business and management strategy. The goal is to develop true future leaders.

2. Communications

It is essential that staff be informed of vital changes and developments in the water utility. Open, timely, two-way dialogue and sharing of information are important in developing good organizational behavior. When change is being implemented there needs to be a formal procedure for reporting progress and feedback. This can become a powerful motivator for monitoring progress and meeting goals.

Communications with outside stakeholders are just as important as internal methods. Typically, a water utility will have a large number of consumers spread over a wide area. This creates challenges to convey information to all consumers. Written material with routine mailings of utility bills is a cost-effective solution. A more general method is through appropriate news media or a web site. There are numerous communication techniques, but it is also important to solicit consumer views. This can be achieved through surveys, focus groups, or structured sampling of consumers.

3. Teamwork

Employee learning, ethical behavior, and fair treatment are investments in staff that will reward progressive water utilities. If a utility recruits and retains good-quality staff, obtains their commitment, and promotes productivity, that organization will establish itself as a good employer. Through employee learning and training programs, the utility will be investing in the development of knowledge, skills and capabilities that contribute to company performance and strategic vision. Figure 1 demonstrates the complex matrix required involved in attracting, retaining and motivating employees. Through utilization of these tools, effective employee attitudes can be achieved.

4. Consumer Focus

"The customer is the most critical element of the water industry." (CH2M Hill, 60). A water utility must strive to ensure that the drinking water being delivered to the consumer is and is seen to be, the quality desired by the consumer. As a result, the water utility must not only provide safe clean drinking water to its customers, but also involve the customer in water utility operations through a number of measures. Such measures may include consultation, customer surveys, providing educational information, public advisory committees, and the publishing of periodic reports on operations and the quality of drinking water being produced by the utility.

5. Creative Learning Organization

Human requirements are critical for an organization to be successful. Behavioral performance is increasingly being understood as transcending all structural management areas. Yet it is the most difficult to measure and judge. Performance indicators are an integral part of the development process. Financial and operational measures allow managers and external stakeholders to judge how a utility is performing. Personal performance goals are also powerful motivators. Careful selection of goals can be used effectively to develop staff. They also can be further encouraged by performance-related pay, in which recognition and remuneration is linked to achievement of explicit, quantifiable goals.

6. Continuing Alignment of People

Industry relationships have demonstrated that like Frontinus, the vast majority of current water utility staff and operators show passion and responsibility in upholding their role in protecting public health. The individuals and the organizations they energize should be able to learn and continuously

improve, and leave this legacy of wisdom to others who renew and inspire to the common goal of public health protection. Instilling a passion for water excellence can create an organizational behavior that regards regulations and standards as a starting point, not merely the minimum quality to be achieved.

B. The Martin Paper

The Martin, Archer, Brill paper (Martin paper) commissioned for the Walkerton Inquiry, presents a foundation for understanding why well intentioned organizations make bad decisions and produce actions that can have tragic results. OWWA/OMWA agree with the following specific findings, conclusions and recommendations from Martin:

1. The organizations that recognize the human frailties behind the behavior will create formal, interpersonal and cultural mechanisms to successfully ameliorate the deleterious effects. (Martin, 38).

2. Interpersonal dynamics in combination with formal systems and structures create a culture that shapes the quality of both the decisions that are made and the results that are achieved. (Martin, 6).

3. Leadership is critical to initiating the shift in behavior. (Martin, 38).

4. Formal mechanisms are an important starting point in improving the performance of the system overall. (Martin, 46).

5. Interpersonal steering mechanisms govern the manner in which people in the organization work together to solve problems. (Martin, 15).

6. Cultural mechanisms are the norms, maps, and myths that guide collective interpretations and actions within the organization. (Martin, 16).

7. In the case of the Ontario water supply, we assert that no matter how thorough or draconian the formal mechanisms, Ontario residents will not enjoy protection against water quality problems unless there are substantial changes in the interpersonal mechanisms as well. (Martin, 45).

VII. OWNERSHIP AND CONTROL

Various ownership models exist with differing governance and oversight structures. Regardless of ownership, levels of performance should be equivalent. Yet both public and private proponents claim advantages which protect the

interests of the customer and improve public health. It is imperative that the external controls of legal and regulatory requirements be consistently applied to all water utilities. There is a perception that the level of accountability to consumers changes with ownership and this is a controversial aspect of water ownership practices.

Water utilities generally are community owned and are a natural monopoly. A monopoly is characterized as being dominant in the market with no competitive motivation. To ensure the common good and to protect consumer rights, an independent or elected body is normally in place to regulate a monopoly. Because of the numerous communities in the province, the number of water utilities is large and this can create a very fragmented industry. The consequence of this reality is a very wide disparity in technical knowledge, financial capacity and conformance to standards providing for safe, reliable water. The level of conformance is most notable with smaller water utility organizations.

Integration of varying utility structures is available in the marketplace. Restructuring options are important as they offer utilities enhanced capacity to provide safe and reliable water. These are illustrated through change in ownership, satellite management, regional collaborations, partnerships, and contract management. Water is vital for fundamental human survival, public health protection, economic development, and quality of life. These social aspects have created tension over whether the public sector or the private sector better manages water and whether water is a commodity or a public resource.

Because water utilities have both business and social responsibilities, elements of accountability to the public good are required. To achieve acceptability, utilities require transparency for public scrutiny, consumer ability to influence policy matters, and an ability to judge utility performance. Proper governance models will allow this to occur, regardless of ownership.

A. Municipal Utility Governance

Elected officials can determine various methods to have the administration of the water utility undertaken. In Ontario the following governance forms are available:

- department operated by the municipal council;
- commission appointed from council by the council;
- commission appointed from the public by the council;
- commission chosen by municipal electors;
- franchise awarded by municipal council.

Freeman states: “In considering the range of models for water utility governance, the choices available are differentiated by the appropriateness of their measure of business autonomy and political control.” The nature of the different Ontario models presented above indicates that the choice of model depends upon local preference. Each model has strengths and weaknesses as presented in Table 1.

B. Private Organizations

Unlike the investor owned utilities in the United States, there are virtually no privately owned and operated water utilities of substantial size in Canada. In certain situations, a land developer of a green field site will invest in the infrastructure, which could entail a well and pipes to a small housing complex. Once the development is completed, the developer will turn the assets over to a housing association and the utility takes on a form of community ownership. However, there are a few instances where this does not occur, and the developer retains ownership. We could categorize these entities along with the numerous other small community systems as less than 500 people. In these privately owned community systems, knowledge, financial capacity, and adherence to regulations would be the principal challenges and would parallel the situation for public ownership.

C. Regional Cooperation

The merger of adjacent utilities through consolidation and regionalization may occur in certain areas. The forces driving this change could be to capture economies of scale, to address infrastructure challenges, or to improve source water and treatment requirements. A regional approach can be initiated through a municipal cooperation strategy or be imposed by the province and can take two forms. The first form would be the amalgamation of governments and services into one entity. A single governance structure would be created which would have a larger water services territory. The second form would be through creation of a new regional government power over specific services in the larger region while still having other municipal government structures in place. The provision of water service could similarly be broken down into the regional government providing wholesale water resource extraction, treatment and transmission services to various distributors who would in turn service consumers with local distribution water mains, meter reading, and customer services. Both models provide consolidation of smaller work forces into larger organizations that could result in greater operational efficiency and enhanced technical resources. These forms of regionalism can be difficult to implement when local pride of ownership, politics, loss of control, job protection, and water rate adjustments are obstacles to overcome. (Okum)

D. Conclusions

Highly effective water utilities are open to restructuring options that can enhance their ability to provide safe and reliable drinking water. Various governance models are presently available in Ontario. A key ingredient will be the accountability of the utility performance to the consumer. Restructuring is not necessary or desirable for all water utilities. However, for smaller utilities in particular, restructuring may provide significant opportunities to enhance performance and improve service.

VIII. RECOMMENDATIONS

Based on the foregoing analysis, the OWWA/OMWA urge that in its final report the Commission recommends that the Ontario Government support, encourage, and promote in consultation with the water industry and other stakeholders the following guiding principles for the achievement of superior performance by water utilities:

- Water utility leadership development plan. The purposes of the plan would include ensuring that utility leaders have:
  1. A vision to serve and protect public health and welfare by providing safe, reliable, and sufficient water supplies to consumers,
  2. Management strategies that create a pride in drinking water,
  3. A continual-improvement program based upon elements of accountability for optimum performance, and
  4. Appropriate attraction, retention and motivational roles that will foster an appropriate learning environment.

- Recognition that water utilities must be sustainable, such that the required infrastructure improvements to produce safe drinking water demanded by the public and the financing capability to achieve this result.

- Investigation of gaps or needs in the current system. Such investigation should include: (1) the appropriate institutional governance model(s) (including scale/size) for utilities to ensure sustainability, (2) organizational and structural requirements for whatever governance model(s) are adopted, (3) consumer and public education and information needs, and (4) financial, technical, and managerial learning needs.

- Water quality regulations are necessary and should be viewed as the collaborative research and development requirement of the industry. Regulatory effort will allow best science, economics, and risk analysis

to be combined with the resulting knowledge being accessible and shared with all stakeholders.

- Water utilities should consider water quality regulations and standards as the minimal acceptable level of performance, and always strive to go beyond this base level of performance.

- The water utility needs to be regularly audited and accredited by a third party as part of the review. The foundation for this approach is available through the AWWA QualServe, Benchmarking, and Accreditation Programs.

- Results of accreditation must be regularly presented to consumers. They must have the ability to influence utility policy especially when changes and challenges are identified through the audit.

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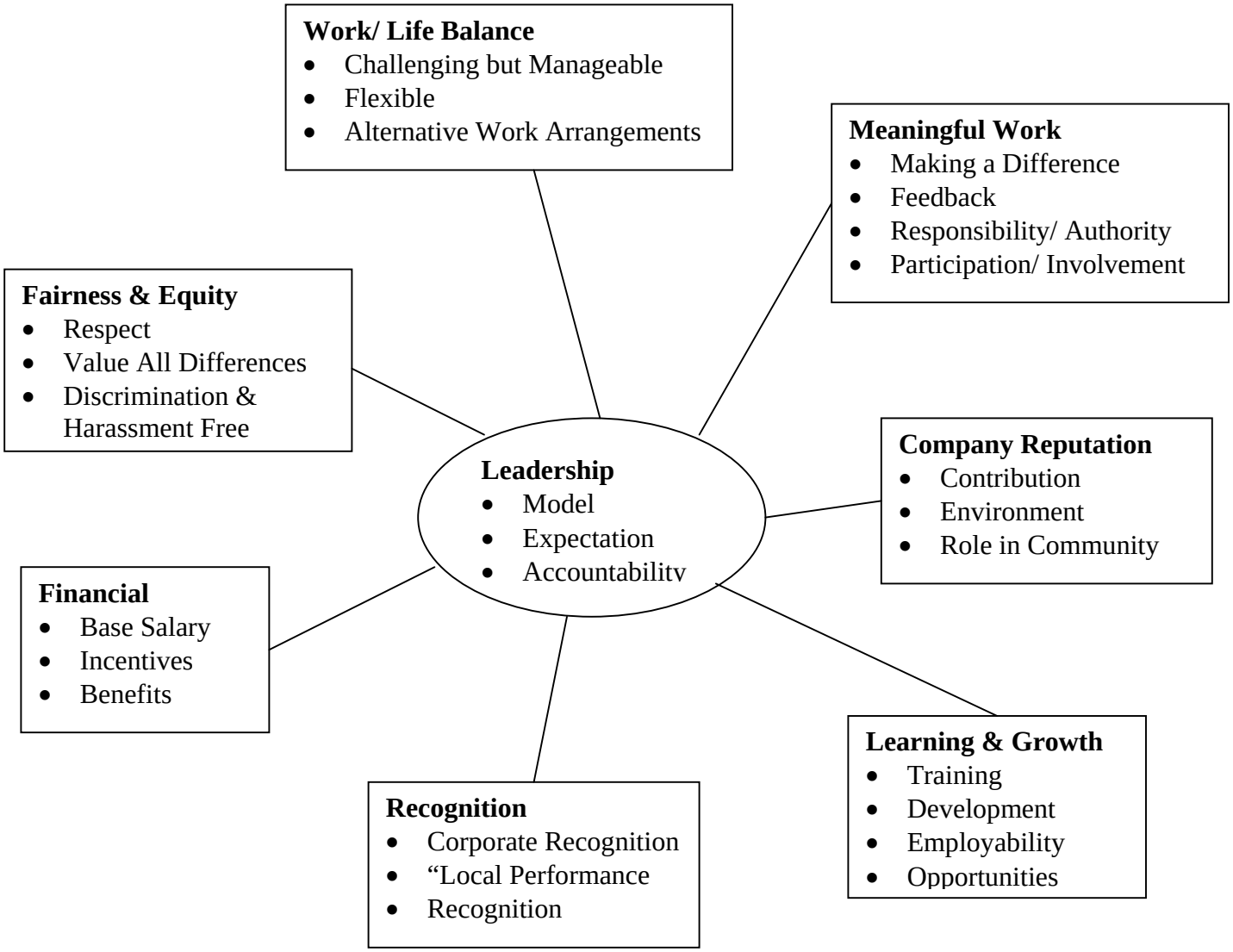
X. APPENDICES

A. Figure 1: Attraction, Retention and Motivation Strategy

Figure 1: Attraction, Retention, and Motivation Strategy



B. Table 1: Governance Factors

Table 1: Governance Factors

GOVERNANCE	POLITICAL	VISION	SUSTAINABILITY	IMPROVEMENT PROGRAMS	BEHAV
Department Operated by Council	Strong	Weak	Medium	Weak	Medi
Commission Appointed by Council from Council	Medium	Strong	Weak	Strong	Wea
Commission Appointed from Public by Council	Medium	Strong	Weak	Strong	Wea
Commission Chosen by Municipal Electors	Medium	Strong	Weak	Strong	Wea
Franchise Awarded by Council	Weak	Strong	Strong	Strong	Stro