Effectiveness of Environmental Management Systems (EMS) as an environmental management tool for local government in South Africa: The City of Tshwane Metropolitan Municipality experience

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Abstract

An Environmental Management System (EMS) can be defined as "*... a formal set of procedures and policies that define how an organization will manage its potential impacts on the natural environment and on the health and welfare of the people who depend on it*" (Andrews et al, 1999:2). In an effort to sustainably manage its own activities, products, services and facilities, various municipalities around the world have, in the past few years, started to follow the private sector trend and implemented the International Standards Organization (ISO) 14001 EMS voluntarily (Von Malmborg, 2003:1). Despite recent growth of EMS literature, evidence in terms of the effectiveness of EMS is still sparse, and little data exists on the effectiveness and benefits of an EMS (Edwards et al, 1999:36) especially in relation to local government. It's also possible that the potential benefits an EMS holds for an organization remains only "*talk*" and "*paper commitments*" (Andrews et al, 1999:2). The purpose of this research was to determine the effectiveness of ISO 14001 for local government with specific reference to the City of Tshwane (CoT). The research results suggest limited effectiveness of EMS. The main reasons for limited achievement of expected EMS benefits and thus its partial effectiveness were mainly identified as low commitment to environmental issues, insufficient resources, poor EMS implementation, low environmental awareness, ignorance and limiting internal procedures. This research concludes with recommendations to the CoT and municipalities in general to improve the overall effectiveness of its EMS.

Key words:

ISO 14001, Environmental Management System, City of Tshwane, Local Government, Effectiveness, Benefits.

Opsomming

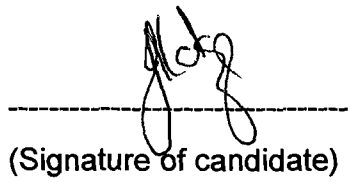
'n Omgewingsbestuurstelsel (OBS) kan beskryf word as 'n formele stel prosedures en beleid wat definieer hoe 'n organisasie sy potensiële impakte op die natuurlike omgewing, asook die gesondheid en welstand van die mense wat daarop staatmaak, bestuur (Andrews et al, 1999:2). Wêreldwyd, in 'n poging om hul aktiwiteite, produkte, dienste en fasiliteite op 'n volhoubare manier te bestuur, het verskeie munisipaliteite die afgelope paar jaar vrywillig begin om die voorbeeld van die private sektor te volg in terme van die implementering van 'n Internasionale Standaard Organisasie (ISO) 14001 OBS (Von Malmborg, 2003:1). Ten spyte van onlangse groei in literatuur ten opsigte van 'n OBS, is bewyse oor die effektiwiteit daarvan steeds skaars, en min data bestaan in terme van die effektiwiteit en voordele van 'n OBS (Edwards et al, 1999:36), veral ten opsigte van plaaslike regerings. Dit is ook moontlik dat die potensiële voordele wat 'n OBS vir 'n organisasie inhou net "*praat*" en "*papier verpligtings*" bly (Andrews et al, 1999:2). Die doel van hierdie navorsing was om die effektiwiteit van 'n ISO 14001 OBS vir plaaslike regerings te bepaal, met spesifieke verwysing na die Stad van Tshwane. Die navorsings-resultaat dui op beperkte effektiwiteit van 'n OBS. Die hoof redes vir beperkte bereiking van die verwagte OBS voordele, en dus ook die beperkte effektiwiteit daarvan, was hoofsaaklik geïdentifiseer as lae verpligting tot omgewingskwessies, onvoldoende hulpbronne, swak OBS implementering, swak omgewingsbewustheid, onkunde, en inperkende interne prosedures. Die navorsing sluit af met voorstelle aan die Stad van Tshwane en munisipaliteite oor die algemeen om die oorhoofse effektiwitiet van 'n OBS te verbeter.

Sleutelwoorde:

ISO 14001, Omgewingsbestuurstelsels, Stad van Tshwane, Plaaslike Bestuur, Effektiwiteit, Voordele.

Declaration

I declare that this research report, apart from the contributions mentioned in the acknowledgements, is my own, unaided work. It is being submitted for the Degree Master of Environmental Management at the North-West University, Potchefstroom Campus. It has not been submitted before for any degree or examination at any other university.



(Signature of candidate)

19th Day of October 2007

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Acronyms

ASD	Alternative Service Delivery
BS	British Standard
CoT	City of Tshwane Metropolitan Municipality
CSIR	Council for Science and Industrial Research
DFA	Development Facilitation Act
DM	Deputy Manager
EMAS	Eco Management and Auditing Scheme
EMP	Environmental Management Plan
EMS	Environmental Management System
ERM	Environmental Resource Management
GETF	Global Environment and Technology Foundation
H, CP & EM	Housing, City Planning and Environmental Management
IDP	Integrated Development Plan
ISO	International Standards Organization
MFMA	Municipal Finance Management Act
MSA	Municipal Systems Act
NEMA	National Environmental Management Act
OBS	Omgewingsbestuurstelsel
PDCA	Plan-Do-Check-Act
PMS	Performance Management System
SA	South Africa
TORH	Town of Richmond Hill
TIEP	Tshwane Integrated Environmental Policy
UN	United Nations
UNEP	United Nations Environmental Programme
USEPA	United States Environmental Protection Agency
WPLG	White Paper on Local Government

Chapter 1: Introduction

This chapter introduces the research by presenting the problem statement, main aim and research questions. It concludes by describing the outline and structure of the mini-dissertation.

The following is an outline of the sections contained in this chapter:

Section 1.1 provides background to this research, followed by the problem statement in section 1.2 and research questions in section 1.3. This chapter is concluded by a description of the structure of the research, contained in section 1.4.

1.1 Background

Local authorities not only operate within the environment, but are also managers of the environment (Drury, 2000:4) and, in terms of environmental management, have obligations in terms of:

- Environmental governance within its area of jurisdiction, which can include the formulation and enforcement of environmental specific by-laws;
- Conservation and sustainable management of environmental common goods; and
- Management of its own municipal activities, products, services and facilities in an environmentally sustainable manner (Nel, 1998:10).

In an effort to sustainably manage its own activities, products, services and facilities, various municipalities around the world have, in the past few years, started to follow the private sector trend to implement International Standards Organization (ISO) 14001 Environmental Management Systems (EMS) voluntarily (Von Malmborg, 2003:1).

An EMS, based on the ISO 14001 standard, is a voluntary tool which organizations, including local government, can utilize to implement environmental policy, and consists of interrelated elements that function together to help an organization to "*manage, measure, and improve the environmental aspects of its operations*" (Delmas, 2000:3).

However, according to Hertin et al (2004:2), tools that rely on voluntarism rather that legislative control, have in the past few years become prominent in the environmental policy milieu of many countries, although critics have been very skeptical if these "*soft*" approaches can truly deliver environmental improvement. It is further stated that the term "*soft*" describes instruments that strive to achieve environmental performance without "*employing direct coercion through law*" and "*without introducing legal or economic (i.e. "hard") constraints*" and can include, to name a few, EMS, environmental product labeling and best practice dissemination.

Despite recent growth of EMS literature, "*empirical evidence about the environmental effectiveness of EMS is still sparse*" (Hertin et al, 2004:4), and few data exists on the effectiveness and benefits of an EMS (Edwards et al, 1999:36). It's also possible that the benefits of EMS can "*turn out to be no more than optimistic speculation*", and the real EMS outcome can merely be a "*short burst of organizational discussions*", or a costly pile of paper documentation and commitments put on record (Andrews et al, 1999:2).

1.2 Problem statement

As highlighted in the previous section that there is a lack of knowledge on the effectiveness of EMS for local authorities even amidst the growing experimentation with its implementation at local government level. Adding to the knowledge on the effectiveness of EMS is especially relevant to the South African context where local authorities are hard pressed to deliver on the extensive demands for services and development with limited financial and human resources.

Although the implementation of the ISO 14001 EMS is voluntary (Delmas, 2000:3), South African organizations, including municipalities, have an environmental obligation in terms of the Constitution of South Africa, 1996 (Act 108 of 1996), which states in section 24 that everyone has the right to a safe and healthy environment (SA, 1996:10), to manage its corporate activities in an environmentally sustainable manner. Since ISO 14001 "*can offer firms an organized approach to managing environmental issues*" (Delmas, 2000:29), it can be a suitable environmental management tool, for local authorities, to achieve this.

The City of Tshwane (CoT) provided a good case example for testing the effectiveness of EMS in the South African context as it is situated in a major metropolitan area as well as in the capital city of South Africa. In terms of its Integrated Environmental Policy (City of Tshwane, 2005b), it further displays attempted commitment to the environment as well as the exploration of environmental management tools.

The aim of this research is to explore the effectiveness of the CoT ISO 14001 EMS in terms of the achievement of its expected benefits, the reasons for non achievement of these benefits, and to explore recommendations to improve the overall effectiveness of the CoT EMS.

1.3 Research questions

In view of the problem statement described in the previous section the main research question for this mini dissertation is:

> What is the effectiveness of the CoT ISO 14001 EMS?

To address the research question above, the following sub research questions also need to be answered:

1. What are the key concepts and enabling South African legislative framework related to ISO 14001 EMS?
2. What benefits does ISO 14001 implementation hold for an organization according to international literature?
3. How is the CoT EMS implemented in terms of its initial establishment, supporting organizational arrangements, approach thereto, and current status?
4. What are, in the opinion of Environmental Resource Management (ERM) Section[(i)], the effectiveness of the CoT EMS in terms of achievement of its expected benefits related to ISO 14001 EMS implementation in the CoT, the reasons therefor, and recommendations to improve the overall CoT EMS?
5. What are, in the opinion of the CoT EMS Representatives[(ii)], the effectiveness of the CoT EMS in terms of the achievement of the EMS benefits, the reasons therefor, and recommendations to improve the overall CoT EMS?

1.4 Structure of the research

To allow for easy interpretation of results the research aimed to provide a clear linkage between the set research questions, the methodology applied to address the questions, the phases in the research process and ultimately the chapters relating to each research question – as illustrated in table 1.1 and described here:

(i) The CoT Environmental Resource Management (ERM) Section is responsible for the overall planning, implementation, management and internal auditing of the municipal EMS

(ii) The CoT EMS Representatives, officially appointed in terms of Section 4.4.1 of the ISO 14001 standard (ISO, 2004:5), represent their respective Departments in terms of the EMS and are responsible for Departmental EMS implementation

To ultimately answer the research question (defined in section 1.3) and research aim related to this research (defined in section 1.2) the following research process was followed which consists of four phases:

Phase 1: Introduction and methodology

In phase one the research is introduced and the methodology therefor explained. It comprises the following chapters:

- *Chapter 1: Introduction* - introduces the research by presenting the problem statement, main aim and research questions. It concludes by describing the outline and structure of the mini-dissertation; and
- *Chapter 2: Methodology* - describes the research methodology applied to address the research question introduced in chapter 1.

Phase 2: Define and prepare

Phase 2 of the research addresses research sub-questions 1 and 2 (outlined in section 1.3), and aims to define the research (in terms of key concepts and enabling legislative frameworks related to EMS) as well as prepare the research (in terms of distilling the EMS benefits from literature). It includes the following chapters:

- *Chapter 3: Introducing EMS* – provides the outcome of the literature review (described in section 2.4) and includes a broad overview of key concepts and the enabling South African legislative framework related to ISO 14001 EMS; and
- *Chapter 4: Benefits of ISO 14001 EMS implementation* - includes a summary description of the benefits of ISO 14001 EMS implementation for organizations, and in particular for local government, as reflected in international literature.

Phase 3: Collect and analyze

Phase 3 of the research addresses research sub-questions 3, 4 and 5 (outlined in section 1.3). In this phase data is collected and analyzed. It includes the following chapters:

- *Chapter 5: Implementation of CoT ISO 14001 EMS* - explores the implementation of the CoT ISO 14001 EMS in terms of its establishment, its supporting organizational arrangements and its status, through questionnaires (explained in section 2.5.1) and interviews (explained in section 2.6.1);
- *Chapter 6: Effectiveness of EMS: ERM Section* - presents research results, obtained through questionnaires (explained in section 2.5.1) and interviews (explained in section 2.6.1), regarding the effectiveness of the CoT EMS (in the opinion of the ERM Section); and
- *Chapter 7: Effectiveness of EMS: Overall organization* – describes, based on the outcome of a questionnaire survey (explained in section 2.5.2) and interviews (explained in section 2.6.2), the effectiveness of the CoT EMS in the organization as a whole (in the opinion of the officially appointed EMS Representatives in the respective CoT Departments).

Phase 4: Conclude and Recommend

In phase 4 final conclusions and recommendations are made in terms of the research results described in *Chapter 8: Discussion and recommendations*.

Table 1.1: Structure of the research

RESEARCH QUESTION: WHAT IS THE EFFECTIVENESS OF THE CoT ISO 14001 EMS? (see chapter 1)				
RESEARCH QUESTIONS (see chapter 1, section 1.3)	**METHODS** (see chapter 2)		**CHAPTERS** (see section 1.4)	
1. What are the key concepts and enabling South African legislative framework related to ISO 14001 EMS?	**Literature review** (see section 2.4)	**Phase 2** Define and prepare	Chapter 3 Introducing EMS	**Phase 1** Introduction and research methodology (see chapter 1 and 2)
2. What benefits does ISO 14001 EMS implementation hold for an organization according to international literature?	**Literature review** (see section 2.4)		Chapter 4 Benefits of ISO 14001 EMS implementation	
3. How is the CoT EMS implemented in terms of its initial establishment, supporting organizational arrangements, approach thereto, and current status?	**Questionnaires Interviews** (see sections 2.5.1 and 2.6.1)	**Phase 3** Collect and analyze	Chapter 5 Implementation of CoT ISO 14001 EMS	
4. What are, in the opinion of ERM Section, the effectiveness of the CoT EMS in terms of achievement of its expected benefits related to ISO 14001 EMS implementation in the CoT, the reasons therefor, and recommendations to improve the overall CoT EMS?	**Questionnaires Interviews** (see section 2.5.1 and 2.6.1)		Chapter 6 Effectiveness of EMS: Environmental Resource Management Section	
5. What are, in the opinion of the CoT EMS Representatives, the effectiveness of the CoT EMS in terms of the achievement of the EMS benefits, the reasons therefor, and recommendations to improve the overall CoT EMS?	**Questionnaires Interviews** (see sections 2.5.2 and 2.6.2)		Chapter 7 Effectiveness of EMS: Overall organization	
RESEARCH AIM (see section 1.2) To explore the effectiveness of the CoT ISO 14001 EMS in terms of the achievement of its expected benefits, the reasons for non achievement of these benefits, and to explore recommendations to improve the overall effectiveness of the CoT EMS.		**Phase 4** Conclude and recommend	Chapter 8 Discussion and recommendations	

Chapter 2: Methodology

This chapter describes the research methodology applied to address the research question introduced in chapter 1, namely:

What is the effectiveness of the CoT ISO 14001 EMS?

The following is an outline of the sections contained in this chapter:

The first section introduces the research design after which the means of dealing with terminology and the criteria for measuring effectiveness are addressed. The approach to the literature review, questionnaires and interviews are explained in sections 2.4 to 2.6. The chapter is concluded with challenges for the research.

2.1 Research design

Due to the general lack of systematic research on effectiveness of EMS evaluation no methodological blueprint exists and, subsequently, the design of a research strategy and methodology provides to be challenging. Moreover, the emerging nature of effectiveness research, especially within the South African context, demands a flexible approach applying more than one method within a "*mixed research strategy*". Thus, the challenge was to identify which methods (or combination of methods) should be included in a research design to answer the research questions and achieve the overall research aim.

So-called "*evaluation research*" has a distinctive purpose but should not be seen as a separate or new research strategy because it could include flexible or fixed strategies as well as qualitative or quantitative data. Its purpose is defined as "*... to assess the effect or effectiveness of something*" (Robson, 2002:202). This type of research typically require a combination of methods, as well as rigorous

and systematic data collection to deal with the potential complexity of evaluation research (McCullock, 2000; Oakley, 2000; Yin, 2003). Experience in evaluation research also suggests that case study approaches are particularly appropriate and that detailed investigation of "*case*" rather than "*sample*" is preferred.

For the purpose of this research the CoT serves as the case in question. The main research methods applied as part of the so-called "*mixed research strategy*" includes literature review, survey questionnaires and interviews. The following Sections provide a detailed description of these methods and their relation to addressing the different research questions.

2.2 Dealing with terminology

Important in terms of this research was to clarify the term effectiveness versus other terms such as efficiency. According to Blanchard (2007:1), "d*oing things right*" in terms of getting the most of the available resources, can be related to efficiency, whereas "d*oing the right things*" in terms of setting goals and objectives correctly and making sure it is reached, is related to effectiveness. Newsletters Ink Plus (2007:1) mentions that efficiency is about doing anything, right or wrong, and getting it done timeously, whereas effectiveness relates to doing the right things the right way to move closer to set goals.

2.3 Criteria for measuring effectiveness

The primary challenges for effectiveness evaluation relate to identifying sound criteria and methods of evaluation. The "*litmus test*" for effectiveness has been described as whether something works as intended and achieves the benefits and purposes for which it is being used (Sadler, 1996). It has also been argued that for this reason effectiveness can only be measured subjectively and qualitatively especially where the intended use is related to unquantifiable objectives such as extent of influence on organizational behavior and or decision making as in the case of EMS (Wood, 2003). When considering the following methodologies for effectiveness evaluation adapted from Therivel and Minas (2002) it suggests as if this argument holds true, with most requiring largely subjective qualitative measurement:

- Comparing the strategic action before and after the intervention was carried out, noting any sustainability or environment related changes;
- Testing whether the intervention achieves a range of agreed environmental objectives or targets stemming from its application;
- Asking key stakeholders whether the intervention was effective, i.e. a subjective view from a specific role player; and
- Measuring the quality of the environment before and after the intervention is carried out, noting any sustainability- or environmental-related changes which can be attributed to the influence of the intervention.

For the purpose of this research the most viable criteria for measuring effectiveness relates to the benefits of EMS for local authorities and the related views of those responsible for implementing and benefiting from the EMS if these benefits are being realized. Quantitative measurement of environmental change and linking that back to the contribution of the EMS was considered un-viable from an availability of data and methodological point of view. The main methodological limitation would be to prove causality between the EMS and environmental change. Subsequently, a more qualitative approach relying on the views of key stakeholders was followed.

The main criteria utilized in this research were mainly a literature study as well as questionnaires and supplementary interviews. The literature study was derived from general international and local literature which included respected sources such as the United States Environment Protection Agency (USEPA), the United Nations Environmental Programme (UNEP) and the Global Environment and Technology Foundation (GETF). The questionnaires and interviews were sent to/held with both the CoT Section responsible for EMS establishment (ERM Section), and officially appointed EMS Representatives in the CoT to obtain case specific views related to EMS benefits in the CoT.

2.4 Literature review

A review of both international- and local literature was conducted as an initial step to obtain a broad overview and key concepts related to EMS and the ISO 14001 series, the enabling South African legislative framework pertaining to EMS and the benefits of implementing an EMS (see chapters 3 and 4).

The types of literature studied include EMS related academic sources, local government documents, reports, framework- and guideline documents, legislation as well as EMS related training resources. Particular attention was given to literature related to EMS effectiveness at local government level.

Problematic in terms of the literature review was that information overload exists on general EMS related literature, but very little on EMS effectiveness internationally and specifically locally. This was also found by Hertin et al (2004:4) in the statement that "*empirical evidence about the environmental effectiveness of EMS is still sparse*", as mentioned in chapter 1. This resulted in challenges such as limited data availability to conceptualize effectiveness of EMS globally and to guide the approach towards this research.

The data obtained in terms of the literature review was integrated with the questionnaire directed to the CoT EMS Representatives, referred to in section 2.5.2.

2.5 Questionnaires

To support the qualitative approach to this research (as explained in section 2.3), questionnaires, distributed via e-mail to stakeholders, were identified as the most viable method as it, according to Madge (2006:2), has the ability to obtain views of key stakeholders quickly and at low cost.

Two different questionnaires (Annexure A and B) were compiled for this research, although each contained an introductory section related to the personal details of participants, including details related to a participant's full name, area of

responsibility, designation, duration of EMS involvement, and tertiary qualifications. Contact details of the researcher were also provided on both questionnaires to ensure sufficient communication.

Problems that arose in terms of the utilization of the questionnaires included non/low response rates, partially completed questionnaires, and unclear responses, probably due to different levels of technical abilities of respondents, bias towards the CoT and lack of time to spend adequate time to complete the questionnaire. The said problems were dealt with in the following manner:

- Non responses were followed up by a reminder e-mails and telephone calls; and
- Partially completed questionnaires and unclear responses were dealt with through telephone calls to identify the reasons therefor, to find solutions to problems identified, and to clarify issues. Where it was found that respondents needed further assistance, personal interviews were scheduled.

2.5.1 Questionnaire to the CoT Environmental Resource Management (ERM) Section

As an initial step a questionnaire was distributed to the CoT ERM Section (Annexure A) to obtain baseline information and views related to the CoT EMS implementation approach (see sections 2 to 4 of the questionnaire).

The rationale for sending the questionnaire to the said Section was the fact that it is responsible for the planning, implementation, management and internal auditing of the CoT EMS and thus has knowledge in terms of its implementation approach. Organizational- and Departmental top management as well as the Environmental Officer responsible for legal register compilation (refer to figure 5.1) were excluded as these were all new/acting appointees and therefore would not have added value to the said questionnaire.

The said questionnaire was e-mailed, with an explanatory letter attached, to the said Section on 25 January 2007. All responses were received back within the specified timeframe, with the exception of one, which was received on 17 April 2007. Personal interviews were also conducted on 31 January 2007 and 21 June 2007 respectively to clarify issues. The final response rate was 100%.

This said questionnaire contained questions in terms of the following:

- The CoT approach to EMS certification, i.e. whether the CoT EMS is certified with an external body and the reasons therefor (Section 2, Annexure A);
- Views in terms of EMS commitment among CoT top management and Departments as well as the degree of financial- and human resource allocations for EMS. Respondents were also requested to comment regarding their responses in terms of the above and to make recommendations for improvement (Section 3, Annexure A);
- How EMS is implemented in the CoT in terms of the approach followed, implementation barriers experienced (supplemented by reasons and solutions therefor), and suggested changes to the implementation approach (Section 4, Annexure A); and
- A description of EMS performance monitoring, as well as obstacles in terms of EMS performance management, supplemented by recommendations to improve the latter (Section 4, Annexure A).

Section 5 of the questionnaire (Annexure A) related to perceptions in terms of the benefits that an EMS holds for the CoT. It included a table where the perceived benefits that an EMS holds for the CoT had to be listed, supplemented by indications whether it have been achieved, the reasons therefor, and recommendations related thereto.

In conclusion, the said questionnaire asked questions related to the overall effectiveness of the CoT EMS and general remarks and comments related thereto (Section 6, Annexure A).

2.5.2 Questionnaire to the CoT EMS Representatives

The distribution of the previously mentioned questionnaire (Annexure A) was followed up by a questionnaire to officially appointed EMS Representatives in the various Departments of the CoT (Annexure B) to test EMS effectiveness in the overall organization, i.e. whether benefits pertaining to EMS implementation in the CoT, identified through a literature review (Section 2.4) as well as by the CoT ERM Section (Section 2.5.1 and 2.6.1), were being achieved in the CoT.

The above was enabled through electronic distribution of a questionnaire (Annexure B) to officially appointed EMS Representatives in the various Departments of the CoT. The said questionnaire contained a list of ten possible EMS benefits to the CoT, identified through merging of EMS benefit data reflected in table 6.1 and EMS benefits identified through the literature review in table 4.1. EMS Representatives were asked whether these benefits were being achieved or not, the reasons for their answers, and to make recommendations in terms of their answers.

The rationale for the questionnaire (Annexure B) was the fact that the EMS Representatives are involved in the operational phase of the EMS at Departmental level and thus have first hand knowledge in terms of its effectiveness in the organization as a whole.

Based on an EMS Representatives list obtained from the CoT ERM Section, a total of 48 questionnaires were e-mailed, with an explanatory letter attached, to all officially appointed EMS Representatives on 28 May 2007. This was followed up on 13 June 2007 as an electronic reminder, and again on 26 June 2007 with reminder e-mails and telephone calls. Personal interviews were also conducted with four EMS Representatives on 14, 15, 27, and 28 June 2007. On 13 July 2007, the final response rate was 56%.

The said questionnaire also asked the EMS Representatives additional questions related to:

- Their commitment to the CoT EMS and the reasons therefor (Section 2, Annexure B); and
- Additional EMS benefits (other than that those listed in section 3.1 of annexure B), barriers related to EMS implementation and the reasons therefor, as well as any suggested changes towards the EMS implementation and management approach in the CoT. (Section 3.2 - 3.4, Annexure B).

The questionnaire concluded with a question related to the overall success of the CoT EMS and general remarks and comments related thereto (Section 4, Annexure B).

2.6 Interviews

The questionnaires explained in the previous section were supplemented by interviews (refer to annexure C for an interview schedule) to clarify issues, obtain further information needed, and to assist respondents to complete the questionnaire where the need for such assistance was identified. Interviews are often hindered by interviewers who make hasty judgments, over-generalization, and bias due to stereotypes in terms of gender and race (Virginia Polytechnic Institute and State University, 2004:2). To ensure validity of interview results the interviewer strived to avoid the abovementioned problems, and also compared interview responses to relevant literature identified in the literature review (Section 2.4). Problems that arose in terms of the utilization of interviews included respondents bias and negativity towards the interview. The said problems were successfully dealt with by explaining, where needed, the need for this research and the fact that their contributions will make a meaningful difference to the data obtained for this research.

2.6.1 Interviews with the CoT Environmental Resource Management (ERM) Section

A combination of a structured interview (where questions are pre-determined) and a semi structured interview (where, according to the Food and Agriculture Organization of the United Nations (1990:1) not all questions asked are pre determined but created during the interview) were utilized to interview two members of the CoT ERM Section, which included the Manager and the Chief: EMS Planning and Implementation (refer to figure 5.1). The said individuals were selected for interviews because they were key personnel directly involved in the overall management, planning and implementation of the CoT EMS. The reason for the interviews was to clarify issues raised and obtain more detailed information in terms of their questionnaire (Annexure A) responses. The combination of interview styles was selected to ensure both organized direction to the interviews and also to obtain interview flexibility to prompt further details and discussions.

The interview with the Manager of the ERM Section contained the following questions:

- When was the CoT EMS initiated and by whom?
- What was the initial rational to initiate an EMS for the CoT?
- Any formal council resolutions related thereto?
- Please explain the ERM Section's organizational structure in terms of the EMS.

The interview with the Chief: EMS planning and implementation of the ERM Section contained the following questions:

- Were any EMS's implemented after June 2006?
- It is noted that you focus on selected units within Departments, and do not 100% complete an EMS for a particular Department before advancing to the next – explain;

- What about those units that has been skipped?
- What methodology did you apply to prioritize Departments?
- How do you identify EMS Representatives?
- Please explain issues surrounding low commitment towards the environment;
- Please explain issues surrounding limited capacity in terms of the EMS;
- Please explain where low environmental awareness in the CoT is most evident; and
- Please explain how you train EMS Representatives.

2.6.2 Interviews with CoT EMS Representatives

Structured interviews were utilized to interview those EMS Representatives who indicated that they needed further personal assistance to complete the questionnaire explained in section 2.5.2 (Annexure B). Structured interviews were selected based on the fact that the questions contained in the said questionnaire were basically asked and clarified in the sequence contained in the said questionnaire. Interviews were conducted with four EMS Representatives on 14, 15, 27, and 28 June 2007.

Please refer to the interview schedule (Annexure C) for interview details.

2.7 Challenges for the research

The following challenges had to be successfully addressed:

- Stakeholder bias toward the CoT itself as well as the EMS, resulting in initial low/no questionnaire responses, partially completed questionnaires, and negative responses to questions asked in questionnaires and interviews;
- Time constraints among stakeholders, possibly resulting in no questionnaire responses and partially completed questionnaires;

- Researcher time constraints, resulting in short response times required for questionnaire responses, which could have resulted in no questionnaire responses, partially completed questionnaires, and negative responses;
- Access to respondents was troublesome as their contact details were often not valid;
- The varied levels of technical ability among respondents in terms of EMS were troublesome as some responses were often of low quality and incomplete; and
- Some respondents were not even aware that they have a role in terms of the EMS, resulting in questionnaires being ignored.

As explained in previous sections, these challenges were successfully addressed. However, for the purpose of future research it is important to highlight these challenges as a contribution to future research methodology design.

Chapter 3: Introducing EMS

This chapter aims to address **research sub-question 1**, namely:

What are the key concepts and enabling South African legislative framework related to ISO 14001 EMS?

Since ISO 14001 is a relative unknown topic for persons outside of the environmental management field and since there are various enabling legislative provisions related to ISO 14001, it makes sense that it should be explored in this research. Therefore, the following chapter explores the key concepts and South African legislative framework related to ISO 14001 EMS.

The following is an outline of the sections contained in this chapter:

The first section introduces the International Standards Organization (ISO), followed by a definition of EMS and an introduction to the ISO 14001 EMS series. The ISO 14001 Standard and its certification are thereafter explained, followed by an exploration of the enabling legislative framework related to ISO 14001.

3.1 The International Standards Organization (ISO)

ISO, located in Geneva, Switzerland and founded in 1946, is a non-governmental organization and has representatives of national standards bodies from over 100 countries (Edwards et al, 1999: 10). ISO mainly promotes "*the development and implementation of voluntary international standards*", for both particular products and environmental management issues (US EPA, 2006:1).

All ISO standards "*are developed through a voluntary, consensus-based approach*" where each member country of ISO develops its opinion on standards, where after it is negotiated by other member countries. Draft standards are sent out for written comment and official votes are casted on drafts by member countries at the appropriate stage of the process (US EPA, 2006:1).

3.2 A definition of an EMS

An EMS can, according to Andrews et al (1999:2), be defined as "*... a formal set of procedures and policies that define how an organization will manage its potential impacts on the natural environment and on the health and welfare of the people who depend on it.*"

3.3 An introduction to the ISO 14000 EMS series

EMS's are mainly implemented according to the International Standards Organization (ISO) 14000 series, which have first been published in 1996 and updated in 2004.

ISO 14001 "*provides the basic framework for the establishment of an EMS*" (Delmas, 2000:5), and is a "*voluntary environmental management and procedural standard*" (Delmas, 2000:37), to provide an "*internationally accepted blueprint for sustainable development, pollution prevention, and compliance assurance*" (Delmas, 2000:5), with the purpose of "*achieving continuous improvement in environmental performance*" (Drury, 2000:1).

Andrews et al (1000:2) state that environmental standards, similar to the ISO 14000 series but varying somewhat in detail, are however also utilized in Great Britain (British Standard (BS) 7750) and the European Union (the Eco Management and Auditing Scheme (EMAS)).

The ISO 14000 series consists of two main categories, i.e. product related standards and organizational management system standards, and includes the following standards:

- ISO 14001: Environmental Management Systems;
- ISO 14004: General guidance for developing and implementing an EMS;
- ISO 14010 to 14012: Environmental Auditing guidelines and principles;
- ISO 14020 to 14025: Environmental Labeling guidance;
- ISO 14031: Environmental Performance Evaluation guidance;
- ISO 14040 to 14045: Life Cycle Assessment principles and guidance;
- ISO 14050: Terms and definitions; and
- ISO Guide 64: Inclusion of environmental aspects in product standards (Lexington Group, 2002:3).

3.4 ISO 14001 explained

ISO 14001 is a "*component of the ISO 14000 series that contains the guidelines for designing an EMS*" (Edwards et al, 1999:6), and its main purpose is to "*provide an internationally accepted blueprint for sustainable development, pollution prevention, and compliance assurance, thereby expedite international trade by harmonizing otherwise diffuse EMS's*" (Delmas, 2000:5).

The following Figure portrays the generic process of developing an ISO 14001 EMS, and clearly indicates that ensuring top management commitment, an initial gap analysis, and the identification of environmental aspects and legal requirements, are critical (Drury, 2000:3).

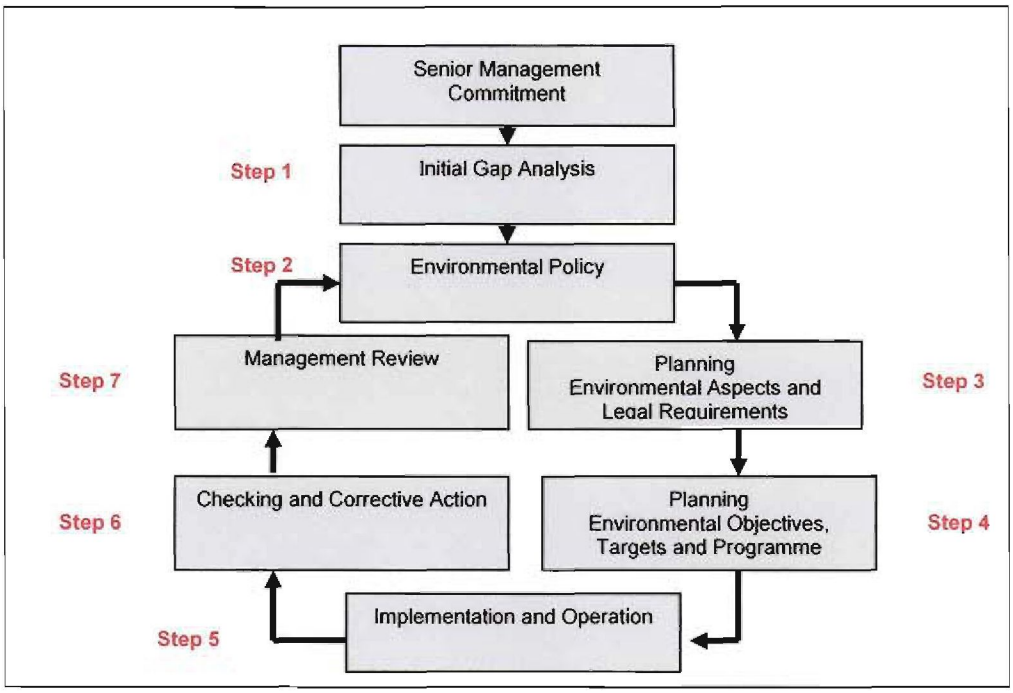

Figure 3.1: The process of developing an ISO 14001 EMS (Drury, 2000:3)

In terms of the above it is clear that ISO 14001:2004 standard is based on the "*Generic Total Quality Management Model*" of "*Plan-Do-Check-Act*" (PDCA) which every EMS is comprised of (UNEP et al, 2001a:13). It is often referred to as the "*PDCA-cycle*", and is "*known in management circles as the Deming model of management*" (Nel and Du Plessis: 2002:52), and can schematically be displayed as follows:

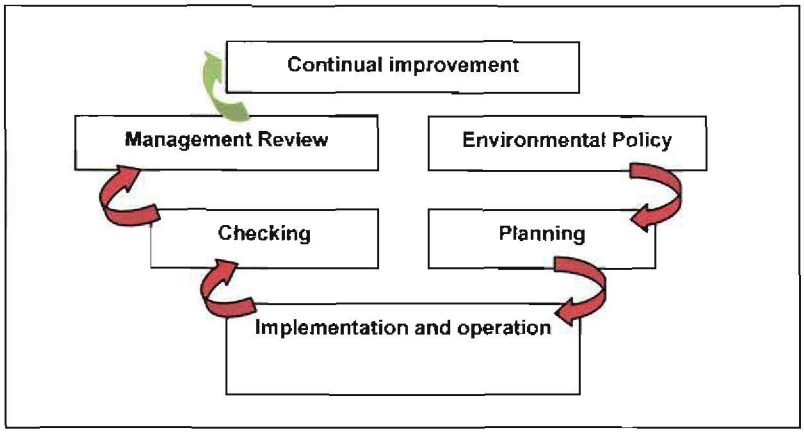

Figure 3.2: The ISO 14001 "Plan-Do-Check-Act" model (ISO, 2004:VI)

In terms of figure 3.2 it is important to note that ISO 14001 does not "*impose specific performance targets or emission levels*", but are designed to foster continual environmental improvement (Edwards et al, 1999:1).

3.5 ISO 14001 certification

ISO 14001 is the only standard of the 14000 series which is certifiable as all the other standards in the series play a supportive role to maximize the effectiveness of ISO 14001. Further, compliance to these supporting standards is not compulsory to obtain ISO 14001 certification (Delmas, 2000:11).

An EMS can be certified if "*it can be officially approved by an auditor authorized by a standards institute*". An organization must implement an EMS in accordance to ISO 14001 prior to seeking certification thereof, and an internal audit must also be conducted to confirm that the EMS meets the requirements of the standard (Edwards et al, 1999:6). The following figure portrays the steps in the certification process:

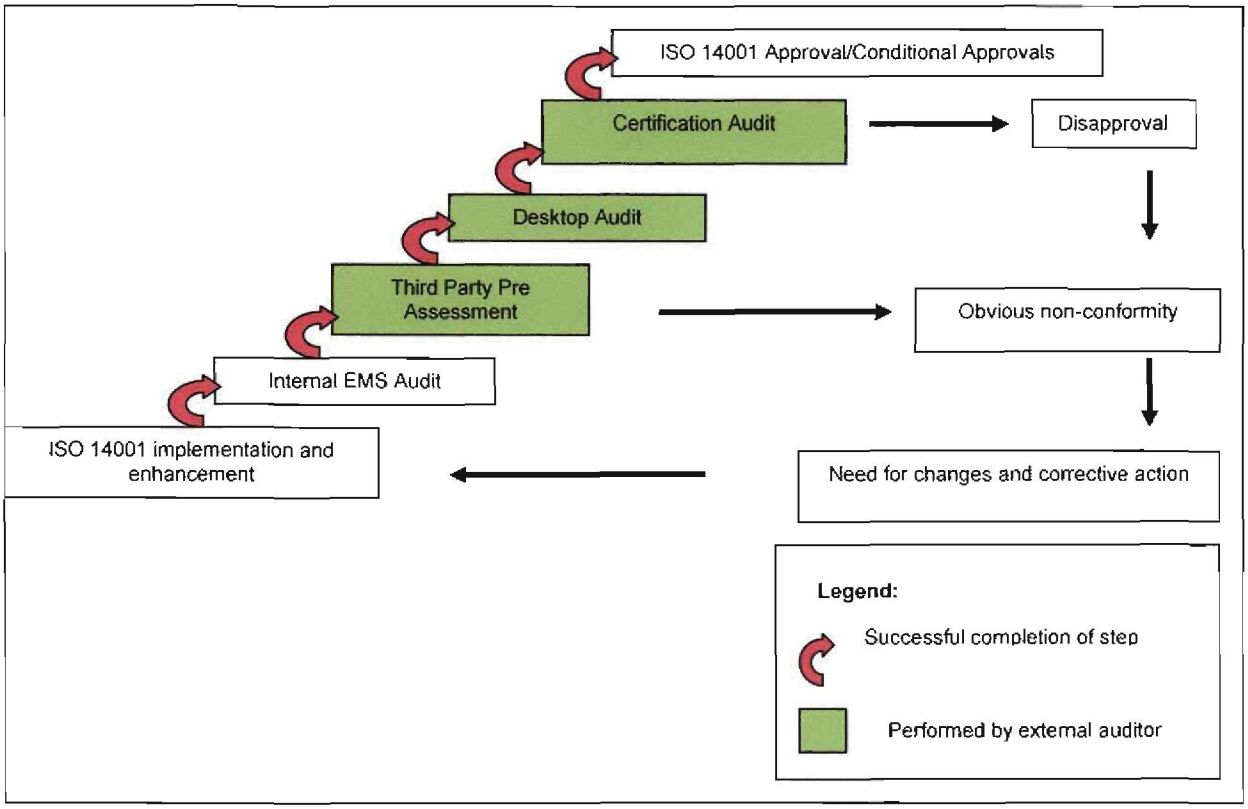

Figure 3.3: The ISO 14001 certification process (Edwards et al, 1999:6)

3.6 Enabling South African legislative framework related to ISO 14001

An enabling legislative framework refers to "*a legal, regulatory or institutional framework which makes certain activities possible by removing obstacles to initiate those activities or by providing support for those activities*" (SA, 1998b:4).

Although ISO 14001 is a voluntary standard (Delmas, 2000:5) and thus not compulsory in terms of South African legislation, the utilization thereof in municipalities is encouraged and/or supported in terms of various ISO 14001 enabling legislative provisions, which are discussed below.

3.6.1 The Constitution of South Africa, 1996 (Act 108 of 1996)

The Bill of Rights in the Constitution of the Republic of South Africa, 1996 (Act 108 of 1996) provides for environmental rights in Section 24, which states that *"Everyone has the right - (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures ..."* (SA, 1996:10).

Schedule 4 of the Constitution lists the functional areas of National- and Provincial government, while schedule 5 lists powers exclusive to provincial government. These functional areas and powers include environmental matters. Municipal powers are listed in Part B of both Schedules 4 and 5, and include air and noise pollution, to name a few (SA, 1996: 117 – 120). National and provincial government may also delegate powers, listed in part A of schedules 4 and 5 of the Constitution (SA, 1996: 117 – 120), to local authorities.

3.6.2 The National Environmental Management Act (NEMA), 1998 (Act 107 of 1998)

NEMA compels municipalities to adhere to relevant environmental implementation and management plans in section 16(4)(b), as well as the principles contained in section 2 to the Act (SA, 1998a:19). In practice, the

section 2 NEMA principles are applicable to all organs of state and must be applied to all local government planning and decision-making activities (SA, 2003:9). NEMA section 32 implies that citizens can take legal action against local government in order to secure their environmental rights (SA, 1998a:35).

3.6.3 The Local Government: Municipal Systems Act (MSA), 2000 (Act 32 of 2000)

The MSA "*recognizes the links between the environment, development and poverty*", and states that municipalities are obligated to render services that are financially and environmental sustainable, while being equitable and accessible to its community (SA, 2003a:10).

Chapter 5 of the MSA compels municipalities to develop an Integrated Development Plan (IDP) (SA, 2003:10), which is "*a plan aimed at the integrated development and management of the area of jurisdiction of the municipality concerned in terms of its powers and duties*" (Glazewski, 2005:203). The aim of the IDP process is to ensure "*the integration of social, economic and environmental concerns through incorporating these issues into a municipal level environmental, poverty and gender and socio-economic analysis*" (CSIR, 2002:12). The MSA further prescribes that an IDP, amongst others, must include an environmental analysis and environmental management plan, which will also contribute to the sustainability of the IDP and all its elements, which includes land use management planning (SA, 2003:15).

3.6.4 The Local Government: Municipal Structures Act, 1998 (Act 117 of 1998)

The above act sets out objectives for local government, which includes an objective that it must "*promote a safe and healthy environment*" (Glazewski, 2005:19).

3.6.5 The Development Facilitation Act (DFA), 1995 (Act 67 of 1995)

The DFA is the earliest framework planning law statute passed in post apartheid South Africa, drafted to fast track development in the light of "*the urgent need to provide housing and adequate residential areas for the previously marginalized communities*" (Glazewski, 2005:4).

Chapter 1 of the DFA contains principles that guide decisions regarding the development of land, which is the reference in considering any future development of land. These principles make provision for the promotion of efficient and integrated land development through promotion of environmentally sustainable land development practices and processes. It further promotes the need to promote sustainable development that "*is within the fiscal, institutional and administrative means of the country, establishes viable communities, meets basic needs of all citizens in an affordable way, protects the environment and ensures the safe use of land*" (CSIR, 2002:5). The DFA further states that policy and legislation should promote integrated land development and that it should encourage environmentally sustainable land development practices (Glazewski, 2005:202).

3.6.6 The White Paper on Local Government (WPLG), 1998

The above paper expands the mandate of local government to include environmental management activities and sustainable approaches in performing its functions. It further provides for the inclusion of environmental considerations into local IDP's, which is the main planning instrument that informs and guides local planning and development (SA, 2003:9). It further underlines that environmental sustainability is critical to ensure sustainability of municipal service delivery (CSIR, 2002:6).

It is therefore clear that the WPLG recognizes that municipalities do have a clear role in terms of environmental management in its area of jurisdiction.

3.7 Conclusion

Environmental Management Systems are mainly implemented according to the International Standards Organization (ISO) 14000 series, which have first been published in 1996 and updated in 2004. It is based on a model of "*Plan-Do-Check-Act*", and does not prescribe specific targets, but rather continual environmental improvement. ISO 14001 is the only standard of the 14000 series which is certifiable by an external body, and all the other standards in the series play a supportive role to maximize the effectiveness of ISO 14001.

Various South African legislative provisions, supported by local policy provisions as well as international agreements, declarations, documents and reports, have established an "*enabling environment*" for the application of ISO 14001 EMS in South African local government. To this effect the South African Constitution clearly indicates that local authorities has specified environmental powers and thus a responsibility in terms of environmental management, and must manage all its activities, products, services and facilities in an environmentally conscious manner. ISO 14001 EMS may be a suitable environmental tool to achieve this.

Support for local level EMS adoption is further evident in South African legislation such as the NEMA, the MSA, and the DFA as it makes provision for aspects such as sustainable development, environmental sustainability, environmental liabilities, environmental principles, and the formulation of environmental management plans (EMP's), which is also applicable to local government. The next chapter highlights the main perceived benefits of EMS as reflected by international literature as the basis for developing criteria against which to measure effectiveness.

Chapter 4: Benefits of ISO 14001 EMS implementation

This chapter aims to address **research sub-question 2**, namely:

What benefits does ISO 14001EMS implementation hold for an organization according to international literature?

Since ISO 14001 implementation is voluntary (Delmas, 2000:3) it makes sense that it should hold certain benefits for an organization to prompt adoption thereof, therefore the following chapter explores the benefits of ISO implementation for organizations as well as municipalities.

The following is an outline of the sections contained in this chapter:

The first section explores the benefits of EMS in general followed by benefits for municipalities. The chapter is concluded by a comparative analysis of EMS benefits.

4.1 Benefits of ISO 14001 implementation

There is a wealth of literature available which describes the benefits of EMS generally and for municipalities specifically. This section describes the benefits highlighted in eight key literature sources. Four of these deal with the benefits for municipalities specifically.

4.1.1 General benefits of EMS

According to Edwards et al (1999:36), general potential EMS benefits can include:

- Better environmental performance;
- Better regulatory performance;
- Improved overall organizational management effectiveness;
- Enhanced communication;
- Improved financial effectiveness; and
- Improved competitive advantages.

The US EPA (2006:2) supports the above identified benefits as it regards the following as potential benefits of an ISO 14001 EMS:

- Improvement in environmental performance;
- Improvement in legislative compliance;
- Increased environmental efficiency and related potential cost savings; and
- Enhanced public image with external stakeholders.

Hertin et al (2004:4) states that an EMS is thought to have a direct impact on environmental performance by encouraging organizational change, although it is not usually the prime motive for a company to adopt an EMS. Other benefits such as strengthening innovation and the enhancement of corporate public image often also play an important role to adopt a corporate EMS.

Andrews et al (1999:2) mentions that an EMS has the potential to enhance compliance with environmental regulations, positively alter economic- and environmental performance, and to refocus the organizational attention beyond compliance to continual improvement processes (enhanced performance) in both environmental and economic performance. It is also mentioned that these benefits can assist an organization to discover new opportunities to prevent rather than simply control pollution, to reduce resource wastage and thus save

money while improving the environment. It is concluded that EMS can even assist in the discovery of opportunities to manage the organization as a whole more effectively.

4.1.2 Benefits of EMS for municipalities

The Global Environment and Technology Foundation (GETF) (2000:6) states that the potential benefits of ISO 14001 adoption by local government entities include:

- Environmental performance and compliance benefits – an understanding of environmental legal requirements has the potential of increasing environmental performance and compliance abilities;
- Increased environmental awareness, involvement and competencies – a better understanding of environmental issues can facilitate buy-in and understanding of environmental issues, resulting in elevated competencies;
- Better internal and external communication related to environmental issues – environmentally aware employees tend to be more articulate in their conversations regarding environmental issues;
- Reduced costs and increased efficiency – an EMS guides the implementation of measures to increase environmental efficiency and reduce resource needs, which results in related expenditure minimization; and
- Enhanced regulator relationship – EMS implementation can provide an opportunity to enhance interactions with regulators and to reduce confrontations.

The Peer Center (2004b:1) lists the benefits of ISO 14001 implementation for municipalities as:

- Better regulatory compliance;
- Improved overall performance;
- Reduced environmental impacts;

- Enabling innovative approaches to protect environmental resources;
- Reduced costs and environmental risks;
- Better efficiency; and
- Better environmental stewardship.

According to UNEP et al (2001a:9-10), the benefits of an EMS for local authorities can either be internal or external:

- Internal benefits:
  - Better efficiency in operations, since the EMS process requires a full review of existing activities with the aim of removing negative impacts and enhancing positive impacts;
  - Enhanced decision making, since EMS target setting can inform and enhance municipal top management target setting to achieve sustainability;
  - Improved information management, since a large amount of data on municipal activities must be collected during the development of an EMS;
  - Improved staff commitment and morale, since an EMS has the potential to emphasize "*staff contribution to environmental protection*",
  - Improved cooperation, as an EMS can expose weak areas of cooperation by challenging cooperation challenges which needs attention; and
  - Cost and resource savings, since an EMS can identify "*overuse or wasteful utilization*".

- External benefits:
  - Image enhancement, since an EMS can portray a municipality's commitment towards environmental protection;
  - Environmental promotion, since the need for better environmental management by all stakeholders is elevated by EMS adoption; and

- Improved environmental protection and environmental benchmarking, as a municipality's EMS can serve as a model for other municipalities as well as role-players within the municipal area of jurisdiction.

The Town of Richmond Hill (TORH) (2007:1) states that the benefits of ISO 14001 adoption by municipalities are:

- Improved environmental performance;
- Minimized negative environmental effects;
- Compliance to environmental regulations and legislation; and
- Continuous environmental improvement.

4.2 Comparative analysis of EMS benefits

It is evident that ISO 14001 implementation holds various benefits for organizations as well as for municipalities which promotes its adoption and implementation. To identify the key benefits of EMS for municipalities require a comparative analysis of the literature highlighted in the previous section. The following table provides a summary of the benefits highlighted from the literature.

Table 4.1: Summary of potential municipal and general benefits of ISO 14001 implementation

Potential benefit	Municipal				General			
	GETF	Peer Center	UNEP et al	TORH	Edwards et al	US EPA	Hertin et al	Andrews et al
1. Enhanced environmental and/or overall performance/effectiveness	x	x		x	x	x	x	x
2. Environmental legislative compliance	x	x		x	x	x		x
3. Increased environmental awareness	x		x					
4. Increased environmental involvement, commitment and cooperation	x		x					
5. Increased environmental competency	x							
6. Better communication (internal and external)	x				x			
7. Reduced costs/financial effectiveness	x	x	x		x			x
8. Increased efficiency/resource savings	x	x	x			x		x
9. Enhanced relationship with environmental regulator	x							
10. Reduced environmental impacts		x	x	x				
11. Enabling/enhancing environmental innovation		x					x	
12. Reduced environmental risks		x						
13. Enhanced environmental stewardship and benchmarking		x	x					
14. Better decision making			x					
15. Improved information management			x					
16. Enhanced corporate image and improved competitiveness			x		x	x	x	
17. Continual environmental improvement				x				

The most widely agreed EMS benefits in terms of table 4.1 are "*enhanced environmental and/or overall performance/effectiveness*" and "*environmental legislative compliance*", closely followed by "*reduced costs/financial effectiveness*", and "*increased efficiency/resource savings*". These benefits are also ranked high in terms of municipalities, although "*reduced environmental impacts*" also ranks high in terms of municipalities. Significant more than half of the listed EMS benefits are only applicable to municipalities which suggest that EMS is considered to potentially deliver more benefits for municipalities than for industry. Not surprising, the benefit related to "*enhanced corporate image and improved competitiveness*" is geared more towards the corporate world.

4.3 Conclusion

According to international literature ISO 14001 EMS implementation holds various benefits for organizations as well as for municipalities, thus prompting implementation thereof. The main benefits which EMS adoption holds for an organization are enhanced environmental/overall performance and effectiveness as well as environmental legislative compliance, which are also ranked high in terms of municipal EMS benefits. Other main EMS benefits for municipalities include enhanced financial effectiveness, increased efficiency due to resource savings and reduced environmental impacts.

The EMS benefits identified in this chapter (Table 4.1) formed the basis of effectiveness evaluation criteria related to the questionnaire directed at the CoT EMS Representatives (as explained in section 2.5.2). Chapters 5, 6 and 7 explore the implementation of the CoT EMS and the effectiveness of the CoT EMS in achieving these benefits.

Chapter 5: Implementation of CoT ISO 14001 EMS

This chapter aims to address **research sub-question 3**, namely:

How is the CoT EMS implemented in terms of its initial establishment, supporting organizational arrangements, approach thereto, and current status?

The following chapter provides appropriate context and introduces the CoT EMS in terms of its initial establishment, supportive structures, the approach as well as the status thereof.

This chapter was informed by sections 1 to 4 of the questionnaire directed at the CoT ERM Section (Annexure A), responsible for EMS establishment, implementation, management and internal auditing in the CoT.

The following is an outline of the sections contained in this chapter:

The first section explores the initial establishment of the CoT EMS, followed by the supportive organizational structure therefor. This chapter is concluded by an analysis of the EMS approach in the CoT and its status.

5.1 Initial Establishment

The case study for this research was the CoT, situated in the Gauteng Province of the Republic of South Africa. It was established on 5 December 2000 when thirteen municipalities which served the metropolitan area were amalgamated to form the CoT (City of Tshwane, 2006a:24). The municipality covers 2 199m^2 and is home to approximately 2,2 million people, with an average population density

of 10 inhabitants per hectare (City of Tshwane, 2005a:10). It further is classified as a category A, grade 6 municipality in terms of Section 4 of the Local Government: Municipal Structures Act, 1998, and has a Mayoral Executive System combined with a Ward System with 152 councilors, of which 76 are ward councilors (City of Tshwane, 2005a:13). In terms of its organizational structure, the CoT has 11 Departments, supported by the office of the Municipal Manager (City of Tshwane, 2007a:23), and its 2005/2006 financial year, had a total staff component of 13 012 (City of Tshwane, 2007a:24).

The utilization of a formal EMS in the CoT was initiated in January 2003 by the Manager of the CoT ERM Section at the time. The initial rationale therefor was the fact that the Manager was asked to design an organizational structure for the then new CoT Environmental Management Division. Since there was no prior experience related to environmental management in the CoT, the said Manager initiated a quick research study and subsequently identified ISO 14001 EMS as a valuable tool in terms of corporate environmental management (pers. comm. Venter, 2007).

The reason for initiating EMS in the CoT is further evident in the first formal CoT decision regarding EMS in terms of a mid 2003 Mayoral Committee resolution stating that "*legal audit results be used to provide baseline information to be used in the development and implementation of an Environmental Management system for the CoT*" (City of Tshwane, 2003:1).

The CoT EMS is also formally supported in the Tshwane Integrated Environmental Policy (TIEP), which clearly states that corporate environmental responsibility must be ensured through "*Implementing an EMS for municipal operations*" (City of Tshwane, 2005b:11).

5.2 EMS supportive organizational structure

Figure 5.1 portrays the EMS supportive organizational structure. The CoT ERM Section of the Housing, City Planning and Environmental Management (H, CP & EM) Department is responsible for the management, planning, implementation, and internal auditing of the CoT ISO 14001 EMS (City of Tshwane, 2007c).

It should be noted in terms of figure 5.1 that the ERM Section is situated in a lower ranking Department and not at a higher strategic level such as the office of the Municipal Manager, which might hinder EMS commitment.

The ERM Section has a total staff component of 14, whereof only 2 staff members (Deputy Manager- and Chief EMS Planning and Implementation) are directly involved in EMS planning and implementation. There are also 3 vacancies in the EMS Planning and Implementation Sub-section, but it is however assisted by the Chief: Environmental Auditing (responsible for EMS internal auditing) and the Environmental Officer: Policy and Information (responsible for compilation of EMS legal registers). The Manager: ERM is accountable for the overall management of the EMS (pers. comm. Venter, 2007).

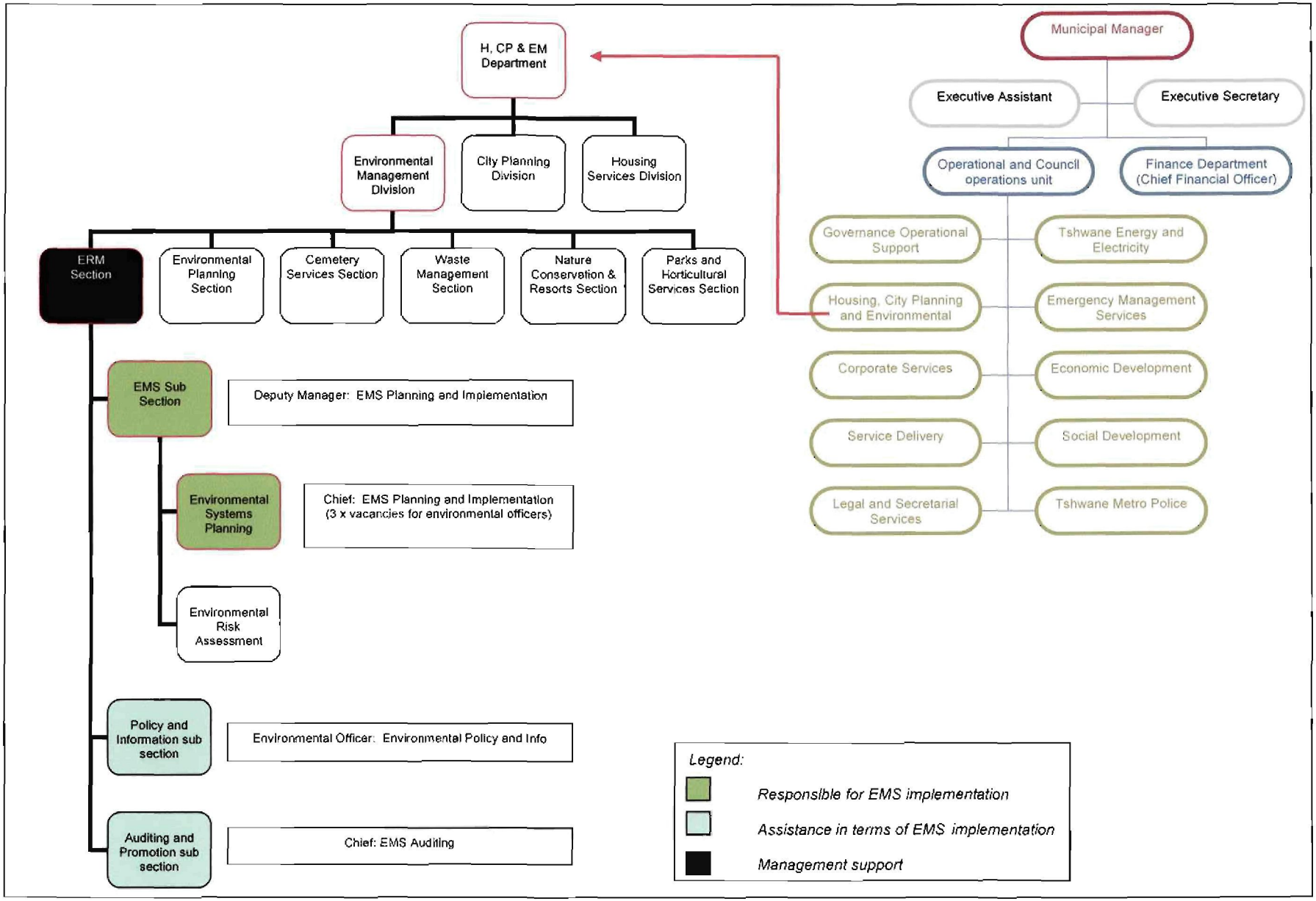

Figure 5.1: The CoT EMS supportive organizational structure (City of Tshwane, 2005c & pers. comm. Venter, 2007)

Questionnaire A asked the ERM Section to indicate what EMS related experience and tertiary qualifications they have, which is indicated in table 5.1. Since the newly appointed Environmental Officer: Environmental Policy and Information was not requested to completed questionnaire (refer to section 2.5.1), his curriculum vitae was consulted to obtain relevant information needed.

Table 5.1: Experience and qualifications of CoT personnel involved in EMS management, planning, implementation and auditing

Designation	EMS experience	Qualification	Institution
Manager: ERM	5 years	National Diploma: Environmental Health (1986) (3 year equivalent)	Technikon Pretoria
		National Higher Diploma: Environmental Health (1990) (4 year equivalent)	Technikon Pretoria
		Bachelor Honors in Adult Education (2000) (4 year equivalent)	University of the Witwatersrand
		Master in Environmental Sciences (2007) (5 year equivalent)	University of the Witwatersrand
		ISO 14001 EMS, Auditing and Legal requirements certificate (2001)	South African Bureau of Standards
Deputy Manager: EMS Planning and Implementation	5 years	Bachelor of Science in Pharmacy (1974) (4 year equivalent)	Potchefstroom University
		Bachelor of Medicine and Bachelor of Surgery (1984) (6 year equivalent)	University of Pretoria
		Master in Business Administration (2000) (3 year equivalent)	Potchefstroom University
Chief: EMS Planning and Implementation	5 years	National Diploma: Environmental Health (1984) (3 year equivalent)	Technikon Pretoria
		National Higher Diploma: Environmental Health (1986) (4 year equivalent)	Technikon Pretoria
		ISO 14001 EMS, Auditing and Legal requirements certificate (2001)	South African Bureau of Standards
Chief: Environmental Auditing	6 years	Bachelor of Technology: Environmental Health (1998) (4 year equivalent)	Technikon Pretoria
		ISO 14001 EMS, Auditing and Legal requirements certificate (2001)	South African Bureau of Standards
Environmental Officer: Environmental Policy and Information	None	Bachelor in Environmental Sciences Honours (2003) (4 year equivalent)	University of Venda
		ISO 14001 EMS and Legal requirements certificate (2007)	South African Bureau of Standards

5.3 The CoT EMS approach and status

According to Urban Environmental Management (1996:1), local government approaches to an EMS can vary from within the framework of the ISO 14001 or outside it and include the following models:

- **Model 1:** *Single Action* – only one action are taken, or a couple of actions, such as water saving through utilization of the "*Reduce, Reuse, Recycle*" approach;
- **Model 2:** *ISO 14001 Certification* – ISO 14001 certification is obtained, but usually for the office buildings only;
- **Model 3:** *Utilities Certification* – each Department obtains certification separately;
- **Model 4:** *Green Procurement and Environmental Management Accounting (EMA)* – suppliers and contractors to the local government must obtain certification in order to qualify to participate in tendering, and EMA is often used to verify the environmental impact of municipal activities and projects;
- **Model 5:** *Work within Civil Society* – the local government work with groups such as residents, children, etc. to implement "green actions";
- **Model 6:** *Link and implement Environmental Initiatives* – the EMS is linked to and used as an implementation strategy for environmental initiatives;
- **Model 7:** *Self declare an EMS* – the local government implements the 14001 EMS but do not go through the ISO certification process; and
- **Model 8:** *The full EMS* – A combination of all the above models plus other actions all actions as specified in the ISO 14001 EMS standard.

ERM personnel were asked in section 2 of questionnaire A to indicate whether the CoT EMS is certified and by which body, and if not, the reasons therefor, and if it is planning to certify its EMS in future. It was found that the CoT EMS is based on the "*self declared*" approach as it is being implemented without

certification. According to questionnaire A responses, the CoT decided not to certify its EMS for the following reasons:

- Lack of financial resources;
- Lack of capacity (human resources);
- Lack of top management and general management commitment;
- Lack of political will;
- Certification is not deemed necessary from a business position point of view;
- The fact that the CoT is very large and diverse, which makes EMS implementation difficult;
- The currently level of environmental compliance is relatively low in the CoT;
- The focus is currently on legislative compliance and not certification; and
- The CoT EMS is being started from scratch.

It was further indicated that it is envisaged that selected Departments (the Electricity Department, the Fresh Produce Market as well as other municipal business entities that will be established in future) might work towards individual certification in future, which also indicates a "*utilities*" EMS approach. This process might however be hindered by the CoT Alternative Service Delivery (ASD) process, aimed at restructuring the CoT (City of Tshwane, 2007b:1), which will be implemented by the CoT in mid 2007, as it might necessitate extensive revisions of current EMS's and/or new EMS's for relevant Departments.

In terms of the CoT EMS, section 3 of the said questionnaire focused in depth on EMS commitment, human resource allocations, and financial resource allocations, and responses thereto are indicated in table 5.2. It is evident from table 5.2 that a perception exists that there is not full EMS commitment among CoT top management and Departments (organization wide), and that both financial- and human resources allocated therefor are insufficient, which can contribute to low EMS effectiveness. The reasons therefor mainly include:

- Lack of management;
- Low priority for EMS;
- Lack of resources;
- Lack of performance management integration;
- Low awareness;
- Political pressure; and
- Human resource prescriptions from National Treasury.

Cognizance of the recommendations made in table 5.2 should therefore be taken to enhance the effectiveness of the CoT EMS, and is further addressed in chapter 8.

Table 5.2: The status of EMS commitment, -human resource allocations, and –financial resource allocations

Status	EMS Commitment (top management and organization wide)		EMS Human Resources Allocations		EMS Financial Resources Allocations	
	Response	**Percentage**	**Response**	**Percentage**	**Response**	**Percentage**
	No commitment	0%	Not sufficient at all	50%	Not sufficient at all	75%
	Some degree of commitment	100%	Sufficient to some degree	50%	Sufficient to some degree	25%
	Full commitment	0%	Sufficient	0%	Sufficient	0%
Reasons for status	• No support from higher level management • Low priority in terms of other projects and political pressure to focus on social and economic development (environmental issues has a low priority) • Lack of funding, time and capacity • Lack of integration of environmental issues into their performance management agreements • Non commitment and absence of awareness in terms of environmental issues		• Not enough dedicated staff (capacity problems) • Guidelines from National Treasury regarding percentage expenditure for human resources		• Other perceived priorities receive more funding • Political pressure for social and economic development exceeds pressure for environmental excellence • No prioritized funding for environmental issues • Pressures on municipal finances	
Recommendations to improve status	• The integration of EMS into political processes in the CoT • The integration of environmental issues into the CoT performance management system (scorecards) and job description of management • The formal inclusion of EMS in the CoT budgeting process of each Department or the establishment of a corporate "environmental" budget (dedicated funding) • Training and awareness • The establishment of an incentives scheme • Expansion of capacity • The appointment of a full time environmental officer in each Department		• Appointment of more EMS personnel • Diffusion of EMS personnel from a central Department only to all Departments (environmental personnel in each Department) to gain shared responsibility		• Introduce obligatory Departmental environmental budgeting • Establish a central, corporate environmental vote • Awareness raising among financial decision makers • EMS should become a political driven process to "enforce" funding thereof	

Section 4 of questionnaire A focused on the CoT approach towards EMS implementation. It was indicated that the CoT utilizes the elements of the ISO 14001:2004 EMS standard (ISO, 2004:4-9) as a guideline only and thus does not follow the standard to the letter. Its EMS procedure manual is also utilized as a guiding document. The EMS is implemented per Departmental Division/Section/Unit, and EMS Representatives, whom should undergo official internal EMS training (provided by the ERM Section), are officially appointed in writing for each of these. The following table indicates the status of EMS implementation in the CoT from April 2003 to 2006:

Table 5.3: Status of EMS implementation in the CoT from April 2003 to 2006

	Date	Department	Division/Section/Unit
1.	Apr 2003	Economic Development	Agricultural Trading Development Division Unit: Fresh Produce Market
2.	Jan2004	Social Development	Health Care Division Research and Development Section
3.	Feb2004	Social Development	Health Care Division Environmental Health Section
4.	Mar 2004	Housing, City Planning and Environmental management (H,CP+EM)	Environmental Management Division Parks and Horticulture Services Section Unit: Depots
5.	Apr 2004	Electricity	Distribution Operations Division Unit: Pretoria West Power Station
6.	May2004	Electricity	Distribution Operations Division Unit: Rooiwal Power Station
7.	Aug2004	H,CP&EM	Environmental Management Division Environmental Resource Management Section All Sub-sections
8.	Aug 2004	H, CP+EM	Environmental Management Division Parks and Horticulture Services Section Unit: Admin+Support
9.	Oct 2004	H, CP+EM	Nature Conservation (Groenkloof Nature Reserve)
10.	Oct 2004	H, CP+EM	Environmental Management Division Nature Conservation Section Units: Wonderboom Nature Reserve Rietvlei Nature Reserve Austin Roberts Park
11.	Nov 2004	H, CP & EM	Environmental Management Division Environmental Planning Section
12.	Nov 2004	Service Delivery	Water and Sanitation Units: Waste Water Treatment Works
13.	Dec 2004	Economic Development	Transport Development Division Units: Bus Depots
14.	Jan 2005	H, CP+EM	Environmental Management Division Cemetery Services Section Units: Crematorium and Cemeteries (excluding Eersterust)
15.	Feb 2005	Social Development	Health Care Division Units: Primary Health Care North Aids Unit
16.	Mar 2005	Social Development	Health Care Division Unit: Primary Health Care South
17.	Apr 2005	Social Development	Health Care Division Units: X-Ray Services Health Programmes Pharmaceutical Services
18.	Dec 2005	Service Delivery	Roads and Storm Water Division Unit: Bon Accord Quarry
19.	Mar 2006	Finance	Unit: Auction Yard
20.	Apr 2006	Emergency Management Services	Northern and Southern Region Unit Community Preparedness Unit HAZCHEM Unit
21.	May 2006	Social Development	Health Care Division Health Programmes Section
22.	Jun 2006	H, CP+EM	Environmental Management Division Cemetery Services Section Unit: Eersterust Cemetery
23.	Jun 2006	H,CP+EM	Environmental Management division Waste Management Section All units and waste sites
24.	Nov 2006	Economic Development	Agricultural Trading Development Division Unit: Fresh Produce Market extension
25.	Dec 2007	H, CP+EM	Housing Division Unit: Hostels (not completed in 2006)

According to the CoT ERM Section (pers. comm. Bekker, 2007) the following factors influenced the prioritization of CoT Departments for EMS implementation:

- Environmental impact: Those Departments perceived to have the highest environmental impacts received priority action;
- Strategic planning: Activities within Departments which necessitated EMS implementation, e.g. the Waste Management Section identified a need for EMP's for its landfills, which automatically indicated a need for and EMS;
- Direct instruction: Instructions from top management within the Housing, City Planning and Environmental Management Department in terms of which Department should receive priority; and
- Complaints: Complaints received often indicates that an EMS might assist in its clarification, e.g. complaints were received regarding chemicals utilized in the Environmental Health Section prompted an EMS for the said Section.

Moreover, the Fresh Produce Market was selected for the first EMS to be implemented as it operates as a small, separate business unit, creating the perception that it might simplify the pilot CoT EMS (pers. comm. Bekker, 2007).

It is evident from table 5.3 that the ERM Section, in most cases, did not implement an EMS for all activities within its Departments, but only for selected units within Departments. As an example, the Nature Conservation Section's EMS excluded its Technical Support Services- and Swimming Pool Sections. The rationale for this approach was due to the fact that the ERM Section is expected, in terms of its performance management system, to implement EMS's for a pre-determined number of CoT Departments per annum, thus forcing the ERM Section, due to time constraints, to focus on only prioritized units within each Department on an annual basis. Priority units are identified by appointed EMS Representatives in terms of its perceived environmental impact. Unaddressed Units and Sections are addressed, according to priority, in future EMS planning (pers. comm. Bekker, 2007).

Section 4 of questionnaire A further indicated the barriers the CoT faces in terms of EMS implementation, and data obtained are portrayed in table 5.4.

Table 5.4: Barriers, reasons and solutions in terms of EMS implementation in the CoT

Barrier	Reason	Solution
Limited human resources	• Other priorities	• Appoint environmental more personnel and in each Department • Obtain funding for designated EMS officers
Limited financial resources	• Other priorities	• Establish central environmental vote • Include in IDP process
Lack of awareness and knowledge	• Poor communication • Insufficient training • Management too busy with other priorities to attend environmental training sessions • Limited ERM capacity to host sessions	• Establish awareness and training programme • Find innovative solutions to bring info to all.
Lack of commitment	• Other priorities • Management support lacking • Attitude	• Increased awareness • Inclusion in corporate performance management system • Strong leadership from top management emphasizing urgency and importance of good environmental governance • Departments and individuals to be held liable for transgressions of environmental legislation
Lack of performance management integration	• Not perceived as important	• Include in job descriptions and scorecards
Change	• Current/continuous municipal restructuring	• No solution identified
Procurement processes	• Delays full EMS implementation	• More streamlined procurement processes

The barriers to EMS implementation identified in table 5.4 are similar to those identified in table 5.2 of this chapter related to EMS non commitment and lack of resources. Cognizance of the reasons therefor and related recommendations made in table 5.4 should therefore be taken to enhance the effectiveness of the CoT EMS, and is therefore further addressed in chapter 8.

Finally, questionnaire A indicated that the CoT monitors the overall performance of its EMS through management reviews as well as annual internal EMS audits. The fact that audit- and review findings are however often ignored, might however impact negatively on these efforts. It was suggested that this problem may be overcome through the incorporation of the EMS in the corporate

performance management system as well as the establishment of an internal EMS information system to track progress.

5.4 Conclusion

The CoT EMS was established in January 2003, the main reasons being:

- Internal managerial decision making;
- An official Mayoral Resolution; and
- Provisions for EMS implementation in the TIEP.

In terms of enabling organizational arrangements it was found that the CoT EMS is managed centrally by a Section consisting of 14 employees, of which only 2 employees concentrates solely thereon, assisted by 2 persons and 1 manager. All these individuals except for the Deputy Manager heading up the EMS Section (who is a qualified medical doctor with an MBA), are qualified in terms of ISO 14001 EMS and/or Environmental Management/Health, and their experience pertaining to EMS' range from one to six years.

In terms of the EMS approach in the CoT it was found that the CoT EMS is not certified and it is not foreseen for the near future, thus implicating a "*self declared*" EMS approach. This is mainly due to lack of resources and commitment, as well as the fact that the ISO 14001 standard is utilized only as a guideline. It is however envisaged that certain Departments might apply for certification in future, which implicates a "*utilities*" approach.

The CoT EMS is further not implemented for the municipality as a whole, but separately for selected units within Departments which are prioritized in terms of its environmental impacts, corporate strategic planning, complaints received and direct management instructions. The CoT also utilizes the elements of the ISO 14001:2004 EMS standard as a guideline only, supplemented by its EMS procedure manual, and thus does not follow the standard to the letter. Separate EMS Management Representatives, whom should all undergo internal EMS

training, are appointed in writing for each Department, and the EMS is audited by an internal auditor only, which is allocated in the same Section as the personnel responsible for the overall management and implementation thereof.

In terms of the status of the CoT EMS it was found that, as on 31 December 2006, EMS' have been implemented for 25 CoT Departments, Divisions and Sections. The status of commitment as well as financial and human resource allocations towards the CoT EMS were found to be insufficient, which can contribute to low EMS effectiveness. The reasons therefor mainly include:

- Lack of management;
- Low priority for EMS;
- Lack of resources;
- Lack of performance management integration;
- Low awareness;
- Political pressure; and
- Human resource prescriptions from National Treasury.

Various recommendations were made by the ERM Section in terms of EMS implementation and increasing EMS commitment and resource allocations, which is further discussed in chapter 8.

Chapter 6: Effectiveness of EMS: Environmental Resource Management (ERM) Section

This chapter aims to address **research sub-question 4**, namely:

What are, in the opinion of ERM Section, the effectiveness of the CoT EMS in terms of achievement of its expected benefits related to ISO 14001 EMS implementation in the CoT, the reasons therefor, and recommendations to improve the overall CoT EMS?

The following chapter explores the effectiveness of the CoT EMS in the opinion of the CoT ERM Section in terms of the identification of the benefits of EMS implementation in the CoT, and to determine whether or not these were achieved, as well as the reasons therefor and recommendations related thereto.

This chapter was informed by sections 5 and 6 of the questionnaire directed at the CoT ERM Section (Annexure A), responsible for EMS establishment, implementation, management and internal auditing in the CoT.

The following is an outline of the sections contained in this chapter:

The first section portrays the expected benefits of EMS implementation in the CoT, followed by an analysis of the achievement of these benefits and an exploration of the overall effectiveness of the CoT EMS.

6.1 Expected benefits of EMS implementation in the CoT

Table 6.1: Expected benefits and related number of responses in terms of EMS implementation in the CoT

	EXPECTED BENEFIT	NUMBER OF RESPONSES
1.	Reduced environmental impacts related to municipal activities, prevention of pollution, better performance, risk reduction	5
2.	Adherence to environmental legislation/other legislation	4
3.	Improved image through practicing what you preach	4
4.	Increased employee commitment , consciousness and awareness in terms of environmental issues	3
5.	Increased management commitment in terms of environmental issues	2
6.	ISO 14001 certification	2
7.	Dedicated environmental funding	2
8.	Further roll-out of EMS in Departments	2
9.	Environmental resource conservation	1
10.	Increased environmental efficiency	1

Table 6.1 portrays, in terms of data obtained from annexure A, the expected benefits that EMS holds for the CoT as perceived by the ERM Section, as well as the related number of responses thereto.

A total of 10 benefits pertaining to EMS implementation in the CoT were identified by the ERM Section. At the top of the expected benefits is "*reduced environmental impacts related to municipal activities, prevention of pollution, better performance, risk reduction*", and "*adherence to environmental and other legislation*", implicating the primary expectance that an EMS will assist the CoT in enhanced environmental management of internal activities and related reduced liabilities. In contrast however was the fact that other identified benefits, also related to enhanced environmental management of internal activities, such as "*environmental resource conservation*" and "*increased environmental efficiency*" is ranked lowest.

The fact that commitments to and resources for the CoT EMS, such as "*increased employee commitment, consciousness and awareness*", "*increased management commitment*", and "*dedicated environmental funding*" has also been identified, hints on environmental management gaps in the CoT, which the ERM Section probably hoped will be fulfilled through EMS implementation. It has however been found in table 5.3, chapter 5, that EMS management commitment and allocation of resources therefor are insufficient.

The fact that "*improved image through practicing what you preach*" is ranked high and "*ISO 14001 certification*" has also been identified, indicate that the CoT also expect external recognition for their EMS. This is contradictory to the fact that it was indicated in section 5.3 that the CoT EMS is not certified and it is not foreseen for the near future, mainly due to lack of resources and commitment, as well as the fact that the ISO 14001 standard is utilized only as a guideline.

The ERM Section also identified "*further roll out of EMS in Departments*" as beneficial to the CoT, indicating their belief in EMS as a corporate environmental management tool. This is however contradictory to the fact that the said Section indicated that 60% (refer to figure 6.1) of the potential EMS benefits for the CoT are perceived as not being achieved, thus implicating negativity towards the EMS.

In terms of the literature review related to this research (see table 4.1) the most widely agreed EMS benefits (the top five) for municipalities were identified as:

- Enhanced environmental and/or overall performance/effectiveness;
- Environmental legislative compliance;
- Reduced costs/financial effectiveness;
- Increased efficiency/resource savings; and
- Reduced environmental impacts.

In terms of the earlier-mentioned comments it is interesting to note that only two of the top five EMS benefits for the CoT (in terms of table 6.1) are aligned thereto, i.e. "*reduced environmental impacts related to municipal activities, prevention of pollution, better performance, risk reduction*" and "*adherence to environmental legislation/other legislation*".

6.2 Achievement of expected EMS benefits in the CoT

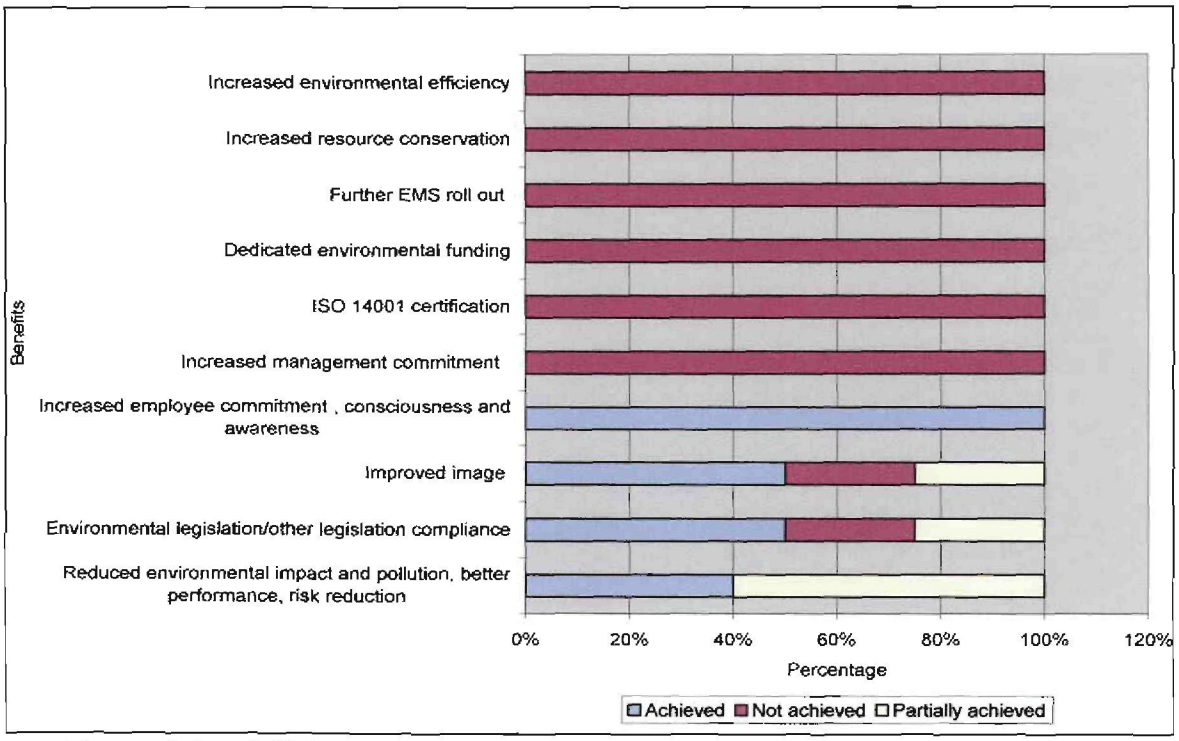

Figure 6.1: EMS benefit achievement in the CoT as identified by the ERM Section

In terms of figure 6.1 it is noted that only one of the top 5 expected EMS benefits for the CoT (refer to table 6.1), i.e. "*increased employee commitment, consciousness and awareness*", were being perceived as being fully achieved by the ERM Section, and that one has been identified as not being achieved at all, i.e. "*increased management commitment*". Issues regarding unsatisfactory management commitment towards the EMS were highlighted in section 6.1 as well as in chapter 5, were it was found that EMS commitment and resource allocations are insufficient (see table 5.2) and that it is also a barrier to EMS

implementation (see table 5.4). This highlights the fact that a lack of EMS management support can have serious implications for its effectiveness.

The remaining top 5 expected EMS benefits were perceived as being achieved only by 45% and 40% respectively. As expected, those EMS benefits which ranked low in terms of table 6.1 were perceived as not being achieved.

Broadly observed it was evident that most EMS benefits were considered as not being achieved by the ERM Section (the red "*not achieved*" section in figure 6.1 dominates). Further, 60% of the EMS benefits identified by the ERM Section were perceived as not being achieved at all. This might hint on general negativity and low morale in the said Section and/or low commitment and faith in the CoT EMS in general. The reasons therefor were however identified by the ERM Section as follows:

- Low commitment and responsibility, as well as ignorance towards the environment and the EMS itself;
- Non compliance to the ISO 14001 standard;
- Low priority to environmental issues in a municipal milieu, which is focused on political issues, service delivery, economic upliftment and social wellbeing;
- Limited capacity in terms of human resources (training and numbers) and financial resources;
- Low general environmental awareness among staff, management and politicians; and
- Various lengthy legislative prescriptive procedures and internal arrangements related to issues such as approval of strategic and operational plans, procurement, appointment of contractors, capital expenditure, etc.

Only one benefit (10%) was perceived as being achieved fully, i.e. "*increased employee commitment, consciousness and awareness in terms of the*

environment". This is however contradictory to the reasons for non achievement of benefits as summarized earlier.

The reasons for achievement of identified EMS benefits in the CoT, as identified by the ERM Section, can be summarized as follows:

- Implementation of an EMS through utilization of the ISO 14001 standard elements as guidance;
- Increased environmental awareness and involvement due to training and activities undertaken in terms of EMS implementation efforts; and
- "*Nagging*", i.e. continuous reminders and follow ups to/with stakeholders in terms of their EMS obligations.

6.3 Overall effectiveness of the CoT EMS

The ERM Section was requested to rate the overall effectiveness of the CoT EMS. All respondents rated it as effective "*to some degree*", indicating that the ERM Section considers the EMS as partly effective. This response might be attributed to reasons and barriers identified in table 5.4 and section 6.2.

6.4 Conclusion

The CoT ERM Section, responsible for EMS planning, implementation, management, and internal auditing, identified the following as the expected benefits which an EMS holds for the CoT:

- Reduced environmental impacts related to municipal activities, prevention of pollution, better performance, and risk reduction;
- Adherence to environmental legislation/other legislation;
- Improved image through practicing what you preach;
- Increased employee commitment, consciousness and awareness in terms of environmental issues;
- Increased management commitment in terms of environmental issues;
- ISO 14001 certification;

- Dedicated environmental funding;
- Further roll-out of EMS in Departments;
- Environmental resource conservation; and
- Increased environmental efficiency.

In terms of the achievement of the above benefits it was found that 60% thereof were perceived as not being achieved at all. The reasons therefor, according to the ERM Section, are:

- Lack of management commitment;
- Constraining internal procedures;
- Lack of resources;
- Low priority assignment to environmental issues;
- Low environmental awareness and responsibility; and
- Ignorance and non compliance towards the EMS.

One benefit was however perceived as being fully achieved and three partially, because of (according to the ERM Section) increased environmental awareness and involvement due to training and activities undertaken in terms of EMS implementation efforts and continuous "*nagging*", i.e. continuous reminders and follow ups to/with stakeholders in terms of their EMS obligations.

In terms of the above results and the overall rating of the effectiveness of the CoT EMS by the ERM Section, it can be concluded that the CoT EMS is only partially effective according to the CoT ERM Section.

It is critical that the recommendations made by the ERM Section to increase the achievement of the identified EMS benefits for the CoT, should be integrated into EMS planning and implementation to ensure effectiveness thereof, and it is therefore further addressed in Chapter 8. The following is a summary thereof:

- Increased awareness among all CoT staff, top management and politicians;
- EMS implementation in all CoT Departments;
- Increased resource allocations to implement and maintain the EMS;
- EMS certification by an external body;
- Implementation of measures to increase top management commitment.
- Appointment of EMS specialists in each CoT Department;
- Enhanced EMS marketing among all CoT staff, top management and politicians;
- Integration of EMS into other CoT processes such as the IDP;
- Integration of EMS in the CoT performance management system;
- Increased EMS compliance reporting to CoT management; and
- Enforcement of EMS implementation by National and Provincial Government.

Chapter 7: Effectiveness of EMS: Overall Organization

This chapter aims to address **research sub-question 5**, namely:

> What are, in the opinion of the CoT EMS Representatives, the effectiveness of the CoT EMS in terms of the achievement of the EMS benefits, the reasons therefor, and recommendations to improve the overall CoT EMS?

The following chapter explores the effectiveness of the CoT EMS in the organization as a whole by obtaining the opinions of the officially appointed EMS Representatives in the respective CoT Departments in terms of the achievement of the EMS benefits identified in chapters 4 and 6, the reasons therefor, and recommendations to improve the overall CoT EMS.

This chapter was informed by a questionnaire (Annexure B) directed to the EMS Representatives and supporting interviews.

The following is an outline of the sections contained in this chapter:

The potential EMS benefits identified for the CoT are portrayed in the first section, followed by the degree of achievement of these benefits in the overall organization. There-after the reasons for EMS benefit achievement/non-achievement and related recommendations are addressed. Finally the overall effectiveness of the CoT EMS is explored.

7.1 Potential EMS benefits identified for the CoT

In terms of this research a review of both international- and local literature was conducted to identify the benefits of ISO implementation for organizations as well as municipalities. The detailed results of the said review are portrayed in chapter 4. The following is a list of the said benefits:

- Enhanced environmental and/or overall performance/effectiveness;
- Environmental legislative compliance;
- Increased environmental awareness;
- Increased environmental involvement, commitment and cooperation;
- Increased environmental competency;
- Better communication;
- Reduced costs/financial effectiveness;
- Increased efficiency/resource savings;
- Enhanced relationship with environmental regulator;
- Reduced environmental impacts;
- Enabling/enhancing environmental innovation;
- Reduced environmental risks;
- Enhanced environmental stewardship and benchmarking;
- Better decision making;
- Improved information management;
- Enhanced corporate image and improved competitiveness; and
- Continual environmental improvement.

In chapter 6 the expected benefits (in the opinion of the CoT ERM Section) of EMS implementation in the CoT specifically were identified through utilization of a questionnaire (Annexure A) and interviews. These were identified as the following:

- Reduced environmental impacts related to municipal activities, prevention of pollution, better performance, and risk reduction;

- Adherence to environmental legislation/other legislation;
- Improved image through practicing what you preach;
- Increased employee commitment, consciousness and awareness in terms of environmental issues;
- Increased management commitment in terms of environmental issues;
- ISO 14001 certification;
- Dedicated environmental funding;
- Further roll-out of EMS in Departments;
- Environmental resource conservation; and
- Increased environmental efficiency.

In an effort to test the effectiveness of the CoT EMS in terms of the achievement of EMS benefits supported by both international literature and the organization itself, the above EMS benefit data, obtained from a literature review and questionnaires as well as interviews to/with the ERM Section, were merged in terms of similarity in context and meaning to formulate the following combined list of EMS benefits:

- Facilitation of enhanced compliance to environmental legislation;
- Facilitating environmental awareness, thus enhancing environmental competency and consciousness and creating a feeling of responsibility towards the environment;
- Facilitation of reduced environmental impacts related to CoT activities, products and services, thus resulting in improved environmental and/or overall performance;
- Facilitation of environmental risk reduction;
- Facilitation of an enhanced corporate image and improved competitiveness;
- Facilitation of environmental best practice and benchmarking for local organizations and other municipalities;

- Facilitation of enhanced CoT top management and employee commitment to the environment, thus building environmental involvement, commitment and cooperation;
- Enhanced environmental decision making due to better communication and information management (internal and external);
- Enhanced financial effectiveness due to increased environmental efficiency and resource savings; and
- Enabling/enhancing environmental innovation.

The above final list of EMS benefits were included in a questionnaire (Annexure B) to explore the effectiveness of the CoT EMS in the organization as a whole by obtaining the opinions of the officially appointed EMS Representatives in the respective CoT Departments. Results are portrayed in section 7.2.

7.2 Achievement of the identified EMS benefits in the overall organization

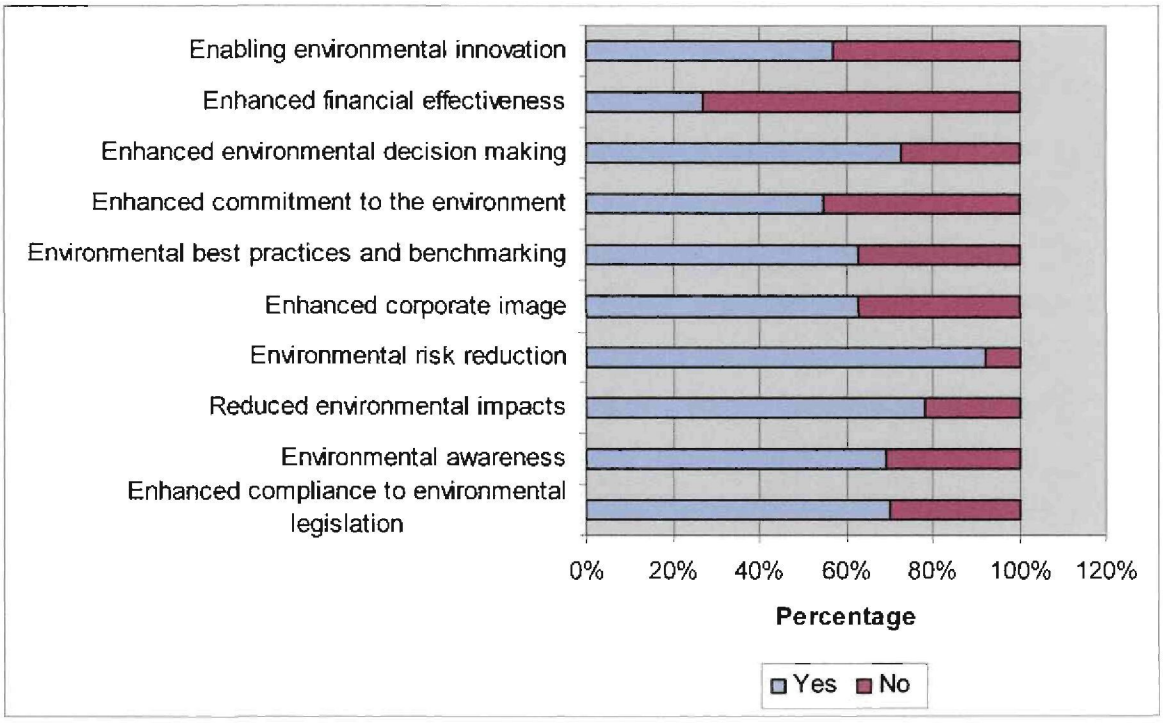

Figure 7.1: EMS benefit achievement in the overall CoT organization as identified by CoT EMS Representatives.

Figure 7.1 provided an overview of the achievement of benefits related to EMS implementation in the overall CoT organization, based on the opinions of the CoT EMS Representatives obtained through a questionnaire (Annexure B) and supporting interviews.

Broadly observed it was found that most EMS benefits were perceived as being achieved to some degree (the blue "*yes*" Section in the Figure dominates), but none fully, which supports the view of partial effectiveness of the CoT EMS. This might further implicate a positive attitude among the EMS Representatives towards the EMS. This was also identified in figure 6.1, Chapter 6, whereby the ERM Section was of the opinion that the EMS benefit most widely achieved in the CoT was "*increased employee commitment...*". It is however contradictory to overall negativity among the CoT ERM Section towards the EMS, identified in section 6.2. This contradictory data might be attributed to the possibility that the ERM Section was more aware of the EMS' obstacles and problems as it deals with the EMS on a daily basis, whereas the EMS Representatives only deals with it on an ad hoc basis, thus making them less aware of its problems. Danger lies in the possibility that the said negativity among the ERM Section might impact on the positive attitude towards the EMS in the organization as a whole, thus ultimately affecting the overall effectiveness of the EMS.

In terms of figure 7.1 it was significant that the EMS benefit related to "*environmental risk reduction*" was perceived as being mostly achieved, followed by the benefit related to "*reduced environmental impacts*", and "*enhanced compliance to environmental legislation*", whereas the benefit related to "*enhanced financial effectiveness*" was perceived as not being achieved in the CoT. Lower environmental risks, reduced environmental impacts and legal compliance can result in lower remedial costs and legal liabilities, thus enhancing financial effectiveness, and it can be derived that financial benefits to EMS implementation were possibly not being perceived as achieved as its link to reduced environmental impacts and risks as well as legislative compliance was

not correctly conceptualized to some degree in the CoT, thus implicating a need for improved internal EMS training.

In terms of internal EMS training the CoT presents a quarterly, internal "*Introduction to Environmental Management*" course, which mainly focuses on EMS concepts, to CoT EMS Representatives as well as any other interested employees (pers. comm. Bekker: 2007). According to Annexure B data, only 52% of the EMS Representatives attended the said course, which supports the view that:

- The environment was not a priority in the municipality;
- EMS Representatives did not have time to attend environmental training courses as they were expected to execute their daily duties in terms of their key performance areas as a priority;
- Poor top management buy-in, support and commitment to the CoT EMS as official EMS Representatives were not nominated or permitted to attend the said course;
- Low commitment from EMS Representatives in terms of low interest in attending the said course; and
- Poor EMS implementation and operation as element 4.4.1 of the ISO 14001 standard dealing with "*Resources, roles, responsibility and authority*" prescribes that resources must be available in terms of the EMS, which include human resources with "*specialized skills*" in terms of the EMS (ISO, 2004:5).

Some EMS Representatives however did indicate that they obtained the following environmental related qualifications which, although not EMS specific, might have assisted in enhanced EMS implementation and operation:

- National Diploma: Agriculture;
- National Diploma and National Higher Diploma: Environmental Health;
- Masters in Public Health;
- Certificate: Environmental Law for Environmental Managers;

- National Diploma: Conservation;
- National Higher Diploma: Game Management;
- Masters in Wildlife Management; and
- National Higher Diploma: Horticulture.

As mentioned most respondents perceived the EMS benefit related to "*enhanced financial effectiveness*" as not being achieved in the CoT. The main reasons therefor were, according to annexure B data, cited as:

- The perception that the procurement of environmental efficient goods and services are not supported by CoT management;
- That the said goods and services are often expensive; and
- Implications in terms of the Municipal Finance Management Act (MFMA), 2003 (Act 56 of 2003).

These reasons identified contradict the earlier finding that "*enhanced financial effectiveness*" was not correctly conceptualized in the CoT, as it indicates a broad understanding thereof. Although the ERM Section did not identify financial effectiveness as an expected EMS benefit (refer to figure 6.1), it was portrayed as important in terms of table 4.1, and the achievement thereof in municipalities should be further researched.

As mentioned earlier the EMS benefits regarded as being achieved by most of the respondents include:

- Environmental risk reduction;
- Reduced environmental impacts;
- Environmental awareness;
- Enhanced environmental decision making; and
- Enhanced compliance to environmental legislation.

In terms of figure 6.1, Chapter 6, the ERM Section also identified these as being achieved in the CoT, thus implicating similar perceptions in terms of benefit achievement and the overall effectiveness of the EMS. This is however contradictory to the overall negative perception among the ERM Section towards the EMS, as identified in section 6.2. The said Section however did not identify "*enhanced decision making*" as an EMS benefit (refer to table 6.1) although it was also identified, in terms of a literature review, as being an EMS benefit for municipalities (refer to table 4.1). This might again support the view of negativity among the ERM Section towards the EMS as it is more aware of the EMS' obstacles and problems as it deals with the EMS on a daily basis.

In terms of the following EMS benefits, it was evident from figure 7.1 that there were split opinions related to the achievement thereof:

- Enabling environmental innovation;
- Enhancing commitment to the environment;
- Environmental best practices and benchmarking; and
- Enhanced corporate image.

"*Enabling environmental innovation*" and "*environmental best practices and benchmarking*" was not identified as an expected EMS benefit to the CoT by the ERM Section (refer to table 6.1), although it was identified as beneficial by international literature (refer to table 4.1). Further, "*Enhanced commitment to the environment*" was identified as a key EMS benefit for municipalities according to international literature (refer to table 4.1), although the ERM Section identified it as not being achieved in the CoT (refer to figure 6.1). "*Enhanced corporate image*" was regarded as partly achieved by the ERM Section (refer to figure 6.1) as well as being a key EMS benefit for organizations in general by international literature (refer to table 4.1). The above findings highlight the need for further research in terms of enhanced achievement to elevate the effectiveness of the CoT EMS.

7.3 Reasons for EMS benefit achievement/non-achievement related recommendations

The overarching reason for the achievement of the EMS benefits as indicated in Figure 7.1 was identified, in terms of questionnaire B data, as the establishment and attempted implementation of the CoT EMS and outcomes related thereto, which include:

- Enhanced environmental research, -decision making, and -legislative compliance;
- The integration of environmental matters into CoT operations;
- Increased environmental awareness and communication;
- Limited integration of EMS indicators into the performance management system (PMS) of some Departments which enhanced environmental performance;
- Enhanced corporate image and benchmarking as CoT tenders, audit reports and communications with environmental best practices included therein were often shared with other municipalities and other spheres of government;
- Visible environmental improvement was experienced, which could have attracted investors;
- EMS implementation activities and audits helped to identify and mitigate environmental risks; and
- The EMS facilitated the integration of environmental matters into day-to day activities, thus enhancing environmental performance.

The following reasons were identified, in terms of annexure B data, for non-achievement of the CoT EMS benefits as reflected in figure 7.1:

- Lack of true EMS implementation:
  - What happened on paper did not happen in practice, it was all just "*talk*";
  - The EMS was still new and could not yet have facilitated the achievement of the mentioned benefits;
  - EMS was not applied on planning, project or maintenance level, and its implementation was thus limited;
  - Lack of internal and external EMS communication caused confusion and hindered the achievement of most EMS benefits and external visibility thereof;
  - EMS training was not sufficient and not focused on all levels, i.e. top management and politicians;
  - EMS arrangements and procedures were not clear; and
  - EMS roles and responsibilities were not clear.

- Lack of EMS commitment:
  - Limited and non-obligatory integration of environmental issues into the corporate PMS, business planning- and budgeting activities took place, thus "*paralyzing*" the EMS; and
  - Management and Politicians had not yet bought into environmental issues and it was thus not a priority, resulting in limited resources being allocated for the EMS.

- Lack of EMS resources:
  - High work loads, budget constraints, limited time and –human resources left no room for environmental activities and –innovation, and basically made EMS implementation and compliance impossible.

The identified reasons for non-achievement of the CoT EMS benefits as reflected in figure 7.1 indicates non compliance to the elements of the ISO 14001 standard, which, for example, specifies that "*Management shall ensure the availability of resources essential to establish, implement, maintain and improve the environmental management system*" (ISO, 2004:5). Although the CoT utilized the said standard only as a guideline (refer to section 5.3), this fact might contribute to low EMS effectiveness in the CoT in terms of achievement of its expected benefits, and must thus be addressed to ensure its effectiveness.

The following is a summary of the recommendations made by the EMS Representatives to increase EMS benefit achievement in the CoT:

- Obtain management and political support and buy in at all levels to secure and/or enhance EMS financial- and human resource allocations;
- Integrate EMS activities into the day-to day operational and strategic activities of Departments to ensure that it is not regarded as something "*new*" or "*additional*", but integral to the business of the municipality;
- Increase EMS awareness among all employees, top management and politicians to enable buy-in and enhanced effectiveness thereof;
- Truly implement the EMS by ensuring that what happens on paper happens in practice; and
- Coordinate EMS communication among all levels in the municipality to achieve buy-in, co-operation and understanding of the EMS.

7.4 Overall perceived effectiveness of the CoT EMS

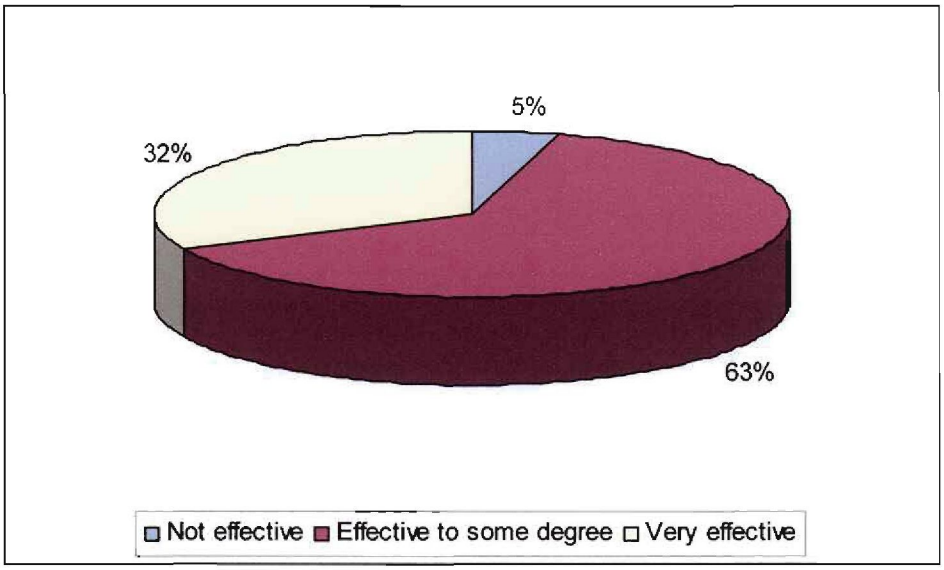

Figure 7.2: Overall effectiveness rating of the CoT EMS as perceived by the CoT EMS Representatives

The overall effectiveness of the CoT EMS was perceived, according to annexure B data, as being effective to some degree by 63% of the EMS Representatives, whereas 32% regarded it as very effective and only 5% being not effective at all, and it can be derived that the CoT EMS is partially effective. This was also found in section 6.3 in terms of the ERM Section's perception that the expected benefits that the EMS holds for the CoT was only partially achieved.

Figure 7.2 also supports the view of an overall positive attitude and commitment among the EMS Representatives towards the EMS, which was also highlighted in section 7.2. In terms of Annexure B data, it was also indicated that 74% of the EMS Representatives are fully committed to the CoT EMS, thus further supporting this view. The 26% EMS Representatives whom indicated that they were only committed to the EMS to some degree cited the following reasons:

- Lack of funding to fully implement the EMS as it is not budgeted for in the various CoT Departments;

- Their actions as EMS Representatives are executed on an ad-hoc basis as they have other job responsibilities and thus limited time to spend on EMS issues;
- They do not have clear implementation guidelines, defined roles and responsibilities to successfully apply the EMS in their respective functionalities; and
- Lengthy procurement procedures which often does not support, for example, green procurement, prescribed by the Municipal Finance Management Act, 2003 (Act 56 of 2003) hinders full commitment.

7.5 Conclusion

It can be concluded that, in terms of the perception of the officially appointed EMS Representatives, the CoT EMS is effective to some degree in terms of benefit achievement. This is not only evident in their overall perceptions related to the effectiveness of the EMS, (63% of the EMS Representatives perceived the EMS as effective to some degree only in terms of figure 7.2), but also because it was indicated that the identified EMS benefits were all perceived as being partly achieved, but none 100% (Figure 7.1).

The main reason cited for achievement of the identified EMS benefits as outlined in figure 7.1 was the establishment and implementation of an EMS in the CoT and outcomes related thereto such as enhanced environmental performance and awareness. Another reason was the overall positive attitude among the EMS Representatives towards the CoT EMS. This finding was however not aligned to overall negativity among the CoT ERM Section towards the EMS, identified in section 6.2, although it was found that the EMS Representatives and the ERM Section had, in terms of the benefits perceived as mostly achieved by the EMS Representatives, similar perceptions.

The reasons for non- achievement of the EMS benefits as outlined in figure 7.1 were mainly cited as lack of true EMS implementation, low commitment thereto and lack of resources, which have also been identified as EMS constraints by the

ERM Section in section 6.2. The mentioned reasons support the view of low compliance to the elements of the ISO 14001 standard, which might hinder the effectiveness of the EMS.

In recognition that the abovementioned reasons could have directly impacted negatively on the effectiveness of the EMS, recommendations were made to address these reasons, which mainly include enhanced management and political support, increased buy in at all levels, integration of EMS into operational and strategic activities, increased awareness, coordinated communication and facilitation of effective EMS implementation. Another recommendation, derived from the findings made in this Chapter, is that the means (how) of enhanced EMS benefit achievement should be further researched. It is further critical that the above recommendations are integrated into EMS planning and implementation to ensure effectiveness thereof and it is therefore further addressed in chapter 8.

It was also found that the ERM Representatives, in some instances, did not correctly conceptualize the potential EMS benefits to the CoT, thus implicating a need for improved internal EMS training. This was highlighted by the finding that only 52% of the EMS Representatives attended the internal EMS course.

Chapter 8: Conclusion and Recommendations

In this chapter final conclusions and recommendations are made in terms the research question introduced in chapter 1, namely:

> What is the effectiveness of the CoT ISO 14001 EMS?

The following is an outline of the sections contained in this chapter:

> The first section outlines the benefits of EMS implementation, followed by final conclusions related to the effectiveness of EMS. There-after the reasons for the identified EMS effectiveness are addressed, followed by recommendations to enhance EMS effectiveness. The chapter is concluded with recommendations for further research.

8.1 Benefits of EMS implementation

Literature argues that tools, such as EMS, that rely on voluntarism rather than legislative control (Hertin et al, 2004:2), can "*turn out to be no more than optimistic speculation*", and the real EMS outcome can merely be a "*short burst of organizational discussions*", or a costly pile of paper documentation and commitments put on record (Andrews et al, 1999:2).

In light of the above, the aim of this research was to explore the effectiveness of the CoT ISO 14001 EMS in terms of the achievement of its expected benefits, the reasons for non achievement of these benefits, and to explore recommendations to improve the overall effectiveness of the CoT EMS. EMS in general and the implementation of the CoT EMS were also introduced in this research to provide appropriate context thereto.

A review of both international- and local literature was conducted to identify the benefits of ISO implementation for organizations as well as municipalities. In chapter 6 the expected benefits (in the opinion of the CoT ERM Section) of EMS implementation in the CoT specifically were identified through utilization of a questionnaire (Annexure A) and interviews. In an effort to test the effectiveness of the CoT EMS in terms of the achievement of all of the above identified EMS benefits, the two sets of benefit data identified were merged in terms of similarity in context and meaning to formulate a final list of EMS benefits. The mentioned final list of EMS benefits were included in a questionnaire (Annexure B) to explore the effectiveness of the CoT EMS in the organization as a whole by obtaining the opinions of the officially appointed EMS Representatives in the respective CoT Departments. Figure 8.1 provides a flow diagram related to the abovementioned process:

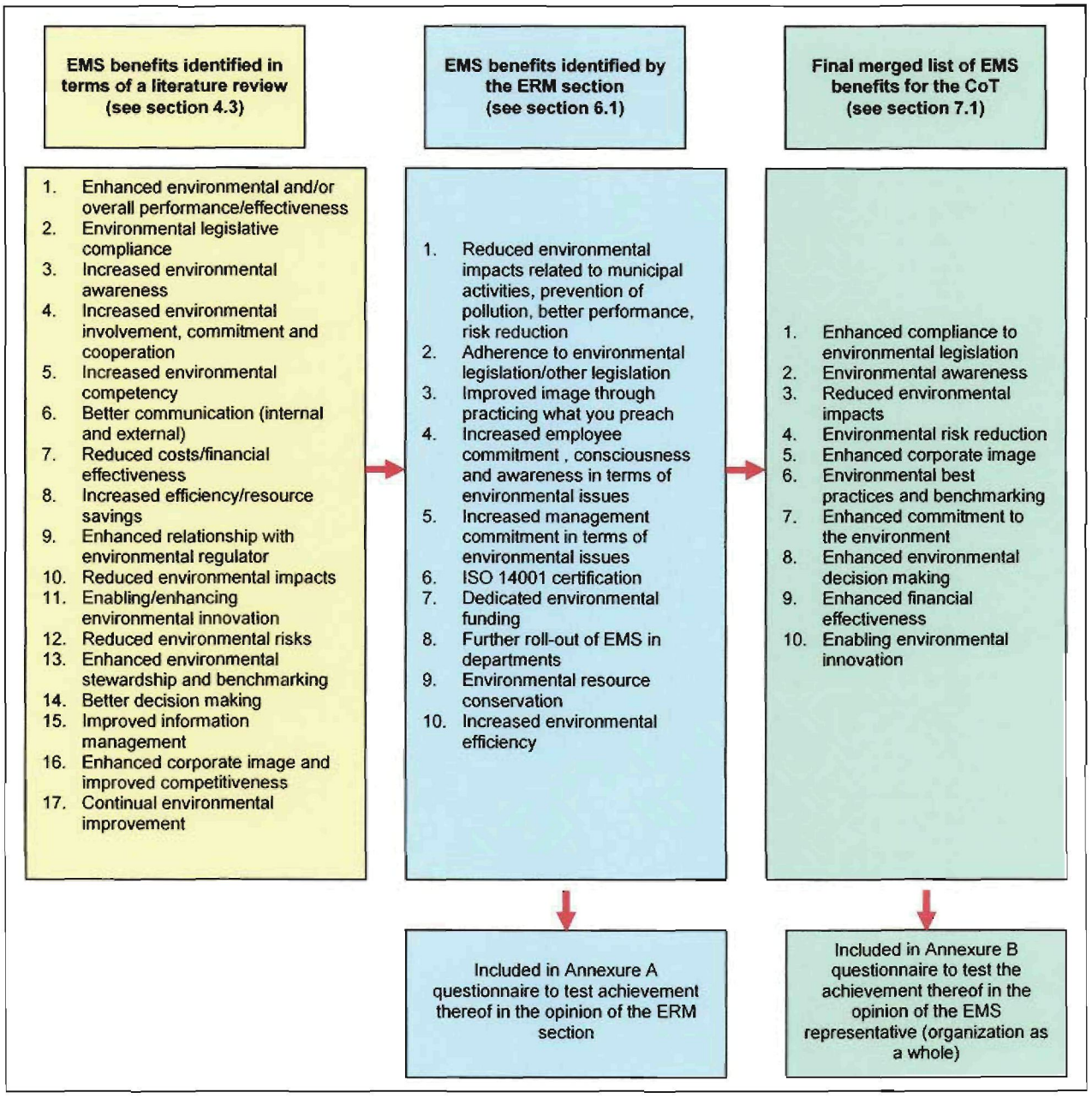

Figure 8.1: Summary of the process followed to identify EMS benefits for the CoT and the related achievement thereof

8.2 Effectiveness of EMS

In terms of this research it was found that the CoT EMS was **partially effective**, the main reasons therefor being 65% achievement of the final merged list of EMS benefits for the CoT (see figure 8.1 and table 8.1) because of low commitment to

environmental issues, insufficient resources, poor EMS implementation, low environmental awareness, ignorance and limiting internal procedures.

The non achievement of expected EMS benefits in the CoT should however be regarded as challenge for both the CoT and other municipalities to enhance the effectiveness of EMS at local government level, and recommendations made in this research should be utilized to guide municipalities in general to more effective EMS.

Table 8.1 portrays a summary of results regarding the effectiveness of the CoT EMS in terms of achievement of the EMS benefits identified by the ERM Section as well as the achievement of the final list of EMS benefits (formulated through the merging of benefits identified through a literature review and the ERM Section).

Table 8.1: Summary of benefit achievement in the CoT

EMS benefits identified by the ERM Section	Achievement of benefits identified by the ERM Section in the opinion of the said Section	Final merged list of EMS benefits for the CoT	Achievement of the merged list of EMS benefits in the opinion of the ERM Representatives
Reduced environmental impacts related to municipal activities, prevention of pollution, better performance, risk reduction	Perceived as being achieved by 40% of respondents	Enhanced compliance to environmental legislation	Perceived as being achieved by 70% of respondents
Adherence to environmental legislation/other legislation	Perceived as being achieved by 50% of respondents	Environmental awareness	Perceived as being perceived by 69% of respondents
Improved image through practicing what you preach	Perceived as being achieved by 50% of respondents	Reduced environmental impacts	Perceived as being perceived by 78% of respondents
Increased employee commitment , consciousness and awareness in terms of environmental issues	Perceived as being achieved by 100% of respondents	Environmental risk reduction	Perceived as being perceived by 92% of respondents
Increased management commitment in terms of environmental issues	Perceived as being perceived by 0% of respondents	Enhanced corporate image	Perceived as being perceived by 63% of respondents
ISO 14001 certification	Perceived as being perceived by 0 % of respondents	Environmental best practices and benchmarking	Perceived as being perceived by 63% of respondents
Dedicated environmental funding	Perceived as being perceived by 0% of respondents	Enhanced commitment to the environment	Perceived as being perceived by 54% of respondents
Further roll-out of EMS in Departments	Perceived as being perceived by 0% of respondents	Enhanced environmental decision making	Perceived as being perceived by 73% of respondents
Environmental resource conservation	Perceived as being perceived by 0% of respondents	Enhanced financial effectiveness	Perceived as being perceived by 27% of respondents
Increased environmental efficiency	Perceived as being perceived by 0% of respondents	Enabling environmental innovation	Perceived as being perceived by 57% of respondents
OVERALL PERCENTAGE BENEFIT ACHIEVEMENT	24%		65%

In terms of table 8.1 it is evident that the CoT EMS is **partially effective** related to EMS benefit achievement as only 24% of the ERM Section and 65% of the EMS Representatives were of the opinion that the expected EMS benefits were being achieved. This view is supported by the finding that six (60%) of the potential CoT EMS benefits, identified by the ERM Section, were perceived as not being achieved at all, as well as their overall rating of the CoT EMS in this research as only effective to some degree. Further supportive of this opinion was the finding that none of the final list of EMS benefits to the CoT were perceived as being fully or 100% achieved by the EMS Representatives. In this research the CoT EMS was further rated as effective to some degree by 63% of the EMS Representatives.

It should however be noted that, in terms of EMS, "*many benefits to be realized are long- rather than short term*" (Zutshi and Sohal, 2002:14), and the above reflection of the CoT EMS being partially effective in terms of achievement of its expected benefits, may improve over time.

8.3 Reasons for partial EMS effectiveness

The following were identified as the main reasons for the CoT EMS being only partially effective in terms of achievement of its expected benefits:

8.3.1 Low commitment towards environmental issues

According to the Peer Center (2004a:2), the most significant EMS resource for an organization is top management leadership and involvement. This is underlined by Drury (2000:11) who states that "*visible commitment, leadership and direction from senior management*" is critical to EMS success. The Global Environment and Technology Foundation (2000:35) also state that "*successful EMS implementation is not possible without top management leadership, visibility, and involvement*".

In terms of this research it was found that top management and Politicians in the CoT had not yet bought into environmental issues and does not see it as a priority, thus resulting in lack of support and resource allocations therefor. It

must however be understood that, in a municipal milieu, the main focus are on political issues, service delivery, economic upliftment and social wellbeing, which leaves limited time for top management and politicians to focus on environmental issues.

In support of the above view the ERM Section were also of the opinion that there was only EMS commitment to some degree among top management and in the organization itself.

It was also found that the lack of top management and political commitment towards the CoT EMS resulted in limited and non-obligatory integration of environmental issues into the corporate PMS, business planning- and budgeting activities took place, thus "*paralyzing*" the EMS.

Organization (CoT) wide commitment to the EMS was however evident as 74% of the CoT EMS Representatives indicated that they are fully committed to the CoT EMS, the main reasons being:

- A broad understanding of the importance of environmental sustainability;
- Buy-in, commitment and awareness achieved through the implementation of the CoT EMS; and
- Environmental awareness creation facilitated by global environmental issues such as global warming.

The above finding supports the opinion of an overall positive attitude in the CoT in terms of the EMS, although it was found that there is a general negativity among the CoT ERM Section towards the EMS, which might be attributed to the possibility that the said Section was more aware of the EMS' obstacles and problems as it deals with the EMS on a daily basis, whereas the EMS Representatives only deals with it on an ad hoc basis, thus making them less susceptible to its problems. Danger lies in the possibility that the said negativity among the EMS Section might impact on the positive attitude towards the EMS in

the organization as a whole, thus ultimately affecting the overall effectiveness of the EMS.

8.3.2 Insufficient resources

A common problem in local authorities is a scarcity of resources such as personnel, money, and time (Emilsson and Hjelm, 2002:443). Sufficient financial-, and especially human resource allocations is however critical to the success of an EMS. To this effect Drury (2000:9) states that "*Resourcing of the development of an EMS needs to be adequate. Staff time, more than money is the resource constraining the development of an EMS*". Element 4.4.1 of the ISO 14001 standard also specifies that "*Management shall ensure the availability of resources essential to establish, implement, maintain and improve the environmental management system*" (ISO, 2004:5).

Although the CoT utilized the said standard only as a guideline (pers. comm. Bekker, 2007) the problem related to insufficient allocation of financial- and human resources for the CoT EMS contributed to the partial effectiveness in the CoT EMS as high work loads, budget constraints, limited time and –human resources left no room for environmental activities and –innovation. This problem was evident in terms of opinion of the ERM Section that that both human- and financial resource allocation in the CoT were insufficient.

The lack of EMS resource allocations (human and financial) were contributed to:

- Lack of prioritized funding for environmental issues;
- Financial pressures on local government as most South African municipalities are in serious financial trouble;
- The fact that economic and social issues as well as service delivery is of higher priority in local government; and
- Prescriptions from National Treasury which prescribes the percentage expenditure related to human resources in local government.

8.3.3 Lack of true EMS implementation

There was the general perception that the CoT EMS was not implemented successfully, that what happened on paper did not happen in practice, and that it was all just "*talk*". This resulted in limited influence over internal operations and an overall invisibility of potential EMS benefits.

It might be argued that this perception is false due to the fact that the EMS is still relatively new, and thus could not yet have facilitated tangible change and influence in the CoT. This argument is however discarded as the EMS was initiated in 2003, and has been in operation for approximately four (4) years.

The following factors were however identified in this research as reasons for unsuccessful EMS implementation:

- EMS was not applied on planning, project or maintenance level, and its implementation was thus limited;
- Lack of EMS communication caused confusion and hindered the achievement of most EMS benefits and external visibility thereof;
- EMS arrangements and procedures were not clear;
- EMS roles and responsibilities were not clear; and
- Non/limited compliance to the ISO 14001 standard.

8.3.4 Low general environmental awareness

According to Drury (2000:11) "*Training of staff is an integral part of developing an EMS and is also a factor of success in minimizing adverse environmental effects*".

Although environmental awareness and training are critical to EMS success it was found, in the opinion of the ERM Section, to be insufficient, thus resulting in limited EMS commitment in the CoT. This statement is supported by the finding that only 52% of the officially appointed EMS Representatives attended the internal EMS specific course, resulting in lacking of basic EMS skills.

Environmental awareness was also low among CoT top management and Politicians as the abovementioned EMS training were not focused on these persons. Management and Politicians are however often too busy with other Municipal priorities like service delivery issues, as mentioned in Section 8.6.2, to attend environmental training sessions.

8.3.5 Limiting internal procedures

Complicated, lengthy internal Municipal procedures, prescribed by the Municipal Finance Management Act, 2003 (Act 56 of 2003) (SA, 2003b) and/or by the municipality itself was identified as one of the main reasons for the partial effectiveness of the CoT EMS. As an example the procurement of resource efficient products such as energy efficient globes which can lead to financial effectiveness was hindered by preferential procurement guidelines as prescribed by the MFMA.

8.3.6 Ignorance towards the EMS itself

According to Emilsson and Hjelm (2002:447) EMS' are often regarded as isolated environmental project because local authorities do not see how it fits into their organization, which makes it difficult to find resources and support it needs.

Although the CoT appeared to have good intentions in terms of environmental management due to the initial voluntary adoption thereof (Pers.Comm. Venter, 2007), an overall ignorance towards the CoT EMS were detected throughout this research project in terms of being a "*nice to have*" isolated environmental project, and that the CoT ERM Section is solely responsible therefor. There was thus no EMS ownership detected in the CoT Departments. This view is mainly supported by the lack of resource allocations for the EMS, ignorance among EMS Representatives in terms of attending the internal EMS course, the low priority of EMS within the CoT, as well as lack of commitment and lack of EMS implementation in general, resulting in the EMS, in most cases, being a "*paper commitment*" system.

The above finding might be attributed to the fact that environmental issues are not integrated into the corporate PMS, business planning- and budgeting activities took place, thus paralyzing the EMS as no obligatory integration thereof into strategic and operational matters of the CoT took place.

8.4 Recommendations

In terms of the reasons for partial effectiveness of the CoT EMS described in section 8.3, recommendations were made by both the CoT ERM Section and EMS Representatives to enhance the EMS effectiveness. Their recommendations, supplemented by literature and the opinion of the researcher, are portrayed in sections 8.4.1 to 8.4.6.

8.4.1 Low commitment towards environmental issues

The following is recommended to enhance the identified low commitment towards environmental issues in the CoT:

- The initial decision to implement an EMS should be based on a high level, strategic decision, formalized in official documents and policies statements to facilitate commitment all levels of the organization thereto;
- EMS should not be initiated at a "*lower level*" Environmental Department but on a higher, strategic, top management organizational level such as the office of the Municipal Manager, where it can be cascaded down with the necessary strategic authority therefore;
- Top Management support can be obtained through continuous implementation and marketing efforts in terms of the EMS. To this effect Drury (2000:9) suggests the following in terms of lack of top management support: "*When senior management is not 100% committed to the EMS process attempt to bring senior management on board by continuing to undertake the EMS with the hope that they will see the benefits and come on board at al later date*";
- The EMS should be marketed in terms of the financial and personal benefits thereof. This is supported by the Lexington Group (2002:37) who suggested that EMS should be marketed in terms of the financial benefits

it holds for the organization as well as the long term benefits it might hold for the community as these aspects can hold personal benefits for top management and politicians such as re-appointment and re-election possibilities;

- Forced EMS commitment at all levels can be increased through the integration of EMS indicators into each job description and the organizational performance management system;
- In an effort to enforce Departmental commitment an EMS non-compliance report should be submitted to politicians and top management on a regular basis. The possibility of linking this initiative to the allocation of annual performance bonuses and holding Departments and individuals liable for EMS and legislative transgressions should also be investigated. To this effect the Lexington Group (2002:38) suggests a "*performance reward system so that middle and operations managers are rewarded for meeting the environmental objectives and targets*";
- Incentives for those Departments which perform in terms of environmental management should be established;
- The Municipal Annual Report should be based on social-, economic- and environmental indicators, i.e. the "*triple bottom line*" to enforce environmental performance reporting in the organization and ultimately also forced commitment towards the EMS; and
- An in depth EMS marketing campaign should be launched both internally and externally to the organization to facilitate commitment.

8.4.2 Insufficient resources

The following is recommended to address insufficient resource allocations toward the CoT EMS:

- The recommendations discussed in Section 8.4.1 related to the enhancement of top management and political commitment towards the EMS is critical as it can result in buy-in and related increased resource allocations for the EMS;

- Visible external EMS marketing and communication is critical as it can enhance the image of the organization, thus increasing possibilities for donor funding for EMS;
- The integration of EMS into the organizational performance management system will automatically result in strategic budgeting therefor by each Department;
- Capital expenditure related to EMS matters can be budgeted for in terms of the municipal IDP as implementation thereof holds direct benefits related to environmental sustainability for the community;
- A centrally managed EMS specific vote should be established to fund non-capital EMS expenditure in the Organization, not sufficiently budgeted for by the respective Departments due to ignorance or capacity constraints in terms of the EMS; and
- Employees of the Environmental Section responsible for EMS planning and implementation should not be appointed to a single central environmental office, but rather as dedicated, full time environmental specialists in each Department whom directly reports to the Manager of the Environmental Section regarding environmental issues. This will result in the elimination of EMS implementation on an ad-hoc basis by unqualified persons.

8.4.3 Lack of true EMS implementation

The following is recommended to enhance EMS implementation in the CoT:

- The EMS should be implemented strictly in accordance with the ISO 14001 standard and should be certified as, according to Zutshi and Sohal (2002a:15), "*EMS related tangible and intangible benefits could only be achieved by obtaining certification by a third party*";
- All CoT employees should be involved in the EMS from the beginning to build understanding, achieve buy in, institutionalize the EMS into organizational culture as "*successful implementation of the EMS depends on employee input and involvement, understanding and buy-in at every*

level of the organization" (Global Environment and Technology Foundation, 2000:35);

- The EMS process itself and its communication must be streamlined through the utilization of an electronic system instead of a paper system as well as the establishment of a central EMS database;
- According to Dyllick (2002:10) "*the development of strategies is of fundamental importance for improving the effectiveness of EMS over time*". Since EMS mainly addresses operational issues it is critical that it is also strategically orientated, planned for and applied at top management level to ensure implementation thereof;
- To contribute to continual improvement it is suggested that the EMS is audited at scheduled intervals by an external auditor as it can add value in terms of impartiality and objectivity; and
- EMS matters should be a standing agenda point in all top management and political meetings to ensure continuality of efforts.

8.4.4 Low general environmental awareness

The following is recommended to address low general environmental awareness in the organization:

- EMS awareness and education at all organizational levels should be a municipal priority, and "*should extend across the entire organization*" (Global Environment and Technology Foundation, 2000:28);
- The attendance of internal EMS- and general environmental awareness courses should thus be obligatory to all employees of the organization and at all levels, and as such should also be integrated into the Municipal performance management system;
- To support buy-in, environmental training should focus on "*the benefits of the EMS to the workers in their workplace, to the communities in which they live and to the health of the environment for their children and future generations*" (Lexington Group, 2002:39);

- Zutshi and Sohal (2002b:14) recommend that employees should be "*involved as early as possible during the EMS process*" to "*assist in reducing their resistance towards the EMS implementation*". Basic environmental/EMS training and awareness should thus be expanded through integration thereof into the induction course of new CoT employees to facilitate their understanding and knowledge of the EMS; and
- To provide EMS leadership and thus facilitate buy-in and commitment, "*management must fully understand what an EMS implies for the organization, be part of developing the project plan, and have a good idea of the human and financial resources that will be required to complete the project*" (Global Environment and Technology Foundation, 2000:35). They "*need to be made aware and trained in the basics and significance of EMS*" (Zutshi and Sohal, 2002b:14) and should be sufficiently trained and involved in all aspects of EMS planning, development and management. This will assist in facilitating their commitment towards the EMS, and only then will the importance thereof be understood and sufficient resources allocated to successfully implement and maintain the EMS.

8.4.5 Limiting internal procedures

The following is recommended to address issues regarding limiting internal procedures:

- Provisions in the MFMA which impacts negatively on EMS effectiveness at local level should be researched and appropriate recommendations made to National Government to amend the said Act; and
- Internal procedures impacting on EMS effectiveness should be identified and re-aligned to enhance EMS implementation.

8.4.6 Ignorance towards the EMS itself

The following is recommended to address ignorance towards the EMS:

- As mentioned in section 8.4.1, EMS indicators should be integrated into the performance management system of the municipality, which will automatically result in the inception thereof into all strategic business planning processes, budgeting processes, and job descriptions of all levels in the hierarchy. This will also result in Departments taking "*ownership*" of the EMS; and
- Duplication as well as the danger that the EMS is regarded as a stand alone environmental project can be addressed by integration thereof into "*existing management systems*" within the organization, such as the Occupational Health and Safety system (Zutshi and Sohal, 2002b:14). To this effect Drury (2000:11) also suggests "*integration with existing management systems such as quality management, business management and asset management*". It is also suggested that the EMS is integrated into all political systems, strategic planning, as well as the municipal IDP.

8.5 Recommendations for further research

The next step building on this research would be to compare the perceived benefits with actual benefits. This could provide valuable insights into the difference between what is perceived and the actual reality of what has been realized. Admittedly the methodological challenges for moving beyond measuring perceptions are significant, probably requiring in-depth studies for each perceived benefit individually, which is beyond the scope of a mini-dissertation. The lack of empirical research on this topic is probably due to these methodological challenges. Ultimately the inability and lack of evidence on the contribution of EMS for organizations could stifle the adoption of EMS, especially in the public sector.

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Annexure A: Stakeholder Questionnaire - ERM Section

Implementation of ISO 14001 Environmental Management Systems in local government - effectiveness within the City of Tshwane

Questionnaire to relevant staff of the CoT Environmental Management Section

Research is currently being conducted to evaluate the effectiveness of the CoT ISO14001 EMS in terms of its perceived benefits. You have been identified as a CoT staff member who are/has been directly involved in the management, planning and implementation thereof and are hereby friendly requested to complete the following questionnaire.

Your contribution to this study will assist in improving the collective understanding of the effectiveness of the CoT ISO 14001 EMS and will assist the CoT in improving its EMS. If necessary, a personal interview regarding this questionnaire will be scheduled with you.

Any enquiries can be directed to Ilse Kotze at:

Tel: 012 358 8665
Cell: 082 377 8159
E-mail: ilsek@tshwane.gov.za

Please forward the completed questionnaire to the above person on or before 30 January 2007 via e-mail or fax. Hard copies may also be delivered at:

Sammy Marks Galleria Offices
c/o Prinsloo and Vermeulen streets
Pretoria Central
First Floor

Please note that the information supplied by you will be utilized in an aggregated form and no reference will be made directly to you personally without your permission.

1. Personal Details

1.1 Date of completing this questionnaire

1.2 Full name

1.3 Department

1.4 Division

1.5 Section

1.6 Designation

1.7 Period of direct CoT ISO14001 management, planning and implementation involvement

1.8 Tertiary Qualifications

NAME	INSTITUTION	YEAR OBTAINED

2. EMS Certification

2.1 Is the CoT ISO 14001 EMS certified with an external certification body?

YES NO (Please tick)

2.2 If no to question 2.1 above, why not (what constraints exist)?

2.3 If no to question 2.1 above, do you plan to certify the EMS and when?

2.4 If yes to question 2.1 above, when and with what external certification body?

3. EMS Commitment

3.1 Which statement represents the commitment of CoT top management regarding the implementation of the CoT EMS?
(Please tick)

No commitment	Some degree of commitment	Full commitment
Reason:		
Recommendations to establish improvements (if applicable):		

3.2 Which statement represents the commitment of relevant CoT Departments regarding the implementation of the CoT EMS?
(Please tick)

No commitment	Some degree of commitment	Full commitment
Reason:		
Recommendations to establish improvements (if applicable):		

3.3 Which statement represents financial resource allocation regarding the CoT EMS?
(Please tick)

Not sufficient at all	Sufficient to some degree	Sufficient
Reason:		
Recommendations to establish improvements (if applicable):		

3.4 Which statement represents human resource allocation regarding the CoT EMS?
(Please tick)

Not sufficient at all	Sufficient to some degree	Sufficient
Reason:		
Recommendations to establish improvements (if applicable):		

4. EMS Implementation

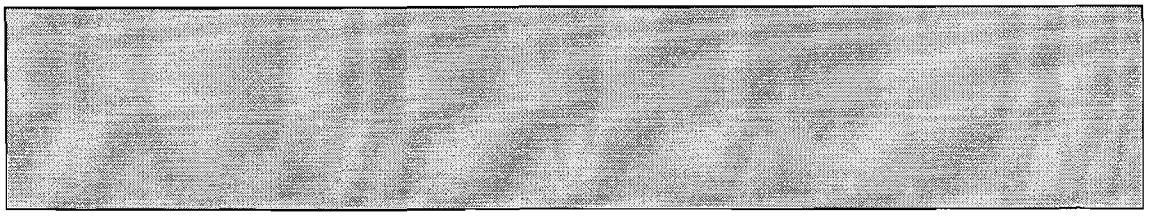
4.1 Briefly describe your approach regarding ISO 14001 EMS implementation in the CoT.

4.2 Please list the barriers that you face when implementing the CoT ISO 14001 and give your perceived reasons and possible solution for each.

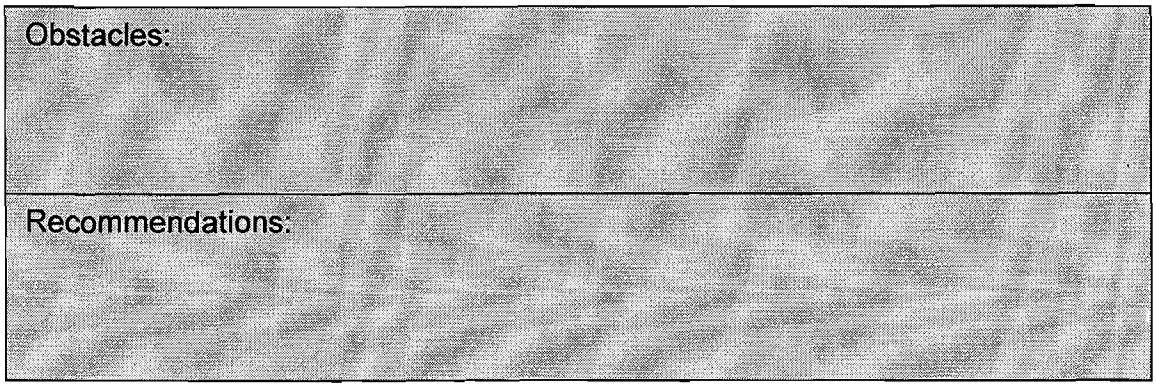
BARRIER	REASON	SOLLUTION

4.3 What overall changes, if any, would you suggest regarding the overall implementation approach to the CoT EMS?

4.4 Please describe how you monitor the overall performance of the CoT EMS.



4.5 What obstacles exist in terms of your EMS performance management system and what recommendations can be made to improve it?



5. Perceived benefits

5.1 EMS implementation, as a corporate environmental tool, has several benefits for an organization. It is most probable that such benefits motivated the CoT to implement an ISO 14001 EMS.

Also, when first initiating the CoT ISO 14001 EMS in 2003, it is possible that CoT staff directly involved in its management, planning and implementation, had their own perceptions of the benefits that this system will hold for the organization in future.

Please thus list underneath your initial perception of the probable benefits (not less than 6) to the CoT in terms of implementing the CoT ISO 14001, by completing the underneath Table:

PERCEIVED BENEFIT	BENEFIT ACHIEVED ((Yes/No)	REASONS FOR ACHIVEMENT/NON-ACHIEVEMENT	RECOMMENDATIONS

6. Conclusion

6.1 Please rate the overall effectiveness of the CoT ISO 14001 EMS.
(Please tick)

Not at all effective	Effective to some degree	Very effective

6.2 Any other remarks and or comments regarding the effectiveness of the CoT ISO 14001 EMS?

You have completed this questionnaire. Thank you again for your contribution.

Kind regards

Ilse Kotze

Annexure B: Stakeholder Questionnaire - ERM Representatives

Implementation of ISO 14001 Environmental Management Systems (EMS) in local government - effectiveness within the City of Tshwane

Questionnaire to Departmental ISO 14001 EMS Environmental Representatives

Research is currently being conducted to evaluate the effectiveness of the CoT ISO14001 EMS in terms of its perceived benefits. You, as the officially appointed ISO 14001 EMS Environmental Representative for your Department/Division/Section/Unit, are hereby friendly requested to complete the following questionnaire.

Your contribution to this study will assist in improving the collective understanding of the effectiveness of the CoT ISO 14001 EMS and will assist the CoT in improving its EMS. If necessary, a personal interview regarding this questionnaire will be scheduled with you.

Any enquiries can be directed to Ilse Kotze at:

Tel: 012 358 8665
Cell: 082 377 8159
Fax: 012 358 8934
E-mail: ilsek@tshwane.gov.za

Please forward the completed questionnaire to Ilse Kotze on or before 13 June 2007 via e-mail or fax. Hard copies may also be delivered at:

Ilse Kotze
Sammy Marks Galleria Offices
c/o Prinsloo and Vermeulen streets
Pretoria Central
First Floor

Please note that the information supplied by you will be utilized in an aggregated form and no reference will be made directly to you personally without your permission.

1. Personal Details

1.1 Date of completing this questionnaire

1.2 Full name

1.3 Department

1.4 Division

1.5 Section/Unit

1.6 Designation

1.7 EMS Representative appointment date

1.8 Please list your environmental related qualifications, if applicable

NAME	INSTITUTION	YEAR OBTAINED

2. EMS Awareness and Commitment

2.1 Which statement represents <u>your</u> commitment regarding the implementation of the CoT EMS in your Department/Division/Section/Unit?
(Please tick)

No commitment	Some degree of commitment	Full commitment
Please provide a reason for your answer above:		

3. EMS Benefits Achievement

3.1 ISO 14001 EMS implementation, as a corporate environmental tool, has several benefits for an organization.

Please indicate whether the following potential benefits (there are 10) were achieved in your Department/Division/Section/Unit by completing the following Table:

POTENTIAL EMS BENEFIT DESCRIPTION	PERFORMANCE	
1. Facilitation of enhanced compliance to environmental legislation	ACHIEVED? (PLEASE TICK)	
	YES	NO
Please indicate the reasons for your answer.		
If your answer was no in terms of the question above, what recommendations can you suggest to ensure future achievement thereof?		

2. **Facilitating environmental awareness, thus enhancing environmental competency and consciousness and creating a feeling of "responsibility" towards the environment**	ACHIEVED? (PLEASE TICK)	
	YES	NO
Please indicate the reasons for your answer.		
If your answer was no in terms of the question above, what recommendations can you suggest to ensure future achievement thereof?		

3. **Facilitation of reduced environmental impacts related to CoT activities, products and services, thus resulting in improved environmental and/or overall performance**	ACHIEVED? (PLEASE TICK)	
	YES	NO
Please indicate the reasons for your answer.		
If your answer was no in terms of the question above, what recommendations can you suggest to ensure future achievement thereof?		

4. Facilitation of environmental risk reduction	ACHIEVED? (PLEASE TICK)	
	YES	NO
Please indicate the reasons for your answer.		
If your answer was no in terms of the question above, what recommendations can you suggest to ensure future achievement thereof?		

5. Facilitation of an enhanced corporate image and improved competitiveness	ACHIEVED? (PLEASE TICK)	
	YES	NO
Please indicate the reasons for your answer.		
If your answer was no in terms of the question above, what recommendations can you suggest to ensure future achievement thereof?		

6. **Facilitation of environmental best practice and benchmarking for local organizations and other municipalities**	ACHIEVED? (PLEASE TICK)	
	YES	NO
Please indicate the reasons for your answer.		
If your answer was no in terms of the question above, what recommendations can you suggest to ensure future achievement thereof?		

7. **Facilitation of enhanced CoT top management and employee commitment to the environment, thus building environmental involvement, commitment and cooperation**	ACHIEVED? (PLEASE TICK)	
	YES	NO
Please indicate the reasons for your answer.		
If your answer was no in terms of the question above, what recommendations can you suggest to ensure future achievement thereof?		

8. **Enhanced environmental decision making due to better communication and information management (internal and external)**	ACHIEVED? (PLEASE TICK)	
	YES	NO
Please indicate the reasons for your answer.		
If your answer was no in terms of the question above, what recommendations can you suggest to ensure future achievement thereof?		

9. **Enhanced financial effectiveness due to increased environmental efficiency and resource savings**	ACHIEVED? (PLEASE TICK)	
	YES	NO
Please indicate the reasons for your answer.		
If your answer was no in terms of the question above, what recommendations can you suggest to ensure future achievement thereof?		

10. Enabling/enhancing environmental innovation	ACHIEVED? (PLEASE TICK)	
	YES	NO
Please indicate the reasons for your answer.		
If your answer was no in terms of the question above, what recommendations can you suggest to ensure future achievement thereof?		

3.2 Please list any other benefits, not addressed in the Tables above, which you have experienced in your Department/Division/Section/Unit as a direct result of EMS implementation.

Benefit experienced	Reason (please explain)

3.3 Please list the barriers/constraints that you face when complying with the EMS implemented for your Department/Division/Section/Unit and give your perceived reasons and possible solution for each.

BARRIER	REASON	SOLLUTION

3.4 What overall changes, if any, would you suggest regarding the overall EMS implementation and management approach in your Department/Division/Section/Unit?

4. Conclusion

4.1 Please rate the overall success of the CoT ISO 14001 EMS implemented in your Department/Division/Section/Unit.
(Please tick)

Not successful at all	Successful to some degree	Very successful

4.2 Any other remarks and or comments regarding the effectiveness of the CoT ISO 14001 EMS?

Kind regards

Ilse Kotze
DM: Environmental Policy and Info Sub-section
Environmental Resource Management Section
Environmental Management Division

Annexure C: Interview Schedule

Involvement	Department/Division/Section	Key Interviewee	Date of interview
Interviews with the CoT Environmental Resource Management Section			
Chief: EMS planning and implementation	Environmental Resource Management Section	Lynette Bekker	31/01/07
Manager: Environmental Resource Management Section	Environmental Resource Management Section	Adri Venter	21/06/07
Interviews with the CoT EMS Representatives			
Officially appointed EMS representative: Nature Conservation	Housing, City Planning and Environmental Management Department	Riaan Marais	14/06/07
Officially appointed EMS representative: Parks and Horticulture	Housing, City Planning and Environmental Management Department	Hendrik de Villiers	15/06/07
Officially appointed EMS representative: Support and Housing Projects	Housing, City Planning and Environmental Management Department	Charmaine Grobler	27/06/07
Officially appointed EMS representative: Hostels	Housing, City Planning and Environmental Management Department	Sylvia Lekutu	28/06/07

Please note that the schedule does not reflect the various follow-up discussions related to the questionnaire sources.