STRATEGIC GROWTH OF EARTH TECH'S WATER/WASTEWATER DEPARTMENT IN BRITISH COLUMBIA

by

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ABSTRACT

In British Columbia, Earth Tech, a multi-disciplinary consulting engineering firm, provides services to four market sectors, water/wastewater, facilities, transportation and environment. The water/wastewater department is the biggest of the four departments; it provides variety of services to public and private sectors within lower mainland and elsewhere in British Columbia. In 2006, the water/wastewater department was responsible for generating approximately 40% of Earth Tech’s annual net sales revenue within the Pacific region.

During a period from 2002 to 2006, the water/wastewater department faced unique internal and external challenges in three major project categories resulting in a drop of 40% in revenues over a five-year period. A detailed analysis reveals that Earth Tech’s reputation and brand recognition fall behind those of its competitors. The department suffers from lack of experienced project managers and high rates of staff turnover. These have direct effects on quality of services provided to the clients.

The department should concentrate on its internal issues and close the gaps between required and existing capabilities to grow in the market. The cost-benefit analysis clearly indicates that to concentrate on two niche markets, benchmarking and municipals’ projects would be the best strategy.
DEDICATION

To my parents,

And

To my husband, Farivar

For your love, support and patience. Without your support, this would not have been possible.
ACKNOWLEDGEMENTS

I would like to thank my team members and classmates. You made the past two years unforgettable. Thank you for your friendship. Special thanks to Dr. Mark Selman for his guidance and encouragement with this project.
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1: EARTH TECH

1.1 Project Objectives

The primary objective of this paper is to provide recommendations for the strategic growth of Earth Tech within Pacific region. As Earth Tech is a multi-disciplinary firm, its successful growth depends on each individual department’s growth strategy. However, the focus of this paper is on water/wastewater departments’ strategic growth and its contribution to the overall growth of the company in British Columbia. In order to achieve this objective, the following analyses will be performed:

- An analysis of consulting engineering and water/wastewater industry
- An analysis of water/wastewater department’s operations in British Columbia
- An analysis of internal strengths and weaknesses of water/wastewater department in Pacific region
- An analysis of strategic alternatives for the department’s growth in Pacific region

1.2 Earth Tech Incorporated

Earth Tech Inc., headquartered in Long Beach, California, is a multi-national provider of engineering, construction, environmental, and infrastructure services to private and public sector clients. Earth Tech Inc. has 7,000 employees and 130 offices in 15 countries. In 1996, Earth Tech became a fully owned subsidiary of Tyco International.
Tyco International has four different divisions, Healthcare, Electronics, Fire and Security and Engineered Products and Services. In 2006, Tyco’s Board of Directors approved a plan to divide Tyco into three independent, publicly traded companies. As part of this plan, the Healthcare and Electronic divisions will be separated and each will be a new independent company. The third company, Tyco International, will be created from combination of Fire & Security and Engineered Products and Services.

Tyco’s Board of Directors believes that Tyco’s businesses can best achieve its full potential as stand-alone, independent companies. With the ability to act as independent companies, Healthcare, Electronics and Tyco International will be able to set their own strategy for acquisitions, alliances, and resource allocations. In addition, marketing and management decisions can be made effectively based on the dynamics within the respective industries. The separation is expected to be completed by the third quarter of calendar 2007.

With the annual revenues of US $1.2 billion, Earth Tech is considered a successful company globally; however, being part of a larger corporation, in many instances Earth Tech acts and moves behind its competitors. In addition, it appears that Tyco is in the process of reviewing a strategic plan to sell Earth Tech in the near future. There have been some rumours about potential buyers who are interested in buying Earth Tech’s North America division only. It seems that Tyco does not have any intention to sell Earth Tech in bits and pieces to different buyers. However, the number of companies that are able to acquire Earth Tech as one global firm are limited.
1.3 Evolution of Earth Tech Canada

As part of investment in Canada, during 1999 to 2000, Earth Tech Inc., acquired two multi-disciplinary consulting engineering firms, Proctor and Redfern in Eastern Canada and Reid Crowther in Western Canada. The information presented below provides a brief description of each firm; it also describes how each historically approached their growth.

1.3.1 Proctor & Redfern

Established in 1922, Proctor and Redfern was a successful engineering firm in Eastern Canada. By the late 1960s, the company had extended internationally with water, sewerage, and drainage survey projects in Malaysia and Singapore. Prior to acquisition by Earth Tech Inc., Proctor & Redfern was a private company and had almost 500 employees who were actively working on transportation, water/waste water and environmental projects in Eastern Canada.

1.3.2 Reid Crowther and Partners Ltd

Reid Crowther was the oldest continuously operating consulting engineering firm in western Canada. Originally incorporated in Regina, Saskatchewan in 1906 the company grew through numerous partnerships, acquisitions and mergers to become Reid Crowther and Partners Ltd in 1965. Prior to acquisition by Earth Tech Inc., Reid Crowther was a 100% employee owned company; it employed more than 900 employees and had a strong presence in Western Canada within market sectors such as industrial, transportation, municipal infrastructure and building engineering.
1.4 Earth Tech Canada

Earth Tech Canada maintains a corporate head office in Markham, Ontario that focuses on corporate strategy and growth initiatives, corporate governance and compliance functions. The organization aims at serving the interests and needs of Canadian and global customers in all aspects of consulting, engineering and construction, while delivering maximum value to its shareholders. The company's current focus is on providing services to public or private clients within North and South America and the Caribbean. Earth Tech Canada provides engineering services to four market sectors, water/waste water, transportation, environment and facilities.

Earth Tech Canada has 900 employees and 16 offices in five Canadian provinces and the Northwest Territories. Due to staff shortages and other internal issues, Earth Tech recently closed its office in Kitimat, British Columbia.

Figure 1-1 Earth Tech Canada Office Locations

Source: Earth Tech
Earth Tech supports a culture of excellence and customer focus. Improvement is an integral part of the company’s culture. The goal is to establish and maintain a standard of performance excellence that provides the clients with the services they need, when they need them.

Earth Tech’s vision is to improve the global environmental condition through the development of private and public infrastructure in ways that make a better tomorrow possible for all people. Earth Tech’s mission is to differentiate itself, for its employees, parent company, and clients, as a powerful, global competitor, through the unique combination of its two businesses - consulting engineering and water infrastructure development.

Integrity, excellence, teamwork and accountability are Earth Tech’s core values. Every employee, manager and director throughout the organization should comply with all company’s policies and laws; also highest standards of individual and corporate integrity are encouraged and demanded.

Earth Tech’s employees are dedicated to diversity, fair treatment, teamwork, mutual respect and trust. They strive to understand their clients and help them to achieve their goals; also, they honour the commitments they make. Building effective teams, maintaining customer focus, embracing learning/change agility, managing diversity and driving for results are extremely important to Earth Tech.
In 2006, Earth Tech Canada reported $100 million in net sales revenue; the Western Canada region was responsible for generating approximately 50% of total revenue in Canada. The following section of this paper provides information about Western Canada and Pacific Region’s operations and their net revenue.

1.4.1 Earth Tech Western Canada Annual Net Sales Revenue

Western Canada consists of four regions, Pacific, North Alberta, South Alberta and Prairies. Figure 1-2 represents the geographic distribution of net sales revenue within Western Canada. In 2006, Western Canada’s annual net sales revenue was slightly over $48 million dollars; the Prairies earned 33% of total net sales revenue. The Pacific region was responsible for generating 33% of total net sales revenue within Western Canada. South Alberta and North Alberta were responsible for generating 23% and 20% of net sales revenue respectively.

![Figure 1-2 Geographic Distribution of Net Sales Revenue within Western Canada](image)

Figure created by author – Data Source: Internal Financial Data
It appears that the Pacific region is the second most important region in terms of generating net sales revenue within Western Canada; therefore the Pacific region's successful operation and future growth is critical to the success of Western Canada's operation as a whole.

Figure 1-3 represents Western Canada's breakdown of net sales revenue by market sectors. As can be seen, the water/wastewater department earned 43% of total net sales revenue within Western Canada. The facilities department generated approximately 32% of annual net sales; transportation and environmental divisions generated 20% and 4% of the net sales revenue respectively.

Figure 1-3 reveals that the water/wastewater department is the strongest market sector in the Western Canada region in terms of generating revenues.
1.4.2 Earth Tech Pacific Region

Earth Tech has two offices in British Columbia. The offices are located in Burnaby and Kelowna. Earth Tech also had a small and remote office in Kitimat for many years; the company closed its Kitimat office recently due to lack of work, staff shortages and other internal issues. In British Columbia, Earth Tech serves the four market sectors (facilities, water/waste water, transportation and environment).

The largest office within the Pacific region is the Burnaby office with 100 employees; 90 percent of them are professional engineers or technical staff. This office serves clients from the four market sectors, water/waste water, facilities, transportation and environmental. The Kelowna office has 25 employees and its focus is on water/wastewater and transportation markets. In 2006, Pacific Region’s net sales revenue was slightly over $11.8 million.

Figure 1-4 depicts the percentage of net sales revenue made by each market sector in British Columbia. According to Figure 1-4, water/waste water and facilities departments together made approximately 80% of the net sales revenue for the Pacific region.
The following section presents an overview of each department and its activities within the Pacific region.
1.4.2.1 Water/wastewater Department

Presently the water/waste water department has 43 employees; this department is the biggest of the four departments in British Columbia and it provides the following services to municipalities within the lower mainland and elsewhere in British Columbia.

- Water Supply and Treatment Plant
- Wastewater Treatment Plant
- Urban Infrastructure
  - Asset Management
  - Planning
  - Design

The department is able to provide design/build (DB), design/build/operate (DBO) or design/build/finance/operate (DBFO) services to its clients based on their requirements. By supporting projects from start to finish, from design to build, construction management and operation, the department provides single source accountability. The efficient and unique service delivery can translate into high quality services and result in time and cost savings for the clients.

As part of asset management services, the department has established the Canadian National Water and Wastewater Benchmarking Initiative, a dedicated service within Canada to assist municipal clients to maximize their returns. The objective of the project is to develop a high-level tool or model that the majority of Canadian Water and Wastewater Utilities will accept and use for managing and monitoring their performance. The benchmarking initiative has developed over many years and now serves as national standard for water and wastewater utility
benchmarking in Canada. Thirty-six different leading municipalities and regional districts participate in benchmarking program annually.

The department’s main clients are Greater Vancouver Regional District, City of Burnaby, City of Coquitlam, City of Surrey, District of Maple Ridge, District of Delta, City of Kelowna and Westbank District.

In 2006, the department’s contribution to the net sales revenue was slightly over $4.7 million or 40% of annual net sales revenue in the Pacific region.

1.4.2.2 Environmental Department

The environmental department is the smallest of four departments in British Columbia. This department mainly operates out of the Burnaby office and it has 10 young and energetic employees. The environmental group provides remediation and restoration, environmental compliance as well as solid/hazardous waste management services to private and public clients. This department was responsible for approximately 7% of the Pacific regions’ net sales revenue during 2006.
1.4.2.3 Facilities Department

Currently the facilities department has 25 employees. In British Columbia, this department provides mechanical, electrical and industrial engineering services. Historically Earth Tech facilities department has been known for providing tenant improvements services for a wide range of clients. These kinds of projects are high in volume but they are low in margin.

In the meantime, the electrical and industrial engineers work very closely with engineers in the water and wastewater department. The majority of water or wastewater plant projects have electrical or industrial components that should be completed by electrical and industrial engineers.

The department’s main clients are Defence Construction Canada, Public Works and Government Services Canada. During 2006 facilities department net sales revenue was $4.6 million or 39% of total net sales revenue in the region.

1.4.2.4 Transportation Department

The transportation department has 25 employees. Their focus is on highways, roads and bridges. They provide designs, renovations, inspections, and maintenance as well as construction management to their clients. Usually highways and roads projects will have urban infrastructure components that should be completed by professional engineers from the water/wastewater department. Transportation department’s main customers are the BC Ministry of Transportation and the Government of Yukon. Transportation department was responsible for 14% of net sales revenue within the region. Their 2006 net sales revenue was $1.6 million.
2: INDUSTRY ANALYSIS

A industry analysis provides information about the major environmental forces that have the greatest impact on a business strategy. A good fit between strategy and environmental forces will lead to a successful performance. By analysing market demand, supply, competition and other external forces we will be able to identify and develop the best possible growth strategy for Earth Tech and its water/wastewater department in British Columbia.

2.1 Consulting Engineering Industry

The consulting engineering sector provides independent professional advice and a broad range of professional services to public and private clients. These services are normally associated with development and implementation of capital projects; consulting engineers design different types of industrial installations, public works, large private and public buildings, transportation systems, water supply, sewage system, water and wastewater treatment plants. Special sectors within the consulting engineering market are mechanical, electrical, civil, water/wastewater, transportation, environmental and structural consulting.

According to the Association of Consulting Engineers of Canada, the Canadian engineering services sector generates gross revenues in excess of $12 billion dollars per year. Based on Industry Canada Statistics, the revenues generated by the 20 largest firms in Canada accounted for one third of industry revenues in 2003. Industry revenues are earned from Canadian private sector clients (45%), followed by Public sector or government clients (43%), individuals (9%) and foreign clients (3%).
Figure 2-1 depicts the consulting revenues by type of engineering services in Canada. According to Industry Canada Statistics, design services and project management capture more than half of the industry revenues. Other engineering services, such as advisory services, various environmental services, geotechnical engineering, and construction management represent less than half of the industry revenues.

![Figure 2-1 Revenues by Type of Engineering Services](image)

According to the Association of Consulting Engineers of Canada, the majority of the engineering firms are small, privately held and Canadian-owned companies employing fewer than 50 employees and providing services to local communities. Larger integrated firms with over 1,000 employees provide a wide range of engineering and other business services within Canada or internationally. Based on Industry Canada statistics, Canada ranks fourth in the world in terms of revenues generated from the export of engineering services to developing countries.
The industry is moving towards a knowledge-based economy; the consulting engineering firms are shifting towards a more flexible corporate structure, focusing mainly on management and technical competency. However, the majority of firms still rely on associates and specialists’ assistance when required. According to the industry Canada statistics, revenues for consulting engineering have increased annually by 15.1% from 1995 to 1998.

The Canadian consulting engineering industry is provincially regulated; each province has strengths and expertise in different areas. While Ontario specializes in environmental, structural, mechanical and electrical building services, Quebec’s strength is in power generation, mining and metallurgy. In Alberta, engineering firms are mostly specialized in oil, petroleum and natural gas sectors. In British Columbia, the primary source of revenues comes from mining, pulp and paper.
2.1.1 Water/wastewater Consulting Industry

According to Industry Canada statistics, Canada has over 700 small to medium-sized water and wastewater consulting firms; the annual sales for this sector are approximately $1.4 billion. It is estimated that domestic and global demand for the water/wastewater consulting industry will increase over the years due to recent environmental concerns about clean air, clean water and climate change.

Many Canadian municipalities are interested in privatising new and existing water and wastewater treatment plants; this provides opportunities for private firms to participate in ownership and operations of water and wastewater facilities. Eventually privatisation of water and wastewater treatment plants will result in greater market demand for consulting firms that are able to provide design/build/operate/finance services to their clients.

British Columbia has over 200 First Nations communities; many of these communities have inadequate water resources and wastewater treatment plants. Recently the Government of Canada has approved a plan to improve the quality of drinking water for the First Nations. This will also increase the demand for water/wastewater consulting firms in due course.

The information provided above is general information about the consulting engineering and water/wastewater industry. However, we still need to understand what forces have impact on the industry; which forces are stronger and how firms can react to the industry forces.
2.2 Porter's Five Forces Model

As mentioned, the industry analysis provides information about the industry attractiveness and the major environmental forces that have great impact on a business strategy. One of the models of industry analysis is Porter’s Five Forces Model. Michael Porter suggests that five external forces can determine an industry’s profitability (Porter, 1980). The five forces are buyer power, supplier power, substitute products, new entrants, and competitive rivalry. Understanding industry forces will provide us with ideas, tactics and strategies that Earth Tech’s water/wastewater department should follow in order to be successful in the industry and grow in the future.

2.2.1 Bargaining Power of Buyers is Moderate

The power of buyers demonstrates the effect that buyers have on the profitability of a business. Porter suggests that buyers are more powerful when they are concentrated and purchase in large volumes. In addition, when the products are standard and undifferentiated, buyers have extra power to choose among the products from different companies.

The buyers of the water/wastewater consulting engineering services are government, public sector clients and foreign clients. An important factor that influences the clients’ selection method is the project size. For small projects, buyers usually select consultants based on referrals and general reputations. For medium to large-sized projects, they select consultants according to other criterion, such as technical competence, rates, and experience.
Buyers with small to medium-sized projects, such as small design or study projects, have moderate power in the industry. These kinds of buyers are able to shop around and negotiate good rates as there are many firms offering the same services and switching costs are relatively low.

Generally, buyers with larger projects have more bargaining power. First, the number of consulting firms that bid on a large project are high. This results in consulting firms having little negotiating power. Firms normally offer relatively low prices. This results in lower profitability. Second, large purchasers have knowledge about the degree of service required, prices, costs and the market demand. During the bidding and proposal process, buyers are able to compare prices and services offered by consulting firms and choose a firm that provides the most reasonable prices. This implies extra bargaining power for buyers. Finally, large buyers are normally repeat clients. In order to establish long-term relationships with them and secure potential projects, consulting firms choose to minimize or reduce their profitability and offer low prices to the buyers. Therefore, a potential repeat client with numerous large projects will have much larger degree of leverage than one without these characteristics.

In the recent years, the industry has experienced many other forces that eventually will result in shifting power to the consulting firms. The growing global and domestic concerns about the environment, clean air and clean water will increase the demand for the water/wastewater consulting firms in the future.

In addition, many Canadian municipalities are interested in privatising new and existing water and wastewater treatment plants as they believe that the private sector is able to better administer operate and fund the projects; this provides opportunities for private firms to
participate in ownership and operations of water and wastewater facilities. On the other hand, numbers of consulting firms that are able to offer design/build/operate/finance services are limited. The increased demand for these specialized firms will eventually shift the power from buyers to the consultants.

Meanwhile, in British Columbia some of the sectors, such as construction and mining, have experienced a boom. This strong uptake in business has created many new opportunities for water infrastructure projects and water waste management projects. Due to lack of experienced and skilled employees, limited numbers of companies are able to provide these specialized services. Therefore, the increased demand for consultants and shortage in supply may shift the power from buyers to the consultants.

The other factor to consider is that the majority of engineers believe that in the long run the trend will be towards having more consolidated consulting firms. If this results in a decrease in total numbers of consulting firms, then the buyers’ bargaining power may be decreased as well.
2.2.2 Bargaining Power of Suppliers is Moderate to High

Porter suggests that suppliers are more powerful when switching costs to another supplier are high or when they can sell directly to the customers. The suppliers are not as powerful when they are dependent on the industry.

The main suppliers to the consulting industry are the engineers. Experienced and capable engineers are the consulting firm's greatest assets. Currently in the consulting industry, the demand for the skilled and knowledgeable engineers exceeds the supply. The shortage of skilled and knowledgeable staff with 15 to 20 years of experience could be the result of North America recession during the early 1980s. Fewer individuals joined the engineering schools during that period; they are now the only experienced engineers and have substantial bargaining power in the industry.

The threat of senior engineers leaving to form their own consulting firm or to join a competitor provides them with bargaining power. When senior engineers leave, they take with them their tacit knowledge, their team and their networking capabilities. This opportunity provides them with power to negotiate relatively high salaries. On the other hand, professional engineers are dependent on the industry; therefore, their bargaining power is moderate to high.

The other less powerful suppliers are sub-consultants that may be hired by engineering firms to perform various technical tasks such as energy analysis. These suppliers have minimal power, as the consulting firms are able to switch to others who provide similar services. There will be no extra costs associated with switching to other suppliers. As a result, consultants often have advantage of negotiating better terms and conditions with the sub-consultants.
In addition, owners generally will cover the cost of hiring sub-consultants; this will have no significant impact on the overall costs to the consulting firms.

Meanwhile, sub-consultants do not have technical expertise to enter the consulting market and provide services to the clients directly; as a result, they are not threats to the consulting firms.
2.2.3 Threat of New Entrants is High

Porter suggests that profit is likely to be higher in industries consisting of fewer competitors. New entrants to an industry have a desire to gain market share; therefore, they are likely to force prices down and reduce profits earned by other competitors. In addition, he argues that with no barriers to entry more competitors try to enter the market to share the industry’s profit. There will be high barriers to entry when companies offer differentiated products or services. Other examples of barriers to entry are large capital requirements to enter a market, and government policy that limits the entry.

The potential threat of new entrants to the engineering consulting market is considered to be high due to low barriers to entry. In British Columbia, limited numbers of consulting firms emphasize on branding or providing differentiated products and services to their clients. This creates low barriers to entry, as the clients are able to switch to other firms with low costs.

There are many different forms of entry to a new market, including a new local start-up company, geographic expansion of an existing firm from other Canadian provinces, or a foreign firm’s expansion to the market through merger and acquisition of an existing firm.

In British Columbia, a common form of entry to the market occurs when a group of individuals breaks off from an existing firm and starts up their own consulting firm. Although larger firms have some advantages in terms of performance and costs due to economic of scale, professional engineers who already have established relationships with customers and suppliers can easily form a new consulting firm within the industry.
The learning curve for this kind of entry is low and does not present a barrier to entry. The capital requirements needed to enter the market are also low; a new start up only needs to secure enough money to cover the monthly rent, staff salaries and other fixed expenses for a limited numbers of months. A few computers and some engineering related software are sufficient. Government and provincial regulations related to professional registration of engineers are barriers to entry; however, the engineers can overcome these barriers easily.

The most important potential barrier to entry is the financial resources of small firms and related professional liability insurance. The cost of liability insurance for small firms are much higher compared to larger firms and this may play a significant role in limiting the new firms from entering to the market.

As mentioned, geographic expansion of an existing Canadian or foreign firm is another common form of entry to the British Columbia consulting industry. Normally the geographic expansion occurs when the firm's growth within its original region starts to decline. Recently two strong engineering firms, Morison Hershfield, from Alberta, and Wardrobe Engineering, from Manitoba, have entered the British Columbia water/wastewater consulting market. These companies compete aggressively with the local engineering firms in BC. The learning curve might be steep for these new entrants, as they do not have enough experience in the new market; however, the mobility of employees provides them with opportunities to capture local knowledge and experience in due course. The number of mergers and acquisitions has increased over the past five years; as a result, engineers believe that the industry is moving towards having more consolidated, equally large sized companies.
2.2.4 Threat of Substitutes is Low

According to the Porter's Five Forces Model, the industry profitability can be reduced if substitutes can place a price ceiling on products. In fact, when there are close substitutes and low switching costs, it is harder for a firm to raise prices and increase profitability.

Generally, there are no substitutes for consulting engineering market, as professional engineers are the only individuals who are allowed to sign off on the projects. Small consulting firms that provide similar engineering services to the clients can be considered as substitutes for larger corporations. These small firms are not large enough to compete with corporations, but their professional engineers can provide design services and are able to sign off on projects. These smaller firms might have performance limitations compared to larger firms; however; they are able to offer more competitive and attractive rates to the clients. Eventually they become the more cost-effective alternatives for the clients.
2.2.5 Rivalry Among Competitors is High

Within the consulting industry, rivalry among competitors is based on different factors such as rates, firm’s knowledge and technical expertise, broad range of services provided, reputation and brand recognition.

The Association of Engineering of Canada encourages the clients to choose their consultants based on technical expertise, experience and credibility rather than price; some of the clients still prefer to hire consultants that offer lower rates while others prefer to work with consultants that have other qualifications.

Rates are set on project-by-project basis; therefore, it will be easy for a client to switch to other firms if required. Typically, larger projects are more attractive as they provide greater revenue stream for the company. In addition, larger projects provide opportunities for the firms to show their talent and their expertise and gain reputation in the market. As a result, firms are willing to reduce their profit margin in an attempt to secure the larger projects and develop a working relationship with the client. The relationship might result in direct award of future projects to the firm.

Meanwhile firms attempt to differentiate themselves through providing wide and broad range of services to the clients; for example, many consultants provide architecture, engineering consulting, construction, project management and operation to their clients. This simplifies the project management and operation process for the clients and it is considered as value added to them. In the meantime, clients do not need to establish and manage different budgets and schedules; it also reduces the risk of possible conflicts among consultants and contractors.
Other important key success factors are reputation and brand recognition. Brand recognition is a relatively new concept that has been introduced to the market recently. While years ago individuals' reputations were considered as the firms' core competency, nowadays more emphasis is placed onto the branding and reputation of the firms.

Branding is one of the tactics that is used by larger firms to reduce the threat of rivals. Generally branding is about creating differences and providing a certain level of quality to the clients; therefore, the clients know what to expect from a brand. In the meantime, brand loyalty creates barriers to entry, as loyal clients do not switch to other firms. Loyal clients are normally less price sensitive since they have already experienced the brand and have been satisfied with the quality of service. This means that consulting firms can offer higher rates and eventually generate greater margins.

The numbers of large corporations that emphasize on branding are still limited in British Columbia; these firms are able to demonstrate that they do have skilled engineers, substantial technical expertise, advanced knowledge and valuable experience and unlimited resources to provide their clients with exceptional and top of the line services and technical assistance.

As mentioned, professional engineers believe that in the long run numbers of large consolidated corporations will be increased in British Columbia. It is important to consider that not everybody likes to work for large corporations; therefore, engineers still break off from existing corporations to start their own businesses. If total numbers of engineering firms stay the same, it is predictable that the larger corporations will have extra power on smaller players in the industry due to their high quality of services and their reputation. However, if the industry
experiences a decrease in total numbers of engineering firms, then the power will shift from buyers to the consulting firms, as the demand for consulting firms is still high, but the supply is limited.

2.3 Industry Analysis Summary

According to the industry analysis, British Columbia consulting engineering industry is under moderate to high competitive pressure. The following presents the Porter's Five Forces ranked according to the pressure each force exercises on the industry.

Rivalry amongst competitors

Threat of new entrants

Bargaining power of buyers (clients)

Bargaining power of suppliers (employees)

Threat of substitutes

Rivalry amongst competitors is based on rates, technical competency, differentiation, reputation, and established relationship with the clients as well as brand recognition. Differentiation through offering wide ranges of services expedites and improves the project management process; as a result, differentiation makes the process less complicated for the clients. Established mutual relationship, good reputation and brand recognition are other key characteristics in consulting engineering market. A satisfied client would definitely refer a good consulting firm to another client; therefore, positive reputation and relationship with the clients are extremely important.
The threat of new entrants is high as a result of low barriers to entry. There are two common types of entry to the BC consulting engineering industry, including new local start up firms or expansion of existing firms through mergers and acquisitions. The growing number of mergers and acquisitions indicates that the industry is moving towards having more consolidated, equally large sized consulting firms. The industry may experience intense rivalry when larger corporations compete against each other to achieve the market leader status.

Based on industry analysis, buyers have moderate power in the industry; however, the new environmental and economical changes may result in shifting power from buyers to the consultants as the numbers of consulting firms that are able to provide specialized services are limited.

Engineers are the main suppliers to a consulting firm; they do have moderate to high power in this industry. As mentioned, the market is in a great need of experienced engineers; as a result, senior staff have numerous job opportunities and they are able to negotiate relatively high salaries to stay with a company. On the other hand, traditionally the majority of clients emphasize on receiving low rates. If this trend continues, companies will earn lower profit margins. Because there are no substitutes to the consulting engineering industry, the larger companies can either work with less price-sensitive clients or increase their prices slowly. Smaller firms might continue to offer low rates for a longer period of time and act as substitutes to larger companies; however in the long run the rates will be increased.
In conclusion, the industry has conditions for monopolistic competition. There are many buyers and sellers in the industry; there is no dominant player in the market. Each firm in the industry provides services that differ slightly from other firms’ services. Firms mostly concentrate on differentiation and branding, they try to convince clients that their brands are better than other brands. Brand loyalty prevents customers from switching to other firms even if a firm raises the price for its services. Since barriers to entry or exit are low, there is free entry into and exit from the industry.
3: COMPETITORS

3.1 Main Local Competitors

This section reviews the main competitors’ products, services and activities against those of Earth Tech’s. The analysis reveals the best practices used by the companies; we can use the information further to develop plans and strategies for the growth of Earth Tech’s water/wastewater department in British Columbia. This department has five main local competitors.

3.1.1 Stantec Consulting

Stantec is a multidisciplinary design firm operating from over 80 offices in North America and Caribbean. With a head office in Edmonton, Stantec has more than 6,000 employees; its goal and vision is to grow into a 10,000-people, billion-dollar firm by 2008. The company’s main strategy is to expand its services and its geographic presence in North America. To achieve this goal, one-half to two thirds of the corporation’s growth is expected to come through acquisitions. With its extensive acquisitions, the company has acquired specialized expertise in industrial ventilation, air pollution control, occupational health and safety, air quality as well as architecture. As a result, the company has become one of the few in the industry to provide engineering, architecture, interior design, landscape architecture, surveying, environmental and project management services under one corporate roof. Stantec has maintained an enviable record of growth and profitability. In August 2005, Stantec was listed on the New York Stock Exchange, becoming the first Edmonton-based company and the only engineering firm in Canada to achieve this distinction.
In BC, Stantec offers a bundle of various services to its clients such as architecture, engineering (structural, water/waste water, mechanical, and electrical) and project management services. Many owners like to deal with only one firm during the design phase since this simplifies the project management and operating process for them. The clients consider this as value added and they willingly pay for it.

Stantec consulting has offices in Vancouver, Victoria, Surrey, Kelowna, Abbotsford and Kamloops. They have exceptional knowledge and expertise in handling all kinds of projects. In British Columbia Stantec predominantly focuses on design and build of water/waste water plants. Stantec has extremely aggressive pricing strategy; in a situation that low price determines the winner, the projects are normally awarded to Stantec.

Another factor to consider is growth through acquisition strategy. Small or large companies that merge with Stantec bring with them their customers and networking capabilities. As a result of growth through acquisition, Stantec’s customer database has expanded rapidly over the years. Strong engineering team, competent and knowledgeable staff, local experience, excellent reputation, powerful clients’ relation and corporate branding are Stantec’s key success factors.

3.1.2 Dayton and Knight

Dayton and Knight is a multi-disciplinary Canadian consulting firm that provides full range of project services from design to project management. Established in 1965, Dayton and Knight has offices in North Vancouver, Smithers, Abbotsford, Fort Nelson and Prince George and Calgary, Alberta. They do provide services in municipal infrastructure as well as water/wastewater field resources. Dayton and Knight has developed close and effective
relationship with over one hundred municipalities, regional districts and first nations throughout British Columbia. The firm is well known for offering low prices in the market.

3.1.3 Associated Engineering

Specialized in the water, transportation, infrastructure and environmental sectors, Associated Engineering has provided consulting services to its clients for over 60 years. The firm has over 500 employees and had been successful in on time and on budget delivery of services.

The company’s water department has focused on water/wastewater treatment plant and infrastructure projects. Associated Engineering has been recognized as a provider of cost effective and innovative solutions to its clients. Highly recognized and experienced staff, enough resources, exceptional reputation in market and reasonable prices have made this firm one of the most successful mechanical firms in British Columbia.

3.1.4 Kerr Wood Liedal (KWL)

Established in 1975, Kerr Wood Liedal (KWL) is a Canadian employee-owned consulting firm that provides services to government, private and first nation clients. KWL has offices in Burnaby, Victoria, Vernon and Castlegar. The company has 90 employees and it provides consulting engineering in the municipal infrastructure. Practical experience, knowledge and management skills have contributed to success of Kerr Wood Liedal.

3.1.5 CH2M Hill

Headquartered in Denver, Colorado CH2M Hill is an employee owned company with over 16,000 employees around the world. With over $4.5 billion in revenue, CH2M Hills provide services in areas of transportation, water, industrial facilities and environmental. CH2M Hill has operated in Canada for over 85 years; it has 700 employees and 18 offices in Canada. CH2M Hill’s water department in Canada actively pursues water/wastewater treatment plants projects.
In summary, a small firm such as Kerr Wood Liedal is specialized in offering only municipal infrastructure services. This firm has strong relationships with the clients outside lower mainland. Medium sized firms such as Dayton & Knight and Associated Engineering offer services to both municipal infrastructure and water/wastewater treatment plants. These two firms offer low or reasonable prices and have effective and strong relationships with their clients.

Larger companies such as Stantec and CH2M Hill, mainly focus on water/wastewater treatment plants. They differentiate themselves through offering broad range of services to their clients. These two companies have recognized brands.

Because the industry is competitive and the services are relatively homogenous, the firms either focus on a special niche market, or differentiate themselves by offering high quality and broad range of services.
3.2 Competitive Analysis

A competitive analysis provides an assessment of strengths and weaknesses of competitors based on the industry key success factors. By conducting a competitive analysis, a company recognizes its current standing in the market; it also identifies the key areas that should be improved in order to grow in the market.

The next section presents ranking of competitors based on the industry key success factors. The ranking has been done based on the information provided to the author by professional engineers currently working at Earth Tech Canada. The analysis reveals the water/wastewater department's current standing in the market compared to its competitors. In addition, the analysis highlights the specific areas that the department has to focus on in order to improve its position in the market.

The highest weighting factor, 0.20 was assigned to reputation, technical competency and relationship with the clients. These are considered to be the most important factors and selection criterion. A weighting factor of 0.10 was assigned to price; because the services are homogenous and hard to differentiate, buyers are able to base their decisions on the price. However many other buyers that are not price sensitive may emphasize on other key factors. A weighting factor of 0.15 was assigned to quality of services. Finally, a weighting factor of 0.15 was assigned to branding. As mentioned previously, branding is about creating differences for the clients and it is one of the key success factors in the consulting engineering market.
A score of one to five, one being the lowest and five being the highest score, has been assigned to each of the competitors’ key success factors. For example, a competitor that offers the lowest price would get the highest score. In the same way, a competitor that has an exceptional reputation in the market would get a score of five.

Table 3-1 and table 3-2 represent the key success factors and the ranking of competitors. The author has ranked the competitors based on the information provided to her by Earth Tech engineers.
### Table 3-1 Competitive Analysis - Un-weighted Scores

Table created by author – Source: Earth Tech Internal Source

<table>
<thead>
<tr>
<th></th>
<th>Weighting Factor</th>
<th>Earth Tech</th>
<th>Stantec</th>
<th>Associated Eng.</th>
<th>Dayton &amp; Knight</th>
<th>Kerr Wood Leidal</th>
<th>CH2M Hill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reputation</td>
<td>0.20</td>
<td>4.00</td>
<td>5.00</td>
<td>5.00</td>
<td>4.00</td>
<td>4.50</td>
<td>5.00</td>
</tr>
<tr>
<td>Technical Competency</td>
<td>0.20</td>
<td>4.50</td>
<td>5.00</td>
<td>4.50</td>
<td>3.50</td>
<td>4.50</td>
<td>5.00</td>
</tr>
<tr>
<td>Relationship with clients</td>
<td>0.20</td>
<td>4.50</td>
<td>4.50</td>
<td>4.00</td>
<td>5.00</td>
<td>5.00</td>
<td>4.50</td>
</tr>
<tr>
<td>Price</td>
<td>0.10</td>
<td>3.00</td>
<td>3.50</td>
<td>4.00</td>
<td>5.00</td>
<td>3.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Quality of Services</td>
<td>0.15</td>
<td>4.50</td>
<td>5.00</td>
<td>4.00</td>
<td>4.00</td>
<td>4.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Branding</td>
<td>0.15</td>
<td>3.00</td>
<td>5.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>4.50</td>
</tr>
</tbody>
</table>

### Table 3-2 Competitive Analysis - Weighted Scores

Table created by author – Source: Earth Tech Internal Source

<table>
<thead>
<tr>
<th></th>
<th>Weighting Factor</th>
<th>Earth Tech</th>
<th>Stantec</th>
<th>Associated Eng.</th>
<th>Dayton &amp; Knight</th>
<th>Kerr Wood Leidal</th>
<th>CH2M Hill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reputation</td>
<td>0.20</td>
<td>0.80</td>
<td>1.00</td>
<td>1.00</td>
<td>0.80</td>
<td>0.90</td>
<td>1.00</td>
</tr>
<tr>
<td>Technical Competency</td>
<td>0.20</td>
<td>0.90</td>
<td>1.00</td>
<td>0.90</td>
<td>0.70</td>
<td>0.90</td>
<td>1.00</td>
</tr>
<tr>
<td>Relationship with clients</td>
<td>0.20</td>
<td>0.90</td>
<td>0.90</td>
<td>0.80</td>
<td>1.00</td>
<td>1.00</td>
<td>0.90</td>
</tr>
<tr>
<td>Price</td>
<td>0.10</td>
<td>0.30</td>
<td>0.35</td>
<td>0.40</td>
<td>0.50</td>
<td>0.30</td>
<td>0.30</td>
</tr>
<tr>
<td>Quality of Services</td>
<td>0.15</td>
<td>0.68</td>
<td>0.75</td>
<td>0.60</td>
<td>0.60</td>
<td>0.60</td>
<td>0.75</td>
</tr>
<tr>
<td>Branding</td>
<td>0.15</td>
<td>0.45</td>
<td>0.75</td>
<td>0.30</td>
<td>0.30</td>
<td>0.30</td>
<td>0.68</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1.00</strong></td>
<td><strong>4.03</strong></td>
<td><strong>4.75</strong></td>
<td><strong>4.00</strong></td>
<td><strong>3.90</strong></td>
<td><strong>4.00</strong></td>
<td><strong>4.63</strong></td>
</tr>
</tbody>
</table>
According to Figure 3-1, Stantec and CH2M Hill have received the highest ranking with scores of over four. The remaining firms received a score of below four. Based on the competitors’ assessment Stantec has the highest ranking of 4.75 followed closely by CH2M Hill, which received a score of 4.63.

A more detailed analysis reveals that Earth Tech’s reputation and brand recognition fall behind those of Stantec and CH2M Hill. Stantec and CH2M Hill offer better quality services to their clients; in terms of relationships with their clients and technical competency, all three companies are almost on the same level.

The ranking reveals that Earth Tech mostly competes with Associated Engineering, Dayton and Knight and Kerr Wood Liedal; these companies are relatively small in size.

![Figure 3-1 Ranking of Competitors](image)

*Figure 3-1 Ranking of Competitors*

*Figure created by author – Data Source: Internal Data*
In conclusion, currently Earth Tech’s water/wastewater department in British Columbia competes against small and medium sized companies as opposed to larger companies such as Stantec or CH2M Hill. Although Earth Tech water/wastewater department is relatively large, its current operations are focused on projects where it is in more direct competition with the lower ranked firms. In the meantime, in order to establish a better position in the market, the department needs to focus on its reputation, branding and its quality of services.
4: INTERNAL ANALYSIS

An internal analysis provides information about the resources that are available to a company. A company should have adequate resources to execute a strategy. The next chapter represents the water/wastewater department’s internal analysis. The analysis assists us to understand whether the department has sufficient resources to execute its growth strategy.

According to the Diamond-E framework, a company’s strategy should be consistent with the industry’s opportunities and challenges. At the same time, the strategy should be in alignment with the company’s capabilities or constraints. High consistency among the strategy, environment and companies’ internal capabilities leads to successful performance, while inconsistency among them leads to failure or poor performance.

4.1 Internal Issues: Post Acquisition Challenges

As mentioned previously in 2000, Reid Crowder and Partners joined Earth Tech Canada. This chapter reviews the post acquisition issues and other challenges that Earth Tech faced in British Columbia that resulted in loss in revenues and market shares.

The post acquisition stage is extremely critical in success of mergers and acquisitions; generally, the internal changes lead to a great amount of pressure, uncertainty, lack of trust, stress, insecurity and fear. During the post acquisition stage, management must create a common ground
and strong sense of community within the organization. Earth Tech faced various issues during the post acquisition stage.

Different corporate cultures resulted in resistance to change and they acted as strong barriers to the success of the acquisition. Earth Tech Canada was created from the merger of two companies, Proctor and Redfern from Eastern Canada and Reid Crowther from Western Canada. In the meantime, Toronto office was selected as the Canadian head office; the business management’s responsibilities had been assigned to Proctor and Redfern and its principals. According to an internal source, Reid Crowther’s principals could not accept the fact that they were supposed to be managed by an eastern company and that Proctor and Redfern had some kind of control and power over Reid Crowther. Consequently, this created a negative working environment in Western Canada.

Reid Crowther had a hierarchical organizational structure, however as the company was smaller the level of bureaucracy was not comparable to that of Earth Tech. Compared to Earth Tech, managers were able to make decisions faster. Meanwhile, Reid Crowther’s employees enjoyed working in an informal environment since there were fewer policies and procedures in place. In contrast, Earth Tech was a large corporation with different sets of policies, procedures, standards and processes; therefore, it was difficult for Reid Crowther’s staff to accept the new structure. They argued that doing business was much easier at Reid Crowther as they did not have to waste their time dealing with bureaucracy and considerable amounts of paperwork.

Evaluating employees’ performance was another issue. Reid Crowther’s managers evaluated the employees as per their contributions or services provided during a year. However,
Earth Tech based its performance review on the employee's utilization. Each employee was supposed to be at least 80% chargeable. Reid Crowther's staff viewed this as an inefficient tool arguing that performance review based on utilization has forced employees to charge their time to projects even when they do not have enough work to do resulting in project budget overruns.

In summary, Earth Tech failed to create a common ground and a strong sense of community and connection between the employees and the new organization. As a result of mismanagement and poor communications, most employees lost their sense of commitment and attachment to the company. They were not satisfied with the situation and did not expect any improvements within a short period; therefore, they left the firm and joined other competitors.

Within Western Canada, the Pacific region was the most affected by these changes; as a result of losing business, revenues and market share, the British Columbia region was turned into a recovery centre by the management. A recovery centre is a region that has difficulties achieving revenues and operating income targets over two or three consecutive years. The senior management team assigns specific goals for the recovery centre to be achieved within certain period. In order to make sure that the business is turning around and it is moving towards achieving its targets, the management team also reviews the region's financial results and its operation quarterly.
In order to re-build the business in Pacific region, management assigned four goals for the region and its departments to be reached within five years. The goals were as follows:

- Improve profitability
- Increase market share
- Re-build the reputation
- Improve quality of services

The following section discusses the region and departments’ goals and their strategies to achieve them in more details.
4.1.1 Strategy to improve profitability

In order to measure profitability, Earth Tech uses an operating margin ratio (operating income to net revenue ratio). This ratio measures what percentage of net revenue (net sales) is a company's operating income. In other words, how much a company makes for each dollar of sales. The region and departments' goal is to achieve an operating margin ratio of 20% to 25% within five years. To improve profitability, three primary initiatives were set:

1- Increase productivity and efficiency in services rendered
2- Increase staff utilization
3- Focus on cost reduction ideas used by other Canadian offices

An increase in productivity can be achieved through enhancing existing methods and procedures and improving the work and use of manpower. To maximize technical staff's productivity, management revised many office processes and procedures in British Columbia; as a result, administration and supporting staff rules were modified to better assist engineers with their workload. In addition, in order to improve staff efficiency the engineering design standards and procedures were re-established.

Generally, staff utilization has great impact on profitability improvement. Increase in staff utilization means additional income for the company. When employees are chargeable, the company makes money on every hour that they work on a project. In contrast, when employees are not chargeable, their times are considered costs to the company.
Cost reduction focuses on internal processes and procedures and determines where efficiency can be improved. Management believed that comparing the business’ functionalities and processes with those of other similar offices would help find cost reduction ideas that have been tested by other offices.

4.1.2 Strategy to increase market share

In order to increase market share, two priorities were identified:

1- Sell more to existing clients
2- Sell to new clients

Selling more to the existing clients requires extended knowledge about the customers, their needs and their objectives. Better understanding of clients’ business assists the firm to identify the areas in which it can better serve the clients and their needs.

Identifying the potential clients and selling to them is challenging, as loyal clients are not going to be convinced easily to switch to another consultant, even though the switching costs are low. In fact, brand loyalty acts as a barrier and prevents them from switching to other firms.
4.1.3 **Strategy to re-build the reputation**

Earth Tech’s strategies to re-build its reputation within the market were as follows:

1. Re-establish relationships with the major clients by face to face meetings
2. Win small jobs, deliver the best quality of services and re-gain customer’s trust

Re-establishing relationship with the clients is difficult and time consuming especially when the clients have lost faith in the firm. This needs persistence and determination from management, engineers and the marketing department.

4.1.4 **Strategy to improve quality of services**

To ensure that the firm provides consistent level of quality, three primary directives were identified:

1. Improve and utilize employee networking system
2. Concentrate on quality assurance system
3. Re-establish office standards and procedures

In 2004, Earth Tech Inc. implemented technical practices network, a knowledge transfer network, within the North America. In order to improve employees’ networking system, all professional engineers and technicians were encouraged to use the network in British Columbia.
To provide clients with smooth delivery of services, senior managers placed more emphasis on office standards and procedures. Although Burnaby office was already part of ISO 9001, the office was extremely disorganized and the normal practices had been forgotten. Improved office standards ensured better quality of services in due course.
4.2 Financial Analysis

This section reviews the unique financial challenges that water/wastewater department faced during a period from 2002 to 2006. It provides useful information about the department’s customer base and its revenue streams.

Figure 4-1 shows changes to the department’s revenues over five years. In 2002, the water/wastewater department earned over five million dollars in revenues; however during 2003 revenues declined by 13%. In 2005, the department’s revenues dropped by 19% compared to the revenues in 2004.

![Figure 4-1 Department's Revenues Over Years](image)

*Figure created by author – Data Source: Internal Financial Data*
Figure 4-2 presents the sources of revenues by the department's major customers. For simplicity, the projects are divided into five categories: International projects, Alcan projects, Lower mainland major cities and districts projects, benchmarking and other miscellaneous projects. The miscellaneous projects are those associated with larger transportation and facilities projects.

As can be seen from Figure 4-2, water/wastewater department was greatly involved in the international projects during 2002 and 2003. Most of these projects were located in Asia Pacific (China, Thailand and Malaysia); due to political instability and high risks associated with these kinds of projects, the number of international projects and revenues started to decline by 2004. During 2005, revenues for international projects declined by 77% compared to the revenues in the previous year.
Alcan’s contribution to department’s revenues was significant in 2002, however the revenues declined by 88% in 2003 as Alcan’s expansion plan in Kitimat was postponed due to some legal issues. Over years, the water/wastewater department was involved in fewer projects; by 2006, no revenue was earned from Alcan’s projects. According to one of the Earth Tech’s internal sources, the Kitimat office struggled with staff shortages over the past few years; as a result, Alcan refused to award new jobs to that office. Subsequently this issue affected the water/wastewater department and its revenues in Burnaby.

In the meantime, the revenues from other miscellaneous projects declined too. In 2002, revenues from miscellaneous projects were slightly over $1 million; however, a sharp decline of 65% was seen in 2003 and the revenues continued to decline over years. As mentioned previously, these projects had direct links to transportation and facilities projects; therefore, the decline in revenues was a result of losing large projects by transportation and facilities departments.

The above analysis reveals that the water/wastewater department eventually lost revenues from international projects, Alcan projects and other miscellaneous projects. As a result, the management started to focus on lower mainland cities and districts projects as well as benchmarking projects.

As can be seen, revenues from benchmarking projects were only one tenth of total revenues in 2002, however they increased by 91% during 2003. Revenues from benchmarking projects remained steady over the following years. In addition, revenues generated from lower mainland cities and districts were approximately $1 million in 2002; the department experienced
a 30% increase in revenues during 2003 and 22% increase during each following year. In 2006, revenues decreased again as a result of intense competition within British Columbia’s market.

In conclusion, the strategy to sell more to the existing clients did not work for the water/wastewater department. The department lost major part of its revenues generated from international projects due to high risks and local instabilities associated with those kinds of projects. In addition, the department lost Alcan’s projects and other miscellaneous jobs as a result of external and indirect issues affecting the department.

The water/wastewater department was more successful in identifying and selling its services to major cities and districts within lower mainland. In addition, revenues generated from benchmarking projects improved over years; this means that new clients joined the benchmarking program.
4.3 Organization Structure

Organization structure shows how a company and its management have chosen to group employees and assign responsibilities to them. Organization structure can increase or limit a company’s capabilities. For example, in a functional structure, people who work in the same department can understand each other’s needs and can allocate resources accordingly, however they are not necessarily able to work effectively with other functional areas. As a result, organization structure can have a direct impact on proposed strategies.

Earth Tech has a hierarchical and geographical organizational structure. Earth Tech Canada senior management team is responsible for making decisions that have a direct impact on the company’s strategy and profitability. The senior management team sets the overall mandate and direction; they are responsible for approving funds and budgets for each market sector.

The next level on the organizational structure is the market sector task force. This group identifies the key issues and approves strategic plans for the market sectors. They finalize the assignment of staff and other resources to each working group. The market sector task force is also responsible for approving scope, budget and schedules developed by each working group.

Regional leaders are responsible for financial results of their regions and the departments. They supervise and manage the overall departments’ productivity and operations.
Business Line leaders develop strategic plans for their related market sectors. Staff selection and hires fall into their responsibilities. They also lead and direct various working groups within the department.

Figure 4-3 represents the department’s organizational chart. As it appears the senior management team is involved in review and approval processes, market sector task force team is responsible for the department’s strategy and marketing decisions, and the regional leader is accountable for maximizing financial results of the department. In summary, different levels of management and control have resulted in slow decision-making process. Generally, companies that are able to make quicker decisions might enforce competitive advantage over the companies that are slower in decision-making processes.

Having a geographic organization structure is considered an advantage for the department, because management and employees have knowledge about the local market, clients, main competitors and local labour forces.

A geographic structure can limit the possibility of sharing work and experience between different regions as the employees have not worked together; they do not know each other and have limited knowledge about other people’s experiences and expertise. For example, according to senior management’s plan, departments located in different geographical locations are supposed to develop working relationships; they are expected to share work and knowledge not only within their regions, but also through Canada. The plan has not been successful as the employees do not know each other and have not built trusting relationship with each other.
On one hand, Earth Tech’s geographic structure does not facilitate the interoffice collaboration; therefore, the structure mitigates opportunities for quality improvement through interoffice teamwork and cooperation. This also means that the management’s aspirations to work together in “one-Canada” may not be fulfilled.

On the other hand, Earth Tech’s hierarchical structure leads to a slow decision-making process. Therefore, the company is not able to respond to the external forces as quickly as possible. Eventually the company may lose its business opportunities.
4.4 Operations

Operations address the way that employees work together to provide specific services to their clients. Operations can have negative or positive impact on organization's capabilities; as a result, the firm might not be able to deliver its promises.

In order to provide clients with on time and on budget service delivery, the water/wastewater department needs to have strong and experienced engineering teams; members of the teams should be able to work together effectively and deliver the best quality of services. Project management is a critical factor to consider as well. Experienced project managers who comprehend both technical and financial aspects of the projects are assets to the department.

Presently the water/wastewater department has some operational issues that have direct impact on the quality of services provided. The sources of these problems rest in the structure of the teams (senior engineers versus intermediate and junior staff), high rates of staff turnover and lack of experienced project managers.

Earth Tech's water/waste water department lacks junior and intermediate designers and specialists. According to the 2007 staff classification one third of employees are in the senior category. Normally intermediate and junior staff have lower salaries and lower charge out rates. It is economically efficient to let junior and intermediate staff complete major parts of the projects. Senior staff should review, manage and make necessary corrections or comments. This process results in on budget delivery of the projects. In the meantime, senior staff can find additional time to capture more business.
The consulting engineering market has experienced high demands for hiring junior and intermediate engineers. The shortage in supply of young and skilled professional engineers has created opportunities for these individuals to choose the best company and the best job offer. For a variety of reasons, Earth Tech is not an employee of choice in British Columbia; however, the majority of Earth Tech’s competitors have excellent names and outstanding reputations in the market. Therefore employees leave Earth Tech as soon as other engineering companies offer them higher salaries and better compensation packages.

The other reasons for staff turnover are lack of appreciation and no sense of attachment to the firm. People who feel appreciated are more positive about themselves and their ability to contribute to the success of a firm. Managers need to assure employees that they are important and they do matter to the department and the company; consequently, this will improve the employees’ sense of attachment to the firm.

Meanwhile, the department lacks experienced project managers. Project managers are responsible for staff working schedules, as well as technical and financial aspects of the jobs. While majority of project managers pay enough attention to the technical details, they do not understand much about financials and have problems in scheduling staff and allocating resources. Management believes that precise and comprehensive project management training is required for the new and existing project managers to understand the financial aspects of the projects. In addition, project managers need to improve their personal and management skills to better handle the staff issues and schedules.
4.5 Human Resources

Human resource departments provide support to the corporations through activities such as recruiting, training, performance evaluation, benefits and compensations. Human resource departments have significant impact on a company’s success and growth by hiring right people with the right capabilities to fill in the open positions. In addition, human resource policies and procedures such as career development, educational assistance and employee referral bonuses can have positive effects on employees and their motivation.

Earth Tech’s Human resource department recruits employees through internal postings, employee referrals, web site postings, external recruiting agencies and newspapers. The Earth Tech employee awards program provides financial incentives to employees and motivates them to introduce their talented friends to the company. Earth Tech also provides career path development. This program helps employees identify development needs and opportunities within the company. The employees will also develop knowledge of career options within Earth Tech.

As mentioned in the previous section, staff turnover is one of the issues that needs to be addressed by the human resource department. In 2006, Western Canada staff turnover was 19%, which was higher than industry average of 15%. It appears that Earth Tech invests in hiring and training the new employees, however they do not stay with the company for long. By conducting numbers of informal interviews, the author has identified that the majority of employees leave Earth Tech due to lack of communication, lack of appreciation, lack of authority and long working hours due to insufficient staffing.
The frequent staff turnover has resulted in a negative working environment specifically in British Columbia. It is the human resource unit’s responsibility to identify the exact sources of staff turnover by interviewing employees and conducting surveys.

It is important to mention that BC consulting engineering community is relatively small; engineers know each other and have contacts everywhere. It is possible that competitors take advantage of the extensive turnover and create uncertainty about the firm within the market and among the clients. Therefore, the human resource unit and the management should take immediate action to resolve this issue; the possible uncertainty can damage the business even further.
4.6 Information Technology

Information Technology (IT) can be used as an important tool to improve communication and productivity amongst separate geographic offices. Companies that are able to use IT strategically have competitive advantage over their competitors.

The IT department supports Earth Tech offices in different ways, such as providing computer networks, intranet and e-mail services, internal shared services, and Technical Practices Network (TPN). Launched in 2004, TPN is a corporate knowledge transfer centre that enables technical professionals to share their valuable knowledge and personal experience with others. This network exists to inspire a level of technical excellence that differentiates Earth Tech from its competitors.

In British Columbia, Earth Tech professionals are not completely aware of the importance of TPN and the value it could add to the day-to-day operations. They do not participate actively in this program to post questions or provide answers to the questions. Due to lack of communication, some of the departments have never used the services before. Generally, the knowledge transfer occurs through using library documents or discussions among team members.

In conclusion, the local management do not believe in the value that IT can add to the region. Strong networking and communication can lead to superior quality of services provided to the clients; however, local managers consider IT as a tool, which is required to support the day-to-day business activities. They do not encourage engineers to take advantage of other
sophisticated tools that are available to them. Considering Earth Tech’s differentiation strategy, engineers can use TPN as a tool to gain competitive advantage over their competitors.

4.7 Marketing Resources

Marketing deals with identifying and meeting customers’ needs. Relationship marketing concentrates on building and developing deep and long-term relationships with customers and suppliers. Traditionally, there are four sets of marketing tools that a firm uses to pursue its marketing objectives; product, price, place and promotion. Marketers decide what features to add to their products and services, what prices to offer, where to sell and how to promote the product and services.

As mentioned, one of Earth Tech’s current strategies is to re-build its reputation within the local market. Since effective marketing and customer relation management contribute to rebuilding the company’s reputation, following section evaluates Earth Tech’s marketing objectives and identifies whether the company has enough resources to overcome this challenge.

Service companies usually face well-informed professional buyers who are skilled in evaluating various offerings. For this reason, Earth Tech’s senior managers and professional engineers are responsible for meeting with the customers, identifying their needs, offering appropriate solutions, staying in touch with the customers and gathering ideas for future improvements.
Normally, marketing staff support the technical employees and engineers in updating their resumes and writing proposals. They also deal with various marketing promotions and events such as client receptions and advertisements on professional engineering websites and magazines.

Generally, the company places an emphasis on relationship marketing and customer satisfaction, since a highly satisfied customer stays loyal to the firm and recommends the firm’s services to others. In order to measure client’s satisfaction and match customers’ expectations in the future, Earth Tech conducts periodic surveys and uses the information to improve its quality of services.

Senior managers and engineers are responsible to re-establish relationships with the customers; many risks exist for the firm when the managers try to establish and maintain individual relationships with the clients. As managers or engineers leave to pursue other opportunities, they take with them their network of customers.

In summary, Earth Tech should place more emphasis onto the branding or differentiating itself from other firms. Building a strong brand requires careful planning, advanced marketing and long-term investment. It is responsibility of the firm to express that it has skilled engineers, valuable knowledge and experience to offer exceptional services to its clients. The clients should be convinced in their mind that no other company could provide them with the same level of services. To achieve this goal and to gain better reputation Earth Tech needs to address its internal issues first. Earth Tech may consider forming an alliance with a strong and well-known company. This may provide them with opportunities to re-build their reputation in the market.
4.8 Financial Resources

Within Canada, the majority of offices and departments are financially stable and profitable; as a result, Earth Tech Canada Corporate office has enough resources to support the operations in British Columbia.
4.9 Summary of Internal Analysis

The internal analysis shows that Earth Tech's water/wastewater department lacks internal capabilities to compete effectively with its competitors. Figure 4-4 summarizes the department's strengths, weaknesses, opportunities and threats.

![Figure 4-4 Internal Analysis – SWOT](image)

Figure created by author – Data Source: Neil Abramson's hand outs – EMBA class of 2005

As mentioned previously, in the consulting engineering industry, rivalry among competitors is strong, threat of new entrants is high and bargaining power of suppliers is moderate to high. These are considered threats to the water/wastewater department.
Staff shortage and lack of experienced project managers are weaknesses of the department. The department’s managers should review the teams’ structures thoroughly; they should also work with the human resource department to replace the missing key staff (staff that left the company). The management should provide project managers with adequate management, personal skills and financial trainings. They should also take the department’s internal and external problems seriously. Without a sense of urgency to act immediately, the department will lose more of its opportunities and its people. In the meantime, the human resource unit should conduct surveys to identify the sources of staff dissatisfaction and the other areas that need immediate attention.

In regards to information technology, the department’s managers and professional engineers can use TPN as a tool to gain competitive advantage over the competitors; however, they do not use TPN that often. Therefore, management should place more emphasis onto the use of this tool. At the same time, Earth Tech’s geographic structure does not facilitate the interoffice teamwork and collaboration either.

Currently Earth Tech’s senior managers are responsible for marketing; however, management should place more emphasis onto the branding or differentiation. Branding is one of the important key success factors in the consulting industry.

Considering the current situation, threats and weaknesses, the author believes that the department is still at the re-structuring stage. In order to be able to pursue the opportunities available in British Columbia, the department should overcome the gaps between the required and existing internal capabilities.
5: OPPORTUNITIES

The following section reviews the current opportunities available in British Columbia.

5.1 Roads and highways projects

Economic development and population growth in British Columbia has led to increased demand in the BC transportation networks. In order to fulfil economic growth and social needs of British Columbians and to secure BC’s position as the Canada’s Pacific gateway to North America, BC Ministry of Transportation plans to invest over $2 billion in the future of the province during the next three years. The Ministry’s plan is to improve safety and efficiency of the highways and to increase capacity in major provincial and national gateways.

As mentioned previously, transportation projects usually contribute to many large or medium sized water infrastructure projects. Opportunities exist for Earth tech’s water/wastewater department to expand its operations and contribute to water infrastructure improvements in British Columbia.
5.2 Mining industry

Mining is BC’s second largest resource industry; over the past few years, the industry has experienced substantial growth and has contributed to the province’s economic development. Opportunities exist for Earth Tech water/wastewater department to expand its operations and provide water and wastewater treatment services to the mines across British Columbia.

5.3 Asset Management and Benchmarking Program

Figure 5-1 represents the geographic distribution and concentration of the participating cities in the asset management and benchmarking program. Because the benchmarking team is located in the Burnaby office, traditionally the program’s main focus had been on British Columbia; as a result limited numbers of cities in Alberta, Prairies and other Canadian provinces or territories have participated in this program.

The benchmarking program serves 36 of Canada’s municipalities and regional districts with a service population greater than 50,000; these cities represent approximately 50% of Canadian utilities. Currently, the benchmarking program does not serve cities and districts with a service population less than 50,000.

Opportunities are available for Earth Tech and its benchmarking program to expand by providing services to the rest of Canadian cities and districts. Because Earth Tech is the sole provider of benchmarking programs and it is the industry leader throughout Canada, the company should secure its competitive advantage and should invest more in this program.
Figure 5-1 Benchmarking Geographic Distribution

Source: Earth Tech
6: STRATEGIC ALTERNATIVES FOR GROWTH

As mentioned, since the Pacific region’s financial results were not acceptable to the senior management team, the region became a recovery centre by the end of 2003. At that time, management assigned various goals for the region to re-structure and reach an operating margin ratio of 20% to 25% within five years. According to the internal financial data, the region has just reached an operating margin ratio of 10% after four years of operation. The author believes that the region can achieve an operating margin ratio of 15% to 18% within five years, provided that the region overcomes its internal issues and finds ways of coping with external issues.

The next section describes three strategic alternatives for Earth Tech and its water/wastewater department in British Columbia. The first option or exit strategy considers selling Earth Tech’s offices in British Columbia since it does not seem realistic to sell only water/wastewater department. As mentioned, in 2006 water/wastewater and facilities departments were responsible for generating 80% of total net sales revenue for the Pacific region; therefore, these two departments drive the financial results of the region. This means that the departments’ operations and financial results can have the greatest impact on the Pacific region. Since both departments suffer from many internal issues, they may not be able to meet their expected targets. This means that the Pacific region may not be able to meet its financial targets either; therefore, the management may consider an exit strategy.
### 6.1 Exit Strategy

An exit strategy is a way by which owners and investors intend to get out of an investment that they have made in the past. In other words, exit strategy is a way of cashing out the business.

Selling the business to another company is an example of exit strategy. In the event that Earth Tech cannot overcome its internal issues, cannot distinguish itself from other competitors, cannot gain better reputation or cannot secure its position in BC's competitive market, the best option will be selling the BC's offices to a larger player and cashing out the business, as the possibility of attracting more projects and expanding the business is relatively low.

Table 6.1 presents a discounted cash flow valuation of Earth Tech in British Columbia. The table provides information about the possible best price for selling Earth Tech's offices in BC. The projection assumes that Earth Tech’s earnings before interest and taxes (EBIT) grow one percent a year through 2010. The company has to pay 35 percent tax on its earnings. Depreciation is $150,000 per year, which is added to earnings after taxes. The author has considered $100,000 as investment on various capital expenditures; the investment will be necessary to support operations.

The projection considers perpetual-growth and assumes that beginning in 2011, free cash flows will start growing at three percent. The weighted average cost of capital (WACC) is needed to calculate the firm’s terminal value. Since the author does not have access to the Earth Tech’s Balance Sheet, a 17% WACC will be used for our calculations. WACC is the expected return to equity owners or debt holders; this percentage represents the investors’ opportunity cost on taking
the risk of purchasing the company. The discounted cash flow valuation indicates that Earth Tech’s value is approximately $2.6 million.

Earth Tech’s EBIT is expected to be $500,000 in 2007; also one percent increase in EBIT seems realistic. The author believes that the accuracy of this forecast depends on the actual WACC, since smaller WACC creates higher values for the company.

Table 6-1 Discounted Cash Flow Projection
Table created by author – Data Source: Assumptions by author

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBIT</td>
<td>$500,000</td>
<td>$505,000</td>
<td>$510,050</td>
<td>$530,452</td>
</tr>
<tr>
<td>Tax Rate - 35%</td>
<td>175,000</td>
<td>176,750</td>
<td>178,518</td>
<td>185,658</td>
</tr>
<tr>
<td>Earnings after tax</td>
<td>325,000</td>
<td>328,250</td>
<td>331,533</td>
<td>344,794</td>
</tr>
<tr>
<td>Add Depreciation</td>
<td>150,000</td>
<td>150,000</td>
<td>150,000</td>
<td>150,000</td>
</tr>
<tr>
<td>Subtract Capital Expenditures</td>
<td>100,000</td>
<td>100,000</td>
<td>100,000</td>
<td>100,000</td>
</tr>
<tr>
<td>Free Cash Flow</td>
<td>$375,000</td>
<td>$378,250</td>
<td>$381,533</td>
<td>$394,794</td>
</tr>
<tr>
<td>WACC 17%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present Value of Free Cash Flow</td>
<td>$835,047</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free Cash Flow in 2011</td>
<td>$394,794</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth Rate in 2011</td>
<td>3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terminal value in 2010</td>
<td>$2,819,956</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present Value of Terminal value</td>
<td>$1,760,697</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value of firm</td>
<td>$2,595,745</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If the company does not overcome its internal and external issues, in the long run it might lose its clients and their business. Therefore, the company might generate operating losses. In the event that Earth Tech’s operating losses are greater than its total fixed costs, the management should consider closing the doors and ceasing operations in the province. Total fixed costs represent the minimum cost or maximum loss that a company should bear even if it closes its doors. Earth Tech’s fixed costs in British Columbia (Rent and utility expenses) are $480,000 per
year; therefore, if the company’s operating losses are greater than $480,000 the management should consider ceasing operations in British Columbia.

It is worth mentioning that selling BC’s offices or ceasing operation in BC will have significant effects on Western Canada’s operation as the Pacific region generates approximately 25% of Western Canada’s revenues per year.

6.2 Strategy to Concentrate on Special Segments

Positioning and segmentation is about identifying group of buyers who are interested in a company’s products or services for various reasons. Identifying and focusing on target markets will provide a firm with the greatest opportunities in the market.

In this section, we assume that the department will focus on two special market segments; for example municipals’ projects and benchmarking program. Table 6.2 represents the revenues projection for the department. The assumptions are based on actual changes to revenues that occurred in a five-year period from 2002 to 2005.

The projection assumes that revenues from municipals’ projects will increase by $300,000 in the first year and it will grow by 20% over the next four years. The projection considers a $300,000 increase in revenues from benchmarking program in the first year; it also assumes that the revenues will grow by 10% over the next four years. Since the department will focus on these two segments, it will lose $200,000 revenues per year generating from other projects.
The projection considers hiring of two key individuals, one with annual salary of $200,000 and the other with annual salary of $100,000. These key individuals are experienced and already have a strong network of people within various Cities, Districts and Municipalities; as a result, they would be able to bring with them new clients and more projects. Their salaries are projected to increase by 10% per year.

The projection assumes marketing costs of $100,000 per year. The marketing costs will include two clients’ receptions per year ($20,000 each) as well as advertising campaigns throughout the year with an aim to re-build the department’s reputation within the industry and to attract new clients.

The projection considers $7,050 for project management training per year. This will include one training course and one refresher course per year. Table 6.3 represents the training courses’ costs breakdown.

According to table 6.2 and the author’s projection, if the company concentrates on benchmarking program and municipals’ projects, it will earn approximately $700,000 over the next five years. The earnings will improve the operating margin ratio by 7%. This means that by focusing on these two segments, the department can reach an operating margin ratio of 17% within five years.
The management implemented a similar strategy during a period from 2002 to 2005. At
the time, revenues from municipals' projects increased by an average of 25% and revenues from
benchmarking projects increased by an average of 20% over five years. Considering the current
internal issues, the author has forecasted lower percentage increase in revenues for the following
years. Since the management employed this strategy before and the result was satisfactory, the
author believes that the accuracy of this forecast is relatively high (90-95%).
### Table 6-2 Revenues Projection
Table created by author — Data Source: Assumptions by author

<table>
<thead>
<tr>
<th>Revenues/Costs</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Revenues from Municipals' Projects</td>
<td>300,000</td>
<td>360,000</td>
<td>432,000</td>
<td>518,400</td>
<td>622,080</td>
</tr>
<tr>
<td>New Revenues from Benchmarking Program</td>
<td>300,000</td>
<td>330,000</td>
<td>363,000</td>
<td>399,300</td>
<td>439,230</td>
</tr>
<tr>
<td>Lost Revenues from other projects</td>
<td>-200,000</td>
<td>-200,000</td>
<td>-200,000</td>
<td>-200,000</td>
<td>-200,000</td>
</tr>
<tr>
<td><strong>Revenue Subtotal</strong></td>
<td>400,000</td>
<td>490,000</td>
<td>595,000</td>
<td>717,700</td>
<td>851,310</td>
</tr>
<tr>
<td>Key Staff Hiring</td>
<td>-300,000</td>
<td>-330,000</td>
<td>-383,000</td>
<td>-399,300</td>
<td>-439,230</td>
</tr>
<tr>
<td>Marketing</td>
<td>-100,000</td>
<td>-100,000</td>
<td>-100,000</td>
<td>-100,000</td>
<td>-100,000</td>
</tr>
<tr>
<td>Training</td>
<td>-7,050</td>
<td>-7,050</td>
<td>-7,050</td>
<td>-7,050</td>
<td>-7,050</td>
</tr>
<tr>
<td><strong>Cost Subtotal</strong></td>
<td>-407,050</td>
<td>-437,050</td>
<td>-470,050</td>
<td>-506,350</td>
<td>-546,280</td>
</tr>
<tr>
<td><strong>Total Gain/Loss</strong></td>
<td>-7,050</td>
<td>$52,950</td>
<td>$124,950</td>
<td>$211,350</td>
<td>$315,030</td>
</tr>
<tr>
<td><strong>Subtotal Over five years</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$697,230</td>
</tr>
</tbody>
</table>

### Table 6-3 Training Courses - Cost Details
Table created by author — Data Source: Assumptions by author

<table>
<thead>
<tr>
<th>Main Training Course</th>
<th>Refresher Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of project managers</td>
<td>10</td>
</tr>
<tr>
<td>Average cost per hour</td>
<td>$40</td>
</tr>
<tr>
<td>Hours of training - two 5 hr sessions</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>4,000</td>
</tr>
<tr>
<td>Instructor Cost - 10 hrs *$40/hr</td>
<td>400</td>
</tr>
<tr>
<td>Food - 2 days</td>
<td>300</td>
</tr>
<tr>
<td>Subtotal</td>
<td>$4,700</td>
</tr>
<tr>
<td><strong>Grand Total - Training per year</strong></td>
<td>$7,050</td>
</tr>
</tbody>
</table>
6.3 Strategy to Re-invest in British Columbia

Re-investment in British Columbia is the second option available to the department. This means that the department should start over; it should re-invest in water/wastewater treatment projects, benchmarking and water infrastructure projects all at once. This also means that management should actively pursue new clients within the region.

Table 6.4 represents revenues projection from the department’s re-investment in British Columbia. The assumptions are based on strategic hiring of key individuals and their contributions to the company’s total revenues. These key individuals are specialized in fields that management is particularly interested in, such as water/wastewater treatment, roads and mining related projects. These individuals are well known within the consulting industry and they already have a strong network of people; as a result, they are able to bring with them new clients and more projects.

The projection considers hiring two key individuals, each with annual salary of $200,000. One of these individuals will be specialized in water/wastewater treatment projects and the other will be specialized in infrastructure projects. Their salaries will be increased by 10% per year. The projection assumes that following the re-investments, the department’s revenues will increase by $600,000 in the first year and it will grow by 10% over the next two years. At the same time, the department will invest $100,000 per year for marketing and re-establishing its reputation within the province. Since the department’s reputation will be improved over years, the projection assumes that starting in 2011 the department’s revenues will grow by 15%.
The projection considers a salary increase of $150,000 per year for the existing employees; the salary increase will provide employees with financial incentives to stay with the company. The cost for project management training will be $7,050 per year.

Table 6-4 Re-investment projection

Table created by author – Data Source: Assumptions by author

<table>
<thead>
<tr>
<th>Revenues/Costs</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Revenues - Various projects</td>
<td>$600,000</td>
<td>$660,000</td>
<td>$726,000</td>
<td>$834,900</td>
<td>$960,135</td>
</tr>
<tr>
<td>Revenue Subtotal</td>
<td>$600,000</td>
<td>$660,000</td>
<td>$726,000</td>
<td>$834,900</td>
<td>$960,135</td>
</tr>
<tr>
<td>Key Staff Hiring</td>
<td>-$400,000</td>
<td>-$440,000</td>
<td>-$484,000</td>
<td>-$532,400</td>
<td>-$585,640</td>
</tr>
<tr>
<td>Salary increase - Existing Staff</td>
<td>-$150,000</td>
<td>-$150,000</td>
<td>-$150,000</td>
<td>-$150,000</td>
<td>-$150,000</td>
</tr>
<tr>
<td>Marketing</td>
<td>-$100,000</td>
<td>-$100,000</td>
<td>-$100,000</td>
<td>-$100,000</td>
<td>-$100,000</td>
</tr>
<tr>
<td>Training</td>
<td>-$7,050</td>
<td>-$7,050</td>
<td>-$7,050</td>
<td>-$7,050</td>
<td>-$7,050</td>
</tr>
<tr>
<td>Cost Subtotal</td>
<td>-$657,050</td>
<td>-$697,050</td>
<td>-$741,050</td>
<td>-$789,450</td>
<td>-$842,690</td>
</tr>
<tr>
<td>Total Gain/Loss</td>
<td>-$57,050</td>
<td>-$37,050</td>
<td>-$15,050</td>
<td>$45,450</td>
<td>$117,445</td>
</tr>
<tr>
<td>Subtotal Over five years</td>
<td>$53,745</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

According to the author's projection, if the department re-invests and concentrates on various types of projects, it will earn approximately $54,000 over the next five years. The earnings will not have a significant effect on the operating margin ratio.

As mentioned earlier, this forecast relies on the ability of key individuals to bring in new projects. However, they may not be successful in winning new projects right away. The author believes that the accuracy of this forecast is relatively low (60%).
7: RECOMMENDATION

Earth Tech's water/wastewater department does not have the internal capabilities to capture additional business, increase its profitability and consequently grow in the market. According to the internal analysis, the department is still at recovery or re-structuring stage. The department needs to concentrate on its internal issues and close the gaps between required and existing capabilities to grow in the market. The department suffers from lack of key individuals, lack of experienced project managers and high rates of staff turnover. These have direct effects on quality of services provided to the clients. It is management's responsibility to address these issues immediately; otherwise, in the long term the water/wastewater department might not be able to deliver its promises and might be in danger of losing its credibility.

On the other hand, the industry has conditions for monopolistic competition. There are many buyers and sellers in the market; each firm in the industry provides services that differ slightly from other firms' services. Therefore, firms mostly concentrate on differentiation and branding, they try to convince clients that their brands are better than other brands.

The cost-benefit analysis clearly indicates that concentrating on two niche markets, benchmarking and municipals' projects, will be beneficial to the department's operation and its future growth. In conclusion, this option is considered the best strategy and should be pursued by the department.
REFERENCE LIST


Kerr Wood Leidal, Services, Retrieved June 20, 2006, from http://www.kwl.bc.ca/service

