

An Assessment of Environmental Indicator Data Quality in GRI Sustainability Reporting

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We accept this thesis as conforming
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Abstract

This project assessed whether the Global Reporting Initiative (GRI) focuses on providing true environmental indicator reporting within its framework. The analysis focused on environmental indicator data quality through observation of the data collection process for a sustainability report. Participants showed satisfaction with the requested data in regards to future comparability and transparency, concerns with data reliability and stakeholder concerns and significant concerns with data gathering systems. A review of 2007 reporting identified a low level of complete environmental indicator reporting and a low level of independent assurance. The study recommends significant enhancements at the GRI and governmental level. At the GRI level, the study recommends mandatory assurance of reports to receive GRI designation. At the governmental level, the study recommends mandatory corporate reporting for larger organizations to limit data quality issues and raise the overall sustainability performance of those organizations having the largest potential impact on sustainability.

DEDICATION

To my partner, Miriam, for her endless support.

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Chapter 1 Introduction

The reporting of sustainability performance is a significant way for organizations to acknowledge their impact on natural systems. It can be argued that organizations have a responsibility and an ability to make positive changes on the world's economy, and environmental and social issues through the communication of these reports.

“Capitalism and sustainability are deeply and increasingly interrelated since our economic activity is based on the use of natural and human resources. More transparency in reporting, as exemplified by the GRI, will help us more broadly “price in” the external costs of investment decisions. This, in turn, will help enable capital markets to achieve their intended purpose - consistently allocate capital to its highest and best use for people and the planet.”

Al Gore, former US Vice President

Corporate sustainability reporting (CSR) leads to improved sustainable development outcomes because it allows organizations to measure, track, and improve their performance on specific issues. Encouraging organization's to measure their performance will increase the chances they will effectively manage the impacts on performance. Since reports are available publicly, reporting also promotes transparency and accountability to an organization's stakeholders. The drivers for organizations to engage in reporting include, 1) branding that links an organization to responsible practices, 2) socially responsible investment selection, 3) legislation compliance and litigation management, 4) employee morale and customer satisfaction and 5) product improvement and cost reductions (EORM 2008). The sustainability report is a tool companies use to communicate performance to stakeholders and shareholders alike. The corporate report should be public and tell its audience how the company is meeting the “corporate sustainability challenges” outlined by Schaltegger et al. (2003) (Daub 2007). A

common method to develop such reports is to use a known framework, such as GRI G3, that outlines how this is accomplished.

The Global Reporting Initiative (GRI)

Over the last 10 years, there has been a significant increase in the level of participation in Global Reporting Initiative (GRI) corporate sustainability reporting (GRI 2008). The GRI is now the de facto sustainability reporting framework for many types of businesses and organizations. As a significant number of GRI reports are being regularly produced, there are concerns about the content and quality of the data that is being communicated (Moneva et al. 2006, Daub 2007, CGA 2006).

The GRI concept was formulated in 1997 by non-profit organizations CERES (formerly the Coalition for Environmentally Responsible Economies), the Tellus Institute and received partner support from United Nations Environmental Programme (UNEP) in 1999. The new G3 version of the GRI, released in 2006, is the third and latest evolution of the framework.

In the current state of sustainability assessment and reporting, the GRI reporting tool has become the primary tool used in Canada and the world. The GRI lays out reporting framework and guidelines with the intention of corporations conducting voluntary sustainability reporting as regularly as they conduct financial reporting (GRI 2000). The reports are submitted by organizations to the GRI for listing in the GRI database and to receive permission to use the GRI icon in their reports.

The framework has requirements for profile disclosures, which includes the organization's strategy, profile and governance; management disclosures; and performance indicators; the key component of the GRI framework and the focus of this thesis. GRI G3 performance indicators consist of 7 main categories; Social Performance, Economic,

Environmental, Human Rights, Labour, Product Responsibility and Society. Additional indicators are provided by the GRI G3 in sector specific supplements. These sectors include Financial Services, Logistics and Transportation, Mining and Metals, Public Agency, Tour Operators, Telecommunications and Automotive.

This project focuses on the environmental indicators of the GRI which consists of 30 different indicators. The GRI break these indicators down into 9 indicator groups; (1) Materials, (2) Energy, (3) Water, (4) Biodiversity, (5) Effluents, Emissions and Waste, (6) Products and Services, (7) Compliance, (8) Transport and (9) a final Overall category. A complete list of these indicators is provided in Appendix A.

The GRI framework also breaks down its environmental performance indicators (EPI's) across these groups into 17 “Core” indicators and 13 “Additional” indicators. Core indicators have been identified to be of interest to most stakeholders while additional indicators are representative of emerging practices. GRI indicators were developed initially through working groups that include stakeholder groups from business, civil society, labour, investors, accountants and other volunteers.

Organizations set their own scope for GRI reporting, which is significant, as is it can greatly influence the information provided for performance indicator reporting. The GRI provides reporting principles that are separated into two groups:

1. Principles for determining the topics and indicators on which the organization should report; and
2. Principles for ensuring the quality and appropriate presentation of reported information.

The topic of this thesis focuses on the issue laid out in the second group. Reporting quality and the GRI principles for ensuring reporting quality include the following (listed with GRI definitions):

Balance - The report should reflect positive and negative aspects of the organization's performance to enable a reasoned assessment of overall performance.

Clarity - Information should be made available in a manner that is understandable and accessible to stakeholders using the report.

Accuracy - The reported information should be sufficiently accurate and detailed for stakeholders to assess the reporting organization's performance.

Timeliness - Reporting occurs on a regular schedule and information is available in time for stakeholders to make informed decisions.

Comparability - Issues and information should be selected, compiled, and reported consistently. Reported information should be presented in a manner that enables stakeholders to analyze changes in the organization's performance over time, and could support analysis relative to other organizations.

Reliability - Information and processes used in the preparation of a report should be gathered, recorded, compiled, analyzed, and disclosed in a way that could be subject to examination and that establishes the quality and materiality of the information.

The GRI also provides boundary setting guidance, recommending that minimum level reporting should include controlled and influenced entities. The level of content required in the GRI report is based on "application levels" which the GRI has set 3 reporting levels (A, B, and C) detailed below (Table 1).

A review of the GRI requirements also showed that reporting to the GRI does not commit an organization to report on all the sections of the GRI. Only one of the 17 core environmental indicators requires reporting to achieve a level B or C rating in the GRI G3 framework (GRI 2000).

Table 1: GRI G3 Application Levels

Report Application Level	A	B	C
Performance Requirements	All core and applicable sector supplement indicators.	Report minimum of 20 indicators. One from each: Economic, Human Right, Environmental, Labour, Society, and Product Responsibility.	Report minimum of 10 indicators. One from each: Economic, Society, and Environmental.

In the reporting process, companies must declare whether the content of their reports have been verified by an external source, but it is not a requirement to do so. The reporting companies identify the level of assurance through one of four application level checks. Application levels are intended to show incrementally expanding approaches to reporting using the GRI Reporting Framework. They are not meant to replace external assurance. The first Self-Declared level is a mandatory requirement, where the reporters state that they have met a certain application level.

The next level, GRI-checked is only a confirmation of the self-declared application level not a detailed review of report value or quality. It is just an indication of the extent to which the GRI Reporting Framework was utilized.

The third level attainable is Third-Party Checked. This implies actual “external assurance” indicating that your report has been audited and therefore, a plus sign “+” can be included with

the application level. Application levels are communicated in reports by icons that provide a quick reference to the application level the reporting organization has selected. The final option for reporters is to not make any declaration, forcing the GRI to list it as Undeclared.

Environmental performance indicators (EPI's)

It is important to first outline the definition and intent of environmental performance indicators (EPI's). EPI's have been defined as the measurement of the interaction between the business and the environment (Olsthoorn et al. 2001). The GRI defines performance indicators as qualitative or quantitative information about results or outcomes associated with the organization that is comparable and demonstrates change over time (GRI 2006). EPIs represent numerical measures, financial or non financial, that provide key information about environmental impact, regulatory compliance, stakeholder relations, and organizational systems (Veleva and Ellenbecker, 2000). However, in relation to this study, EPI's are best defined as representing the quantification of the effectiveness and efficiency of environmental action with a set of metrics (Neely et al., 1995).

While the GRI is well accepted, some organizations choose to develop their own tools for assessment and reporting, either on their own or with a consulting firm. This study has utilized a case study organization in Canada that has chosen to develop their own report using the GRI guidelines. This allows for flexibility and allows organizations to incorporate unique indicators into their reports. While this would appear to allow omission of key information, organizations truly committed to the initiative will incorporate some type of verification process, often through an independent auditing organization.

This study focused strictly on the environmental component of GRI reporting because of the significantly greater expectations in reporting compared to social and economic issues. Economic reporting is already well established through standard financial reporting and the emphasis on social indicators more often are intended for non-western countries with significantly greater human rights, safety and health concerns. Additionally, the case study organization is an environmental consulting firm that felt the environmental component was of most significance to them at this time.

The primary objectives of this research were:

1. To examine the process of data collection at a case study organization for the purpose of GRI environmental reporting in order to identify the limitations in the current most accepted reporting guidance system;
2. To summarize and analyze a sampling of 2007 GRI reports in order to assess the current state of data quality in reporting;
3. To critically assess the quality of environmental indicator data collected from the case study organization and the currently reported GRI data with a view to identifying areas of improvement; and
4. Provide recommendations on how to improve the quality of data in GRI environmental reporting.

Chapter 2 Literature Review

The field of corporate reporting has previously been criticized for a lack of independent analysis or critical literature (Blowfield, 2008). However, in recent years the number of academic papers, journals, published articles and books focussed on the topic has increased.

A recent study on environmental performance indicators looked at the extent association between firm characteristics and the use of EPI's. It was found that EPI priority was found in a) firms having a more active environmental strategy, b) ISO 14001 compliant firms, c) larger firms, and d) public firms (Henri 2008). This speaks to the importance, influence and impact of EPI tool use in general. These characteristics also significantly follow those on the list of companies submitting GRI reports for 2007 (Appendix B).

Corporate reporting methods have become a key area of debate in the evolution of Corporate Social Responsibility (CSR) and are seen as part of the economic evolution of putting monetary value onto environmental services. Some research is providing evidence that the incorporation of environment issues into financial reporting offers a range of economic benefits, but in general, little research has been generated in the field of sustainability assessment reporting (Daub 2007).

Daub also looked at a new way to assess the quality of sustainability reporting by identifying performance indicators as the priority and less emphasis on reporting context, policies and management systems. The author's assessment system weighted indicators twice the amount of other reporting components. Looking at 76 Swiss reporting organizations, the study found that there was a significant weakness in the area of performance indicator reporting (Daub 2007) compared to the subject reports level of context, policies, management systems, stakeholder relations, and transparency. The fact that report scoring for indicators was twice that

of other areas led the author to determine that companies had a significant load of work ahead of them to integrate hard data into reporting.

Daub's research also clearly identified non-reporting of information that was readily available and should have been published, a concern that would significantly affect data quality. This is a significant cause for concern in the area of transparent indicator reporting for this study. GRI reporting allows for this selective reporting of indicators and it can be perceived that several companies take advantage of this. To date (October 12, 2008), of the 48 Canadian and American companies who submitted 2007 GRI reports, 8 reported an application level "A" and 4 of those had received external assurance provided to their reports.

Moneva also notes that along with the already mentioned lack of verification, recent research has produced moderate scepticism regarding the format of sustainability reporting and concern over their use to actually conceal un-sustainability (Moneva 2006).

The underlying issue that this project is seeking to address is the concern that indicators are being developed to meet corporate needs instead of installing new business standards for sustainability. Moneva identified this issue and expressed concerns about 3 main areas that apply to this thesis:

- Absence of integrated indicators that provide cross referencing of environmental, economic and social metrics (also supported by Bebbington 2001);
- Key sustainability concepts are excluded such as full-cost accounting; and
- A lack of indicators for suppliers, limiting ability to conduct life-cycle assessments (LCA's).

The current GRI system obscures the acquiring of an integrated view of business sustainability removing the development of integrated indicators as the way forward. It promotes

the construction of a set of indicators instead of instilling business with values to change their mentality so they can subscribe to the assumptions of SD.

The Certified General Accounts (CGA) of Canada completed a detailed review of the draft G3 guidelines which produced several comments on issues surrounding GRI indicators. Five of their recommendations speak directly to potential impacts on data quality. These recommendations included:

1. Indicators should be defined in the context of what is of importance to stakeholders and not the organization.
2. It should be explicit that relevant issues and indicators are those that are of importance to stakeholders identified through stakeholder engagement.
3. The wording “considered to be important” used to define relevance should be expanded to the more detailed “Information is relevant by its nature when it can influence the decisions of users by helping them evaluate the sustainability impact of past, present or future performance or correct previous evaluations – relevance is achieved through information that has predictive value or feedback value and by its timeliness.”
4. The wordings “substantively influence” and “threshold at which an indicator or issue becomes sufficiently important” used to define materiality do not provide sufficient guidance and suggest expanding the definition to “Materiality is the term used to describe the significance of information on an organization’s sustainability performance to decision makers. An item of information, or an aggregate of items, is material if it is probable that its omission or misstatement would influence or change a decision.”
5. Clarification is required on prioritization for issues and indicators and their relation to the GRI’s principle of relevance and materiality.

While there are different formats to sustainability reporting, performance indicators have been identified as a key component of a corporate sustainability report (Morhardt 2002). Referring to sustainability reporting in general, in 1999, an evaluation of corporate and environmental sustainability reports found that most reports were below the standards of the GRI and ISO 14031 framework requirements. The report showed that the environmental reports of 40 of the world's largest companies complied with only 20% of the GRI framework.

Veleva and Ellenbecker (2001) present a different perspective of sustainability reporting by proposing a methodology for measuring companies performance, generating the term indicators of sustainable production (ISP's). The tool proposes 22 core indicators and detailed instruction on their use. In their methodology, the authors lists 9 principles of sustainable production (adapted from the Lowell Center for Sustainable Production), 3 of which are of note as they are not represented in the GRI G3 guidelines. (1) Products and packaging are designed to be safe and ecologically sound throughout their life-cycles, services are designed to be safe and ecologically sound. (2) Energy and materials are conserved, and the forms of energy and materials used are most appropriate for the desired ends and (3) chemical substances, physical agents, technologies, and work practices that present hazards to human health or the environment are continuously reduced or eliminated.

The authors point out that, at the time of the study, the GRI was the only framework to use quantitative and qualitative indicators to measure an organization's performance. However, they also noted the GRI was not following the general trend towards using a manageable number of indicators. The researchers also point out that GRI does not provide guidance on how organizations select their indicators.

Chapter 3 Research Methodology

The methodology for this project was organized into the following four stages; (1) preparation, (2) data collection, (3) data analysis and (4) discussion. The project looked to review the data collection process for GRI environmental indicators by conducting an actual data collection program at a facility and then examining the process critically. Data was collected by subject facility representatives and then they were interviewed through a questionnaire and comment feedback method. The results of this feedback were analysed, leading to discussions on the current quality of environmental data in the GRI.

The Jacques Whitford-AXYS (JW-AXYS) Sidney office on Vancouver Island was been selected as the Subject Facility for the assessment report in the second stage of the project. Established in 1972 as a geotechnical engineering firm, JW-AXYS has expanded into environmental, engineering, scientific and planning services. The company has grown to more than 1500 employees in 40 locations across Canada, the United States and internationally. The Sidney office, located approximately 40 km north of Victoria, has approximately 30 employees and is approximately 4000 square feet in size.

This office has a smaller number of the service groups than the average JW-AXYS office across Canada but is considered one of the medium sized offices for the company. However, the activities in the office are fairly representative of other offices in that large projects (up to \$1 million contacts) are managed and staffed out of the Sidney office. There is also a significant amount of field work conducted by the Sidney staff.

Corporately, JW-AXYS has several components of a sustainability management system in place across the company including a corporate health and safety program, offices that have established environmental management systems to the ISO 14001

standard and a company-wide Human Resources program designed to address social concerns within the company. In 2007, JW-AXYS initiated a carbon management plan and baseline sustainability assessment of their offices.

The preparation stage for this project consists of preparation of the GRI environmental facility report for the Sidney office. To achieve this, JW-AXYS participants were selected to compile the report based on the criteria that they would be the relevant expert for data collection in that indicator area. A summary of participant's employee title, indicator subgroup expertise area and applicable GRI environmental indicators are provided below (Table 2). An effort was made to have a cross-section of employee roles, from junior scientist to senior management, to add an element of perspective to the research. A data collection request worksheet was also created for each participants to organize facility data for the corporate report. An attempt was made by participants to collect data for as many core and additional indicators as possible. Some indicators could not be completed due to non-applicability to the facility type or data was not yet available. This data was compiled into a facility environmental report (Appendix B).

Then a participant's questionnaire was developed to interview which asked questions that could be responded to through a combination of multiple choice responses and open comments (Appendix E). Subject facility staff that assisted in the acquisition of data was requested to complete the questionnaire independently so they could take their time responding to the questions.

Table 2: Environmental Indicator Subgroup Assignments

Expertise Area	GRI Indicators (EN#)	Participants Title
Energy and Greenhouse Gases	3 - Direct Energy 4 - Indirect Energy 5 - Energy Saved 16 - Green House Gas Emissions 17 - Green House Gas Emissions 18 - Green House Gas Emissions 20 - Other Air Emissions 29 - Transportation Impacts	Subject 1 Geomatics Specialist (Junior)
Materials, Water and Waste	1 - Material Usage 2 - % Material Recycled 8 - Water Withdrawal 9 - Water Sources 10 - Water Recycled 19 - ODS Emissions 22 - Total Waste 24 - Hazardous Waste 27 - Reclaimed products	Subject 2 Administraor
Biodiversity	12 - Protected Areas 13 - Habitats 15 - Red List Species 21 - Total Water Discharge	Subject 3 Senior Wildlife Biologist (Project Manager)
Biodiversity (Corporate)	23 - Significant Spills 25 - Discharge Impacts 28 - Non-Compliance Issues	Subject 4 Group Leader (Manager)
Energy (Corporate)	6 - Efficiency Initiatives 7 - Consumption Initiatives 14 - Managing Biodiversity	Subject 5 Vice-President Sustainability (Senior)
Materials (Corporate)	11 - Protected Areas 26 - Initiatives (Services) 30 - Protection Expenditures	Subject 6 Area Manager (Senior)

All participants were asked the same questions which focussed on issues regarding the quality of data that the participants had collected. Questions were formed through findings from previous research (Chapter 2).

The questions asked included:

1. Based on your experiences prior to this research project, how strong was your understanding of sustainability?
2. Prior to your data collection, what was your knowledge of the Global Reporting Initiative (GRI)?
3. What do you consider the level of reliability and potential for error in the requested data?
4. Based on the data you were requested to collect, will this data be available in the future to enable comparability?
5. Looking at each portion of data you collected, is the data beneficial towards global environmental sustainability? How do you feel this information represents this particular sustainability aspect of the subject facility in terms of environmental quality? Based on what you know of GRI, is there other information that you feel is important to include?
6. Is this data easily available or was a new data-gathering system required?
7. Does the data requested adequately consider stakeholder (employee and general public) concerns for the indicator areas you reviewed?
8. Were there any potential transparency or ethical issues that arose during the collection of data?

The results from the questionnaires were collected and summarized to identify potential patterns and issues within the data collection process and with the environmental indicators themselves. Multiple choice questions were summarized in tables and open comment responses were summarized through key comment identification (Chapter 4). The data analysis then included a critique of these components based on previous scientific research other sustainability tools, standards and indicators discussed in Chapter 2 Previous Research. This was concluded with a discussion on key issues identified in the analysis phase.

Finally, to provide the most recent comparative examples and complement the collected research data, a subject group of reporting organizations was established for the 2007 reporting year. This list of organizations was identified through those listed on the GRI website. The group included:

- Only American and Canadian organizations;
- Reports for the reporting year 2007; and
- Reports that had been submitted to the GRI by October 12, 2008.

The reported indicators for each organization were documented along with application levels and other details collected for this research. The list of these organizations and their reported environmental indicators is provided in Appendix C.

Chapter 4 Summary of Data Collection Results

4.1 Facility Report Summary

The facility report, generated for the purpose of analysis, was completed through the input from 6 company employees and managers. A template of the data collection sheets completed by participants is provided in Appendix D. The result was an environmental report that reported on 82% (14 of 17) of core GRI environmental indicators and 62% (8 of 13) of additional GRI environmental indicators. Based on the GRI G3 reporting requirements, this report could potentially apply for B Level of reporting, depending on the level of reporting in other GRI sectors (Economic, Social, etc.). This report could not be eligible for GRI application on environmental indicators alone. In addition, this data has not been verified by the GRI or an external party, so it could not presently be considered for assurance designation. The report also provides recommendations on where changes can be made to improve the company's reporting.

4.2 Summary of Subject Interview Responses

The first part of the interview questionnaire attempts to ascertain the participants knowledge and experiences with the GRI. Participants were asked general background and specific data collection questions through the use of a questionnaire. Only question (e) was a non-multiple choice question.

General Questions Summary

1. Based on your experiences prior to this research project, how strong was your understanding of sustainability?
2. Prior to you date collection, what was your knowledge of the Global Reporting Initiative (GRI)?

Table 3 – Questions 1 and 2 Responses

Question 1. Knowledge of Sustainability	Question 2. Knowledge of GRI	<i>Good understanding on what GRI is and its purpose.</i>	<i>I had only heard of the term.</i>	<i>This was an unknown term.</i>	<i>No response</i>
<i>Very good understanding</i>	2	1	0	0	
<i>Partial understanding</i>	0	0	3	0	
<i>No real understanding of the term.</i>	0	0	0	0	
<i>No response</i>	0	0	0	0	

Those using the GRI system of reporting are expected to have certain level of sustainability knowledge, and in this subject group there was a split between those with a very strong and partial understanding of sustainability. Generally those using the system are sustainability practitioners themselves, however, it can be expected that there is also a

range of those familiar with the system and those who are not. This result is viewed as a balanced and appropriate subject group for this research topic.

Data Collection Questions Summary

3. What do you consider the level of reliability and potential for error the requested data to be?

Table 4 – Question 3 Responses

Response Options	# of Responses
<i>Information requested has a high level of detail and a good representation of the requested data. (STRONG)</i>	0
<i>The information requested is more general but is still a good representation of the requested data. (MODERATE)</i>	5
<i>The information requested is very general and not a good representation of the requested data. (WEAK)</i>	0
<i>No response (N/A)</i>	1

Key Comments Summary

“Changes in buildings for the organization required some decision making on bills. Air travel tracking was difficult as there are various travel systems and there was no tracking system in place and the start of the year. No extrapolations were conducted on any of the data sets.”

“Vehicle travel had most room for error, guesses in administration costs for travel.”

“Over counted rather than undercounted to ensure coverage.”

“Detail was limited to coefficients, actual burner information not collected for individual buildings.”

“The data is still fairly general but we are rapidly working to improve both the quantity and sophistication of the data collection.”

4. Based on the data you were requested to collect, will this data be available in the future to enable comparability in future periods?

Table 5 – Question 4 Responses

Response Options	# of Responses
<i>Yes (STRONG)</i>	5
<i>Partially(MODERATE)</i>	0
<i>No (WEAK)</i>	1
<i>No response (N/A)</i>	0

Key Comments Summary

“Yes next year will be easy and more accurate.”

“Easy to obtain.”

“No actual data was collected on the indicators – assessment of office ‘state’ with respect to these indicators was a subjective evaluation on my part, based on a good understanding of the local environment and the subject facility’s place in this environment.”

“Now part of an ongoing company commitment and process.”

“Data for each indicator should be easily available for future comparability. The nature of EN26 is qualitative and would be difficult to compare over time. There should be metrics available for indicator EN30 that will be easier to compare.”

“Different personnel may affect how the data is collected from year to year. The data will need to be consistently managed.”

5. Looking at each portion of data you collected, is the data beneficial towards global sustainability? How do you feel this information represents this particular sustainability aspect of the subject facility in terms of environmental quality? Based on what you know of GRI, is there other information that you feel is important to include? *(This is the only question that does not include an option for multiple choice responses.)*

Key Comments Summary

“Good, but accountability of information needs to be more detailed”

“Can be used to a company advantage.”

“Companies would show off reductions but not increasing footprints.”

“Companies need to focus on biggest footprint issue.”

“As the subject facility is a new small office building built on previously developed land, the application of the data indicators and the relevance of those indicators to understanding the relevance of this facility to global environmental sustainability is weak. Better information to characterize the affect of this facility on global environmental sustainability would be amount of paper used, volume (and type) of waste discarded, and fuel used by office staff commuting and in support of field work, to name just a few examples.”

“This information is beneficial because it tracks occurrence of spills and the related environmental impacts and associated punitive actions. Over time this information (if collected across a large number of businesses) could provide a strong indication of trends in spill occurrence, the related environmental effects and the effectiveness of fines and sanctions in minimizing the occurrence. I feel that this information adequately represents the sustainability metric of spills of deleterious substances.”

“The data is beneficial but represents only a few components of our sustainability profile.”

6. Is this data easily available or was a new data-gathering system required?

Table 6 – Question 6 Responses

Response Options	# of Responses
<i>New data collection techniques were required to obtain all of the information.(STRONG)</i>	2
<i>New data collection techniques were required to obtain some of the information. (MODERATE)</i>	2
<i>Data collection systems for all information were already in place. (WEAK)</i>	0
<i>No response (N/A)</i>	2

Key Comments Summary

“The work was very time consuming, systems were not in place to track efficiently. This was initial trial process and data collection issues were common. New systems are being set up and will be used at multiple offices eventually.”

“Paper invoices required detailed review. Effort has to be made for most data collection, systems should be put place.”

“Top management system of collection is required in order to move forward. They must support a corporate system. Systems linked to Key Performance Indicators (KPI’s) for Area Manager’s is one possible method.”

7. Does the data requested adequately consider stakeholder (employee and general public) concerns for the indicator areas you reviewed?

Table 7 – Question 7 Responses

Response Options	# of Responses
<i>Yes, the data requested considers stakeholder concerns. (STRONG)</i>	1
<i>Some of the data requested adequately considers stakeholder concerns. (MODERATE)</i>	3
<i>No, the data requested does not consider stakeholder concerns. (WEAK)</i>	2
<i>No response (N/A)</i>	0

Key Comments Summary

“The work was very time consuming, systems were not in place to track efficiently. This was initial trial process and data collection issues were common. New systems are being set up and will be used at multiple offices eventually.”

“Paper invoices required detailed review. Effort has to be made for most data collection, systems should be put place.”

“Top management system of collection is required in order to move forward. They must support a corporate system. Systems linked to Key Performance Indicators (KPI’s) for Area Manager’s is one possible method.”

“In this first go round we didn’t really reach out to stakeholders except indirectly through other more general aspects of our sustainability initiative.”

“Indicators do not appear to have any ties to stakeholder impact. None evident to the subject.”

8. Were there any potential transparency or ethical issues that arose during the collection of data?

Table 8 – Question 8 Responses

Response Options	# of Responses
<i>No (STRONG)</i>	6
<i>Yes (WEAK)</i>	0
<i>No response (N/A)</i>	0

Key Comments Summary

“No, very transparent. No ethical issues were noticed personally. Carbon information, offsets costs were different than other systems, but final results were a good start. Overall a good process and getting better next year.”

“No ethical issue concerns.”

“I do not foresee any issues that would arise with the collection of data related to these data indicators.”

Breakdown of Responses by Indicator

This section provides an analysis of multiple choice responses by environmental indicator. This basis of this framework was developed from a study on sustainability standards (Bebbington 2001). As Bebbington states:

“The “weak” sustainability position does not question the present mode of economic development and views SD as being compatible with some modified version of “business as usual”. In contrast, the “strong” sustainability position throws this assumption into doubt and seeks to redefine the ends which human population (especially in the West) should seek. In particular, there is the suggestion that, once basic needs are met, increased material consumption may not constitute development.”

Responses by Indicator Summary

To provide a summary of indicator responses, a rating system was developed so that a value could be assigned for analytical purposes. Responses from participants were broken down into the following descriptors:

STRONG (S): Participants had a positive response to the issue presented, identifying a favourable reaction to the current GRI system.

MODERATE (M): Participants had a moderate response to the issue presented

WEAK (W): Participants had a negative response to the issue presented, identifying potential concerns with the existing GRI system.

NOT APPLICABLE (N/A): Assigned when a subject could not appropriately respond to the interview question.

Table 9– Summary of Results by Indicator

GRI Section	Q3 Data Reliability	Q4 Future Comparability	Q6 Data Gathering Systems	Q7 Stakeholder Concerns	Q8 Transparency Issues
MATERIALS					
EN1: Material Usage	M	S	S	M	S
EN2: % Material Recycled	M	S	S	M	S
ENERGY					
EN3: Direct Energy	M	S	M	M	S
EN4: Indirect Energy	M	S	M	M	S
EN5: Energy Saved	M	S	M	M	S
EN6: Efficiency Initiatives	M	S	M	W	S
EN7: Consumption Initiatives	M	S	M	W	S
WATER					
EN8: Water Withdrawal	M	S	S	M	S
EN9: Water Sources	M	S	S	M	S
EN10: Water Recycled	M	S	S	M	S
BIODIVERSITY					
EN11: Protected Areas	NA	S	S	W	S
EN12: Protected Areas	M	W	NA	S	S

EN13: Habitats	M	W	NA	S	S
EN14: Managing Biodiversity	M	S	M	W	S
EN15: Red List Species	M	W	NA	S	S
EMISSIONS, EFFLUENTS AND WASTE					
EN16: GHG Emissions	M	S	M	M	S
EN17: GHG Emissions	M	S	M	M	S
EN18: GHG Emissions	M	S	M	M	S
EN19: ODS Emissions	M	S	S	M	S
EN20: Other Air Emissions	M	S	M	M	S
EN21: Total water discharge	M	W	NA	S	S
EN22: Total Waste	M	S	S	M	S
EN23: Significant Spills	M	S	NA	M	S
EN24: Hazardous Waste	M	S	S	M	S
EN25: Discharge Impacts	M	S	NA	M	S
OTHER INDICATORS					
EN26: Service Impact Reduction	NA	S	S	W	S
EN27: Reclaimed Products	M	S	S	M	S

EN28: Non-Compliance Issues	M	S	NA	M	S
EN29: Transportation Impacts	M	S	M	M	S
EN30: Protection Expenditures	NA	S	S	W	S
Summary	Q3 Data Reliability	Q4 Future Comparability	Q6 Data Gathering Systems	Q7 Stakeholder Concerns	Q8 Transparency Issues
Strong Responses	0	26	12	4	30
Moderate Responses	27	0	11	20	0
Weak Responses	0	4	0	6	0
Not Applicable	3	0	7	0	0

Responses by Indicator Conclusions

This analysis revealed clear patterns in the respondent's attitudes and perceptions across the different GRI indicators. There were clearly strong (positive) responses to the GRI in the areas of future compatibility (87%) and transparency issues (100%).

Results show strong level of transparency to the reader. However, verification was not approached in the subject questionnaire. Indicators may give the impression of transparency, but this is controlled at the verification level.

Participants did identify moderate concerns with data gathering systems, data reliability and stakeholder concerns. A detailed analysis of these results and analysis of responses to Question 5 are provided below in Chapter 6.

A review of individual indicators showed that no indicators scored more than one “weak” response among the five criteria. Indicators that scored one “weak” response in the Future Comparability area included EN12 Protected Areas, EN13 Habitats, EN15 Red List Species and EN21 Total Water Discharge. Indicators that scored one “weak” response in the Stakeholder Concerns area included EN6 Efficiency Initiatives, EN7 Consumption Initiatives, and EN14 Managing Biodiversity. Each of these identified indicator areas are analyzed further in Chapter 6. The areas of Data Reliability, Data Gathering Systems and Transparency Issues scored no “weak” responses.

Chapter 5 Data Analysis

The breakdown of subject responses by indicator identified areas of weakness and strengths in the current GRI environmental indicator system. Participants showed satisfaction with the requested data in regards to future comparability and to transparency, concerns with data reliability and stakeholder concerns and significant concerns with data gathering systems. A detailed review of the responses to each individual question is provided below.

Participants were asked their opinion on the level of reliability and potential for error for their requested data (Q3). 5 out of 6 of the participants interviewed indicated that for the indicators they were responsible for, the information requested by GRI was general but was still a good representation of the requested data. In the responses by indicator summary, 27 of 30 indicators responded to showed moderate responses. This indicates some concern with the indicator requirements requested by the GRI, however comments from participants were generally based on the issue of working on improving their own internal collection systems. This was more an indication of the potential errors in developing new collection systems rather than the GRI instructions themselves.

These results correlate with responses participants provided when asked their opinion whether data was easily available or new data systems were required (Q6). 4 out of 6 of the participants interviewed indicated that for the indicators they were responsible for, new data collection techniques were required to obtain some or all of the information requested. In the responses by indicator summary, 11 of 30 indicators (37%) responded to

showed moderate responses and 12 of 30 indicators (40%) responded to showed strong responses.

Comments for this question showed a considerable level of time commitment to accurately obtain data and repeated requests for new systems to be set for accessible collection of data. This implies a certain level of effort is required for compiling the data in a GRI report.

Participants were asked to provide their opinions on whether the collected data would be available in the future to enable long term comparability (Q4). 5 of the 6 participants interviewed showed that for the indicators for which they were responsible, the information requested by GRI was appropriate for future comparability. In the responses by indicator summary, 26 of 30 indicators (83%) responded to showed strong responses indicating that the majority of indicators provided good levels of future comparability. Comments reinforced these findings, although one subject expressed concern about personnel changes affecting the consistency of collected data. It is also worth noting that three of the four “weak” indicators were within the GRI biodiversity sub-group. EN12 Protected Areas, EN13 Habitats, and EN15 Red Listed Species, however, it is not clear why this pattern emerged.

Question 5 asked tiered questions regarding the collected data's connection to global sustainability. This was the only component of the questionnaire that did not provide a multiple choice option. In general the subject responses show a pattern of low indicator resolution and identified the absence of a focus on environmental footprints.

This identifies a potential issue with the lack of complexity in the current environmental indicators.

When participants were asked their opinion on the adequacy of data requests addressing stakeholder concerns (Q7), 3 of the 6 participants indicated that some of the data requested adequately considers stakeholder concerns and 2 of the 6 participants indicated that the data requested did not consider stakeholder concerns. In the responses by indicator summary, 20 of 30 indicators (66%) responded to showed moderate responses and 6 of 30 indicators (20%) responded to showed weak responses. Weak indicators included two from the energy sub-group, EN6 Efficiency Initiatives and EN7 Consumption Initiatives, and two from the biodiversity sub-group, EN11 Protected Areas and EN14 Managing Biodiversity.

Combined results show 5 of the 6 subject's environmental indicator responses had some concern about the representation of stakeholders with the current GRI EPI's. The GRI has addressed the issues of stakeholders by heavily incorporating stakeholder groups in the design of the GRI framework, even more so in its latest evolution (G3). However, the results indicate the concerns of stakeholders for the individual reporting companies need to be better addressed.

When participants were asked their opinion on the adequacy of data requests addressing transparency or ethical issues (Q8), all 6 of the participants indicated that they had no concerns. In the responses by indicator summary, 30 of 30 indicators (100%) responded to showed strong (positive) responses to the issue of transparency. This can be attributed to efforts by the GRI to create clear and understandable EPI's. While the

transparency of reported data can be a concern for non-verified reports, subject comments indicated no foreseeable concerns, based on the indicator requests themselves.

For the analysis conducted of 2007 GRI reporters in Canada and the US, a detailed data collection table was developed and is provided in Appendix B. The analysis looked at the following:

- 1) A breakdown of reporting levels;
- 2) A breakdown of application levels; and
- 3) A direct comparison of reported indicators to identify the most and least frequently reported indicators.

A total of 48 reports from Canada and the US were reviewed. Table 10 provides a summary of the reporting levels for the subject group.

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Table 10 – Reporting Levels of 2007 Subject Group

Reporting Level	Number of Reports (of 48)
A+	4 (8%)
A	4 (8%)
B+	6 (13%)
B	12 (25%)
C+	0 (0%)
C	11 (23%)
Undeclared	11 (23%)

This information indicates 16% of organizations are providing the optimum amount of environmental data in their reports and half of those are independently assured. In a review of reporting levels of the subject group by indicator, 5 indicators were reported more than 70% of the time and 9 other indicators were reported less than 40% of the time. A breakdown of these indicators into core and additional groupings is provided below in Table 11.

Table 11 – Breakdown of Indicator Reporting Frequency

Indicator Type	>70% Reporting	<40% Reporting
Core	EN3 – Direct Energy EN16 - Green House Gas Emissions EN26 - Initiatives (Services) EN28 – Non-Compliance Issues	EN11 - Protected Areas EN27 - Reclaimed products
Additional	EN18 - Green House Gas Emissions	EN9 - Water Sources EN10 - Water Recycled EN15 - Red List Species EN24 - Hazardous Waste EN25 - Discharge Impacts EN29 - Transportation Impacts EN30 - Protection Expenditures

As it is up to the reporting organization to determine which indicators are reported, within the GRI reporting requirements, this data provides information on reporting preferences and those indicators that are less preferred.

Table 12 provides a summary of the application levels for the subject group. Application level descriptions were provided in Chapter 1.

Table 12 – Application Levels of 2007 Subject Group

Application Level	Number of Reports (of 48)
Third-Party Checked	3 (6%)
GRI Checked	11 (23%)
Self-Declared	23 (48%)
Undeclared	11 (23%)

This information shows a significant number of GRI reports (71%) are not being checked by either the GRI or a Third-Party. The combination of results from both tables indicates a generally low level of environmental reporting and data assurance. Looking at these reports in more detail, the following table (Table 13) breaks down how each application level completely reports the core indicators. The results indicate a significant reduction in core indicator reporting between reports with no assurance and reports with some form of verification.

Table 13 – Average Core Indicator Reporting in Subject Group

Application Level	Average Core Indicator Reporting
Third-Party Checked	78.4%
GRI Checked	65.2%
Self-Declared	52.4%
Undeclared	57.8%

Self-declared or undeclared reporting results were assessed for whether unique indicators were reported less frequently than others, potentially identifying a pattern of indicator avoidance. In these 34 reports, 3 core environmental indicators and 7 additional environmental indicators were reported less than 40% of the time (Table 14). These indicators similar to the least reported indicators for all report application levels with the exception of the additional of core environmental indicator EN1.

Table 14 – Least Reported Indicators for Self of Undeclared Reports

Indicator Type	<40% Reporting
Core	EN1 – Material Usage EN11 - Protected Areas EN27 - Reclaimed products
Additional	EN9 - Water Sources EN10 - Water Recycled EN15 - Red List Species EN24 - Hazardous Waste EN25 - Discharge Impacts EN29 - Transportation Impacts EN30 - Protection Expenditures

Chapter 6 Discussion

The first objective of this thesis was to examine the process of data collection for a case study facility for the purpose of GRI environmental reporting in order to identify the limitations in the current most accepted reporting guidance system. The data collection process for this study utilized internal staff from the organization to gather environmental indicator data from areas of relative expertise to produce a facility report.

Study participants were asked a specific question on their experiences in the data gathering process. The results showed that an appropriate mix of participants was involved as each had some understanding of sustainability concepts but had a varied understanding of the GRI. This represented the qualities that could be expected of those requested to compile data in other reporting organizations.

Participant's multiple choice responses to the data gathering systems question (Q6) showed a strong trend that participants were neither disapproving nor fully satisfied with the reliability of data generated by the indicator request. However, based on participant's comments, there was no specific suggestion of concern regarding indicator quality or communication. For the purpose of sustainability reporting, the definition of data reliability can be described as the complete and accurate reporting of information. However, this is strongly influenced by how the data collection requirements are communicated to the user. The description of the indicator should convey how complete the set of information must be to address this indicator. Participant's lack of concern with the current system may be attributed to comments regarding the need for new systems or

more detailed systems. Participants also understood that this was a new process for the organization and may have given more leeway to this issue.

The need for intensive and time consuming data gathering for the simplified corporate report for the subject facility speaks to the rigour required to properly respond to the GRI data requests. While it is important that the task not be so challenging that reporting is discouraged, a simplistic reporting system may reduce the credibility of the reporting system. In general, participants' comment responses to the data gathering inquiry raise concerns regarding a lack of precision and of room for additional detail. This can be expected when attempting to quantify any type of data set and understanding the parameters that can influence the output is essential.

The second objective of this study was to summarize and analyze a sample of 2007 GRI reports in order to assess the current state of data quality in reporting. This information was reviewed in Chapter 5 – Data Analysis and summarized in Appendix B. Information from this analysis is included in discussions below.

The third objective of this study was to critically assess the quality of environmental indicator data collected from the case study organization and the currently reported GRI data with a view to identifying areas of improvement. A key issue identified in the area of data reliability was that the majority of companies reporting are not having their reports checked by a third party or the GRI. This is supported by the review of 2007 reports where only 6% of reports were identified as third-party checked and 21% of reports were GRI-checked. This leaves 73% of reports without any external review. This raises significant concerns that many reporting organizations are satisfied

with and benefiting from having their reports simply associated with the GRI standard. Participants in the case study data collection process identified a moderate level of concern with data reliability in the collection process, which indicates that there may be a correlation between the data reliability in the collection process and the lack of verification of final reports.

Actual “external assurance” indicates that your report has been audited and therefore, a plus sign “+” can be included with the application level. This is one of the significant marks against the GRI framework in that it can permit organizations that are dishonest about their data to claim GRI status. This is important as data quality will be affected if there is a lack of accountability at the highest level of a reporting system (Palenberg et al. 2006). For readers not familiar with this system, the icon can imply a form of certification, and can be therefore perceived as misleading.

Another key issue identified was the majority of companies reporting are not reporting all environmental indicators and showing significant preferences towards certain indicators. The data analysis identified that 8 of 48 organizations (16%) in the 2007 sample group reported all core environmental indicators and an average of 10 core environmental indicators was reported for the sample of 2007 GRI reports. Core indicators have been defined in GRI as being of interest to most stakeholders. There is also a significant leap in report quality from application level B to level A. Level B requires the reporting of 20 indicators, but it is worth noting that they can be either core or additional

Analysis of individual indicator reporting identified two core indicators that were reported less than 40% of the time; EN11 and EN27. The following provides a closer look at these two indicators.

EN11 - Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas.

EN11 is a core indicator that was reported only in 18 of 48 (38%) reports. Along with EN12, the GRI uses the term “Areas of High Biodiversity Value” and defines this as areas not subject to legal protection but recognized as significant by a number of governmental and non-governmental organizations. Reasons for the low reporting of this indicator may be linked to the potential scope of the term “non-governmental organizations”. Ecological protection groups can range greatly in size and focus and protection status can be also issued at many different levels. There is also the issue of how non-governmental organizations recognize an area of biodiversity and the potential for a group consisting of disgruntled stakeholders forming a group. In addition, the organization may not want to bring additional public attention to potential biodiversity areas.

EN27 - Percentage of products sold and their packaging materials that are reclaimed by category.

The indicator reporting for EN27 was also 18 of 48 (38%). EN27 and EN26, both provide the most relevant links to Life Cycle Analysis (LCA) of products in GRI reporting. LCA is a method of assessing the environment impacts of a product or service during its life cycle - extraction, processing, manufacturing, transport and distribution,

consumption, maintenance, reuse and recycling, and final disposal. EN26 seeks initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation. Returning to the literature review, one author identified concern with the lack of indicators for suppliers, limiting the ability to conduct LCA's (Moneva 2006). The reason for the low completion rate for this environmental indicator may be that many organizations do not have the LCA systems integrated into their processes. The GRI has made efforts to address LCA issues and the challenge lies in where the reporting body draws the line in its reporting process. If they integrate upstream and downstream processes in their value chain, their influence over the performance of producers, suppliers, distributors or retailers will be limited. (Thrum 2004).

Looking at the 2007 list from another perspective of reporting, only 16% of organizations are fully reporting to the 'A' level of the GRI standard. Earlier research on 40 of the world's largest companies found that environmental reports complied with only 20% of the GRI framework (Morhardt 2002). The subject facility was able to report on 14 of 17 core environmental indicators but did not assess for other indicator areas. It would likely be some time before the facility could report at an A level, but this was not fully assessed.

The potential barriers preventing reporters from communicating certain indicators are 1) resources (cost and time) for managing the external process and 2) negative stakeholder reaction to reporting. The GRI paid considerable attention to ensuring collaboration from major multinational corporations, accountancies and the SRI sector while activists and labor received less attention (Morhart et al. 2002). This may explain

why larger firms have engaged the GRI and smaller firms have largely ignored it (Henri 2008). As many of the reporting organizations are large, it is difficult to defend how the marginal costs of verification outweigh the marketable benefits of external assurance. Further study could identify evidence as to whether regular assurance is cost effective.

It also ignores the benefit of reporting the absence of an environmental concern. For example, reporting the fact that your organization had no spills is important news to stakeholders, yet only 65% of the 2007 subject group reported to this indicator (EN23). This implies that 35% of reporting organizations, including several large energy and utility organizations, chose not to report their significant spills, a serious concern, or they chose not to report a positive result, equally concerning. Mandatory reporting of applicable indicators would eliminate the gaps in transparency. In an example from 2007 reports, Bell Canada and Coca Cola both did not report environmental indicator EN4, indirect energy consumption by primary source, an easily reported value for each organization.

It could be argued that for certain organizations, reporting “core” disclosures that have no relevance to an organization will strain resources and limit the ability to properly report. This argument is weak as the reporting of “no emissions related to our operations” could be stated and credit for this indicator received. For example, in the JW facility report both of the low reporting indicators listed above, EN11 and EN27, were reported to in this manner. Currently the facility does not impact protected areas, nor does it incorporate reclaimed materials in its products. However, both could potentially apply in

the future. To list these items as “does not apply” would be missing the intention of full disclosure reporting.

Non-reporting of information that was readily available makes a significant impact on data quality. Interestingly, some studies have found that companies admit to making an effort in their reporting to avoid giving the public the impression of being too “social” a company. Publicly traded companies most frequently argued that they must focus on their business capabilities and worried about “competitive disadvantages” by publishing ecological and/or social performance indicators (Daub 2007).

Canada's national accounting association recommended full indicator reporting arguing that since the GRI has identified “core” indicators as critical for measuring sustainability, the extent to which each disclosure applies to an organization will be useful to readers (CGA 2006). It is also noted that this information is valuable for readers to compare impacts across the different reporting organizations. Also worth noting is the materiality test to determine whether to include “core” and/or “additional” indicators which can be perceived as moving an organization away from true sustainability reporting (CGA 2006). The JW facility report was able to report on all but 3 of the core GRI environmental indicators. The reasons for not reporting on these indicators were related to a lack of specialized resources available and not due to non-applicability. Financial and manpower resources were going to be allocated for the next reporting year.

One potential solution to improving the issues of poor environmental indicator reporting and limited verification of reports is the concept of mandatory reporting. This was instituted in France by means of government legislation and the result was a

significant increase in reporting. The number of reports more than doubled in three years following approval in parliament (Westrik 2007). However, providing credible assurance standards and enforcing them have proven challenging. While the popular response to one survey favoured setting mandatory reporting requirements, the inclination towards voluntary systems has grown since 2002 (Pleon 2005). In a shared publication, UNEP and KPMG advocated mandatory minimum requirements for sustainability reporting enhanced with incentives for more extensive reporting (UNEP and KPMG 2006). Most recently, Denmark has required that hundreds of the largest private and state-owned companies and institutional investors in Denmark must now include corporate social responsibility information in their annual financial reports beginning in 2010. This was passed in a vote in Danish Parliament in December 2008 (GreenBiz.com 2008).

Clearly the GRI has put a significant amount of effort into establishing stakeholder guidance for GRI reporters but allowing such a significant number of unverified reports to be posted under the GRI banner degrades the link of stakeholder responsibility in data collection through to reporting. Indicators should be defined in the context of what is of importance to stakeholders and not the organization alone and it should be explicit that relevant issues and indicators are those that are of importance to stakeholders identified through stakeholder engagement (CGA). This is likely to be particularly important with reference to social indicators and some environmental ones such as biodiversity. While participants were asked their opinion on stakeholders in Question 6, there was no stakeholder engagement component to the data collection of the

facility report. Therefore, analysis is limited to participants' opinions and not their experiences.

Research Limitations

The model used for this research project had some limitations. Firstly, the GRI data collection process was tested on a organization and participants that had not used the framework in the past. This lack of experience with the system may have limited the level of detail in subject comments. An effort was made to address this in the study by providing the subject group with background material on the GRI G3 guidelines. However, the benefit of this model is to have fresh perspectives review the concepts, similar to the situation of many readers of GRI reports.

It should be restated that one of the initial parameters of the project was that there was no intention to have the project's reported data GRI-Checked or verified by an independent third-party. A different level of interest in responses may have been generated from participants with the knowledge of potential verification.

A larger scale data collection phase of the project would likely generate issues that are common to large scale organizations. While these types of organizations are the prominent user of the GRI, the framework was designed for all sizes of organizations to use and the facility represented a sample of the larger organization. For this type of methodology, further data collection participants could have provided more detailed results and allowed for an increased scale of statistical analysis. This could also have been established by requesting each subject to collect data for all 30 of the GRI G3 EPIs

and then compare the experiences of each across the spectrum of indicators. This would have provided additional comparisons per indicator. However, there would have been potentially more issues of variability in understanding and interpretation between subjects with a larger group.

Finally, individual interviews were initially contemplated, but it was determined that allowing the participants to complete the questionnaire was an effective approach to obtaining some thoughtful commentary in the responses. It is important to note that there is a lack of academic research into the area of corporate sustainability reporting (Daub 2007).

Chapter 7 Conclusion and Recommendations

The final objective of this study was to provide recommendations on how to improve the quality of data in GRI environmental reporting. The G3 version of the guidelines was a significant improvement from its predecessors, making strides in key areas including indicator focus and explanation. However, the next evolution should consider the following recommendations to enhance the level of data quality in GRI reports.

First, it is recommended that the concept of mandatory reporting of all sustainability indicators be considered for GRI designation. Data reliability will be increased by greater encouragement and incentive to increase application levels and verification requirements. The initiative would assist in resolving the following issues:

- 1) Eliminate preferential and non-reporting of certain indicators;
- 2) Potentially standardize data gathering systems; and
- 3) Potentially fill in the data gaps in products streams and enhance LCA options.

Further study could investigate the most effective means of implementation. For example, companies of a particular minimum size could be forced to report through regulation. One way to achieve this is to institute government intervention in the process. However, it is more likely and practical for the GRI to initially set the requirement of complete reporting as a part of voluntary reporting. This step would enhance the reputation of the GRI and would raise the level of data quality in the areas of transparency, reliability and future comparability. The GRI is in a well-established position to integrate this new requirement. It is expected that there would be an initial

reduction in participation, but it would force currently under-reporting companies to raise their reporting levels or risk the repercussions of removing GRI ratings from their reports. Further research opportunities could be pursued to identify evidence as to whether regular assurance is cost effective.

The second recommendation is for GRI to require that all GRI reports of all application levels received some level of assurance. As the financial reporting systems of all companies are subject to regular review, so should the sustainability performance of these organizations, particularly as sustainability issues become intertwined with financial ones? Seventy three percent of 2007 reports did not receive any form of independent assurance. This initiative would assist in resolving the following issues:

1. Improve data quality in reports by encouraging an environment of sustainability reporting compliance; and
2. Ensuring those who achieve GRI designation are being rewarded appropriately for their efforts.

A possible alternative solution to this recommendation would be to revise the current application and reporting level systems to accentuate those organizations that are assured.

The thoroughness of indicator reporting needs to be increased by JW-AXYS in order to establish a robust corporate report, particularly in the area of stakeholder engagement. As far as thoroughness of reporting and data quality, JW-AXYS is ahead of the standard for environmental indicators, but needs to integrate social and economic indicators to establish true sustainability reporting. The organization has started to take

steps in these directions by bringing in GRI experienced consulting services to help guide the reporting process.

The GRI's current list of priorities is many and diverse including initial discussions on addressing supply chain transparency issues. Other priority areas included climate change, financial markets, smaller enterprises and many others. While it is important that the GRI looks to integrate and embrace all aspects of sustainability, it is important to continue to solidify the quality and credibility of the original components of environment, economy and social well-being.

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APPENDIX A
GRI Environmental Indicators List

GRI Environmental Indicators List

GRI G3 Environmental Indicators			
MATERIALS		EN15 ADD	Red List Species
EN1 CORE	Material Usage	EMISSIONS, EFFLUENTS AND WASTE	
EN2 CORE	% Material Recycled	EN16 CORE	GHG Emissions Direct/Indirect
ENERGY		EN17 CORE	GHG Emissions Other
EN3 CORE	Direct Energy	EN18 ADD	GHG Emissions Reduction
EN4 CORE	Indirect Energy	EN19 CORE	ODS Emissions
EN5 ADD	Energy Saved	EN20 CORE	Other Air Emissions
EN6 ADD	Efficiency Initiatives	EN21 CORE	Total water discharge
EN7 ADD	Consumption Initiatives	EN22 CORE	Total Waste
WATER		EN23 CORE	Significant Spills
EN8 CORE	Water Withdrawal	EN24 ADD	Hazardous Waste
EN9 ADD	Water Sources	EN25 ADD	Impacts on Waterbodies
EN10 ADD	Water Recycled	OTHER INDICATORS	
BIODIVERSITY		EN26 CORE	Service Impact Reduction
EN11 CORE	Protected Areas (Loc./Size)	EN27 CORE	Reclaimed Products
EN12 CORE	Protected Areas (Impacts)	EN28 CORE	Non-Compliance Issues
EN13 ADD	Habitats Protected/Restored	EN29 ADD	Transportation Impacts
EN14 ADD	Managing Biodiversity	EN30 ADD	Protection Expenditures
Ref: http://www.globalreporting.org/ReportingFramework/G3Online/PerformanceIndicators/			

APPENDIX B
JW-AXYS 2007 Baseline Environmental Report

2007 BASELINE ENVIRONMENTAL REPORT

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INTRODUCTION

At Jacques Whitford, we focus on doing business in a way that protects, enhances and ultimately restores the environmental, social and economic fabric of our world. This commitment is at the heart of how we operate and how we deliver solutions for our clients. With more than 1,600 employees in 45 offices, Jacques Whitford is continuing to demonstrating how it holds itself to the same high standards we prescribe for our wide range of clients.

Jacques Whitford has taken significant strides in establishing a strong and growing sustainability service line matched to the needs of current and prospective clients. In conjunction with this, we have committed ourselves to “walking-the-talk” which allows us to lead by example and expand our sustainability knowledge by looking internally. For more information on our commitment to sustainability, go to www.JacquesWhitford.com.

This report is the first step in a process that seeks the establishment of a cross-company office sustainability report template that contributes to moving Jacques Whitford forward towards becoming a next generation sustainable consulting organization.

The Jacques Whitford office used as the pilot to initiate the environmental component of the sustainability reporting process is the Sidney office, located just north of Victoria in British Columbia. A detailed description of the office is provided in Section 1.0 below.

Jacques Whitford has used the environmental component of the Global Reporting Initiative (GRI) as a framework for this 2006 baseline assessment. The GRI's Reporting Framework is largely seen as the global de facto standard in sustainability reporting.

The GRI vision is that reporting on economic, environmental, and social performance by all organizations becomes as routine and comparable as financial reporting. GRI accomplishes this vision by developing, continually improving, and building capacity around the use of its Sustainability Reporting Framework. An international network of thousands from business, civil society, labor, and professional institutions create the content of the Reporting Framework in a consensus-seeking process.

Our corporate sustainability lead at Jacques Whitford is Mr. Marty Janowitz, Vice President of Sustainability. Mr. Janowitz has assisted Mr. Mark Boysen, Project Manager at the Sidney office, in the development of this report. If you have any inquires regarding this report please contact either person at anytime.



.01 THE SIDNEY OFFICE

The physical location of the office is in a business park near the Victoria International Airport in Sidney, BC. In 2006, the office managed a staff of 23 employees and it has grown significantly in 2007. The office has integrated the Victoria based firm C.E. Jones into its operations.

The office services have traditionally been focused on environmental and biological assessment and this was the case during data collection reporting year (2006). In 2007, the office has expanded into new areas including mine reclamation, socio-economic and environmental management services.



Data for the collection year 2006 had to be modified to estimate a move of office locations in the middle of the year as the previous building was shared with other companies. The new, independent building location allows for simpler environmental data management and calculations.

The environmental impacts and current and future environmental initiatives for the office and the company as a whole are discussed throughout this report.

.02 MATERIALS

.2.1 Reportable GRI Environmental Indicators

EN1 – Material Usage

EN2 – % Material Recycled

.2.2 Facility Data

The products developed by environmental and engineering consulting business are solutions developed through the creative application of knowledge and analysis. Like many knowledge based organizations, copy paper products are by far the most consumed material. The Sidney group purchased a total of 385 bundles, 3,493 kilograms or 192,500 sheets of paper. Based on an office of 23 employees, each employee consumed approximately 8,370 sheets or 152 kilograms of paper in 2006.

All paper purchased at the Sidney office in 2006 had a recycled content of 30%, translating into 1,048 kilograms of recycled content.

Sidney reception staff also has started significant initiatives to reduce other wastes in the office which is discussed further in Section 6.

Corporately, Jacques Whitford corporate procurement strategy will assess paper use and other material purchases from a sustainability perspective. A Sustainable Procurement Advisory Panel was initiated in autumn 2007 to undertake a systematic review of procurement practices and options. This initiative is expected to begin to impact purchasing decisions late in the year. .

Suggested Actions for 2007:

- 1) Switching to 100% recycled paper.
- 2) Set up methods for tracking all recycled materials.
- 3) Initiate paper use reduction initiatives.

Switching to 100% recycled paper will result in a 50% increase in costs which translates to approximately \$1000, based on current consumption levels. An effort to reduce overall consumption would assist in reducing this cost. For example, double sided printing should become mandatory for all possible printer jobs.

.03 ENERGY

.3.1 Reportable GRI Environmental Indicators

EN3 – Direct Energy

EN4 – Indirect Energy

.3.2 Facility Data

The Sidney office likely has similar energy consumption devices and practices as other company offices, but will have unique direct and indirect energy sources due to its geography. Direct energy sources are fuels consumed at a facility while indirect energy is energy generated at a distance and then the electricity is delivered to the office.

In Sidney the office consumes direct energy through natural gas heating. The office consumed 1.78 cubic meters of natural gas in 2006, which translated into 68.4 Gigajoules (GJ) of energy. This translates into 0.8 cubic meters of natural gas per employee and 2.97 GJ per employee.

Sidney consumes indirect energy through electricity use for computers, appliances and lighting. For 2006 it was estimated that the office used 67,606 kilowatt hours (kwh) of electricity from hydro power sources. This translates into 2939 kwh of electricity per employee

In 2006 energy efficient services and energy consumption initiatives for the

office had not yet been established. Also, parameters for 2007 calculations will need to be adjusted due to a number of new employees and increased office space.

Corporately, Jacques Whitford has initiated several new energy saving programs that are being rolled out this year. The first such initiative started in autumn of 2006, when the first hybrid car was introduced into the company fleet. As of October 2007, all new cars in the company fleet will be hybrids, including trucks.

In addition, the company, assisted by the aforementioned Procurement Advisory Panel will also include a focus on energy efficient products. For example, in the future all computer monitors will be energy efficient (LED) and all light bulbs will be required to be more energy efficient. The group will also explore zoned lighting systems for all building to automate and minimize lighting use.

Future corporate initiatives include energy auditing and the review of green power alternatives. The Markham office has led the way in this area by purchasing power from an independent green energy provider.

Suggested Actions for 2007:

- 1) Establish comparisons to 2006 baseline data, calculations for energy savings could not yet be calculated as 2006 is the baseline year.
- 2) Integrate findings and recommendations of the Procurement Advisory Panel into procurement decision-making.
- 3) Investigate potential green energy sources.

.04 WATER

.4.1 Reportable GRI Environmental Indicators

EN8 – Water Withdrawal

EN10 – Water Recycled

EN9 – Water Sources

.4.2 Facility Data

The Town of Sidney receives its water supply from the Sooke Reservoir which is managed by the Capital Regional District. Our Sidney office consumed 40,000 gallons of water from this system in 2006. This translates into 1,740 gallons per employee. Currently, the office does not have a water recycling or use reduction program.

Although the office is located in an industrialized warehouse district, there are some opportunities for water use reduction that should be considered for 2007. The new office location does have lower flow toilets installed, which may provide a reduction for 2007.

Suggested Actions for 2007:

- 1) Establish comparisons to 2006 baseline data.
- 2) Further investigation should be made into the accuracy of the consumption values provided by the water bill.
- 3) Investigate storm water management programs such as a green roof program.

.05 BIODIVERSITY

.5.1 Reportable GRI Environmental Indicators

EN11 – Protected Areas (Loc./Size)

EN14 – Managing Biodiversity

EN12 – Protected Areas (Impacts)

EN15 – Red List Species

EN13 – Habitats Protected/Restored

.5.2 Facility Data

For our Sidney facility, the office is not located near protected areas, nor does its operation make impacts on any protected areas. The organizations has also not engaged in protecting or restoring habitats outside of our consulting services.

Corporately, the company is currently developing a protocol for selecting sites for new office locations to manage our future potential impacts on biodiversity. The process will utilize our sustainable buildings experts across the company.

Our biologist representatives have not identified any potential impacts on red listed species from the corporate operations.

While our wildlife and terrestrial consulting teams are always focused on biodiversity protection, how Jacques Whitford manages biodiversity issues during projects should be clarified in our field procedures.

There are issues to consider during field collection including impacts from field operations and working in protected areas. Procedures for dealing with animal encounters are in place, but there is a need for instructions on working in protected areas and sensitive habitats.

Suggested Actions for 2007:

- 1) Develop new procedures that address biodiversity protection issues including working in sensitive and protected habitats and in areas of protected species.

.06 EMISSIONS, EFFLUENTS AND WASTE

.6.1 Reportable GRI Environmental Indicators

EN16, EN17, EN18 – Green House Gas Emissions	EN23 – Significant Spills
EN20 – Other Air Emissions	EN24 – Hazardous Waste
EN21 – Total Water Discharge	EN25 – Impacts on Waterbodies

.6.2 Facility Data

.6.2.1 Emissions

The Sidney office greenhouse gas emissions data was collected for the year 2006. This data includes vehicle emissions related to operations of the business but not commuting. Emissions were estimated from all air travel, vehicle rental mileage and building electricity and heating.

The initiative determined that Sidney office personnel generated 73.53 tonnes of carbon dioxide (CO₂) emissions. This equates into 2.72 tonnes of CO₂ per employee. This total was broken down into the following categories to identify CO₂ reduction opportunities.

Car Emissions - 7.1 tonnes

Electricity and Heat - 1.4 tonnes

Air Travel - 65 tonnes

Jacques Whitford made its most significant sustainability efforts in 2006 by initiating a carbon footprint tracking program and then offsetting its carbon emissions through the Carbonfund.org's CarbonFree program.

As of June 1, 2007 all of Jacques Whitford's operations and facilities must now become carbon neutral through a combination of conservation efforts and the purchasing of carbon offsets through the fund. The non-profit foundation verified the work undertaken by Jacques Whitford's scientists to analyze the firm's carbon footprint and recommended investments in carbon-reducing projects such as renewable energy, alternative energy and energy efficiency.

Based on the Sidney data, it is clear that initiatives to reduce emissions need to focus on airline travel; however, this can be a difficult challenge when client work requires our presence in the field. An area where reductions can be made is minimizing the travel required for internal meetings, training sessions and conferences. Improved technology at Jacques Whitford allows for improved communication tools and should be used whenever possible if plane trips can be avoided.

One important point to consider is that 60% of the air travel for the office



was taken by 3 members of the office. By focusing on the travel planning of these key people, significant reductions may be achievable.

Airlines have taken notice of their emissions and the concerns of their passengers. Most airlines now provide carbon offsetting options for individual flights. Jacques Whitford accounts for and includes emissions associated with air travel in its overall carbon footprint and offset acquisition. The emissions calculated from vehicles are based on work related travel. Although only total mileage was used to calculate emissions, vehicle type should be considered in future calculations, so that the effects of encouraging high-efficiency car use can be determined. Staff commuting to the office was also not included. Car-pooling has not officially been initiated at the office, but it is being encouraged by "Green Teams" throughout the company.

The Sidney office does not have any other significant air emissions to report, including NOx or Sox emissions.

All waste water is discharged to the CRD sewer system for treatment. All discharges to this treatment system meet the CRD requirements for sewer discharge quality. Facility wastewater does not have any impact on neighboring water bodies.

.6.2.2 Wastes and Spills

While the Sidney office generates a relatively small volume of waste, efforts are being made to minimize these wastes. Sidney reception staff has started initiatives to reduce waste and increase recycling in the office. These wastes include cardboard, plastic bags, bottles and cans, and foil packets. Currently, there are no systems in place for tracking this information.

The office does not generate any hazardous wastes in its operations.

The office also does not formally track spills to the environment, however, field staff indicated that there were no reported spills for the Sidney office or field operations for this reporting year.

Suggested Actions for 2007:

- 1) Initiate requirements to reduce airline travel and to identify airlines that support greenhouse gas reduction initiatives.
- 2) Develop procedures for tracking and managing wastes.

.07 OTHER ENVIRONMENTAL INFORMATION

.7.1 Reportable GRI Environmental Indicators

.7.2 Facility Data

Jacques Whitford's existing, new and proposed environmental initiatives have been discussed throughout this report. Systems are now being put in place to monitor and track our environmental performance. The initiatives take time, but significant time and investment has been made by Jacques Whitford in these areas.

These additional reporting areas have not yet been established for the company, with the exception of EN28. The Sidney office has had no incidents of non-compliance.

Future initiatives should involve a review of our transportation impacts by considering our selection of couriers and other suppliers.

Suggested Actions for 2007:

- 1) Track costs for all environmental initiatives and protection expenditures to accurately document all protection efforts being made.

.08 SIDNEY OFFICE GRI SUMMARY

This report was compiled based on the environmental performance indicator component of the GRI. The page number and section of this report where the applicable indicator information can be found is provided below. As with all businesses, some indicators were not reported. All indicators could potentially be reported by the Sidney Office's operation, so for those listed as "NR - Not Reported" it was not possible to gather the data required in time for the production of the report. Indicators are also listed as Core or Additional.

Table 1: 2006 GRI Summary – JW-AXYS Sidney Office

GRI Section		Report Page	GRI Section		Report Page
	MATERIALS		EN15 ADD	Red List Species	6
EN1 CORE	Material Usage	4		EMISSIONS, EFFLUENTS AND WASTE	
EN2 CORE	% Material Recycled	4	EN16 CORE	GHG Emissions Direct/Indirect	8
	ENERGY		EN17 CORE	GHG Emissions Other	8
EN3 CORE	Direct Energy	5	EN18 ADD	GHG Emissions Reduction	8
EN4 CORE	Indirect Energy	5	EN19 CORE	ODS Emissions	NR
EN5 ADD	Energy Saved	NR	EN20 CORE	Other Air Emissions	8
EN6 ADD	Efficiency Initiatives	NR	EN21 CORE	Total water discharge	8
EN7 ADD	Consumption Initiatives	NR	EN22 CORE	Total Waste	NR
	WATER		EN23 CORE	Significant Spills	8
EN8 CORE	Water Withdrawal	6	EN24 ADD	Hazardous Waste	8
EN9 ADD	Water Sources	6	EN25 ADD	Impacts on Waterbodies	8
EN10 ADD	Water Recycled	6		OTHER INDICATORS	
	BIODIVERSITY		EN26 CORE	Service Impact Reduction	NR
EN11 CORE	Protected Areas (Loc./Size)	6	EN27 CORE	Reclaimed Products	9
EN12 CORE	Protected Areas (Impacts)	6	EN28 CORE	Non-Compliance Issues	9
EN13 ADD	Habitats Protected/Restored	6	EN29 ADD	Transportation Impacts	NR
EN14 ADD	Managing Biodiversity	6	EN30 ADD	Protection Expenditures	NR

THE NEXT STEP – REPORTING FOR 2007

While the data presented in this report is focused on the Sidney office, Jacques Whitford is using this report as an initial baseline template that can be refined for use across the company. The expectation is that this report will develop questions, concerns and ideas that will enhance the overall environmental reporting and performance of the company.

As an outcome of this report, a series of macro-level next steps have been identified for the company:

- 1) Determine the effectiveness of the GRI report for the purposes of Jacques Whitford's environmental reporting.
- 2) Review the gaps that were identified in this report and develop an action plan to address these issues.
- 3) Initiate the process of integrating environmentally conscious practices into our safe work practices.
- 4) Implement a baseline assessment and reporting process across other and ultimately all Jacques Whitford offices.

These actions will assist the Sidney office in determining its own next steps for environmental reporting. This year the office will look to improve its 2006 GRI reporting record of 22 indicators reported and 8 not-reported. 3 of the non-reported indicators are core GRI environmental indicators.

2007 has seen significant expansion at the Sidney office and for many offices across the company. Jacques Whitford needs to utilize its own areas of expertise to improve its environmental footprint including sustainable building solutions, sustainable transportation solutions, policy and governance for sustainability and sustainable materials and energy solutions.

This is an important step in Jacques Whitford's efforts to lead the way with sustainable solutions.

APPENDIX C
2007 Subject Reporting Companies

APPENDIX D
Data Collection Worksheet Template

Interviewee Data Collection Request (Template)

Employee Name:
Employee Position:
Years with Company:
Data Collection Period: **2006**

The researcher has requested your assistance in collecting environmental indicator information that helps fulfil the requirements of the Global Reporting Initiative. The following lists the areas where you have been requested to assist collecting data.

INDICATOR	DETAILS

We will also be discussing this information in person. If you have any immediate questions regarding the specific information required, please contact the researcher at any time at 250-709-4330.

Thanks very much for your assistance.

Mark Boysen, B.Sc., EMS(LA)

APPENDIX E
Questionnaire Template

Thesis Project: GRI Environmental Indicator Data Quality

Researcher: Mark Boysen, B.Sc, EMS(LA)

Interviewee Questionnaire Template

Employee Name:

Employee Position:

Years with Company:

Interview Date:

Data Collection Period: 2006

Requested GRI Data Collection Focus Areas:

1. Based on your experiences prior to this research project, how strong was your understanding of sustainability?

- a) Very good understanding*
- b) Partially understanding*
- c) I had no real understanding of the term.*

Comments:

2. Prior to you date collection, what was your knowledge of the Global Reporting Initiative (GRI)?

- a) I had a good understanding on what GRI is and its purpose.**
- b) I had only heard of the term.**
- c) This was an unknown term.**

Comments:

Thesis Project: GRI Environmental Indicator Data Quality

Researcher: Mark Boysen, B.Sc, EMS(LA)

3. What do you consider the level of reliability and potential for error the requested data to be?

- a) The information collected has a high level of detail and a good representation of the requested data.**
- b) The information is more general but is still a good representation of the requested data.**
- c) The information is very general and not a good representation of the requested data.**

Comments:

4. Based on the data you were requested to collect, will this data be available in the future to enable comparability in future periods?

- a) Yes.**
- b) Partially.**
- c) No.**

Comments:

5. Looking at each portion of data you collected, is the data beneficial towards global sustainability? How do you feel this information represents this particular sustainability aspect of the subject facility in terms of environmental quality? Based on what you know of GRI, is there other information that you feel is important to include?

Comments:

Thesis Project: GRI Environmental Indicator Data Quality

Researcher: Mark Boysen, B.Sc, EMS(LA)

6. Is this data easily available or was a new data-gathering system required?

- a) Data collection systems for all information were already in place**
- b) New data collection techniques were required to obtain some of the information.**
- c) New data collection techniques were required to obtain all of the information.**

Comments:

7. Does the data requested adequately consider stakeholder (employee and general public) concerns for the indicator areas you reviewed?

- a) Yes, the data requested considers stakeholder concerns.**
- b) Some of the data requested adequately considers stakeholder concerns.**
- c) No, the data requested does not consider stakeholder concerns.**

Comments:

8. Were there any potential transparency or ethical issues that arose during the collection of data?

- a) No.**
- b) Yes.**

If yes, please comment on the potential issues: