

Freshkills Park

A Communications Strategy to Address Public Health Concerns



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IN THE CITY OF NEW YORK



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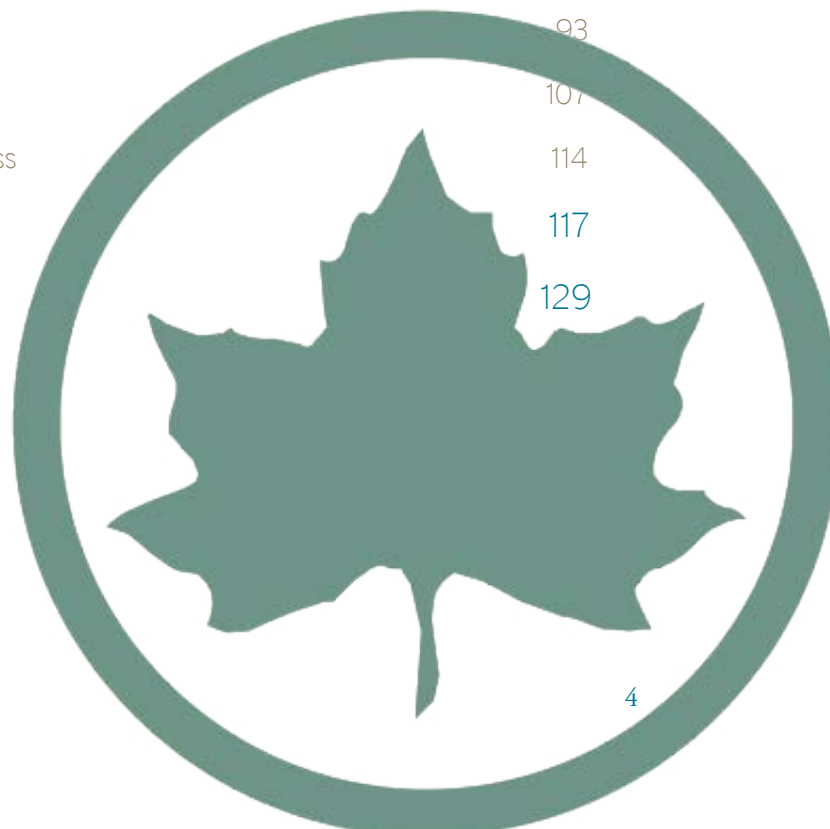
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1. Executive Summary

Freshkills Park, a 2200 acre site in western Staten Island, is currently being transformed from what was formerly the world's largest landfill into the largest park developed in New York City in over 100 years. Based on a 2010 survey commissioned by the Parks Department and additional community feedback, Park administrators are aware that some Staten Island residents have health concerns associated with the possible risks resulting from the site's conversion from a contaminated area to a public space. The Parks Department seeks a communications strategy to effectively reach Staten Island residents with credible and digestible information that will be responsive and reassuring to public concerns about the transformation of Fresh Kills Landfill into Freshkills Park. The Capstone Team performed survey data analysis, scientific research on health risks and the Park's mitigation approach, as well as research on best practices in communications to inform the recommendations for a final communications strategy, the goal of which is to significantly reduce the number of references to health concerns on the next survey conducted by the Parks Department.

The Parks Department shared a part of the 2010 survey data with the Team, which consisted of the home location of the respondent, distance to Freshkills Park, age, sex, visitation preference and the free response comments. The key finding of the Team's survey data analysis is that regardless of whether or not an individual plans to visit the Park, health and safety was the most cited concern. General words like "toxic," and "contaminated" were frequently used in health-related comments, but no specifics about the concerns were identified.

As a result of the survey analysis findings that health and safety is the key concern associated with visiting Freshkills Park, the Team investigated whether there are any public health risks for Park visitors. The scientific research process began with grouping all potential health risks into four categories of possible exposure pathways: airborne, groundwater, soil, and surface water/sediment. These pathways represent all potential means for contamination from waste decomposition.

The Team determined that although the former landfill certainly contains harmful materials, the park's risks to public health have been managed and controlled by the City. Portions of Freshkills Park are planned to open in phases between 2012 and 2036, only after meeting the United States Environmental Protection Agency (EPA) and the State Department for Environmental Conservation (DEC) regulations for landfill closure and standards for soil, water and air quality. The sophisticated engineering and monitoring of Freshkills Park are the critical aspects of the site, which enabled its transformation from a landfill to a safe space for public recreation. Specifically, the leachate management system, the landfill gas collection system,

the capping system, and a series of walls are designed to work together to insulate the byproducts of waste decomposition (landfill gas and leachate) from reaching people and the environment.

After the scientific research was complete, the Team explored communications best practices by researching landfill-to-park case studies, risk communication theory and crisis communication case studies. The research methods comprised of literature reviews of publicly available websites, newspaper articles, academic papers and interviews with experts.

Key Takeaways

- Involve the community as a partner
- Be honest, frank and open
- Communicate with compassion
- Customize your message for different audiences
- Meet the needs of the press
- Be ready for a crisis

The final recommended communications strategy consists of the following critical components:

- **The Target Audience:** Staten Island residents were grouped into eight segments:
 - Academic institutions
 - Activity groups
 - Catholic churches
 - Environmental groups
 - Politicians
 - Community Boards
 - Press
 - Family-based groups

- **The Message:** Six key message points were created for the Parks Department to utilize in communicating with the target audience:
 - We Acknowledge and Understand the Public's Skepticism
 - We Take Public Health and Safety Very Seriously
 - Our state-of-the-art engineering systems and monitoring programs are designed to protect public health and safety.
 - Freshkills Park builds on an extensive history of landfill-to-park conversions with the largest and most technologically advanced project to date
 - Freshkills Park is Committed to Transparency, Education and Community Involvement
 - Freshkills Park is a demonstration site that will be a model for land reclamation projects around the world
- **Message Customization:** The Team developed three customized messages (for the general public, researchers, and the press) which together cater to the entire target audience. When speaking to the general public, messaging should be clear, simplified and actionable. When communicating with the technical audience, messaging should be detailed, transparent, and informative. When speaking to the press-focused audience, messaging should be simple, compelling, and honest.
- **Channels and Tactics:** The Team researched the possible channels and tactics, considered their limitations, and determined which are appropriate to utilize for Freshkills Park. The Team determined that advertising on radio, print, television, and internet channels would not be perceived as a trusted source and should not be used for disseminating health information. Instead, assuming no increased budget, the Parks Department should focus on:
 - *Engaging the Community*
 - Create a Freshkills Park Public Health Community Advisory Committee
 - Develop and Enact a Traveling Community Health Road Show
 - Develop a Crisis Communications Plan
 - *Engaging the Press*
 - Develop an Enhanced Press Kit with Specialized Health Information
 - Build Strong Relationships with Targeted Press Outlets and Reporters
 - *Enhancing Web Strategies*

- Partner with the Freshkills Park Alliance and Create and Enhanced Web Page for Health Communications
- Ensure Search Engine Optimization
- Enhance Participation in Online Social Networks
- **Budget Scenarios:** The Team analyzed and constructed the recommended communications strategy under three different budget scenarios (status quo in which no additional funds are available; medium budget in which an additional \$10,000 is available; high budget scenario in which an additional \$25,000 is available).

Should Freshkills Park receive a *\$10,000 grant* for health communications, the Team recommends:

- Implementing the status quo budget scenario recommendations above
- Developing an online interactive web tool that engages users to learn and experience the park virtually

Should Freshkills Park receive a *\$25,000 grant* for health communications, the Team recommends:

- Implementing the status quo budget scenario recommendations above
- Developing an online interactive web tool that engages users to learn and experience the park virtually
- A professionally curated exhibit about the site's reclamation that includes the history of Freshkills and also focuses on how public health is protected
- A custom built model of the landfill cap that can serve as an educational tool used by the Freshkills team to help illustrate the process of capping the mounds visually.
- **Implementation:** The Team recommends implementing the communications strategy in three phases. Phase I is the testing ground phase; Phase II is the full roll-out phase; and Phase III is the reassessment and evaluation phase.

2. Introduction

Project Scope of Work

The Columbia University Masters of Science in Sustainability Management Capstone Workshop Team, comprised of Jenni Chun, Daniel Giuffrida, Daniel Held, Sarah Hogue, Tyler Johnson, Dina Mustafa, Monica Perez Nevarez, Pamela Quinlan, Robert Sciortino, Julie Shershavin, Jonathan Simkins and Sean Simpson (hereafter referred to as “the Team”), have been tasked by the New York City Department of Parks and Recreation (hereafter referred to as “the Parks Department”) with developing a communications strategy for Freshkills Park, which meets specific objectives.

In particular, the Parks Department asked for a communications strategy that proactively encourages residents to use the park while also responding to their questions and concerns about its transformation from a landfill to a park. Although the landfill has closed and the creation of the park is underway, the Parks Department is currently faced with a public perception challenge, as public discourse about the site is still dominated by imagery of a contaminated landfill and its associated health concerns. In order to address and diminish public apprehension, the Team's objectives included incorporating credible scientific research on potential public health risks associated with the project, lessons learned from other similar case studies and related initiatives, and cutting-edge communications practices tailored to difficult situations.



The Team was also asked to analyze survey data previously collected and provided by the Parks Department and to integrate key findings into the proposed strategy. The data analysis was used to establish relationships between public opinion and demographics, as well as to examine specific concerns raised by the respondents. Hence, the Team agreed to perform scientific

research, identify and explore potential case studies, and incorporate the results of survey analysis into a communications strategy that is responsive and reassuring to public concerns about the transformation of the Fresh Kills Landfill into Freshkills Park.

Freshkills Park Background

Freshkills Park is located in western Staten Island in New York City, along the banks of the Fresh Kills estuary. Prior to development, the area primarily consisted of tidal creeks and coastal marsh, hence Staten Island's seventeenth century Dutch settlers named it "Fresh Kills," which translates to "fresh creek" or "fresh waters" (Freshkills Park, n. d.).

In 1946, New York City purchased the 2200 acre site, which was considered useless swamp land, for a proposed three year municipal waste dump, as a temporary solution to the closing of the Rikers Island Landfill. It was common practice at the time to locate garbage mounds on marshland, because the environmental value of wetlands was not yet understood (Rozsa, n. d.). From the beginning, the dump proposal created a strong "Not in my Back Yard" (NIMBY) backlash among residents, who began the first of three actions for Staten Island's secession from New York State, in an effort to secure a voice in the city's land-use plans for the Island (Staten Island History Timeline, n. d.).¹ The secession effort failed to pass Congress and the Fresh Kills landfill started operating in 1948, in spite of the strong opposition.

Although the Fresh Kills landfill was originally planned as a temporary solution to the City's increasing waste management challenges, it remained open for 53 years and received as much as 29,000 tons of trash per day during its peak years of operation (Freshkills Park, n. d.), becoming the largest landfill in the world and the only other manmade object, besides the Great Wall of China, which could be seen from space (Trash Timeline, n. d.). By 1991, 88 metropolitan landfills had closed and Fresh Kills was New York City's sole operating landfill and the City's primary venue for waste disposal (Freshkills Park: Site History, n. d.). Finally, in 1996, NYC Mayor Rudolph Giuliani and NY State Governor George Pataki signed a mandate to close Fresh Kills by 2001 (Fresh Kills Landfill Closure Agreement, n. d.).

By the time of closure, about 150 million tons of waste were shaped into four mounds and consisted of more than half a decade's worth of household garbage. Typical items disposed at Fresh Kills included paper, bottles, cans, Plexiglas, paperback books, pre-cooked frozen foods, polyethylene film food wrap, food packaging and storage, aerosol cans, Styrofoam, disposable ball point pens, improved paper cup for hot

¹ The residents tried to secede in 1947 and then again in 1989 and in 1993.

liquids, convenience foods, TV dinners, High-density polyethylene (HDPE) for milk containers, photocopiers, fax machines, easy open pop tops for cans, disposable razors, aluminum cans for beverages, Polyethylene terephthalate (PET) soda bottles, Polypropylene for butter and margarine tubs, televisions, desktop computers, laptops, and cell phones (Fresh Kills Landfill Closure Agreement, n. d.). In addition, toxins like insect sprays, engine oil, paints, solvents, and weed killers are also likely landfilled there (Brown, 2004).



Map of Fresh Kills Landfill²

Although officially closed in 2001, Fresh Kills was briefly reopened after the 9/11 World Trade Center attack in order to accept 1.2 million tons of debris from the fallen towers during a 10 month recovery effort. The 9/11 materials were screened and sifted for human remains, and the rest of the debris was placed in a 48-acre area on top of the West Mound, where a monument to the victims will be constructed (Freshkills Park, n. d.). The FBI, NYPD and Office of Emergency Management agreed

that the retrieval process had been exhaustive, yet some families of the victims remain opposed to the idea of leaving 9/11 debris in a landfill due to the possibility of their loved ones not receiving a proper burial (Freshkills Park: Site History, n. d.; Donnelly, 2011).

The four landfill mounds comprise about 45% of the 2,200 acre site and the remainder consists of creeks, wetlands and dry lowland that function as an important wildlife habitat (Fresh Kills Park Project, n. d.). The area is one of the few remaining vast open spaces in the City, so the NYC Department of City Planning and the architectural firm Field Operations developed a plan to convert this unique site into a world-class park and alleviate the City's need for open space, while restoring its natural environment (Freshkills Park, n. d.). Freshkills Park will be almost three times the size of Central Park and the largest park development project in the City for the past 100 years. The Park is being constructed using state of the art ecological restoration and engineering techniques with the goal of creating safe natural settings for recreation,

² Source: <http://www.nyc.gov/html/dcp/html/about/pr092903.shtml>

public art, and facilities for various sports and other programs; places that are prized in overcrowded cities. Sophisticated engineering systems have been installed to collect and treat methane (an odorless, colorless, and highly flammable gas produced by the decomposition of organic matter) and leachate (the liquid that drains or leaches from a landfill, caused primarily by rainfall penetrating through waste), the primary byproducts of waste decomposition, while protecting the environment and public health (Freshkills Park: Site History, n. d.).

The Park project is undergoing a 30-year construction plan and is projected to open to the public in phases between 2012 and 2036 (Freshkills Park: Frequently Asked Questions, n. d.). Development over the next several years will focus on providing public access to the interior of the site and showcasing its unusual combination of natural and engineered beauty, including creeks, wetlands, expansive meadows and spectacular vistas of the New York City region.

The first projects to be built are neighborhood-focused amenities at the perimeter of Freshkills Park. Schmul Park, an existing blacktop playground, will be renovated, replacing asphalt with colorful rubber-clad play mounds, plantings and other porous surfacing. The Owl Hollow Fields will provide four synthetic turf soccer fields, a loop pedestrian path, parking and landscaped lawn areas. Both projects are anticipated to open in 2012. The Parks Department hopes that Freshkills Park will eventually become “a productive and beautiful cultural destination” and “a symbol of renewal and an expression of how our society can restore balance to its landscape” (Freshkills Park, n. d.). A detailed history of the site and project timeline is presented in **Appendix A**.

3 Source: http://www.nyc.gov/html/dcp/html/fkl/fkl_index.shtml

Infrastructure Background

The sophisticated engineering of Freshkills Park is a critical aspect of the site, which enabled its transformation from a former landfill to a safe space for public recreation. The Leachate Management System, the Landfill Gas Collection System, the Capping System, and a series of walls are designed to work together to insulate all contamination originating in the landfill from reaching people and the environment.

The Leachate Management System consists of multiple components that are engineered to collectively reduce and treat the liquid being discharged from the landfill. When rain or groundwater comes into contact with an exposed landfill, it infiltrates the mounds and absorbs various compounds that leach out of decomposing trash. The result is a potentially toxic mixture, known as “leachate,” which could seep out of the landfill unless constrained through special infrastructure. At Freshkills, the leachate creation process is decelerated and controlled by “slurry walls,” which are barriers constructed of cement bentonite, essentially clay and soil, which extend up to 65 feet below the surface (Tully Construction Co. Inc., n. d.). Through the use of the slurry walls, leachate is funneled towards specified collection points, then treated and released into the environment, in a cleaner state than the water in the nearby Arthur Kill strait (Freshkills Park: Site History, n. d.).

Additionally, the Capping System at Freshkills is the key method for reducing the production of leachate, assisting with the capture of landfill gas, and sealing all contaminants in the landfill from the Park above. The centerpiece to the Capping System is a low permeability High Density Polyethylene (HDPE) Geomembrane. The Geomembrane is a several inches thick plastic layer, designed to prevent any contaminant or water from getting into or out of the landfill. It is damage resistant and long-lasting, having been successfully tested in many landfills, with a predicted lifetime of up to hundreds of years (Rowe & Sangam, 2002). In order to maximize the Geomembrane’s lifetime and effectiveness, it is kept separate from the landfill by a soil barrier layer and the gas-vent layer. The Geomembrane is also separated from the surface by at least 2 feet of residential-grade earth and a coarse-grained drainage layer (Freshkills Park: Site History, n. d.). The combined barriers of the Capping System equate to approximately 3 feet of protection between the surface and the landfill, with lower risk of contamination passing through the cap.

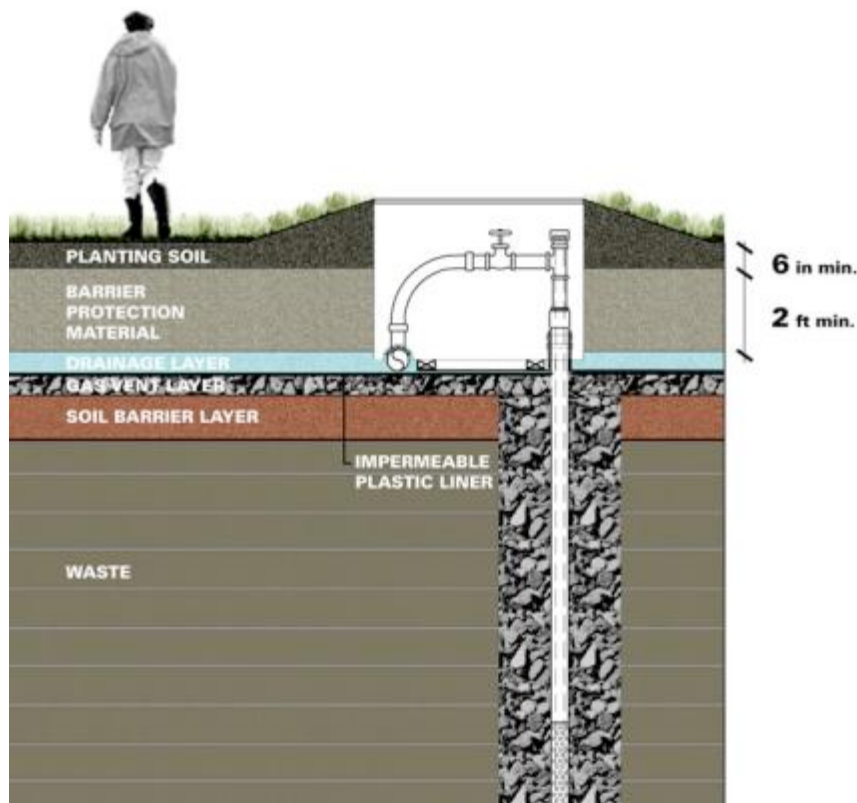


Illustration of Freshkills Park landfill cap⁴

Landfill gas (LFG), primarily composed of methane and carbon dioxide, is another byproduct of waste decomposition. The Landfill Gas Collection System (LGCS) is designed to collect the gas and route it to an on-site LFG recovery plant for energy generation, while preventing it from escaping the landfill. The LGCS is integrated with the cap and is composed of a gas vent layer, landfill gas well heads and pumps, and pipes for gas transport. The gas vent layer is highly permeable and along with the Geomembrane, funnels the gas towards special collection points. LGC Systems are reported to recover over 94% of the landfill gas over 5 years, with the remainder generally passing through the Leachate Management System (Spokas et al., 2006).

Overall, the landfill infrastructure at Freshkills is designed to meet and exceed the environmental standards set by the New York State Department of Environmental Conservation for landfill closures. The combined systems ensure that water, soil and air quality standards in and around the landfill are maintained, and also help to remedy the environmental and health impacts produced by the landfill (Sub-Part 360-1: General Provisions, 2006).

⁴ <http://www.nycgovparks.org/park-features/freshkills-park/about-the-site#tabTop>

3. Survey Data Research

Data Provided

The Team received 681 free responses from a survey sent out to 3,100 Staten Island residents in 2010. The survey data consisted of the home location of the respondent, distance to Freshkills, age, sex, and their free response comments. This data was part of a community-wide survey on current and planned parks on Staten Island as part of a project to help the Parks Department understand Staten Island residents' views on the available public parks and outdoor recreation areas on Staten Island, as well as plans to transform the former Fresh Kills Landfill into Freshkills Park.

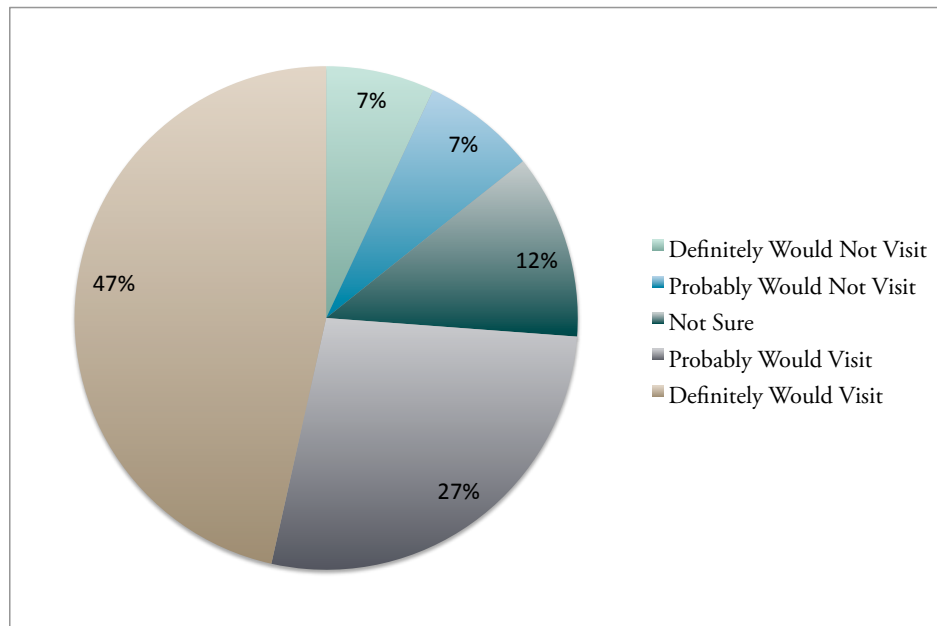
The data was grouped by visitation preference of the respondent into five categories:

- Definitely would not visit
- Probably would not visit
- Not sure
- Probably would visit
- Definitely would visit

The Team also received 100 free responses that were categorized as “other thoughts.” Data from the 1500 respondents who did not provide a free response was not shared. In addition, for those respondents that did fill out the free-response section, the answers to the rest of their surveys were not provided.

Research Methodology & Key Findings

The quantitative research included figuring out the proportion of the respondents that falls into each of the five visitation preference categories in order to understand the overall state of public opinion among this data sample in regards to visiting Freshkills Park. The breakdown of the results is provided below. The key finding of the visitation preferences analysis is that less than 15% of respondents are not likely to visit Freshkills Park and the majority (74%) expressed a desire to visit.



Visitation preferences of 681 individuals that provided free response answers

The most significant portion of the analysis involved qualitative data in the free response section. To analyze this data, the Team utilized social science research methods for transforming qualitative responses into quantitative data used to make comparisons and draw more concrete conclusions. These methods are part of the “qualitative tradition in social science” and are referred to by various names, such as “open coding,” “qualitative analysis” or “latent coding,” which are used to induce themes from texts (Berelson, 1952; Shapiro & Markoff, 1997).

There are four major techniques in discovering themes in texts:

- Words analysis
- A careful reading of larger blocks of texts
- An intentional analysis of linguistic features
- A physical manipulation of texts

The Team utilized the pawing and word repetition (also called word-frequency) processes to analyze the data. Pawing is commonly used by researchers to begin qualitative data analysis by familiarizing themselves with the data and begin hunting for patterns in qualitative data (Ryan & Bernard, 2003). To “paw” data, the Team marked the text with different colors - physically manipulating text and carefully reading it to identify common themes and get a feel for the text by handling it multiple times. Upon completion of the pawing process, the Team utilized the word repetition method to generate a list of all the unique words in the text and then counted the number of times each word occurred. The word-frequency lists assisted the Team in

establishing themes that were later used to code the texts into a quantitative format, which allowed the Team to draw quantitative conclusions and identify common themes or patterns in the survey data. The 12 identified themes are listed below:

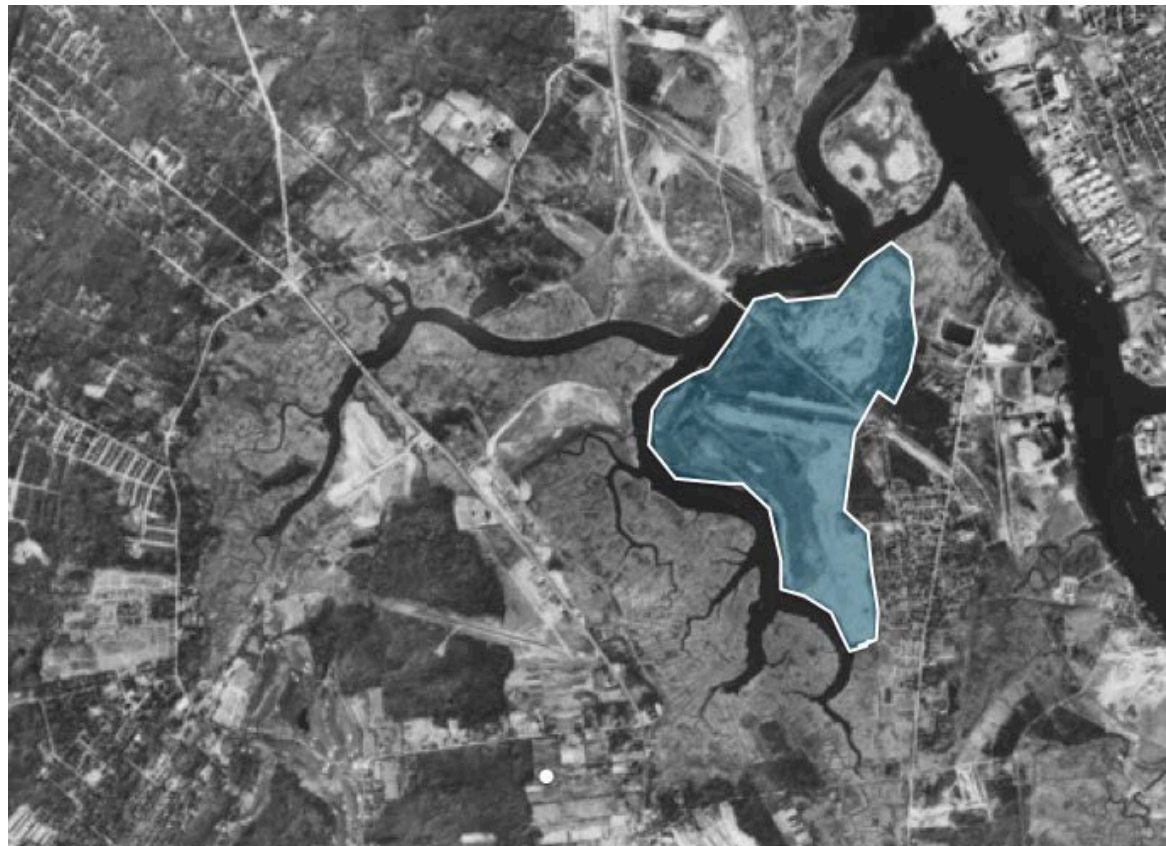
Categories (abbreviated)
Convenient
Park for family time
Asset for Staten Island
Park is desirable
Demands for the park to provide
Neighborhood concerns
Mistrust
Disinterest
Health concerns
Physical wellbeing
Inconvenient
Curiosity of outcome

The Team identified twelve themes through the process of “open coding” from the free response data received from the survey data. The Team utilized these twelve themes to provide all data responses with an A-L code, allowing for the Team to analyze visitation preference in relation to age, gender, and proximity to the park. Please see **Appendix B** for the absolute number of respondents coded under the twelve aforementioned groups as well as inconclusive responses which received the entry “NA.”

Once all responses received a key (or 2 keys if applicable) based on the selected categories, the Team was able to draw quantitative conclusions in regards to visitation preference, age, gender and distance to the park. Detailed results of this analysis are presented in **Appendix B**.

Key Takeaways

- Regardless of whether or not an individual plans to visit the Park, health and safety was the most cited concern. Sometimes word like “toxic” was mentioned but no other specifics about their concerns were generally identified.
- The distance a respondent lives from the park positively correlated with his or her visitation preference.
- Among the respondents who probably or definitely will visit the park, a majority expressed their excitement about the nature, scenery and outdoor activities.
- No correlation has been found between stated concern with health and safety and the respondents’ gender, age and distance to the park. All groups across the board were concerned with potential health risks associated with visiting the Park.



4. Scientific Research

The principal concerns of survey respondents consisted of possible public health and safety risks associated with visiting Freshkills Park. As a result, the Team investigated whether there are any dimensions of Freshkills Park that could negatively affect visitors and determined that, while the landfill certainly contains harmful materials, the risks to public health have been managed and controlled by the City.

The scientific research process began with grouping all potential health risks into four categories of possible exposure pathways: airborne, groundwater, soil, and surface water/sediment. These pathways represent all potential means for contamination from waste decomposition to reach humans. Also, cancer was chosen as an additional research topic due to its mention as a concern in the surveys and because the former landfill's potential linkage to cancer rates in Staten Island continues to be a high point of contention for Staten Island residents (E. Hirsh & C. Grassi, personal communication, April 6, 2012). The Team's findings related to each category are summarized below and explained in detail in **Appendix C-G**.

Typical Landfill Contaminants
Total Solids
Biological Oxygen Demand
Chemical Oxygen Demand
Organic Nitrogen
Total Phosphorous
Chloride
Sulphate
Iron
Manganese
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Zinc

(Kjeldsen et al, 2002)

Airborne Risks

Landfill gas, primarily composed of methane, carbon dioxide and trace amounts of Volatile Organic Compounds (VOC's), is one of the main byproducts of waste decomposition (Site History, n. d.). The main danger associated with methane is high flammability, not inhalation (Chemical Profiles: Methane, n. d.). The main danger associated with carbon dioxide is asphyxiation, but only at very high concentrations that are extremely unlikely (Chemical Profiles: Carbon Dioxide, n. d.). VOC's produced by Freshkills include over 41 individual chemicals, but the highest concentrations of these are Freons (113 and 114). VOC's are acknowledged carcinogens, and so have been discussed in the cancer section below (Chemical Profiles: Volatile Organic Compounds, n. d.). However, overall, the Team determined that airborne public health risks are very limited, due to the landfill gas management system that has been implemented at Freshkills to capture the gas and generate electricity. This management system has the dual advantage of removing contaminants from the

air, while actively monitoring the landfill capping system for leaks, if properly used. While it was deemed very likely that a failure of the landfill cap will occur in the Park's distant future, the use of the gas capture system to monitor for leaks should allow a rapid response in the case of a failure. In addition, should an unmanaged leak occur, the public should be able to recognize and avoid this by the smell. This reduces the associated risk to public health.

Groundwater Risks

Public health risks associated with groundwater are also very limited at Freshkills. Although groundwater contamination, particularly from heavy metals such as Lead and Mercury, has been occurring on the site since the beginning of landfill operations, the primary reason for the low risk is the lack of an exposure pathway to the public. Groundwater on Staten Island is isolated from the drinking water system and not commonly utilized for any other purposes. In addition, monitoring data showed that the concentration of contaminants in groundwater was trending lower, with capping predicted to further reduce continued contamination of groundwater (Shaw Environmental, Inc., 2007).

Soil Risks

Risks associated with soil also present very limited public health risks. The capping system has isolated surface soil from potential contaminants with physical barriers (such as the geomembrane), as well as by laying approximately two feet of clean soil above the capping materials. Therefore, any chance of contamination of soil is low, with risks further reduced by soil's low-risk pathways to humans (i.e. ingestion, dust inhalation and skin contact all require high contaminant concentration to be dangerous). Also, the highly localized nature of soil contamination makes any future system failure easily managed.

Surface Water & Sediment Risks

Surface water and sediments are likely to be the most risky pathway for public health, due to the concentrations of confirmed contaminants being above New York State Department of Environmental Conservation standards. Some of these contaminants are "leachate indicator" contaminants and are directly linked to the landfill. The term "indicator" refers to whether the contaminant exists above background levels in proximity to Freshkills (i.e. if a contaminant exists at higher concentrations near Freshkills) it is attributed as a likely sign of leachate.

The major contaminant of concern that is likely leachate-derived is Mercury, and Mercury concentrations are at low levels, such that a 20kg child would have to consume 45L of surface water to

experience significant risk of adverse health effects (goodguide). The most dangerous contaminants include Poly-Chlorinated Biphenyls (PCBs) such as Aroclors, Poly-Aromatic Hydrocarbons (PAHs) such as Anthracenes, and Pesticides such as DDT and its derivatives. However, these contaminants are not at significantly higher concentrations near Freshkills than elsewhere in the lower Hudson river waters, and so likely did not originate in the landfill. However, the Parks Department's encouragement of residents to interact with surface water, through activities such as kayaking, results in an increased public health risk. As this risk only becomes significant with regular, repeated exposure via ingestion, the Team reasoned that careful management by the Parks Department could reduce the risk to within acceptable levels.

Cancer Risks

While cancer was not explicitly mentioned in the 2010 parks department survey, the Team researched the link between the former Fresh Kills landfill and cancer due to the request of the client. Potential cancer risks associated with Freshkills Park and the former landfill have become a major concern for residents on Staten Island. This is a result of Staten Island's higher rates of cancer than any other New York borough, particularly in Larynx and Thyroid cancers.⁵ These higher cancer rates have motivated studies into Staten Island's cancer, often centered on Fresh Kills landfill. The last study completed, by Associate Professor of Clinical Epidemiology at Columbia University Judith S. Jacobson, found that the areas closer to Fresh Kills did not exhibit increased cancer rates; indeed, their pattern of higher rates in the south of the island led her to the conclusion that "Staten Island has elevated cancer rates before Fresh Kills; my personal view is that this is linked to contaminants blown onto Staten Island from New Jersey" (Jacobson, personal communication, 2012).

It is important to make the distinction between Fresh Kills Landfill and Freshkills Park. Multiple studies both on Staten Island and worldwide have concluded that, statistically, there is no increased risk of cancer for people living near landfills. However, substances produced by landfills have been comprehensively linked to cancer. The most significant risks are associated with PAHs and pesticides, with additional risks associated with PCBs, VOCs, and some heavy metals; therefore, if residents were to interact directly with these contaminants, they would be exposed to risks.

However, these contaminants are well managed by Freshkills, as they are transported to humans by the same routes of exposure as listed above (air, soil, surface water and groundwater) and therefore, are confined by the infrastructure installed at Freshkills. The Team is unable to concretely conclude a risk level for cancer

5 <http://www.health.ny.gov/statistics/cancer/registry/vol1/v1crichmond.htm>

exposure. The potential link between cancer and Fresh Kills Landfill will require further study. As such, the Team has not made any direct recommendations on how to address cancer in its communications strategy.

5. Communications Best Practices

To gain insights into the best ways for Freshkills Park to communicate effectively to alleviate public concerns, the team researched communications best practices. This included reviewing case studies of comparable landfill-to-park projects, speaking to top experts in the discipline of risk communications, and researching public relations strategies of organizations during high profile crises.

Landfill-to-Parks Case Studies

Hundreds of former landfills all over the world have been transformed to popular parks and recreational open spaces. Innovative engineering techniques have given new life to these forgotten places. The first known conversion goes back to at least 1916, when Seattle created Rainier Playfield from the Rainier Dump (Harnik, Taylor, & Welle, 2006). There is no known database tracking the sites, but estimates range between 250 to 1000 such locations around the world (Harnik, Taylor, & Welle, 2006). Comparable to Freshkills Park, each site has a unique history and infrastructure.

The Team focused on five such landfill-to-parks case studies, in order to draw lessons for the Parks Department, particularly for the formation of its communications strategy in response to potential health concerns from the public. The research methods comprised of literature reviews of publicly available websites, newspaper articles, and interviews with park administration employees. The selected projects include Mount Trashmore Park, Danehy Park, Pelham Bay Park, Spectacle Island, and Nanjido Park, which all vary in age, location, history and infrastructure. Detailed information about each case study is presented in **Appendix H**. The most significant finding from all five case studies is that no cohesive communications strategy has been created to deal with public health concerns that could be used as a model for the Parks Department. However, some projects do offer lessons that Freshkills could use to inform its future strategy.

Mount Trashmore (Virginia Beach, VA) Key Findings:

Size	Date of Landfill Operations	Date of Park Opening
165 acres	1967 – 1972	1974

Potential infrastructure problems and the associated public health concerns should be anticipated by park administration. Virginia Beach could have benefitted from a more proactive and transparent communications strategy to deal with the infrastructure challenges it faced. Specifically, creating a contingency plan in advance and anticipating the scenarios where infrastructure problems could arise, testing messages in advance, and having up-to-date full information disclosed on the park's website may have helped to prevent some apprehension from the community.

Danehy Park (Cambridge, MA) Key Findings:

Size	Date of Landfill Operations	Date of Park Opening
50 acres	1952-1971 (municipal); 1978-1983 (construction fill)	1990

The public has not been concerned about safety due to a long history of a lack of serious infrastructure problems. In addition, the community is satisfied with the park because it answers public needs, such as open recreational space and athletic fields. As long as visitors are satisfied with park amenities and are able to personally experience the site's safety, they are not likely to raise health concerns.

Pelham Bay Park (Bronx, NY) Key Findings:

Size	Date of Landfill Operations	Date of Park Opening
81 acres	1963-1978; illegal dumping until 1980	TBD

Pelham Bay and Fresh Kills landfills have had similar levels of public opposition and both have led to cancer cluster claims. However, Pelham Bay Park is in earlier stages of planning than Freshkills Park and is not likely to serve as an important case study for a communications strategy.

Spectacle Island (Boston, MA) Key Findings:

Size	Date of Landfill Operations	Date of Park Opening
105 acres	1990s – 1959	2006

The site was transformed from the most environmentally degraded island in Boston Harbor to the most environmentally friendly and is considered a popular tourist destination and city asset. It probably succeeded, in part, due to it being isolated from residential communities and the lack of public opposition to the park. Hence, no coordinated communications strategy was needed to deal with public health issues.

Nanjido Park (Seoul, Korea) Key Findings:

Size	Date of Landfill Operations	Date of Park Opening
856 acres	1978 – 1993	2002 (partial) – 2020

An unsanitary landfill was converted to a successful eco-friendly park and no infrastructure challenges have been reported, hence no public health concerns have been raised and there has been no need to create a communications strategy to deal with them. However, budget constraints have also prevented the use of more extensive marketing and communication plans.

Risk Communication Theory

The discipline of “Risk Communication” can provide a valuable framework for helping the Parks Department administrators develop and implement a communications strategy that is responsive and reassuring to public concerns about the transformation of the Fresh Kills Landfill into Freshkills Park. The fundamental dilemma that risk communication addresses is that there is virtually no correlation between the risks that kill people and the risks that alarm them. In fact, findings reveal that people often perceive risk more in terms of outrage factors than in terms of potential for real harm or hazard. Risk communication efforts attempt to reduce outrage, and thus, reduce perception of risk. Research findings are summarized below and more detailed information about risk communication best practices and recommendations are presented in **Appendix I**.

Risk communication best practices include:

- Involving the public as a partner
- Taking different actions for different audiences
- Listening to the public's specific concerns
- Being honest, frank and open
- Working with other credible sources
- Meeting the needs of the press
- Speaking clearly and with compassion

Key Takeaways

- Establish, convene and assist the “Freshkills Park Community Advisory Committee”
- Enhance Freshkills Park website to include a special section for “community”
- Work with local community boards and politicians
- Host smaller, more informal community information sessions where people can learn about the project and give feedback in lieu of large public meetings that can sometimes get out of hand
- Engage third party sources such as environmental groups, academia, press, regulatory agencies and support third party research and monitoring
- Be transparent about the information on public health and environmental safety at the park (via website, on site monitoring stations, signage, fact sheets, etc.)

Crisis Communication Case Studies

Freshkills Park faces various barriers to mitigating public health concerns as well as suspicion of the Park itself. In order for the Parks Department to extrapolate, understand, and adopt best practices in public relations and image repair strategies, the Team researched public relations strategies of organizations during high profile crises including the BP oil spill in 2010, in which BP, like Freshkills, had to face and alleviate health concerns as a major issue for residents in the Gulf. The Team further investigated the banking sector's communications strategy after the global financial crisis of 2008. The banking sector, like Freshkills, had to face and mitigate public suspicion. These communication strategies are discussed below and in more detail in **Appendix J-K**.

The BP Oil Spill (2010)

In 2010, British Petroleum (BP) was held responsible for the worst oil spill in history, releasing approximately 4.9 billion barrels of crude oil into the Gulf of Mexico before the leak was stopped (Hoch, 2010). This world known event made BP one of the most negatively viewed corporations at the time; however, since BP is so large and diverse (it is active in over 70 countries, has 22,100 retail sites, and has a sales and operating revenue of approximately \$297,107 million), the corporation created a wide-scale marketing initiative to combat this negative publicity (BP, 2010). The Team's research findings that are helpful for Freshkill's purposes are summarized below and more detailed information about BP's best practices in crisis communication and image repair strategies are presented in **Appendix J**.

Lessons learned for Freshkills Park:

- Combat negative dialogue by focusing on creating a new public image
- Direct communication with the public will help to build trust
- To maintain trust, the Parks Department will need to deliver on promises made to the public

In 2008, the stock market saw some of its biggest losses in years. The collapse of Fannie Mae and Freddie Mac (two government sponsored enterprises used as quasi-buyers of mortgages), the liquidation of Lehman Bros., the buyout of Merrill Lynch, and the crash of Bear Sterns left many working and middle class citizens without their savings. When the U.S. government bailed out the financial system using \$700 million of taxpayer money, the public view of investment and commercial banks deteriorated rapidly. In addition to this, top banking officials' inflated salaries and bonuses were being exposed on national news broadcasts. Bank of America had a particular problem with negative publicity as well as other commercial banks, such as Chase. Bank of America and Chase particularly targeted the concerns of the client in their marketing and communications strategy. Research findings that are helpful for Freshkills' purposes are summarized below and more detailed information about best practices in financial crisis communication and image repair strategies are presented in **Appendix K**.

Lessons learned for Freshkills Park:

- Empower Staten Island residents by having them feel part of Freshkills Park such as through the establishment of the advisory committee
- Incorporate public interests into Freshkills Park activities and offerings: to the extent possible, give them what they want

6. Freshkills Park Current Communications Approach

The Parks Department has already made significant progress in developing a communications strategy for Freshkills Park. Many valuable communications channels are being utilized to connect with potential visitors and create a fan base for the Park. However, the health concerns that Staten Islanders have expressed in the 2010 survey are not being directly and effectively addressed through any current communication channels targeting the public.

The Parks Department today is reaching out to the public through multiple tactics, including community outreach, print-based, and web-based mediums. All the primary tactics, where the message is directly controlled by the Parks Department, are listed in **Table 2**. This list includes the update frequency/date of last update, estimated reach and whether infrastructure and health information are communicated in each channel. In addition, the Team performed a SWOT analysis for each tactic.

Community Outreach

Among community outreach tactics, the annual “Sneak Peek” events were among the most successful, attracting about 1800 visitors in 2010 and 2000 people in 2011, and offering a unique opportunity for the public to experience the Park prior to its official opening (freshkillspark, 2010; freshkillspark, 2011b). For example, at the 2011 “Sneak Peek” event, visitors were able to walk or bike around a portion of the site, as well as enjoy kayaking, public art, performances, and purchase crafts, among other entertainment (freshkillspark, 2011a). About a dozen other Park events took place in 2011, including kayaking, bus tours, birding tours and various talks. The primary achievement of all the Park events was showing the public that the landfill is transformed and nature has reclaimed the land. In addition to public events, the Parks Department engages in presentations to community boards, civic organizations and other influential Staten Islanders.

Print

Print-based mediums primarily include well designed brochures that are given out at community outreach events. One of the main web-based channels is the Parks Department website, which is the most

extensive source of information about Freshkills Park and includes details about the design, construction, events, public review, infrastructure, safety, brief descriptions of other landfill-to-park projects around the world, and much more (Freshkills Park, n. d.).

Social Press

The Parks Department utilizes many popular social press pages (Facebook, Twitter, Blogger, Youtube, Flickr), but they all rely on updates from volunteer interns, which undermines the long-term consistency of social press, and may limit the amount of scientific information that is posted. The Freshkills blog and Facebook page are important web-based tactics, which are being regularly updated and have consistent messaging (E. Hirsch, personal communication, January 31, 2012).

However, many of the blog posts are aggregations (articles written by others) about sustainability topics not directly linked to Freshkills or health and safety concerns. Most of the Facebook posts link back to the blog and there is minimal interaction with the public on the page. Social Press requires constant monitoring and interaction of the sites, usually from one person or a small group of people who know their audience, know the topic, can maintain continuity, and can relate easily to their readers.

In addition, there are less than 600 fans of the Freshkills Facebook page, compared to close to 90,000 fans for Central Park in Manhattan and just over 25,000 fans for Prospect Park in Brooklyn (Central Park, n. d.; Freshkills Park, n. d.; Prospect Park, n. d.). Of course, it is not realistic to expect a developing park like Freshkills to have the same amount of fans as established parks in the City, but the enormous gap displays the potential opportunity. The Parks Department should consider adding an “e-mail capture” feature on all of the sites where they have a presence and a “like us” feature on Facebook to start building their fan base.

Newsletter

Another important communications tactic is the “Fresh Perspectives” newsletter and news alerts, which are regularly disseminated to about 5,000 subscribers, providing updates on upcoming events, progress on Park construction, wildlife sightings and other sustainability topics (C. Grassi, personal communication, April 18, 2012). Some underutilized web-based communication channels include Youtube, Flickr, and Twitter. YouTube only has one video about Freshkills that has been created by the Parks Department (NYCParksDepartment, 2010). The Flickr account has low membership and the photos are not organized by

folders, making it difficult to navigate or easily view photos from specific events. The Freshkills Twitter account has not been updated in over six months and has few followers.

Opportunity for Specific Health and Risk Mitigation Messaging

As shown in **Table 2**, the Team found only two public communication channels (the Parks Department website and the Environmental Impact Statement) that extensively discuss health and safety of the Park. The website includes an “About the Site” section that describes the landfill engineering and that the Park meets all regulations for landfill mitigation, air quality, soil standards and water quality (Freshkills Park: Site History. (n. d.). Basic information is given about the mitigation of landfill gas and leachate, the different components of the landfill cap, and the environmental monitoring and control systems.

The second communication channel to address health and risk mitigation is the Environmental Impact Statement, which was published in 2009 and can be downloaded from the Parks Department website. Hard copies are also available at all Staten Island libraries and Community Boards. This document “identifies any potential adverse environmental effects” of the Freshkills Park project “and proposes measures to eliminate or mitigate significant impacts” (Freshkills Park, n. d.) The “Public Health” section of the report explains all the possible pollutant exposure pathways; the risk mitigation measures related to infrastructure and monitoring; the federal, state and local regulations and standards applicable to Freshkills; results of modeling projected pollutant concentrations; and the monitoring process and data (Statement of findings: New York City Department of Parks & Recreation Fresh Kills Park project, 2009). Although the information in the Environmental Impact Statement is detailed and extensive, it was written in the early stages of the project’s development and so it does not provide the most recent information, such as the monitoring data, and in addition, it is a very lengthy document that the vast majority of the community would not read.

As part of the monitoring program at Freshkills, annual monitoring results for surface water, sediment, air, soil, and groundwater quality are prepared by Shaw Environmental, Inc. The data analysis in the reports indicates the levels of contaminants at the site and whether the levels meet or exceed applicable government standards. These reports are not published online.

Current Press Discussing Freshkills

In reviewing the current dialogue about Freshkills, the Team explored Freshkills Park coverage in the news media today. Below are summaries of articles that are indicative of the Team’s findings from its review of news coverage from February 2012 to May 2012. It is important to note that although there are several issues raised in Freshkills Park news coverage, there was no mention of public health in relation to Freshkills Park.

Does Staten Island's Freshkills Park need a new name?

Staten Island Live – http://www.silive.com/westshore/index.ssf/2012/05/staten_islands_new_park_needs.html
– Published: Wednesday, May 02, 2012, 9:50 AM by Mark D. Stein.

Description: Frustration about the name of Freshkills Park is apparent as some councilman would prefer to name it Phoenix Park while others would like to hold a contest to get the community involved. The article claims the Parks Department “has not budged.”

Brush Fires Across Region Are Spread by High Winds

NY Times – <http://cityroom.blogs.nytimes.com/2012/04/09/5-alarm-fire-raging-in-former-staten-island-landfill/> – Published: April 9, 2012, 3:07 PM By Andy Newman and Hannah Miet.

Description: Dry, gusty conditions have caused brush fires to start throughout the tri-state region. One of which is Freshkills Park. The fire required 198 firefighters to battle the blaze but at 4:11 am the fire was declared under control.

Projects to Add Wind Power for City Gain Momentum

NY Times - <http://www.nytimes.com/2012/02/29/nyregion/new-york-to-renew-push-for-wind-power.html> – Published: February 28, 2012 By Mireya Navaroo.

Description: The city's Department of Environmental Protection will solicit plans for major wind projects around the city. One site in consideration is the Fresh Kills landfill in Staten Island. There is also talk of installing solar, as well. The article continues to discuss other wind power concepts to address New York City's need for renewable energy.

Freshkills Park: Look for goats, off-road biking and more

Staten Island Live - http://www.silive.com/southshore/index.ssf/2012/04/freshkills_park_look_for_goats.html
– Published: Wednesday, April 18, 2012, 11:11 AM By Mark D. Stein

Description: Eloise Hirsh updated Community Board 2 on the progress of Freshkills Park. The article discusses the fact that the Parks Department is looking for goats for wetland restoration, that there are elements designed for the park, but progress is slow due to lack of money and finally the fact that request for proposals have gone out for solar and wind projects.

SWOT Analysis Key Findings

SWOT stands for Strengths, Weaknesses, Opportunities and Threats and is a common business tool. This is a “four-part approach to analyzing a company’s overall strategy...all four aspects must be considered to implement a long-range plan of action” (Collett, 1999). Although a SWOT analysis is typically used to analyze a company or a brand, the Team found it to be a useful tool for understanding the challenges and opportunities of each communication channel.

Strengths

- Freshkills Park’s main web presence is the Parks Department website, which is a hub for retrieving detailed information about the site and Park project.
- Landfill infrastructure is discussed clearly and consistently across many channels.
- Park tours and events are successful tactics for attracting local community members to visit and experience the transformed site. Unique events can also attract press attention and generate positive dialogue in the community.

Weaknesses

- Several social press accounts are not updated frequently or consistently.
- The Team found few channels that communicate information about public health and safety concerns raised by Staten Islanders in the 2010 survey.

Opportunities

- Monitoring data is available, but could be made publicly accessible to ensure complete transparency.
- The public health and safety messaging could be made more clear and consistent via all applicable communication channels.
- Public presentations about the Park could be made accessible online (i.e. YouTube) for the general public.
- There is an opportunity to integrate and streamline all web tactics with consistent and up-to-date messaging.

Threats

- Lack of public access to monitoring data can be misconstrued as intentional.
- Management of some web communication tactics rely on volunteer assistance, which can undermine consistency.

- Having the NYC Parks Department as the main hub of information may limit content format and updating consistency.
- Social press websites can create opportunities for negative commentary from the public, undermining Freshkills' image.

7. Recommended Communication Plan

The Park Department needs a strong communications strategy to best reach Staten Island residents and assuage their concerns regarding the safety of Freshkills Park. Communications planning looks at how to communicate with various audiences and should reflect the organization's mission, goals and objectives.

Elements of a Communications Strategy

The Team researched literature and sought expert advice to gain insights into the key elements of a strong communications strategy. These key elements are:

- Establishing the Communications Goal
- Identifying the Target Audience
- Crafting the Message to be Clear, Consistent, Actionable, and Transparent
- Choosing the Right Channels and Tactics
- Timing of Activities
- Evaluating the Outcome (Communication Press Studies. 2010)

Establishing the Communications Goal

The first step to a successful communications plan is to establish a clear and measurable goal. The goal of the communications strategy is to be responsive and reassuring to the concerns of Staten Island residents related to the health risks at Freshkills Park. This success should be measured by the reduction in the number of references to health concerns on the next survey conducted by the Parks Department.

Target Audience

To best reach the stated communications goal, the Parks Department will need to target its communication to the audience that will best be able to influence the Staten Island concerns about health risks at Freshkills Park.

Identifying the Audience

To identify the target audience for Freshkills, the Team focused on identifying how the Staten Island community assembles today, specifically looking at the number of people that individuals or groups can influence, or their overall “reach”. In addition, the Team considered if these individuals or groups are influencing the existing dialogue about Freshkills today.

The Team utilized the survey data analysis, demographics data from Arbitron’s Qualitap, and interview and web-based research in order to identify the following eight primary segments of Staten Island with their detailed reach in the table below. The “estimated reach” is reflective of the number of individuals that the indicated Audience is able to influence. This number was estimated from membership information and interviews that determined the individual active participants in these audience groups.

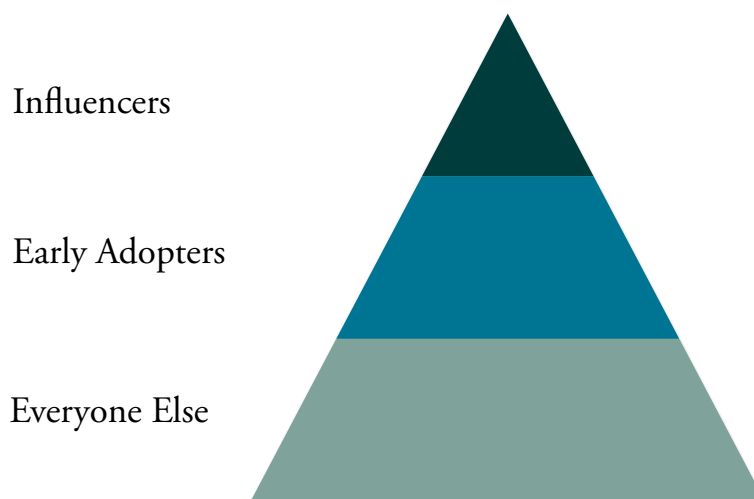
- Academic Institutions
- Activity Groups
- Catholic Churches
- Environmental Groups
- Politicians
- Staten Island Community Boards
- Press
- Family-Based Groups

Segment	Audience	Estimated Reach
Activity Groups	Staten Island Little League	2,000
Activity Groups	The Staten Island Athletic Club (SIAC)	800
Activity Groups	Kayak Staten Island (Free Public Kayaking)	100
Catholic Churches	Church of St. Rita	1,200
Catholic Churches	Church of Our Lady Peace	1,300
Catholic Churches	Church of the Holy Family	1,400
Community Boards	Staten Island Community Board 1	163,000
Community Boards	Staten Island Community Board 2	127,000
Community Boards	Staten Island Community Board 3	153,000
Environmental Groups	Protectors of Pine Oak Woods	2,500
Environmental Groups	Greenbelt Conservancy	1,100
Environmental Groups	Environmental Student Organizations at College of State Island	1,000
Family Groups	Staten Island Museum	80,000
Family Groups	Staten Island Children's Museum	50,000
Family Groups	Staten Island Parent	55,000
Political Leaders	Staten Island Borough President – James Molinaro	468,730
Political Leaders	New York State Senator – Andrew J. Lanza	306,072
Political Leaders	New York State Assemblyman District 63 – Michael Cusick	128,652
Political Leaders	Council Member District 49 – Debi Rose	157,616
Political Leaders	District 50 Council Member – James Oddo	149,902
Political Leaders	District 51 Council Member – Vincent Ignizio	150,654
Political Leaders	NY Congressional District 13 Representative – Michael Grimm	654,360
Private Schools	Moore Catholic High School	1,058
Private Schools	St. Patrick School	546
Private Schools	Jewish Foundation School	480
Public Schools	I.S. 72 Rocco Laurie School	1,636
Public Schools	P.S. 60 the Alice Austen School	1,065
Public Schools	P.S. 69 Daniel D. Tompkins School	1,034
Universities	The College of Staten Island (CSI)	12,829

Prioritize the Audience

To enable the Parks Department to best leverage resources, the Team applied concepts from “Influencer Marketing”, to determine the key individuals (or types of individuals) that should be prioritized for outreach (**Appendix L**). As shown in the figure below, by targeted some individuals, the Parks Department can leverage their influence to disseminate information to the overall public. These “influencers” and “early adopters” can be effective communication channels (Roberts, 2009).

The target audience groups and their respective groups and individuals (where appropriate) were



grouped together based on membership numbers and/or what the organization is currently saying about Freshkills, if anything. Those with the largest reach, of over 10,000 people and already participating in the public dialogue about Freshkills were categorized as “influencers”. The “early adopters” are those individuals and groups that can still reach around 1,000 people, are currently speaking about Freshkills or are trusted members of the community. The remaining groups and individuals fall into “everyone else.”

Influencers

- Community Boards: 1, 2, and 3
- Press: NY1 and Staten Island Advance, NY Times and Staten Island Parent
- Politicians: Borough President Molinaro, State Senator Lanza, State Assemblyman Michael Cusick, Council Member Debi Rose, Council Member James Oddo, Council Member Vincent Ignizio, Representative Michael Grimm.
- Academic Institutions: College of Staten Island

Early Adopters

- Environmental Groups
- Catholic Churches
- Family Groups
- Activity Groups

The Message

In targeting the influencers and early adopters, the Parks Department will need to utilize robust messaging that addresses the health concerns raised by Staten Island residents. The goal of the message is to reduce outrage, build trust, educate and empower. The Team has created six key message points for the Parks Department to utilize for any health-related communications:

We Acknowledge and Understand the Public's Skepticism

To reduce outrage and develop a good standing rapport within the Staten Island community, public skepticism must be openly acknowledged. The risk communications best practices research states that openly accepting the skepticism of community members makes the discussion fair and more open for cooperation (**Appendix I**).

Talking Points:

- The Parks Department understands the mistrust that Staten Island residents have towards the City after being near the City's trash site for over 50 years, in spite of strong opposition to the landfill.
- The public has every right to be concerned about health; the former landfill defined and stigmatized Staten Island and the onus is on us to demonstrate that the park is safe.

We Take Public Health and Safety Very Seriously

For Staten Island residents to subscribe to the messaging assuaging health concerns, the Parks Department administrators must take a firm stance about health and safety being their primary responsibility. Based on the SWOT Analysis on the Parks Department's current communications strategy, messaging about health is not often directly discussed. The Team recommends greater penetration of health concerns

information throughout the communication channels. Transparent and honest dialogue regarding public concerns is a best practice of risk communications and is an important talking point for the Parks Department (**Appendix I**). In addition, the case study on BP's communications strategy echoed the importance of keeping the discourse transparent and honest through social press (**Appendix J**).

Talking Points:

- Freshkills Park operates under New York State's strict air, soil, water and landfill regulations act to protect and preserve public health and the environment through risk mitigation.
- An extensive, three-year environmental impact examination was performed and used to tailor a multi-layered, site-specific monitoring and management strategy.
- No area of Freshkills Park will be opened to the public until regulatory standards for health and safety are demonstrably met.

Our state-of-the-art engineering systems and monitoring programs are designed to protect public health and safety.

Freshkills Park's primary health mitigation asset is its infrastructure. The landfill cap, leachate containment system, and methane capturing network all work to minimize any toxins being released into the soil, air and water (**Appendix C-G**). In reference to the risk communications equation: "Risk = Hazard + Outrage", the park's infrastructure reduces the hazard associated with the former landfill (**Appendix I**). As the survey analysis clearly states, health concerns are the main deterrent for Staten Islanders, so having a message that specifically ties infrastructure to hazard reduction is essential (**Appendix B**).

Talking Points:

- The landfill cap consists of walls, a completely sealed "roof" barrier, new, clean soils, and other features specialized to keep you and the waste completely separated.
- The methane gas capturing network harnesses Freshkills' gas as an energy resources that generates enough electricity and heat for 20,000 Staten Island homes.
- The liquid by-product (leachate) containment system that collects, contains and treats water is capable of processing more leachate than the landfill ever produced

- Environmental control systems and monitoring programs will monitor conditions to protect the environment, public health, and indigenous and migratory wildlife from adverse environmental impacts associated with the landfill. As a result, the potential pathways of pollutant exposure—areas used by hikers or kayakers for example—are monitored and regularly tested to ensure that the public health and the environment are protected.

Freshkills Park builds on an extensive history of landfill-to-park conversions with the largest and most technologically advanced project to date.

Although the history of landfill-to-park conversions dates back to the early 20th century and includes a global project portfolio, the process of turning a landfill into public space still raises questions for potential visitors. This talking point is important for Freshkills Park as the site is the largest and most sophisticated of its kind. The case study research confirms that landfill-to-park conversions have widely been touted as successful and positive for nearby communities (**Appendix H**). Since Freshkills Park utilizes the latest and greatest in infrastructure, The Parks Department should promote itself as the leader amongst an already successful land reclamation model. Current communication by the Park already touches on the history of some of these projects; the Team recommends bringing this topic to the forefront of the messaging strategy.

Talking Points:

- Landfill to park conversions date back to the early 1900's
- Landfill operations and closure are subject to numerous local, state and federal regulations and standards that ensure public health and safety. By applying these or similar standards, as well as environmental controls and monitoring programs, many closed landfill sites regionally, nationally and around the world have been reopened to public use.
- Freshkills' infrastructure and management systems were developed in line with previously trialed successful measures
- Previous landfill to park conversions have had positive impacts on nearby communities, such as raising land value

When addressing health concerns, transparency and stakeholder empowerment are critical overarching principles for the Parks Department. Both points should be integrated within all of the messages delivered to Staten Islanders. As captured in the communications research and BP Oil Spill case study, transparency reduces outrage and skepticism (**Appendix I**). In addition, community involvement is the most effective way to recruit advocates and put ownership into the hands of others. This talking point is specifically important to the Parks Department as the survey data determined health concerns were distributed throughout all groups (**Appendix B**). Transparency and public empowerment act to shed light on health concerns, no matter what audience is targeted.

Talking Points:

- Public will have access to the testing and monitoring metrics that demonstrate the safety of the park

Freshkills Park is a demonstration site that will be a model for land reclamation projects around the world.

Freshkills Park is already promoted as innovative, state-of-the art, and an example of how to turn wasted land into an asset. This statement is not specific to health concerns; it is utilized more as a selling point. However, promoting Freshkills Park as a model for the world could attract a greater audience, creating more opportunities to voice health-specific messaging and reduce apathy and outrage in Staten Island. From a risk communications perspective, this talking point transforms interest in the park's conversion from a health liability into an asset. The survey analysis shows that 7% of survey respondents alluded to Freshkills Park as an asset to Staten Island; this message point seeks to improve that percentage (**Appendix B**). One risk mitigation strategy is simply getting people to attend the site. As landfill-to-parks case study research indicates, when the public visits converted parks, enjoys their amenities, and experiences all they have to offer, health and safety concerns are diminished (**Appendix H**). As the largest and most advanced of its kind, Freshkills Park is already a source of inspiration for other park conversion projects. For example, Pelham Bay Park administrators noted their desire to utilize Freshkills Park as a case study to address their own set of health concerns.

Talking Points:

- The reclamation of Freshkills—with restored tidal marshes, scenic trails for hiking and biking, playing fields and playgrounds—will be one of the most significant and exciting open space projects in our city’s history
- Park will feature a suite of recreational activities that emphasize the importance of environmental sustainability, conservation, and ecological restoration.
- The transformation of the formal landfill to Freshkills Park is a symbol of renewal and restoration to safe and healthy lifestyle
- This transformation will establish Fresh Kills Park as an important asset and destination for the residents of Staten Island, the city and the region.

Tactics: How to Reach the Audience

To best reach the target audience with the core messaging, the Parks Department should implement a three pronged approach:

Community Outreach

- *Create a Freshkills Park Public Health Community Advisory Committee*
- *Develop and Enact a Traveling Community Health Road Show*
- *Develop a Crisis Communications Plan*

Engaging the Press

- *Develop an Enhanced Press Kit with Specialized Health Information*
- *Build Strong Relationships with Targeted Press Outlets and Reporters*

Web Tactics

- *Partner with the Freshkills Park Alliance and Create Enhanced Web Pages for Health Communications*
- *Enhance Web Content and Keep Current*

Under the current Parks Department budget, the Team recommends utilizing tactics and best practices which can all be achieved using only Parks Department staff and resources with no additional funds. These recommendations are divided into the three pronged approach.

Community Outreach

Create a Freshkills Park Public Health Community Advisory Committee

The Parks Department has already utilized a successful community advisory group comprised of stakeholders representing local and regional recreational, environmental, cultural and youth organizations that helped to plan the development of the park. Community Advisory Committees (CAC) are an effective way to ensure the community feels engaged in the process since a representative of their community is speaking on their behalf. CACs are typically made up of members of the community and are designed to serve as a focal point for the exchange of information among the local community and the Parks Department. The Public Health CAC will provide a forum for representatives to discuss their health concerns about the Park, offer recommendations on how to help the Park effectively address public health concerns in the community, and to learn from each other. The Parks Department provides administrative support for the CAC and often presents information at CAC meetings, and in return, learns from the group members' experiences and observations (**Appendix N**).

Membership in the CAC should reflect the target audience and be primarily composed of community influencers and residents that live near Freshkills. Representatives should include public health and environmental science experts knowledgeable about the health risks and mitigations associated with the landfill; local environmental or public interest groups; local academic groups; local government units; and local businesses leaders. Meetings should be held quarterly to assess progress and discuss any new concerns. The Parks Department should test messaging with the CAC when applicable (**Appendix N**).

Develop and Enact a Traveling Community Health Road Show

Between the fall of 2004 and March 2006, a series of meetings and workshops were held to devise a comprehensive vision for the future of Fresh Kills Landfill between residents and the project Team. Staten Islanders, as well as other participants, offered a wide variety of ideas. The success of engaging the public face-to-face, learning about their preferences and their concerns, as well as getting them involved in the project, needs to be duplicated with health related content as the Park needs the community to be reassured about the safety of the park in order to be successful. A similar series of informational meetings, panels and tours should

be held to specifically discuss health concerns, explain the engineering that manages those risks, and introduce the scientists and engineers that built and manage the systems (put a face to the action) (**Appendix M**).

The Parks Department should travel to neighborhoods across the borough with experts and credible third party contributors to deliver the key messages in the previously identified talking points. The Parks Department, in partnership with the community influencers identified above, should hold special events that focus on educating Staten Island residents about public health and safety at the Park, or alternatively incorporate public health and safety themes into broader events. The overall road show could be titled “Freshkills Park and Your Health: How State-of-the-Art Engineering Transforms the Former World’s Largest Landfill into a Green Oasis for Staten Islanders.”

- **Information sessions** around the borough where experts answer community questions/concerns. Not necessarily a “Town Hall” type meeting but smaller, more intimate sessions where the community members can come speak to park experts one on one. These sessions can be co-hosted with Community Boards and local elected officials.
- **Service Learning projects** in partnership with the College of Staten Island’s Center for Environmental Science and other local schools where students can learn first-hand about the park’s infrastructure and create innovative ways of communicating their findings to the community to be displayed in the visitor’s center and online.
- **Guided tours** to give visitors an opportunity to see and learn about the landfill engineering systems, and experience the park first-hand.

These specialized events would not only allow the Parks Department to control consistent messaging, but would get the public to be more engaged with the Park’s progress. The Team recommends that the Parks Department utilize the trickle down communications approach in determining where to acquire venues and whom to invite (**Appendix M**).

Develop a Crisis Communications Plan

The Parks Department must be able to respond promptly, accurately and confidently during an emergency. Many different audiences must be reached with information specific to their interests and needs. Park visitors will want to know how they will be impacted. Regulators may need to be notified and local government officials will want to know what is going on. Employees and their families will be concerned and want information. Neighbors living near the park will need information—especially if they are threatened by

the incident. The press will need information, and denial or refusing to comment can easily overtake the original story. A crisis communications plan can help to prepare staff members on how to properly react to any unique situation that may arise with Freshkills Park. More information on creating a crisis communications plan can be found in **Appendix O**.

Engaging The Press

Develop an Enhanced Press Kit with Specialized Health Information

A press kit is a streamlined way to convey to journalists everything they need to know about the safety of Freshkills Park. Reporters are often under intense deadlines and will need easily accessible, thorough, and clear information about Freshkills' safety; and press kits are a preferred method for satisfying a reporter's needs (**Appendix O**).

The Team recommends that the kit contain the following components:

- Key message talking points
- Fact sheet/FAQs/Myths vs. Reality on park safety and landfill systems
- Bios and contact information for key Team members highlighting their expertise / qualifications
- Glossary of terms specific to landfill systems
- Press-ready compelling visuals of landfill systems/process
- Existing documentation or articles that discuss site safety, state of the art landfill engineering systems, previous successful landfill-to-park conversions, site events
- Research/statements validated by a third party about the safety of the site (can work with CAC on this)

The Team recommends that this be prepared on an easily accessible document or if possible, within an online press room section of a customized website (**Appendix O**).

Build Strong Relationships with Targeted Press Outlets and Reporters

Dealing with the press presents unique challenges in that the news press cannot be controlled since journalists have ultimate control over whether to accept stories pitched to them or how the story is framed. Hence, building ongoing relationships between an organization and the news press is vital to ensuring credible

and relevant material is published (Johnston, 2008.) Creating a list of journalists that have covered Freshkills in the past, informing them about upcoming events or new initiatives calling and speaking to them every three or four months with helpful updates, and inviting them to Sneak Peaks and other important events will create the kind of relationship that is mutually beneficial (**Appendix O**).

The Parks Department must be an accessible source of reliable, verifiable information, regardless of whether the news is good or bad. Be available when reporters need you and try to connect with them. Although a good reporter will not give you preferential treatment, an educated reporter may not have to. Similar to the road show, the Team has identified the press “Influencers” extracted from the target audience.

- Staten Island Advance / silive.com
 - Staten Island Advance Circulation: 59,461
 - silive.com 830,000 unique visitors and over 7.5 million page views every month
 - Most read paper in SI; largest penetration of local market - 79%
- The New York Times / nytimes.com
 - New York Times Circulation: 1,150,589
 - nytimes.com: 44 million page views every month (#1 news site)
 - reporters that focus on Staten Island and Environmental issues
 - No. 1 in overall reach of U.S. opinion leaders.
- New York 1 / ny1.com
 - NY1: approximately 4.5 million home viewers and more than 10,500 corporate offices, 1,900 restaurants and bars, and 60,000 hotel rooms; 46% of NYC residents have access to NY1 at home;
 - ny1.com receives about 21,630 unique visitors and 64,890 (3.00 per visitor) page views per day;
 - 2 shows dedicated to Staten Island: This Week in Staten Island and Your Staten Island News Now
 - Amanda Farinacci – Staten Island Reporter
 - This Week on Staten Island, currently hosted by Anthony Pascale and Christopher Pessolano
- SI Parent / siparent.com
 - Part of the Family Group segment;

- Monthly Publication: 50,000 magazines printed & distributed plus website, e-newsletter, Facebook

The press representatives that the Parks Department should target are listed below with their relevant contact information. A comprehensive list of potential press outlets and reporters contact information covering environmental science, sustainability, engineering, public health, Staten Island, family interest and science is provided as a supplement at the end of the document.

Name	Company	Title	Coverage
Laline, Brian	Staten Island Advance	Editor	Local News; National News; Regional News
Hanley, Mark	Staten Island Advance	Editorial Page Editor	Editorial Page
Randall, Judy	Staten Island Advance	News Reporter	Local Government and Politics; Local News
Young, Deborah	Staten Island Advance	News Reporter	Education; Local News; Secondary Education
Wroblewski, Tom	Staten Island Advance	Political Editor and "Strictly Political" Blogger	Government and Politics
Rich, Kiawana	Staten Island Advance	Staff Writer	Community/Neighborhood News; Local News
Foderaro, Lisa	New York Times, The	Reporter	
Navarro, Mireya	New York Times, The	Environment Writer	Environment; Green Technology
Driscoll, Bree	NY1 News	Your Staten Island News Now Anchor/Reporter	Staten Island
Montalbano, Mara	NY1 News	Your Staten Island News Now Anchor/Reporter	Staten Island
Pascale, Anthony	NY1 News	Your Staten Island News Now Anchor/Reporter	Staten Island
Farinacci, Amanda	NY1 News	Staten Island Reporter	Staten Island
Frischia, Gerri	Staten Island Parent Magazine	Editor	Parenthood
Hecht, Roselle	Staten Island Parent Magazine	Publisher/Editor-in-Chief	Parenthood
Stein, Marc D.	Staten Island Advance	News Reporter	West and South Shore of Staten Island

ENHANCING WEB IMPACT

The internet is an extremely versatile tool for communications with such tactics as web logs (blogs), emails, social network statuses, videos, text/audio/video chats, and custom designed websites. The web is so expansive and ever changing that every tactic cannot be acknowledged nor can the reach be accurately assessed, so the Team attempted to research the most popular and applicable services to meet the Parks Department's objective which include:

- Landing pages which are the first contact a visitor will have after being directed by a particular web campaign.

- Search Engine Optimization (SEO) which is achieved by designing a website in a manner that attracts traffic from “free”, “organic”, “editorial”, or “natural” listings in search engines such as Google, Yahoo, and Bing.
- Email marketing in which an email newsletter contains content created by the sender, which is distributed to subscribers that have opted in to receive updated information.
- Social networking which utilizes online platforms to help build social relations. These networks include but are not limited to Facebook, Wikipedia, Wordpress, Twitter, Flickr, YouTube, and Google+.

“The importance of e-government cannot be understated. More and more, citizens turn to the web as a starting point when they need to engage the federal government” (Freed, 2011).

Partner with the Freshkills Park Alliance and Create Enhanced Web Pages for Health Communications

Developing this site to be the primary location for health related information is important because the Parks Department has indicated that updating the NYCgovparks.org web page can be time consuming, which undermines the need to have timely, relevant and transparent information on the web, potentially hindering communications. A specific landing page will need to be developed that addresses only health related content. Within this page, the focus should be on Search (this function will need to be implemented), Functionality, and Online Transparency, including posting easily accessible and understandable monitoring results in order to achieve high satisfaction with users (Freed, 2011) (**Appendix M**)

Ensure Search Engine Optimization (SEO)

In order to improve SEO, the Parks Department should adhere to the following suggestions.

- Create Unique Content - Provide original and quality content including page titles, landing page content, and proprietary online articles distributed throughout the web.
- Go Mobile – More than 75% of users browse the internet using smart phones and tablets so ensure the new website is mobile friendly (Top 5 SEO Tips For 2012, 2012).
- Speak the Code – Update the websites code to contain the most relevant keywords people will use in their searches.

- Rework the Navigation – the site needs to have a high quality user experience and easy accessibility. Items such as page load speed will be factored into the algorithms (Top 5 SEO Tips For 2012, 2012).
- Be Social – Use social tactics and stay active with them. When the Team performed searches based on Freshkills keywords, Wikipedia appeared within the top five for every search; therefore it should be continuously updated with new and relevant content. Also, Facebook and blog comments are factored into search results and should be utilized (**Appendix M**).

Enhance Web Content and Keep Current

The primary services the Team recommends the Parks Department utilize are Facebook, Wikipedia, Wordpress blogging, Twitter, Flickr Photo Sharing, YouTube Video Sharing, and Google+. In order to successfully navigate the social networks the Parks Department should follow the guidelines below:

- Interact with clients regularly - Get social network users involved by introducing questions to help create conversations among all community members. When members begin to respond, make sure to provide them with feedback so that the Parks Department is portrayed more as a human interaction rather than a robotic corporate response. For instance, the Parks Department could ask the Facebook subscribers, “When you describe Freshkills Park to your friends, what do you say?” Then engage with the responders.
- Talk about the organization - Consumers wish to know how an organization's products or services will directly benefit him/her (Rooney, 2009). Based on this information, communities should be informed about new milestones the park has achieved or services the park will offer that would be significant and beneficial to the stakeholders of the firm.
- Beat the obstacles – Managing the range of social networks can be difficult. The Team has identified 6 that can be useful, but more could present themselves as beneficial. Keep the networks limited as unresponsive posts can leave followers discouraged. The Team recommends the internet service Ping.Fm to post and monitor multiple networks at once.
- Be transparent and honest - In order to attract clients to Parks Services business, it is necessary to be completely honest and transparent in the use of social networks (Cocheo, 2009). The information should always refer back to the key messaging points established by the Team (**Appendix M**).

Message Customization Strategy

In distributing the above core talking points to the identified target audience, the Parks Department should seek to customize the information to best engage their intended audience.

General Public

When speaking to the general public, messaging should be clear, simplified and actionable (Glenn and Gray, 2012). The goal of targeting the general public is to redirect associated outrage, fear and apathy into active engagement and self-education. By increasing the number of active participants in the discourse, the messaging becomes more influential, thus enhancing the ability to address health concerns. The Team recommends the Parks Department reference the following points when communicating to the general public:

- Acknowledge public skepticism at the start to disarm those ready to impressively discount the message.
- Declarative statements keep the message's tone transparent and the stance of the Parks Department strong and clear.
- Maintain a positive tone throughout the message by avoiding words with negative associations.
- Scientific jargon should be omitted from the message, however direction to more detailed information can be provided via web link or references.
- Keep the structure of each talking point consistent: If a message starts with a declarative sentence in the first talking point, all talking points should begin the same. This keeps a crisp flow throughout the message.

Technical Audience

When speaking to a more technical audience such as academics, environmental health professionals, health practitioners and other research professionals, the messaging should be detailed, transparent, and informative (Glenn & Gray, 2012). The goal of targeting this audience is to achieve a level of third-party verification from health experts in Staten Island. Researcher-focused groups can be strong influencers within a community, both for and against initiatives related to public health. Therefore, the Parks Department should seek support from technically inclined experts willing to promote the health and safety of the park. In addition, the Parks Department should communicate to technical focused groups who oppose the Park's

development in an effort to establish trust and cooperation going forward. The Team recommends the Parks Department reference the following points when communicating to the technical audience:

- Be objective. The message should not aim to persuade, but rather inform (EPA, 2007).
- Provide specific examples of how the park's health and safety are managed and monitored to date.
- Demonstrate commitment to transparency by requesting feedback and leading people to additional resources about the Park.
- Explain the infrastructure at a detailed level. Provide a diagram of the landfill cap to ensure clarity.
- Encourage sharing of toxicological research, resources, and testing results by making them readily available via web links or phone requests.
- Focus less attention on showcasing park amenities, but do explain how people interact with the park.

The Press

In communications with the press, the messaging should be simple, compelling, and honest (Ingenium Communications, 2009). Maintaining a consistent and positive dialogue with Staten Island journalists requires a unique set of messaging tactics, as it will likely alter before reaching the public. Given this lack of control, messaging should leave minimal room for interpretation by the press representative. Thereby, the Team recommends the Parks Department reference the following points when communicating to the press:

- Be transparent about the health and safety of Freshkills Park. While every question does not need to be answered, it is dangerous to fabricate or assume (Ingenium Communications, 2009).
- Use plain language when addressing technical elements like the landfill infrastructure and toxicology.
- Openly acknowledge skepticism and validate public health concerns determined from the free response survey. Good news and bad news should be communicated with equal detail (Ingenium Communications, 2009).
- Provide compelling facts and figures that convey the park's devoted work on managing and monitoring public health.

Communications Strategy Action Plan

Understanding the overall target audience, the main message that needs to be delivered, and how those messages should be customized, the Team integrated these findings into an overall action plan. The communications strategy action plan is focused on those characterized as “influencers” and “early adopters,” and it identifies the customized tactics and messaging that is critical to use in reaching the specific audience.

Influencers			
Audience	Reach	Tactics	Message
Politicians	470,000	<ul style="list-style-type: none"> – Health Community Advisory Committee – Site Tours – One-on-One Meetings with Elected Officials/Staff – Co-Host Information Sessions – Co-Host Tours and Events – Fact Sheets 	State-of-the-Art Engineering Public Health Model for Land Reclamation Projects Acknowledge Skepticism
Academic Institutions	15,000	<ul style="list-style-type: none"> – Health Community Advisory Committee – On-Site Student Learning – One-on-One Meetings with Faculty 	State-of-the-Art Engineering Public Health History of Landfill-to-Park Conversions
Press	470,000	<ul style="list-style-type: none"> – One-on-One Meetings with Reporters – Press Kit (Fact Sheet/Bios of Team Members/Visuals/Articles) – Press Tours – Online Press Room 	Public Health Transparency Technology Model for Land Reclamation Projects Acknowledge Skepticism
Community Boards	470,000	<ul style="list-style-type: none"> – Health Community Advisory Committee – Site Tours – Present at Community Board Meetings – Co-Host Information Sessions – Co-Host Tours and Events 	Acknowledge Skepticism Public Health State-of-the-Art Engineering Transparency Model for Land Reclamation Projects

Early Adopters			
Audience	Reach	Tactics	Message
Activity Groups	2,900	<ul style="list-style-type: none"> – Co-Host Activity-Based Events – Activity-Based Fact Sheet – Online Social Networks – Information Sessions – Health Community Advisory Committee – Site Tours – Landing Page 	Public Health State-of-the-Art Engineering Transparency History of Landfill-to-Park Conversions Model for Land Reclamation Projects
Catholic Churches	3,900	<ul style="list-style-type: none"> – Information Sessions – Fact Sheet – One-on-One Meetings with Pastors – Site Tours – Co-Host Church Events – Site Tours – Landing Page 	Public Health State-of-the-Art Engineering Transparency Model for Land Reclamation Projects
Environmental Groups	4,600	<ul style="list-style-type: none"> – Information Sessions – Environmental-Based Fact Sheet – Health Community Advisory Committee – Online Social Networks – Co-Host Environmental Events – Site Tours – Landing Page 	Acknowledge Skepticism Public Health State-of-the-Art Engineering Transparency History of Landfill-to-Park Conversions Model for Land Reclamation Projects
Family Groups	185,000	<ul style="list-style-type: none"> – Information Sessions – Family-Based Fact Sheet – Health Community Advisory Committee – Online Social Networks – Co-Host Family Events – Site Tours – Landing Page 	Acknowledge Skepticism Public Health State-of-the-Art Engineering Transparency History of Landfill-to-Park Conversions Model for Land Reclamation Projects

Budget Scenarios

The recommendations above are based upon an assumption that the Parks Department has no additional funds to put towards addressing health concerns in a communications strategy. If the Parks Department was to secure additional funds, through grants or otherwise, the Team has made recommendations for optimizing the use of \$10,000 and \$25,000 of extra funds to address and assuage health concerns of Staten Island residents.

Budget Scenario - \$10,000

If Freshkills Park had an additional \$10,000 for health communications, in addition to the recommendations above, the Team recommends that the Parks Department:

Develop an online interactive web tool that engages users to experience the park virtually while educating the public on how the Parks Department is protecting the public from health risks.

The online tool will have an aerial shot of Freshkills that will contain dozens of color-coded dots that users can click (**Figure 13**). When a user clicks the dot, a photo pops up that is an actual photo of that location within the Park. This will allow the user to view the park from that vantage point while also being provided information about the park conversion and in particular, the infrastructure that is ensuring that the park is safe. The color coded dots will correspond to different themes of the Park:

- Nature (green)
- Sports/Activities (Red)
- Engineering (Brown)
- Future (Yellow)
- History (Orange)
- 9/11 (Purple)

For example, a point on the north mound could be a yellow dot. Once a user clicks this yellow dot, a photo would appear showing the view of Freshkills Park from that spot. While looking at the photo, the user can review information about that section of the park. For example, this information can include when the north mound is expected to open to the public, what it will look like when fully converted, what it will offer, and how the infrastructure at that location is protecting people from health risks. This tool will reinforce the

messaging that Freshkills Park has state of the art landfill infrastructure system and the Parks Department is committed to transparency and community engagement.

To implement this recommendation, the Parks Department will need to hire a graphic software designer. tool is something the Parks Department will be able to implement if a grant is obtained for hiring a graphic software designer. This tool will primarily operate as support for the Status Quo initiatives indicated above.

A more advanced version of this tool is giving the user the ability to laterally navigate around the park at ground level as if virtually walking around in the park – as seen in the image here.

Quotes from software development firms indicate that the cost for this tool will be somewhere in the range of \$8,000 – \$10,000 for the advanced version of this tool and under \$5,000 for the basic version (NetSmartz, A-1 Technology).



Budget Scenario- \$25,000

If Freshkills Park had an additional \$25,000 for health communications, in addition to the recommendations above (including the interactive web tool) , the Team recommends that the Parks Department:

- Partner with the Staten Island Museum on a professionally curated exhibit about the site's reclamation that includes the history of Freshkills and also focuses on how public health is protected
- Creating a custom built model of the landfill cap to be used an educational tool to help illustrate the process of capping the mounds visually

Custom Built Model of the Landfill Cap

A custom built, scaled model of the landfill cap can serve an educational tool used by the Freshkills Team to help illustrate the process of capping the mounds visually. The model can be housed in the Freshkills Park Visitors or Educational Center, and used in community outreach presentations such as school and library demonstrations.

There are several ways to produce the landfill cap model, depending on the design method and the materials used and cost:

- The Capstone Team contacted Rutgers School of Engineering Mechanical Engineering Department on 5/2/2012, (<http://www.soe.rutgers.edu/>). The department suggested working with undergraduate students to create a CAD (Computer Added Design) design of the capping system with topography (side view). Then creating the prototype as part of a project based on the CAD design. A summer internship was another suggested idea.
- The School of Engineering also suggested holding a student competition for the best design and model created.
- The Capstone Team contacted the California based KiwiMill company (<http://www.ammodel.com/>), that specializes in custom model fabrication. They gave a quote of (\$2,000 – 5,000) for a 3 foot model showing the side view of the cap system and soil layers. The variation in price comes from in size and technical detail of the model.

In utilizing a model, the Parks Department can educate the public about the infrastructure of a landfill cap helping to address their concerns about the safety of Freshkills Park. This is an engaging tool that would enable a direct conversation about how infrastructure can protect the public from health risks.

Exhibition with the Staten Island Museum (SIM)

SIM has archives for both natural history/environment and the history of Staten Island and refer to themselves as the leading environmental institution on the island. Building on existing ties with the museum, a professionally curated exhibit about the site's reclamation that includes the history of Freshkills and also focuses on how public health is protected could eventually have a home in the Freshkills Park Visitors or Educational Center. The starting point of the exhibit could be Ian McHarg's (author of Design with Nature) vellum architectural blueprints and landscape drawings of Fresh Kills from 1967. Photographic archives could be supplemented by SI Advance historical photos of Freshkills as well as renderings from the Master Plan and information about the landfill engineering systems. Cost to set up an exhibition varies, but in speaking to the museum, \$10,000-\$15,000 was cited as a good range for design and preparation for a small museum exhibit.

Implementation of Communications Strategy

The key recommendations for the Parks Department is to develop a Public Health Community Advisory Committee, conduct a community health roadshow, prepare crisis communications, build a comprehensive press kit, seek partnership and build relations with the press, and implement key web enhancements.

The Team recommends the Parks department implement these recommendations in phases. A phased approach is consistent with best practices in communication as it allows lessons learned in early phases to be incorporated in the systems prior to a full roll-out of the communications strategy (Stevens, 2009).

With that guidance the Team recommends that the Parks Department implement the Communications Strategy in three phases.

Phase 1: Testing Ground – 0 to 6 months

In the first phase, the Parks Department should focus on building its public health community advisory committee. The members of the advisory committee should consist of the prime targets in the “influencers” category as well as select members of the “early adopters”, with the exception of the press. In establishing the community advisory committee, the Parks Department should first focus on recruitment but should quickly set goals for what it needs to accomplish in reaching the Staten Island community and addressing health concerns related to Freshkills Park.

This first 6 months should also be used to test the actual messaging. The Parks Department should seek feedback from its public health community advisory committee and make any modifications necessary. This feedback should be included in the press kit that should be developed in these first six months and also be leveraged to start to build materials for the public health roadshow.

Finally, the Parks Department should immediately start to integrate health information on its web platforms, such as the inclusion of health fact sheets.

Phase 2: Full Roll-Out – 6 months to 2 years

In the second phase, the Parks Department should incorporate the findings from the testing ground phase to complete the full roll out of the communications strategy. This will include hosting public health road show related events such as information session, tours and service learning projects. Also, the Parks Department should focus on its engagement with the press: build relationships and get ahead of the story

with a prepared crisis communications plan. Finally, the Parks Department should implement search engine optimization, while also integrating its assorted web platforms while providing consistent social press communication.

Phase 3: Reassess – After 2 years

After 12 months of the Staten Island community interacting with the Parks Department through its fully launched communications strategy, it is time to reassess progress. In the third phase, the Parks Department should reissue the 2010 survey to Staten Island residents to gauge the impact that this strategy has had on the health concerns of Staten Island residents.

In particular, the Parks Department should examine the survey findings against the audience and messaging segmentation to determine if concerns have been assuaged and people's perceptions about Freshkills Park has changed.

The Parks Department should utilize these findings to determine what changes are necessary to ensure that it is continuing to be responsive and reassuring to Staten Island residents concerns about health risks at Freshkills Park.

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9. Appendix

Appendix A: Fresh Kills Landfill History

1940 – Waste disposal in NYC exceeded 27 million cubic yards annually, 87 landfills open in NYC

1943 – Rikers Island Landfill, a 460 acre site, closed; operation moved to Fresh Kills

1946 – The government of Staten Island begins to expropriate private homes in the Western Shore under the guise of building “a park in Fresh Kills”

1947 - First secession bill introduced in the NY State Legislature by SI residents due mainly to the frustration of not being in control over land use decisions.

1948 - Fresh Kills garbage dump opened in the face of public outcry, supposedly for three years

1951 – A comprehensive waste management plan for the City of New York was developed, 11 new incinerators constructed, but it did not solve the landfill capacity problem

1956 – Only 8 landfills remained in NYC, the city was forced to raise the final grade of existing landfills to maximum heights of 40 feet. NYC’s volume of waste is now at 4.4 million tons per year.

1974 – Due to the Clean Water Act of 1972, wading birds are first spotted returning to the cleaner waters around Staten Island. By 1994 there were approximately 1300 pairs of wading birds on Shooters Island (43 acres), Prall's Island (80 acres), and the Isle of Meadows (101 acres)

1985 –Fresh Kills and a small Queens facility were the only two remaining landfills in New York City. Vertical limit of landfills was increased to 505 feet.

1986 – Fresh Kills becomes the largest landfill in the world.

1987 – Volume of waste in New York City is 8.1 million tons per year

1989 - The state ordered the landfill closed by July 1991, but then-Mayor Ed Koch insisted it could stay open for another 40 years. State Legislature passed a bill authorizing a study, and initiating the process of Staten Island’s secession at the petition of Staten Island residents.

1993 - In a non-binding referendum, voters on Staten Island approve secession from New York City. 65% of Staten Island voters approve a draft charter for an independent City of Staten Island but the charter was not adopted by the state government.

1996 – The New York State Senate approves the closing of the Fresh Kills Landfill

2001 – Fresh Kills Landfill briefly closed, reopened to accept debris from 9/11 tragedy, and closed again permanently after that

2004 – The first meeting held to discuss the first section of the park project, where many residents voiced worries about health, construction, traffic and safety.

2009 – Public hearing on the Scope and Supplemental Environmental Impact Statement held at PS58 and Wagner College

2010 – New York State Department of State awarded Freshkills Park with a grant of \$1.25 MM for the design and construction of North Park signature features and educational outreach. The first large-scale public event was held at the Freshkills Park site. 'Sneak Peak at Freshkills Park' drew approximately 1,800 visitors

2011 – The New York City Departments of Sanitation and Parks & Recreation celebrated the 10th Anniversary of the last barge of waste to Fresh Kills Landfill by welcoming a barge loaded with young trees to the site

Appendix B: Data Analysis

In absolute terms, health and safety along with an interest in park activities and nature were the two most frequent responses on the survey. The most telling detail of the data is that health and safety is a concern across all preference groups, regardless of whether they want to visit the park or not. In contrast, respondents who are excited about activities and nature are almost entirely drawn from respondents who will probably or definitely visit the park (**Figure 1**).

- Health concerns are consistent regardless of resident's willingness to visit (**Figure 2**).
- Of those respondents who selected "Definitely Would Not Visit," 80.4% listed "Health concerns" (**Figure 3**).
- Of those respondents who selected "Probably Would Not Visit," 57.8% listed "Health concerns" (**Figure 4**).
- Of those respondents who selected "Not Sure," 47.9% listed "Health concerns" (**Figure 5**).
- Of those respondents who selected "Probably Would Visit" 34.1% listed "Curiosity of outcome," 25.3% listed "Park is desirable," while 19.4% listed "Health concerns" (**Figure 6**).
- Of those respondents who selected "Definitely Would Visit" 25.3% listed "Park is desirable," 20.6% listed "Park for family time," while only 4.9% listed "Health concerns" (**Figure 7**).

Another key finding from the data analysis is that health concerns do not vary widely by age. Health concerns are fairly consistent across age groups (**Figure 8**). Gender is also not a determining factor in visitation preference (**Figure 9**).

Another key finding is that proximity to the park contributes to visitation preference. For those respondents that would definitely not visit, probably not visit or were unsure, their preference negatively correlates with their distance to the park; in short, the farther someone lives from the park, the less likely he or she wants to visit the park (**Figure 10 & Figure 11**).

Gender is not a significant determinant in whether a respondent listed health and safety in the free response data as 18.6% of males and 25.1% of females listed health and safety as a concern.

Appendix C: Freshkills Park Scientific Research

In examining the possible dangers to public health, the Team considered contaminants in the air, groundwater, surface water, and soil. These vectors were chosen as they are the primary routes for any contaminant to come into contact with a person, as well as being the primary routes that contamination could escape the landfill. In all of these cases, the Team found that the risks to public health were or could be managed adequately by Freshkills.

Appendix D: Airborne Risks

The air at Freshkills Park poses very limited risk to users of the park. The public health risks are linked to landfill gas produced by decomposing garbage that is composed primarily of methane and carbon dioxide, as well as trace amounts of over 41 Volatile Organic Compounds (VOC's) (see **Figure 12**). Methane gas is hazardous by inhalation only in very large concentrations that are very unlikely in any open space; its primary danger is its flammability (Chemical Profiles: Methane, n. d.). Carbon Dioxide is also hazardous by inhalation only when present in large concentrations (very unlikely in open spaces) and has no other associated risks (Chemical Profiles: Carbon Dioxide, n. d.). Also, VOC's are suspected carcinogens, but this link is not confirmed (Chemical Profiles: Volatile Organic Compounds, n. d.). Unfortunately, due to the low density of these gases, they move upward through the landfill and soil toward the open air. To combat this, Freshkills, has installed a significant and well-designed landfill gas capturing system, utilizing a geomembrane overlying porous and permeable gravel to funnel the gas into a landfill gas powered electricity generator. This process removes a large percentage of the methane in the gas and emits the carbon dioxide in a way that is not dangerous to health, enabling park administrators to monitor the quantity of landfill gas being released by the landfill.

Remaining health concerns include the amount of VOC's produced, the potential of a landfill gas leak, and the eventual venting of low-level landfill gas directly to the atmosphere. The Team was unable to find current data on VOC output; however the historical total VOC content was found to be below 1,000 ppm in the landfill gas, with the major contributor being ethane (see **Figure 12**). There are no existing standards for VOCs in non-industrial settings or for VOC's as toxins, rather than as carcinogens. Therefore, to assess the VOC output of Freshkills, the Team researched the levels of VOCs in New York City through the New York State Department of Environmental Conservation and found that in the majority of cases, the VOC concentrations at Freshkills are comparable to that elsewhere in the city, particularly in some schools (Volatile Organics Network Description, n. d.). Unfortunately, these records show an unusually high concentration for many VOCs in 2001 and again in 2003. This suggests that although landfill gas leakage is significantly controlled, this control is not perfect; therefore, monitoring should be strict and an emergency response plan constructed.

The concern of a landfill gas leak is a valid one, with a 90% probability of a liner failure within 40 years (Pivato, 2011). This risk is somewhat mitigated due to the landfill gas monitoring system in place because of the collection of landfill gas for electricity generation; so through proper coordination and additional monitoring methods (particularly as the quantity of landfill gas collected naturally decreases with time), the

Parks Department will increase its likelihood of being aware of a leak at an early stage. Finally, Freshkills may eventually consider releasing low amounts of landfill gas when quantities are no longer efficient for capture and burning; however, before this option is considered, VOC output should be very carefully monitored to ensure public health.

Appendix E: Groundwater Risks

The groundwater associated with Freshkills also poses a very limited risk to residents of Staten Island. Although the groundwater is likely to be contaminated [the latest data the Team identified on contamination levels was in a report by Shaw Environmental (2007)], there is little potential for an exposure pathway to humans. This is because Staten Island's drinking water is supplied by the New York City water supply system and originates from upstate New York. There is potential for residents to use the groundwater for irrigation, but this potential is considered low, with only five wells within a mile of the landfill as viable sources of non-potable groundwater (Petitioned public health assessment, 2000).

The contaminants were found to show generally decreasing concentration trends, though the contaminants still exceeded groundwater protection standards (Shaw, 2007). These decreasing trends are a result of the decreasing volume of water infiltrating the landfill, the effectiveness of the leachate management system, and the natural aging process of the landfill. The landfill walls and the geomembranes have been effective at reducing the rainfall that enters the capped mounds and therefore, effective at reducing the quantity of leachate produced. Groundwater inflow is effectively halted by the use of a Water Level Reduction system (Varicore, 2012), designed to prevent an increase in leachate quantity or the bypassing of the leachate management system. The leachate volume will likely be further reduced as the final two mounds are capped. The management system routes most of the leachate that is produced towards treatment, further reducing the contamination of the groundwater. The percentage of leachate re-routed by this system may also increase with time, depending on the porosity and permeability of the sediments underlying the mounds. Lastly, the aging process of the landfill results in less leachate produced with time, as the quantity of soluble chemicals remaining in the landfill is reduced.

Thus, the potential risk to public health of groundwater contamination is low and is lessening due to the low risk of exposure and reducing contamination. The concern of a failure of the geomembrane, congruous with a landfill gas "leak" mentioned above remains valid, though in the case of groundwater infiltration the increase in hazard resulting from a leak is much smaller than that from landfill gas (Pivato, 2011). This is because the failure is likely to be above the level of the water table inside the landfill, so a "leak" is unlikely even if there is a failure; further, even if a failure may produce more contamination of groundwater, there is still low risk because there isn't an exposure pathway to humans.

Appendix F: Soil Risks

The soil associated with Freshkills Park again poses a very limited public health risk. For soil contamination to affect human health, contaminants can be ingested, absorbed by the skin, or inhaled through the attachment of contaminants to dust. Soil contamination itself is primarily produced by leaching or by direct mixing of solid contaminants into the soil. The most common soil toxins include heavy metals, such as Chromium and Lead, as well as petroleum, pesticides, nitrates and ammonia; however, the Team was unable to find soil sampling data detailing the concentrations of these contaminants.

Regardless, the surface soil is not expected to have any contamination as Freshkills Parks' development requirements mandate that in addition to the soil separating the waste from the actual capping of the mound, an average of two feet of new soil is added as an additional barrier between the mound and the public (New York City Department of Parks & Recreation, 2009). By implementing this infrastructure, Freshkills effectively prevents any possible contamination from reaching the soil. In the event of a geomembrane failure along with a high quantity of water transmitted into the landfill, capillary action could result in contamination of the clean soil. Although this case is unlikely and it will result in a low concentration of contaminants contained in a localized area, the monitoring and emergency response plans should consider this risk; however, due to the gas monitoring system mentioned above, if there is an opening in the cap, landfill gas will be released, transforming the gas monitoring system into an early warning system. Although this is reassuring, soil monitoring is still necessary.

Appendix G: Surface Water and Sediment Risks

The surface water and sediment surrounding Freshkills poses the greatest public health risk of any contamination pathway in the park. The surface water at Freshkills has significant concentrations of a variety of contaminants, including several that can exceed New York State Standards (NYSS) at times. The contaminants of concern that exceed NYSS include ammonia, dissolved oxygen, metals, poly-chlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and pesticides. There is also a range of contaminants present in the surface water which have no current standards; therefore these may also be exceeding safe levels.

The most relevant standards for contaminants at Freshkills include SD-class NYSS and New York State Saltwater Sediment Criteria (NYSSSC). The SD-class standards are defined for water that is suitable for secondary contact recreation, where contact with water is minimal and ingestion is unlikely; thus, these standards are applicable to waters where activities such as boating and kayaking are present. The NYSSSC provides standards for contaminants that pose any risk to human or environmental health (NYSDEC, 1999). Therefore, contaminants exceeding either of these standards should be a cause for concern and need to be addressed with specific target actions in an emergency response plan.

Of the contaminants known at Freshkills, some are defined as “leachate indicators” (Shaw, 2010), while others are “non-indicators.” The terms Indicator refers to whether the contaminant exists above background levels in proximity to Freshkills (i.e. if a contaminant exists at higher concentrations near Freshkills, it is attributed as a likely sign of leachate contamination); if it exists near Freshkills at concentrations seen commonly elsewhere, then it is deemed a non-Indicator. Seventeen contaminants have been determined potential indicators of landfill leachate, as these contaminants are present at higher than background levels in proximity to the landfill. Four of these indicator parameters exceeded SD-class NYSS at times of peak concentration (Fresh Kills Landfill Annual Surface Water and Sediment Monitoring Report, 2010). Twenty-seven non-indicator parameters exceeded New York State Department of Environmental Conservation (Shaw, 2010) criterion, either of surface water or of saltwater sediments. For more detail on the individual parameters, please see **Table 1**. This is not necessarily a guarantee that the contaminant either comes from or does not come from Freshkills, but serves as a useful indication. However, for public health risks, the danger that is due to Freshkills isn’t because of the pollution it leaks into the surface water and sediment, but because park activities encourage interaction with the surface water and sediment, risking ingestion.

The health hazard associated with the identified contaminants varies, but the substances that exceed standards include recognized carcinogens, developmental toxicants, and reproductive toxicants. The contaminants that present the greatest hazard are contained in the sediment; a 20kg child would have to regularly consume over 45 liters of surface water over a lifetime for the surface water contaminants to have significant adverse health effects (goodguide.com, 2012). Unfortunately, there are contaminants in the sediment that could cause adverse health effects at as low a regular consumption as 1 gram of sediment per day (Shaw, 2010). In terms of risk, the “regular” dosage requirement is important, as it can be used to dramatically lower the risk associated with these contaminants. It is worth noting that none of the more toxic contaminants are designated indicator parameters and therefore, are unlikely to be a result of the landfill itself.

Freshkills Park increases the risk of adverse public health effects because of surface water when it encourages residents of Staten Island to interact with the surface water and sediment. The activities that are promoted, particularly kayaking and other water sports, increase the risk to participants. The risks can be managed through signage and monitoring of participants in identified “risky activities.” As a result, Freshkills should be able to actively minimize risk.

Appendix H: Landfill-to-Parks Case Studies

Mount Trashmore Park, Virginia Beach, VA

Size	Date of Landfill Operations	Date of Park Opening
165 acres	1967 – 1972	1964

Mount Trashmore is one of the oldest landfill conversion projects in the United States and is currently one of the most popular parks in Virginia Beach, with over one million visitors per year (Garrow, 2007). Some interesting features and amenities include an educational xeriscaping garden, skate park, vert ramp, and two man-made lakes that function as a stormwater retention system (Mount Trashmore Park, n. d.).

Public Health Concerns

According to park staff, there are usually no concerns from the public. Amy Woodson, the Park Supervisor, explained that because the park has been around for so long, visitors do not generally question its safety (A. Woodson, personal communication, February 10, 2012). Furthermore, even when the park first opened, the Virginia Beach community welcomed the project. A review of newspaper articles from the 1970's indicated that the public was mostly enthusiastic at the time of conversion and Trashmore was viewed an asset, instead of a safety issue (Carney, 1972; Bonko, 1972; Ferraro, 1978). However, between 1998-2000 the public did raise safety concerns upon the discovery of leaks from the mound and ensuing tests that revealed elevated levels of chemicals, such as lead and benzene in groundwater and arsenic in the soil (J. Waller, personal communication, February 13, 2012; Harper, 1998). The public expressed concerns via phone calls to public officials and newspaper reports (J. Waller, personal communication, February 13, 2012; A. Woodson, personal communication, February 10, 2012). Public officials took several years to determine that the Park was indeed safe and “only heavy, long-term exposure to the leakage would cause health problems” (Abrams, 1998). Furthermore, the city determined that Mount Trashmore was not a source of pollution, because arsenic was naturally occurring in the soil and contaminated groundwater was not affecting adjacent properties (J. Waller, personal communication, February 13, 2012; Harper, 1998). Although the site was determined to be safe, the mountain was recapped in 2003 in order to prevent leakage (J. Waller, personal communication, February 13, 2012).

Public Health Communications Strategy

Currently, there is no comprehensive communications strategy in place to address public health concerns, because no such concerns are normally reported (A. Woodson, personal communication, February 10, 2012). Caryl Thompson, the Press and Communications Coordinator for City of Virginia Beach Parks and Recreation, explained that Mount Trashmore is treated like any other park from a public relations and marketing perspective (C. Thompson, personal communication, February 15, 2012). However, during the period of elevated public concerns associated with the leakages described above, it appears that the city's response has been reactive instead of proactive. Newspaper reports suggest that safety tests were performed quietly from 1996-1998 and the public was not informed that there may be safety issues until the City was ready to issue a final report on the matter (Harper, 1998). When the city became aware of health concerns, public officials organized a press conference and utilized internal documents with message points to be used when responding to questions from external and internal stakeholders (Abrams, 1998; A. Woodson, personal communication, February 10, 2012). Although the City has effectively managed this public relations challenge, as evidenced by the long-term park popularity, park officials could have been more proactive in managing public relations and potentially lessening a situation of panic. For instance, Baruch Fischhoff, a risk communications expert, suggested creating a contingency plan in advance and anticipating the scenarios where infrastructure problems could arise, testing messages in advance, and having up-to-date full information disclosed on the park's website (B. Fischhoff, personal communication, February 29, 2012).

Communication Channels

According to park staff, the communication channels frequently used at Mount Trashmore Park include signage, kiosks, and bulletin boards at the park; press conferences and press releases; public meetings; email newsletters and news alerts; as well as social press, such as Facebook and twitter (A. Woodson, personal communication, February 10, 2012; C. Thompson, personal communication, February 15, 2012).

Size	Date of Landfill Operations	Date of Park Opening
50 acres	1952 – 1971 (municipal); 1978 – 1983 (construction fill)	1990

Danehy Park is another project that is frequently cited in the press as a successful landfill transformation case study. The park is an important city asset, because Cambridge is one of the most densely populated U.S. cities and the park has increased its open space by 20% (Mayor Thomas W. Danehy Park, n. d.). In addition, surrounding property values have risen as a result and even luxury condos were constructed overlooking the site (O’Connell, 1999). A unique characteristic of park infrastructure is that the landfill has no synthetic liner or cap. Instead, the pre-existing clay walls contain the waste and the substitute for the cap includes construction fill on top of the municipal waste, as well as the added sandy loam and gravel (Kissida & Beaton, 1991). Another unique feature of the infrastructure is that the park has a crushed stone passive venting trench around the perimeter of the former landfill instead of the gas ventilation system with flares, which is normally used at other similar sites to dispose of the gas (O’Connell, 1999).

Public Health Concerns

According to Richard Rossi, the Deputy City Manager of Cambridge, there are usually no health concerns raised by public (R. Rossi, personal communication, February 8, 2012). Since the infrastructure at the park is older and less advanced than that of more recent landfill conversions, there could have been problems and public concerns. However, Richard Rossi revealed that there have only been minor infrastructure challenges in the past, so the community has had no reason to question its safety. These problems consisted of methane getting trapped in water fountains and inadequate drainage on athletic fields. The methane problem was fixed by re-routing some gas pipes and drainage issues ceased when an advanced drainage system was installed as well as an artificial turf surface on the fields (R. Rossi, personal communication, February 8, 2012). The Team has found no references to methane problems in press reports, which means that either the information was never publicized or that the issue was not a huge concern. Drainage problems did cause public complaints due to the limitations of site use, but not because of health concerns (Marton, 1996).

Public Health Communications Strategy

Richard Rossi stated that the park does not utilize a communications strategy to address health concerns because there are normally none reported. Furthermore, because of the park's old age and unique topography, the public is not always aware of its history as a landfill, so the park staff educates the public about the history via some of the channels described below (R. Rossi, personal communication, February 8, 2012).

Communication Channels

The channels include park signage; monitoring reports that are available at City Hall and the local public library; and brochures. Also, a public art project was created at the park by Mierle Ukeles, who has been the artist-in-residence for the NYC Department of Sanitation and a part of the Freshkills master plan Team. The path was made from crushed recycled glass and stone in order to educate visitors about recycling (R. Rossi, personal communication, February 8, 2012).

Pelham Bay Park, Bronx, NY

Size	Date of Landfill Operations	Date of Park Opening
81 acres	1963 – 1978; illegal dumping until 1980	TBD

The former Pelham Bay landfill consists of less than 3% of the 2,772-acre Pelham Bay Park, which is the largest public park in New York City. The site has been repressed and currently poses no apparent public health hazard (Agency for Toxic Substances and Disease Registry (ATSDR), 2009). It is now in the design planning phase to reintegrate the site into the rest of the park and open it for passive use. Tours are given to special interest groups who have invested resources in park development, but it is not open to the public yet (Rocchio, 2011; M. Anderson, personal communication, February 20, 2012).

Public Health Concerns

There have been numerous public health concerns and community protests associated with past exposures and site conditions before repression of the landfill in the 1990's. Complaints included noxious odors, leachate seeping from the site, and many others hazard (Agency for Toxic Substances and Disease Registry (ATSDR), 2009). A 1990 lawsuit filed by the New York Coastal Fishermen's Association against New York City forced city officials to clean up the site, because it was leaching toxins into nearby Eastchester Bay (Schneider, 1993). Although the majority of the toxic chemicals escaped, about 1.1 million gallons of

toxic waste remain in the landfill; mostly a result of illegal dumping of oil processing byproducts (Goldin, 1994). In 1991, another lawsuit was filed by a group of plaintiffs claiming that exposure to toxins from the landfill caused their cancers. This lawsuit has lasted for over 20 years due to multiple delays and appeals, partially resulting from insufficient scientific evidence (Hartocollis, 2006). In 2011, the case was allowed to proceed to trial, but it appears that no final decision has been made yet. Although many health concerns have been raised regarding the landfill, none have been raised regarding the site's conversion to a park (M. Anderson, personal communication, February 20, 2012).

Public Health Communications Strategy

According to Marianne Anderson, the park administrator, no structured communications strategy will be created to promote the park or ameliorate potential health concerns until the planning phase of the project is completed (M. Anderson, personal communication, February 20, 2012).

Communication Channels

The communication channels include community board meetings and special tours of the site (Rocchio, 2011; Pelham Bay Park News and Issues, n. d.). Most of the messaging is done through community groups involved with the park, such as the Hutchinson River Restoration organization (M. Anderson, personal communication, February 20, 2012). Also, there is only minor mention of the landfill on the NYC Parks website (Pelham Bay Park, n. d.).

Spectacle Island, Boston, MA

Size	Date of Landfill Operations	Date of Park Opening
105 acres	1900s – 1959	2006

Spectacle Island is located in the middle of Boston Harbor and has had an interesting history over the past 300 years. It was home to a quarantine hospital, resort hotels with casinos, a brothel, a horse rendering plant for glue production, and other unique uses (History of Boston's Harbor Islands, n. d.). During the time of landfill operations, it was the primary waste disposal site for the city of Boston. Although it used to be the most environmentally degraded island in the Harbor, it now touts many sustainable features, such as solar panels, wind turbines, electric vehicles, and composting toilets among others (Klein, 2008).

Public Health Concerns

The landfill was a public health hazard for decades, because it was leaching pollutants and toxins into Boston Harbor. To solve this problem, 3.5 million cubic yards of road construction fill was used to cap the landfill and reshape the island, along with added topsoil and vegetation (Klein, 2008). Environmental groups had advocated the park's construction and there have been minimal health concerns raised, particularly because it is located on an island with no nearby communities. In addition, there is only a small percentage of hazardous waste within the site (D. Sarno-Bucca, personal communication, February 20, 2012). Currently, the only potential health hazard on the island is the asbestos tile that occasionally washes up onto the beaches. Hence, the on-site park rangers have been trained in asbestos abatement and signage has been posted near the beach requesting the public not to take any sea glass or tile (D. Sarno-Bucca, personal communication, February 20, 2012).

Public Health Communications Strategy

There has been no long-term communications strategy developed, because there have been no health concerns raised by the public. However, there are elements in park design and programming that provide context about the park's history and infrastructure (D. Sarno-Bucca, personal communication, February 20, 2012).

Communication Channels

The channels include signage in the park to indicate the location of methane vents, prior reclamation sites, and park history. The visitor's center has exhibits and display boards highlighting the site's history (D. Sarno-Bucca, personal communication, February 20, 2012). Other channels include park rangers living on site, many sustainable design features, and guided tours. In addition, links to several YouTube videos about the park's history, infrastructure, and amenities are posted on the park's website (Bostonharborislands, 2009; Bostonharborislands, 2011).

Size	Date of Landfill Operations	Date of Park Opening
856 acres	1978 – 1993	2002 (partial) – 2020

Out of the five case studies presented, Nanjido Park is probably most similar to Freshkills Park in size and its emphasis on environmental design and programming. Nanjido was an unsanitary landfill without the proper gas and leachate management systems; hence, it contaminated groundwater, air, soil, and the nearby Han River (Singh, 2009). In order to prevent further pollution and as a response to overpopulation and rapid industrialization, Seoul had transformed the landfill into eco-friendly park and its opening coincided with the 2002 World Cup (Yoon, Lee, Kwon, & Han, 2003). The City was rewarded for its efforts with the United Nations Habitat Scroll of Honor Award (Seoul wins UN Habitat award, 2010).

Public Health Concerns and Opposition

According to Byung Wook Lim, the Nanjido Park Manager, there have been no concerns reported after the park conversion (B. W. Lim, personal communication, February 19, 2012). Initially, there was opposition to the park from nearby low-income residents who were forced to relocate off the site (B. W. Lim, personal communication, February 19, 2012). Also, environmentalists opposed the conversion of this site into a golf course, due to the environmental damage typically associated with golf courses (Joo-Hee, 2001). A portion of the park now includes an “eco-friendly” golf course, in spite of the opposition.

Public Health Communications Strategy

There is no coherent strategy in place to address health concerns, since there are normally none reported. Also, budget constraints have prevented the use of more extensive marketing and communication plans (B. W. Lim, personal communication, February 19, 2012).

Communication Channels

The typical channels include brochures, press releases, park website, public monitoring reports, eco tours, environmental classes, park signage, sustainable design elements and an on-site gallery with exhibits about the site history, conversion, and environmental education (B. W. Lim, personal communication, February 19, 2012). The park’s website has the most detailed informative out of the five case studies researched by the Team and the content is translated into several languages (Seoul: World Cup Park, n. d.).

Appendix I: Risk Communication Theory

Risk Communication Overview

Definition

“Risk Communication” was created, in part, to guide the new partnership and dialogue of government and industry with the public. It addressed a fundamental dilemma made clear by that dialogue: The risks that kill people and the risks that alarm them are often completely different.

There is virtually no correlation between the ranking of hazards according to statistics on expected annual mortality and the ranking of the same hazards by how upsetting they are. Risk communication is a scientifically based discipline that confronts this dilemma. Where data indicate that a hazard is not serious, yet the public is near panic, it can be used to calm people down; for this kind of situation, its goal is to provide reassurance (Covello & Sandman, 2001).

Risk = Hazard + Outrage

Findings reveal that people often perceive/assess risk more in terms of “outrage” factors than in terms of potential for “real” harm or hazard. For the public, Risk = Hazard + Outrage. This equation reflects the observation that an individual’s perception or assessment of risk is based on a combination of hazard (e.g., mortality and morbidity statistics) and outrage factors. When present, outrage often takes on strong emotional overtones. If the outrage model is accepted as valid, then a broad range of risk communication and management options become available for resolving risk controversies. Indeed, if “Risk = Hazard + Outrage” is taken literally, then making a risk fairer, more familiar, and more voluntary does indeed make the risk smaller, just as reducing hazard makes it smaller. Similarly, because personal control is important, efforts to share power, such as establishing and assisting community advisory committees, or supporting third party research, audits, inspections, and monitoring, can be powerful means for making a risk more acceptable (Covello & Sandman, 2001).

- *Seven Cardinal Rules of Risk Communication* (Covello & Allen, 1988)
 - **Accept and involve the public as a partner.**
Your goal is to produce an informed public, not to defuse public concerns or replace actions.
 - **Plan carefully and evaluate your efforts.**
Different goals, audiences, and press require different actions.
 - **Listen to the public's specific concerns.**
People often care more about trust, credibility, competence, fairness, and empathy than about statistics and details.
 - **Be honest, frank, and open.**
Trust and credibility are difficult to obtain; once lost, they are almost impossible to regain.
 - **Work with other credible sources.**
Conflicts and disagreements among organizations make communication with the public much more difficult.
 - **Meet the needs of the press.**
The press are usually more interested in politics than risk, simplicity than complexity, danger than safety.
 - **Speak clearly and with compassion.**
Never let your efforts prevent your acknowledging the tragedy of an illness, injury, or death. People can understand risk information, but they may still not agree with you; some people will not be satisfied.
- *Risk Communication Myths and Actions* (Chess, C., Hance, B. J., & Sandman, P. M., 1988)
 - **Myth:** Telling the public about a risk is more likely to unduly alarm people than keeping quiet.
Action: Decrease potential for alarm by giving people a chance to express their concerns.
 - **Myth:** Communication is less important than education. If people knew the true risks, they would accept them.
Action: Pay as much attention to your process for dealing with people as you do to explaining the data.
 - **Myth:** We shouldn't go to the public until we have solutions to environmental health problems.
Action: Release and discuss information about risk management options and involve communities in strategies in which they have a stake.

- **Myth:** These issues are too difficult for the public to understand.
Action: Separate public disagreement with your policies from misunderstanding of the highly technical issues.
- **Myth:** Technical decisions should be left in the hands of technical people.
Action: Provide the public with information. Listen to community concerns. Involve staff with diverse backgrounds in developing policy.
- **Myth:** If we listen to the public, we will devote scarce resources to issues that are not a great threat to public health.
Action: Listen early to avoid controversy and the potential for disproportionate attention to lesser issues.
- **Myth:** Activist groups are responsible for stirring up unwarranted concerns.
Action: Activists help to focus public anger. Many environmental groups are reasonable and responsible. Work with groups rather than against them.
- *Factors Influencing Risk Perception* (Fischhoff, Lichtenstein, Slovic, Derby, & Keeney, 1981)
 - People's perceptions of the magnitude of risk are influenced by factors other than numerical data.
 - Risks perceived to be voluntary are more accepted than risks perceived to be imposed.
 - Risks perceived to be under an individual's control are more accepted than risks perceived to be controlled by others.
 - Risks perceived to have clear benefits are more accepted than risks perceived to have little or no benefit.
 - Risks perceived to be fairly distributed are more accepted than risks perceived to be unfairly distributed.
 - Risks perceived to be natural are more accepted than risks perceived to be manmade.
 - Risks perceived to be statistical are more accepted than risks perceived to be catastrophic.
 - Risks perceived to be generated by a trusted source are more accepted than risks perceived to be generated by an untrusted source.
 - Risks perceived to be familiar are more accepted than risks perceived to be exotic.
 - Risks perceived to affect adults are more accepted than risks perceived to affect children.

Recognize the importance of community input. Citizen involvement is important because (a) people are entitled to make decisions about issues that directly affect their lives; (b) input from the community can help the agency make better decisions; (c) involvement in the process leads to greater understanding of - and more appropriate reaction to - a particular risk; (d) those who are affected by a problem bring different variables to the problem-solving equation; and (e) cooperation increases credibility. Finally, battles that erode public confidence and agency resources are more likely when community input isn't sought or considered.

- To the extent possible, involve the community in the decision-making process.
 - Involve the community at the earliest stage possible.
 - Clarify the public's role from the outset.
 - Acknowledge situations where the agency can give the community only limited power in decision making.
 - Find out from the communities what type of involvement they prefer.
- Identify and respond to the needs of different audiences.
 - Try to identify the various interests in a situation at the beginning and meet with representatives of each informally.
 - Recognize the strengths and weaknesses of citizen advisory groups.
 - Deal with everybody equally and fairly.
- When appropriate, develop alternatives to public hearings. In particular, hold smaller, more informal meetings.
 - If you cannot avoid a large public meeting, the logistics should enable both the agency and the community to be treated fairly.
 - Consider breaking larger groups into smaller ones.
 - Be clear about the goals for the meeting. If you cannot adequately fulfill a citizen's request for a meeting, propose alternatives.
 - In certain situations, one-to-one communication may work best.
- Recognize that people's values and feelings are a legitimate aspect of environmental health issues and that such concern may convey valuable information.

- Provide a forum for people to air their feelings.
- Listen to people when they express their values and feelings.
- Acknowledge people's feelings about an issue.
- When people are speaking emotionally, respond to their emotions. Do not merely follow with data.
- Show respect by developing a system to respond promptly to calls from community residents.
- Recognize and be honest about the values incorporated in agency decisions.
- Be aware of your own values and feelings about an issue and how they affect you.

Recommendations for Freshkills Park Communications Strategy (Based on best practices and personal communication)

Recommendation #1:

Establish, convene and assist “Fresh Kills Park Community Advisory Committee”

Based on:

- Risk Communication and the Community Recognize the importance of community input.
- Risk Communications Best Practices Risk Communications Myths and Actions Activists help to focus public anger. Many environmental groups are reasonable and responsible. Work with groups rather than against them (Musso, M., personal communication, 2012)

Recommendation #2:

Enhance Freshkills Park Web site to include a special section for “community.”

Based on:

- Risk Communication and the Community Recognize the importance of community input (Musso, M., personal communication, 2012)

Recommendation #3:

Work with local community boards and politicians

Based on:

- Risk Communication and the Community Recognize the importance of community input When appropriate, develop alternatives to public hearings (Zarr, G., personal communication, 2012)

Recommendation #4:

Host smaller, more informal community information sessions where people can learn about project and give feedback in lieu of large public meetings that can sometimes get out of hand

Based on:

- Risk Communication and the Community Recognize the importance of community input When appropriate, develop alternatives to public hearings (Musso, M., personal communication, 2012)

Recommendation #5:

Engage third party sources such as environmental groups, academia, press, regulatory agencies and support third party research and monitoring

Based on:

- Risk Communication Best Practices Factors Influencing Risk Perception Risks perceived to be generated by a trusted source are more accepted than risks perceived to be generated by an untrusted source.

Recommendation #6:

Be transparent about the information on public health and environmental safety at the park. (via Web site, on site monitoring stations, signage, fact sheets, etc.)

Based on:

- Risk Communications Best Practices Risk Communications Myths and Actions Provide the public with information. Listen to community concerns. Involve staff with diverse backgrounds in developing policy.

Appendix J: Crisis Communication Case Studies, BP Oil Spill

BP Oil Spill Public Health Concerns:

Cleanup workers who were in close contact with crude oil, smoke fumes and dispersants reported feeling ill along with many residents in the area; long-term impact of toxins in the environment could produce respiratory problems, severe headaches, nausea, endocrine and fertility issues, cancer, problems with contaminated seafood, and post-traumatic stress syndrome (Marcus, 2011); not only is prolonged exposure to crude oil a concern, but there is concern over prolonged exposure to the more than 800,000 gallons of chemical dispersants sprayed on the slick; air quality data released earlier by the EPA suggested the presence of chemicals that while still within legal limits could be dangerous (Marcus, 2011).

Communications Strategy:

Restore (or Create) Brand Value

Spent \$93.4 million on newspaper advertisements and TV spots in the weeks (April thru July) following the Deepwater Horizon oil spill, targeting mostly national and local newspapers, magazines, and national and local television stations (WSJ, 2010)

- This is more than three times the money spent on ads as it did during the same time last year, (according to the U.S. House Energy and Commerce Committee) (WSJ, 2010)
- Internalize branding—in BP's case “beyond petroleum” and make the public aware of branding ideal and BP's plans and goals to get back on track (Bean, 2010).
- Showing support for environmental awareness through their website (Bean, 2010).

Expand the Marketing Scope

BP Expanded the scope of its marketing efforts in newspapers, running ads in 17 states—including Florida, Louisiana, Alabama and Mississippi—up from just two states the previous year (WSJ, 2010)

Create a New Public Image

BP's primary goal was to inform the public about clean-up efforts and, more importantly, the claims process that allows oil-spill victims to receive compensation for lost wages or property damage (WSJ, 2010).

"Our objective has been to create informational advertising to assure people that we will meet our commitments and tell them how they can get help—especially claims. It is an important tool to help us be transparent about what we are doing." — BP spokesman Scott Dean (WSJ, 2010)

- Provided grants up to \$170 million to several states affected to alleviate the state economies that were negatively affected by the spill (Bean, 2010)
- Donated \$15 million for behavioral health outreach and support programs in Louisiana (Bean, 2010)
- Set up a new Safety and Operational Risk Unit that would have the authority to intervene on any technical activity (Bean, 2010)

BP purchased several phrases on search engines such as Google and Yahoo so that the first result that shows up directs information seekers to the company's official website with the tagline "Learn more about how BP is helping." (Friedman, 2010)

Communicate with the Public Directly (Bean, 2010)

BP's Social Press Campaign played a huge part in getting BP's message out to a vast amount of people all at once.

- Created a perception that BP was technologically advanced
- Created a perception of transparency, providing detailed information
- Created a perception of tangibility and accessibility
 - Twitter: up-to-date information of what BP was doing to clean up its act
 - Facebook: did not censor people's concerns, rather confront them
 - YouTube: BP has its own channel to publicize clean-up and oil spill aftermath
- TV ads and commercials are an effective way to communicate to a large audience.

Set Yourself Apart From Others in Similar Situations

BP has tried made huge endeavors to set itself apart from companies such as Exxon-Valdez by specifically promoting health research and making it clear that other oil companies dealing with spills didn't take the same measures

- BP announced it would provide \$10 million to the National Institutes of Health (NIH) for research into the potential health problems resulting from the oil spill (Institute of Medicine of the National Academies, 2010).
- Pledged \$500 million over a 10 year period to the Gulf Research Institute to assess the environmental impact the spill had on the gulf (Bean, 2010)

Identify Weaknesses and Transform Them Into Strengths

Strength: BP is an influential company that has a diverse and wide network

Strength: Loyalty to brand

Give employees and public a reason to support BP

- Donated \$100 million for unemployed rig workers (Bean, 2010)
- Vowed to pay all legitimate claims from damages resulting from the oil spill (Bean, 2010)

BP Weakness: Improper Management

- Informed the public that they engaged in better management practices to ensure that negligence won't happen again
- Make the public aware of internal changes (Safety and Operational Risk Unit)

Deliver on Promises Made to the Public

BP learned from the Exxon oil spill public image fiasco that you can promise a lot of things, but you need to follow through for lasting legitimacy as a corporation and loyalty from the public. BP has made a clear vow to public that they will deliver on all promises made.

Continue with PR Strategies for Long-Term Goals (Heine, 2011).

Communication Channels

Television, Newspapers, Magazines, Website, Social Press (Twitter, Facebook), YouTube, Custom e-newsletters.

Key Takeaways

Direct Communication with public is essential. Perception of transparency and accessibility is the way to win over the public. Promote or create a brand; actively change public image; identify the strengths and weaknesses and transform weaknesses into strengths; set your product apart from similar products; offer the customer what they want; make the client feel special (custom market).

Appendix K: Crisis Communication Case Studies, Banks

Bank Concerns in the U.S.:

Investment and commercial banks were negatively viewed by the public since many of their top officers were receiving large compensation and huge bonuses during a time of recession. The U.S. government also used \$700 million of taxpayer money to bail out the U.S. financial system (Clark, 2008).

Know what the customer wants (and give it to them, if possible)

Bank of America conducted a survey to find out what specific services customers wanted and found fast, efficient, targeted ways to get those services to them

- Customers valued relationship with banks personnel
 - Bank of America added call centers
 - More local bank branches

Make the client feel special

Banks changed the way they reached out to customers

- Marketing campaigns are geared toward digital services

Custom marketing

- Many banks are finding that custom content in the form of e-newsletters, print publications, videos, mobile content, and other press is highly effective in attracting consumer attention and providing valuable information to assist them with daily financial matters
- Leveraging custom, integrated content to engage specific consumers with content that is truly relevant to them may go a long way in regaining consumer confidence” (New Report Ranks Bank Communications Effectiveness During a Year of Global Financial Turmoil, 2011).

Give the client power

Chase Bank allows customers to input financial “what if” information and see future possibilities. Citi is offering their customers coffee, donuts, etc when they visit branches. Chase makes it possible for their small business customers to network with other businesses.

Identify Weaknesses and Transform Them Into Strengths

The weakness of bank marketing strategies is that banks aren't trusted and are stereotyped to be non-regulated: to combat this, banks are adopting reform measures ahead of the regulators and legislators (Evolving Banking Regulation A long journey ahead – the outlook for 2012, 2011).

Appendix L: Influencer Marketing

Given that Freshkills is a unique model for land renovation and transformation, the Team sought to learn best practices of promoting effective information dissemination to mass audiences. During this research, the concept of “Influencer Marketing”, in which focus is placed on specific key individuals (or types of individual) rather than the target market as a whole kept resurfacing as an effective method of reaching mass audiences for the type of public health messaging that the Parks Department seeks to disseminate among Staten Island residents.

Origins

Influencer marketing’s origins emanate from “The people’s choice” a Lazerfeld and Katz 1940 study on communication that claims that the majority of people are influenced by secondhand information and opinion leaders. They stressed that some people have a disproportionate degree of influence on others and can be effective communications channels (Roberts, 2009). “Influencers” may be potential “buyers” (park visitors) themselves, or they may be value-added influencers such as journalists or academics.

Supporting Research

Research shows that this type of influencer communication is at least twice as powerful as traditional marketing communications in influencing sales, and given the rise of electronic word of mouth (mobile and internet), word of mouth is now some 50% more influential than it was 30 years ago (Roberts, 2009). This is supported by a Nielsen survey showing the most trusted form of advertising was “recommendations from other consumers”, being cited by 78% of respondents (Robert, 2009). According to Roberts, customers are seeking out opinions because they don’t trust marketing as much and thus independent influencers become more influential than ever before.

Face-to-Face

According to the Keller Fay Group, 73% of marketing-related conversations take place in person, and only 10% happen online. So, the focus of the influencer marketing strategy should be face-to-face (mouth not mouse), rather than mouse-to-mouse communication. (Roberts, 2009).

Who to Target

Central to most influencer strategies means targeting those who have the greatest viral impact rather than engaging the masses. The Word of Mouth Marketing Association defines an influencer as a person who has a greater than average reach or impact through word of mouth in a relevant marketplace.

Recommendation

The Team recommends that the Parks Department use the influencer marketing approach as its proven success in other industries is analogous for the Parks Department's purposes to create an effective information dissemination strategy.

Key Takeaways

- "Influencer Marketing", in which focus is placed on specific key individuals (or types of individual) rather than the target market is an effective method of reaching mass audiences for the type of public health messaging that the Parks Department seeks to disseminate among Staten Island residents.
- The influencer marketing strategy should be face-to-face (mouth not mouse), rather than mouse-to-mouse communication.
- The Word of Mouth Marketing Association defines an influencer as a person who has a greater than average reach or impact through word of mouth in a relevant marketplace.

Appendix M: Controlled Messaging

Controlled Messaging – Television Advertising

Television is regarded as the press vehicle with the furthest reach. *Broadcast Networks* like ABC, CBS, and NBC distribute their programming over the air via local broadcast television stations at no cost to households. *Cable Television Networks* like The Discovery Channel, MTV, and ESPN instead distribute their programming via cable or satellite television systems that charge fees to consumers. Within this medium Freshkills Park could utilize advertising as a form of controlled messaging or interact with news stations to influence reports.

In 1941 the first television ad was aired for Bulova clocks in New York City before a baseball game between the Brooklyn Dodgers and Philadelphia Phillies (Stewart, 1941). Since then, the television medium has grown into one of the key markets for advertising because it can reach an extremely large audience at an instant. According to Crawford (2007), television programs dedicate about 22% of air time to advertisements. In addition, “With respect to advertising market outcomes, we find that affiliates of the Big-4 broadcast networks (ABC, CBS, NBC, and Fox) provide more advertising minutes at higher prices than do other broadcast television stations and that this advantage appears to be increasing over time... and with prices per 30-second ad more than twice as high, revenue per ad is almost triple that of independents and the other network affiliates (Crawford, 2007). With this information, the Team limited the scope to just the Cable Television Network due to the Park’s limited budget. The Team contacted a Time Warner representative to better assist with determining the feasibility of utilizing television advertising as a potential tactic for addressing health concerns. Currently the Parks Department is not utilizing Television advertising as a form of communication.

Television Advertising Benefits

After the Team presented the objective to the Time Warner representative, he indicated that the Parks Department could air around 500 advertisements throughout different daytime periods and networks of their choosing. This number could be adjusted up or down depending on budget and programming variables described later. Pursuing the tactic of using only local (i.e. New York Metropolitan area) advertising, the Parks Department has the potential to reach 60,000 to 100,000 unique viewers. Unique viewers are distinct individuals that have seen the ad at least once, as opposed to potential viewership which can be much higher, but counts viewers that have seen the ad multiple times (J. Caplan, personal communication). The reach of the ads cannot be narrowed to only Staten Island residents; however the NY1 news station airs a Staten Island

report to which the ads can be aired before or after those reports in order to better connect with Staten Island residents. Time Warner also offers creative services (for a fee) to better assist local advertisers such as Freshkills Park.

Television Advertising Costs

Television is a very dynamic medium in regards to pricing. Elements that affect pricing include: season of the campaign (summer, winter etc.), ideal length of the campaign (approximately how many months), creative needs (either Time Warner or the Parks Department could develop the commercial), network chosen (NY1, Nickelodeon/NIK at Nite, The Weather Channel, Lifetime, HGTV, Discovery and TLC, etc.), and time of airing (primetime, daytime, or event focus, such as during a New York Yankee game). Due to the many variables associated with pricing, it is challenging to determine a final cost. However, the Time Warner representative made estimates in order to provide context. Using summer months as the season (May-Aug), he estimated that the Parks Department could air 500 ads at \$50 an ad, which would be shown during various daytime periods, as well as aired over various networks, totaling to \$25,000. This price should be considered a base price and can be significantly altered according to how the Parks Department would prefer to utilize Time Warner's services. For instance, airing more ads during non-peak hours can increase the quantity of airings to 1,000 while staying at the same total price. Time Warner also has the capability to assist with creative development. Depending on the complexities of the production and what resources might already be available, production costs range from \$1,000 to \$2,500 (J. Caplan, personal communication).

Television Advertising Recommendations:

The primary benefit to the television medium is that it will reach a large audience within a short time, but the Park Department's objective is to reach a targeted local audience to which the information is relevant, reassuring, and allows for an interactive response. The Team's research indicates that utilizing a television advertising tactic is feasible; however the expense is too great, given the limited budget.

Controlled Messaging – Radio Advertising

Radio is one of the first mediums to broadcast communications to the nationwide public. Radio is the distribution of audio signals via electromagnetic "radio" waves to boom boxes, car stereos, and home entertainment systems. Due to limited range of the radio waves, local stations are set up throughout the country to ensure clear signals to receivers. More than nine out of 10 Americans (93%) say they use or own an AM/FM radio, and the device is second only to television as the medium most prevalent in people's lives, according to Arbitron's data (The State of News Press, 2012). However, in recent years radio has received a

technological advancement and can now be transmitted digitally which gives it the capability to be streamed over the internet and through smart phone devices allowing the reach to expand internationally. Digital options are beginning to have an impact, especially through mobile technology. According to eMarketer, Nearly 40% of people are estimated to listen to online-only audio services like Pandora or Spotify which can be distributed through advanced cell phone devices “smartphones”, mobile “tablet” devices, and computers. That number is expected to double by 2015. Even more impactful to AM/FM radio, in-car listening via smartphones nearly doubled in the last year to 11% of smartphone owners. Carmakers are now installing new models with internet-ready listening. (Journalism)

Radio offers a variety of programming including news, music, comedy performances, and talk shows of which all have advertisements interspersed throughout the programs. The advertisements typically run in 30-60 second intervals for each advertiser. Currently the Parks Department has not utilized radio as an advertising tactic.

Radio Advertising Benefits

The Team’s demographics research revealed that Clear Channel Communications Incorporated held 4 of the top 7 radio stations in the Staten Island area with WLTW, WKTU, WHTZ, and WAXQ at first, third, fourth and fifth respectively (QUALITAP™, 2011). After describing the Parks Department’s needs, the Clear Channel representative suggested two tactics: have the Parks Department endorse Clear Channel Communication events which will provide the Parks Department the opportunity to have expert representatives at booths connecting them to thousands of people for direct contact or advertise on Clear Channel Communication’s digital radio service which is referred to as iHeart Radio which can also be downloaded as an application on smart phones and can reach a local and national audience.

One example of an event endorsement, as provided by the representative, is WLTW Lite FM’s presentation of Broadway in Bryant Park which takes place during lunch at the historic midtown Bryant Park on six consecutive Thursdays from 12:30 p.m.-1:30 p.m.; July 5th — August 9th. the Parks Department can have an expert representative occupy a booth for three of the six weeks and WLTW will use different methods to attract the over 10,000 people in weekly attendance to the booth including:

- On-Air and Online promotions leading up to the event
- Logo Placement on the Stage Banner

- 10x10 Tent at Bryant Park including Brand Ambassadors, signage and contests that drive traffic to the tent
- Weekly Stage Announcements
- 1 Page Ad in Broadway in Bryant Park Guide, distributed at Bryant Park and at partner retailers

This benefits the Parks Department's objective because it will allow them the opportunity to exchange mutual information through personal expert to public interaction as well as generate publicity within a short period of time.

Advertising using iHeart Radio's digital music distribution provides the Parks Department an opportunity to advertise through Clear Channel Communication's top rated stations which reach Staten Island listeners and since iHeart has a smart phone application the range can be extended nationally. The ads would be a 60 second audio clip. With the budget provided the representative suggested an advertising campaign that consists of: a homepage banner ad on LITE FM's website; 475-60 second iHeartStreaming Commercials aired from 5am-8pm daily (distributed over an 8 week period with 58 spots airing per week); a companion banner (appears every time the audio ad airs which will be hyperlinked to the website of the Parks Department's choosing); and 28-10 second promos as additional influence to have listeners visit the Parks Department's website. Each day an ad airs an average of 3,636 Staten Island residents will hear it and each month of advertising reaches a cume audience of 199,437 totaling for this campaign nearly 400,000 cume listeners (QUALITAP™, 2011). This benefits the Parks Department's objective because it will reach a large audience in a short amount of time and can direct listeners to the Parks Department's website for follow up information.

Radio Advertising Obstacles

Radio's two tactics each have big setbacks, in regards to the Parks Department's objective. The Broadway in Bryant Park primarily caters to musical fanatics, Manhattan residents, and tourists which does not directly reach the designated target audiences. The iHeart streaming commercials only distribute information one-way thereby not meeting the Teams requirement for mutual exchange of information; however the hyperlink to the website of the Parks Department's choosing does assist with directing interested individuals on how to initiate this type of preferred communication. The brief time of 60 seconds also restricts the ability to distribute true credible and digestible information that will be responsive and reassuring to public concerns.

Radio Advertising Costs

Each of the tactics provided will utilize the entirety of the Parks Department's \$25,000 proposed budget. The Broadway in Bryant Park event cannot be appropriated into smaller increments, however the quantity of iHeart commercials can be reduced to better meet the Parks Department's limited budget. The commercials will require further creative development costs which when included will exceed the Parks Department's budget. There are little to no administrative costs after development.

Radio Advertising Recommendations

Representation at a popular event will allow the Parks Department to have expert representatives to educate the public but unfortunately this benefit will be minimally beneficial as the audience reached will be much too general. iHeart's streaming commercials will reach a large audience, however the one-way communication and brief 60 second messaging contrasts with the Parks Department's goal of mutual exchange of information to educate the public. Considering these obstacles and the fact that each of these tactics exhausts the Parks Department's entire potential budget, this press tactic is not recommended as a means to satisfy the Parks Department health communication objectives.

Controlled Messaging - Print Advertising

Print is a very versatile medium. Print can range from newspapers to magazines and flyers to billboards. The advertisements can be purely graphic or literary based. Depending on the tactic selected the range can be as narrow as individuals handing out flyers to designated public members or as wide as placing a centerfold ad in a nationally distributed magazine.

For the purposes of trying to cater to the Parks Department's objective of reaching Staten Island residents, the print tactics researched were ads placed in the Staten Island Advance daily newspaper or the Staten Island Business Trends, posters on the Staten Island Ferry, as well as a billboard on Highway 440. The Parks Department currently has a press kit prepared for printing as well as a previously developed a flyer; however the flyer is very difficult to find on the NYC.gov website and is no longer distributed by the Parks Department. There was also a proposal for a billboard being held up by one of the trash diggers; however this is not a form of health communication but rather, to quote Eloise Hirsch, a "large identification sign" (Fresh Kills Park Update: Billboards from Skynet!, 2009).

Print Advertising Benefits:

A picture is worth a thousand words and print press offers that capability. Using print press the Parks Department can incorporate visual representation of the park including the image of the material capping the waste and beautiful photos of the park itself. The tactics the Team contacted that can use this image or any creative development of the Parks Department's choosing were the following:

- **Staten Island Advance Daily newspaper** – a daily newspaper published for the residents of the borough of Staten Island covering local and community interests.
- **Staten Island Business Trends** – a monthly published paper published for business leaders discussing issues affecting Staten Island's economic health, quality of life and community leadership
- **Staten Island Ferry** – a ferry that provides 75,000 passengers every weekday with service between St. George on Staten Island and Whitehall Street in lower Manhattan (FerryAds, n. d.).
- **Billboard on Highway 440** – a 14' x 18' display for travelers driving towards the Staten Island Mall and Freshkills Park

According to the Team's demographics research the Staten Island Advance newspaper can reach a daily audience of 155,810 readers (QUALITAP™, 2011). This tactic will reach across all target audiences as the readers are Staten Island residents. Staten Island Business trends will be beneficial in reaching the target audience of Influential Information Conduits with around 6,000 copies produced monthly. The other two print press tactics will target commuters, which also have the benefit of reaching across all target audiences as these commuters originate or operate within the Staten Island borough. There are a projected 75,000 commuters that would see the Staten Island Ferry posters located at the station or on the ferry itself (FerryAds, n. d.). An estimated 50,000 Staten Island commuters traveling past the Freshkills site will see the Billboard on Highway 440 (Out of Home Billboard, n. d.).

Print Advertising Costs:

Print has a range of pricing methods depending on the form of advertisement. Within the Staten Island Advance pricing is daily and based on square inches of space occupied as well as whether the ad is placed on weekdays (\$68 per square inch) or Sundays (\$75 per square inch) as readership is greatly improved on Sundays (QUALITAP™, 2011). The Staten Island Business Trends flyers are priced based on amount produced, size of flyer, and choosing color versus black and white. The Parks Department can get 10,000 flyers, of which 6,000 will be distributed within the newsletter and 4,000 will be provided to the Parks

Department for personal distribution, at full color for \$1,400. If the Parks Department wishes to include an ad in the newsletter the price rises to \$1,800. The Staten Island Ferry posters run on a 12 week cycle and the prices range based on size and location of the ad (i.e. located at the station or on the ferry itself) and range from \$2,500 to \$9,000 in cost. The Highway 440 billboard requires a one-time installation fee of \$1,200 and then a monthly rental fee is applied thereafter (ranges from \$1,000-\$5,000 a month) for as long as the Parks Department wishes to run the ad. Each of these tactics require a graphic designer to develop the creative which adds cost to the overall budget, however there are minimal administrative demands after the ads are placed.

Print Advertising Obstacles:

The use of print press opens Freshkills to criticism as advertising on paper flyers or posters will eventually be discarded into waste streams and since the park was converted from a landfill there results a conflict of interest. In addition, the advertisements are not only limited in terms of providing enough content to educate the public, they are also deemed untrustworthy. In her book Press Relations: Issues and Strategies where Jane Johnston explains how to approach press organizations she says, “Readers trust and value any information they read in an article or column far more than any data they glean from an advertisement (Johnston, 2008). This critically handicaps advertising in the print medium because no matter how credible and digestible the creative developer can design the ad, ultimately the public will not fully honor the content.

Print Advertising Recommendations

Due to the conflict of print press becoming part of the waste stream the Parks Department requested that this medium be avoided if possible; however even if this request wasn’t made this medium has very little upside because readers ultimately will not “believe” the content provided within a print advertisement. Therefore, the Team does not recommend the Parks Department pursue this press tactic.

Controlled Messaging - Internet

The internet, also called the web, is a system of interconnected computers that create a digital network for sharing information globally. Devices can share information through hardwired connections or via wireless transmissions.

The internet is extremely versatile for communications using such tactics as web logs (blogs), emails, social network statements, videos, text/audio/video chats, and custom designed websites. The web is so expansive and ever changing that every tactic cannot be acknowledged so the Team attempted to research the

most popular and applicable services to meet the Parks Department's objective. Currently the Parks Department utilizes the internet with controlled messaging through the following tactics:

- Freshkills website – A site with very limited content including a short paragraph describing the project and a list of links to other news articles about the Freshkills park, has not been updated since 2010
- NYC Parks website – a government managed website that has a specific segment dedicated to Freshkills park, currently the most comprehensive site about the park on the web
- NYC Dept of City Planning website – another government managed website that has a single page describing the Freshkills park
- Freshkills Park blog using wordpress – a very simple site that is frequently updated about events and the progress of the park
- Facebook – a “public place” profile on the largest social press network in the world
- Twitter – a profile that allows rapid sharing of information at 140 characters or less
- Flickr – a profile on a social press photo sharing network
- Freshkills Newsletter "Fresh Perspectives" – newsletter that are sent utilizing a listserv of individuals that have indicated they are interested in the park and have voluntarily provided their emails
- Wikipedia – an article describing the development of Freshkills park within the socially developed free encyclopedia
- Staten Island Development Forum – a website dedicated to the mutual exchange of questions and answers in regards to the development of Staten Island, this site is not specific to Freshkills and is highly outdated
- YouTube – a few videos describing the development of Freshkills park posted on a video based social network

Internet Benefits:

The web has the ability to provide resources that users can remotely access for relevant and current information as well as provides a platform for users to then share that information to their social network. These services allow for low budget organizations to progressively develop a digital community. “The incredible advances in communications technology over the past quarter-century make possible an entirely new model of organizing and ways of bringing people and resources together quickly and efficiently to tackle a single problem or to form lasting communities. In short, online communications today is about forming connections, creating community, and organizing action in previously unimaginable ways” (Online Communications, 2007).

The internet provides both paid and complimentary tactics for online marketing. Examples of paid tactics are Google Adwords, Facebook Ads, and Microsoft/Yahoo banner advertisements which are tactics that attempt to entice users to click through to the advertisers desired website. They can be useful to reach a specific target audience because the ads will be associated with user’s online activity. For example, someone searching for New York City parks may not necessarily come across the Parks Department’s website through search engines, however a Google Adword will place the link next to the results heightening awareness. the Parks Department could benefit from this by having these ads show up when people search for health related topics associated with the landfill to park conversion. Facebook has an added benefit because of their massive database of personal information. This database allows advertisers to focus directly on the target audience. For instance, the Parks Department could choose to advertise to Staten Island residents with college level education who work for community organizations around Freshkills Park. Other tactics cannot be this narrow in focus.

Complimentary tactics are services the web offers that do not contain fees but do require set up. Examples of complimentary tactics are web optimization (landing pages and search engine optimization), social network profiles, and email marketing.

Internet Optimization - Establishing Landing Pages

A landing page is a website that is the first contact a visitor will have after being directed by a particular web campaign. For instance, if an email newsletter is sent out which contains a hotlink (a clickable link to another internet page) to the Parks Department’s blog, the blog will be the landing page from that hotlink. A landing page is not always, and should not always, be the homepage of a website. “Your brand homepage is about everything on the shelf. Your landing pages, ideally, are all about a focused, offer-driven fulfillment

environment. The goal is to provide just enough messaging support and calls to action to achieve a simple goal (Kennon, 2008). In the Parks Department’s case the goal is to educate the user with credible and digestible information and optimizing this message will make it easiest on the user.

Internet Optimization - Search Engine Optimization

Search Engine Optimization (SEO) is the tactic of designing a website to attract traffic from “free”, “organic”, “editorial”, or “natural” listings in search engines such as Google, Yahoo, and Bing (What Is SEO / Search Engine Optimization?, n. d.). Every popular search engine ranks their results of a search based on how their algorithm determines the most relevant websites associated with that search. For instance, searching for the words “Bottled water” returns the following top three links: a Wikipedia page about bottled water, a link to www.bottledwater.org, and a link to www.erg.org which is a page about a Bottled Water Quality Inspection. According to PEW research 92% of adult internet

users in the U.S. use a search engine to find information online. Therefore if the Parks Department is reaching out to the public with health information, many will respond by conducting their own research online. Optimizing the links those users find will better help the Parks Department to communicate the proper message.

In an effort to determine current results of searches with key words or phrases associated with Freshkills Park, the Team performed three separate searches. Because of the dynamic nature of search engines the Team had a third party user, unassociated with the project perform the searches using Google’s search engine in an effort to best reflect the results of a new user from the targeted audience.

Keyword	First Result	Second Result	Third Result	Date of Park Opening
Freshkills Park	Wikipedia	Freshkills – The New York City Band	NYCgovparks.gov	FKP blog comes in seventh
Fresh kills landfill	Wikipedia	Images for Freshkills park	NYCgovparks.gov	FKP blog comes in seventh
Will I get cancer from Freshkills park?	ATSDR public health assessment	ATSDR public health assessment	Freshkills Park GEIS	NYCgovparks.gov and Wikipedia came in fifth and six respectively and the FKP blog does not appear on the first page of search results

The lack of consistency demonstrates poor SEO because the Parks Department should have targeted sites show up at the top for every potential keyword, but they do not have them, so other, potentially misleading sites show up first.

Internet - Social Network Profiles

Social networks are online platforms that help build social relations. These networks include but are not limited to Facebook, Wikipedia, Wordpress, Twitter, Flickr, YouTube, and Google+. Being active in these networks will help to build a community of users that will not only follow the progress of the park, but will share the information about the health and safety of the park to their peers.

- Facebook makes up 52% of sharing on the web (Fach, 2011a)
- 96% of searches have Wikipedia within the top 5 positions (Wikipedia: Page One of Google UK for 99% of searches, 2012)
- 57% of Facebook users and 25% of Twitter users have over 100 friends (Fach, 2011b). And it can be estimated that many of those friends are located within the same region.
- Facebook users are 1.5 times more likely to post status updates with only positive brand mentions (Fach, 2011b).

Internet - Email Marketing

An email newsletter contains content created by the sender, which is distributed to subscribers that have opted in to receive updated information. If used properly email marketing can return a high response rate. “Traditional direct marketing has a typical response rate of 0-2 percent, while the response rate of email marketing (including newsletters) is 6-20 percent (Yudkin, Gutzman, & Holland, n. d.). This is beneficial to the Parks Department because this will allow them to engage with users that are not active on social networks.

Internet Costs

Paid services utilize different pricing methods. The two most common are Cost Per Mille and Cost Per Click.

Cost Per Mille (CPM): CPM is the price at which a thousand viewers have seen a banner ad. This was the original method used for pricing online advertisements and remains the most common method for pricing banner ads. Sites that use this pricing method include Hulu and Microsoft/Yahoo, and pricing starts at \$3.15 rising up to \$6.00 a CPM.

Cost Per Click (CPC): CPC tracks the cost of interacting with a client or potential client. In traditional marketing, CPC is viewed as a one-way process of reaching target audiences through means such as direct mail, radio ads and television ads. Search advertising provides opportunities for two-way contacts through web-based chat, internet-based calls, call-back requests or mailing list sign-ups. There are some guidelines to establish minimum acceptable counting procedure for clicks. Each and every click has a life cycle which is known as click referral cycle. It comprises four stages: Initiated click, Measured click, Received click, and Resolved click (Click Measurement Guidelines, Version 1.0., 2009). Sites that use this pricing method include Facebook and Google. Facebook uses a bidding feature that is the maximum amount the Parks Department has indicated they are willing to pay for each click (CPC) or per 1000 impressions (CPM). Facebook allows for focused advertising which has indicated the most beneficial bid price to reach the target audience is \$.95 per click. Google Adwords reach a much broader audience and the price per click ranges from \$.87 to \$1.31. Each site allows the Parks Department to set a daily or monthly budget meaning that if 50 clicks are reached in a day and the budget is \$100, the ads are no longer shown for the rest of the day.

Production costs for web marketing vary depending on services chosen. If the Parks Department chooses to use banner advertisements or to custom design an advanced personal website then a range of creative development costs will be incurred, whereas social press posts, such as “Tweets” via the Parks Department’s Twitter profile, are executed with only administrative costs to consider. Custom websites that are developed from scratch will require a programmer, which depending on the expertise level will cost \$40,000 to over \$100,000 in salary expenses (Web Programmer Salaries, n. d.).

Internet Obstacles

The largest challenge with internet communications is maintaining a daily presence as well as managing the expansiveness of messaging. Information on the web can spread quickly and it is vital to monitor what exactly is being shared, especially in regards to health information. Also, if not properly organized important content created by the Parks Department may get lost in the universe of digital networks. If information is not properly marketed or websites are not user friendly, users may never find the content they need.

Internet Recommendations

“People's perceptions of the magnitude of risk are influenced by factors other than numerical data. Risks perceived to be generated by a trusted source are more accepted than risks perceived to be generated by an untrusted source” (Fischhoff, Lichtenstein, Slovic, Derby, & Keeney, 1981). This is the driving force behind why the web is the best press tactic for the Parks Department to reach their objective. The web will be

effective in achieving the Parks Department's objective because transparent and expert information will originate from the Parks Department's various social press profiles and through posts, likes, pluses, pins, and tweets it will spread throughout the networks attaining a perception that the information is coming from a trusted source, peers. In tandem with establishing a social presence on the web, the Parks Department can start optimize their management of non-social sites by implementing search engine optimization and email marketing. Since the majority of these tactics are complimentary, the Parks Department does not have to request a larger budget and can begin implementation impressstely.

Controlled Messaging Community Outreach

Between the fall of 2004 and March 2006, a series of meetings and workshops were held to devise a comprehensive vision for the future of Fresh Kills Landfill between residents and the project team. Staten Islanders, as well as other participants, offered a wide variety of ideas: new roads to ease local traffic problems and provide public access to the site; active recreational uses such as kayaking and canoeing, horseback riding, sports fields and courts, golf, and hiking; nature programs and a wildlife refuge; blossoming cherry tree groves and gardens; an observation tower to take advantage of the panoramic views. Some residents thought the site should house alternative sources of energy, like wind-driven generators, in addition to the landfill gas recovery plant that currently extracts and processes energy. Others emphasized the potential for scientific and environmental research and education; or the opportunity to make Fresh Kills' transformation an international model for excellence in land reclamation and neighborhood-based planning.

The success of engaging the public face-to-face, learning about their preferences and their concerns, as well as getting them involved in the project, has the potential to be duplicated with health related content. A similar series of meetings should be held to specifically discuss health concerns, explain the engineering that manages those risks and introduce the scientists and engineers who do the work (put a face to the action), as well as sponsor health forums with the CDC and Richmond University's Oncology Center doctors so that residents can ask them specific questions about cancer risks as they relate to landfills.

The Team determined the best way to engage the community is to travel to their respected neighborhoods with experts and credible third party contributors distributing the previously identified talking points. The Parks Department will hold special events that focus on educating Staten Island residents about public health and safety at the Park, or alternatively incorporate public health and safety themes into broader events. The events can include:

- Information sessions around the borough where experts answer community questions/concerns. Not necessarily a “Town Hall” type meeting but smaller, more intimate sessions where the community members can come speak to park experts one on one.
- The events could return back to the Park with guided tours to give visitors an opportunity to see and learn about the landfill engineering systems, and experience the park first hand.

These specialized events would not only allow the Parks Department to control consistent messaging, but would get the public to be more engaged with the Park’s progress. The Team recommends that the Parks Department utilize the trickle down communications approach in determining where to acquire venues and whom to invite. The Team has identified through demographics data, membership info, and current opinions of the park, the groups, pulled from the target audiences, that are considered the first priority “Influencers”, second priority “Early Adopters”, and “Everyone Else.”

Appendix N: Influenced Messaging

Influenced Messaging through Television

Broadcast Networks reach a larger audience, but only have news segments that are limited to 30 minute or hour long shows scattered throughout the week. Cable Networks, on the other hand, have news channels that run 24 hours a day, but reach a smaller audience. Hence, Broadcast Network shows, such as 60 Minutes, often focus primarily on national stories featuring reports that are either high profile or investigative. However, each network also contains local affiliates which have news shows that spend a much larger portion of air time focusing on local issues. Cable Network stations, such as CNN, FOX News, and MSNBC also focus on national stories, but have more time to delve into distinct components of a story rather than the broad points.

Influenced Messaging through Television

In the table below, the Team used Arbitron's Qualitap local market qualitative consumer information software to identify the top television viewership ratings in Staten Island. This information was used to determine which affiliates will reach the largest audience. WABC is a clear leader in this industry having four time slots that are in the top 10 Cume Ratings* and should be noted when approaching news stations with press releases.

	Station / Time Periods Ranked	Cume Rating*
1	WABC:M-SA 8-11P SU 7-11P	41.70%
2	WCBS:M-SA 8-11P SU 7-11P	40.60%
3	WNBC:M-SA 8-11P SU 7-11P	31.90%
4	WNYW:M-SA 8-11P SU 7-11P	31.40%
5	WABC:M-F 9A-4P	31.10%
6	WCBS:M-F 9A-4P	20.50%
7	WABC:M-F 7P-8P	20.40%
8	WABC:M-F 5P-7P	16.90%
9	WNBC:M-F 11:30P-12:30A	16.40%
10	WNET:M-SU 6AM-12AM	16.40%

Source: QUALITAP Television Rank Report, March 2010-February 2011, Adults 18+, Staten Island, New York. *The percent of all the people in the geographic area who meet the qualitative (if any) and current category's criteria (listed directly to the left) that listen to/view/read the specified medium.

A more important item in Qualitap Television Rank Reports is the appearance of WNET's Channel Thirteen, which is the flagship public television station of the New York City tri-state area and is the most-watched public television channel in the nation (Thirteen, n. d.). WNET carries specialized programming that would be prone to doing a feature story on Freshkills Park.

In addition to the broadcast networks top viewership ratings, NY1 - Time Warner Cable's 24 hour news channel, airs a weekly show called *This Week on Staten Island*, currently hosted by Anthony Pascale and Christopher Pessolano, and also airs an hourly newscast called "Your Staten Island News Now" with Amanda Farinacci as the Staten Island borough reporter. NY1 is seen on channel 1 in more than 2.1 million homes, representing approximately 4.5 million viewers and more than 10,500 corporate offices, 1,900 restaurants and bars, and 60,000 hotel rooms (NY1 Advertising, n. d.).

In a highly localized effort, the Parks Department may also want to consider Staten Island Community TV which offers equipment and facilities for local programming created by the wide variety of individuals, groups and organizations within Staten Island. They are noncommercial and the producer has full editorial control. SICTV operates on Time Warner Cable's Channels 34, 35, 56 and 57. The facility includes 2 Studios, 5 editing suites, and a portable camera division. SICTV provides comprehensive television production training for eligible community members. Eligible members are defined as Staten Island Residents or individuals affiliated with Staten Island based Not-For-Profit Organizations. Freshkills Park could provide a video or film an expert panel about the safety of the park and air it using SICTV.

In the table below, the Team used Arbitron's Qualitap local market qualitative consumer information software to identify the top radio outlets in Staten Island. As stated previously Clear Channel Communications holds many of the top rankings however those are primarily entertainment stations and the only stations of interest for reporting purposes WINS-AM and WCBS-AM because they carry talk radio and news segments.

	Stations Ranked	Cume Rating*
1	WLTW-FM	52.30%
2	WCBS-FM	44.40%
3	WKTU-FM	43.90%
4	WHTZ-FM	34.80%
5	WAXQ-FM	30.20%
6	WWFS-FM	29.90%
7	WXRK-FM	26.10%
8	WCBS-AM	23.00%
9	WINS-AM	21.20%
10	WPLJ-FM	20.70%

Source: QUALITAP Television Rank Report, March 2010-February 2011, Adults 18+, Staten Island, New York. *The percent of all the people in the geographic area who meet the qualitative (if any) and current category's criteria (listed directly to the left) that listen to/view/read the specified medium.

Additional radio stations to consider

WNYC produces 100 hours a week of its own programming, including local news and interview shows that include The Leonard Lopate Show, Soundcheck and The Brian Lehrer Show. The entire schedule is streamed live over the internet (and several shows also air over XM Satellite Radio); as a result the station receives listener calls from far-flung states and even has international listeners. With more than one million unique listeners each week, WNYC has the largest audience of any public radio station in the United States (New York Public Radio, Annual Review, 2011). Consisting of AM 820, FM 93.9, and wnyc.org, WNYC aims to inform the public locally and globally on current events, politics, and civic affairs; export New York's arts and cultural riches to the rest of the world; and give voice to diverse audiences. WNYC provides the most comprehensive news, music, and cultural programming radio has to offer. The Web site www.wnyc.org references "Staten Island" over four million times and references "Freshkills" over 50,000 times (New York Public Radio, Annual Review, 2011).

WSIA is a college radio station located on the campus of The College of Staten Island, part of the City University of New York. The station broadcasts on 88.9 MHz FM. WSIA is an alternative rock station, with specialty jazz, rock, and urban formatted content, in addition to talk radio. WSIA transmits to Staten Island, Brooklyn, Manhattan, and Queens, New York. WSIA can also be heard in parts of Union County, New Jersey as well as Essex County, New Jersey. This is a station that should be targeted by the Parks Department because of its localized collegiate origins.

Influenced Messaging through Print - Newspapers

Print is a very versatile medium. Print can range from newspapers to magazines and flyers to billboards. The advertisements can be purely graphic or literary based. Depending on the tactic selected the range can be as narrow as individuals handing out flyers to designated public members or as wide as placing a centerfold ad in a nationally distributed magazine.

Newspapers provide ongoing, up-to-date coverage of national and local stories. There are generally two types of newspapers – daily and weekly. Daily newspapers are divided into distinct sections, including national news, local news, features, editorials, columns, opinion editorials (also known as op-eds), and letters to the editor. Op-eds or letters to the editor can be written by an organization or an individual supporter which discusses an opinion based on current issues of importance. Weeklies usually follow a similar format, but stories cover the last week as opposed to dailies that cover the last day.

Daily newspapers often target larger metropolitan areas and the content covers a wide variety of news topics. Some of the major dailies will even have editions that are tailored to submarkets or regions within the larger metropolitan area. The daily newspapers have a larger staff than weekly publications and often seek information from a variety of sources. When presenting a press release to a daily publication a reporter will usually reach out to the organization that published the release to ask investigative questions to determine if the information is really newsworthy. Weekly papers are more commonly located in smaller communities and concentrate more on local news. As opposed to daily publications weeklies have smaller staffs and, as a result more often release a press release in its original form rather than pursuing further investigation. It should be noted that the Parks Department has been prominent within the print medium in regards to news articles, but as stated previously, the content of those messages are not controlled by the Parks Department and are not being considered as press advertising tactics.

In the table below, the Team used Arbitron's Qualitap local market qualitative consumer information software to identify the top newspapers in Staten Island.

	Newspapers Ranked	Cume Rating*
1	Staten Island Advance(SUN)	65.00%
2	Staten Island Advance(M-F)	52.70%
3	New York Daily News(M-F)	38.30%
4	New York Daily News(SUN)	35.50%
5	New York Post(M-F)	32.80%
6	New York Post(SUN)	18.60%
7	New York Times(SUN)	14.80%
8	New York Times(M-F)	11.40%
9	am New York(M-F)	6.00%
10	Metro New York(M-F)	4.60%

Source: QUALITAP Television Rank Report, March 2010-February 2011, Adults 18+, Staten Island, New York. *The percent of all the people in the geographic area who meet the qualitative (if any) and current category's criteria (listed directly to the left) that listen to/view/read the specified medium.

Influenced Messaging through Print - Magazines

Magazines, like newspapers, utilize the print medium to focus on stories with detailed and fact-driven information. Often the reports are written from a particular angle of the story which caters to their subscribers. For example, Popular Science Magazine will write articles discussing the technology used in Freshkills Park, rather than the politics surrounding the park. Unlike newspapers, magazines require a much longer lead time for their stories. Often, a story will hit the newsstands several months after the idea has been pitched. Therefore, when utilizing this medium, time constraints must be addressed.

After researching and reviewing Staten Island local, city-wide, and industry magazines indicates that Freshkills Park should target the following magazines based on target audience and circulation:

- *New York Magazine* – a weekly magazine principally concerned with the life, culture, politics, and style of New York City. In 2011 there was an average of 405,398 copies per edition/ volume circulated.

- *Time Out New York* – a comprehensive source for arts and entertainment listings in New York City. In 2011 there was an average of 392,231 copies per edition/ volume circulated.
- *Staten Island Parent* – a monthly magazine supporting Staten Island's growing families. Each edition features a monthly calendar that highlights events and programs offered for children and adults, as well as a wide array of articles and columns written by local writers.

With additional resources, there are also a plethora of parenting and industry (science, engineering, health, and environment) trade magazines that Freshkills Park could reach out to. Listings of these magazines are contained within the press list provided in the supplement at the end of the document.

Influence Messaging through the Internet

Previously, news was primarily disseminated through once daily printed newspapers and scheduled television and radio airings; however the digital medium provides a source that can be constantly updated with up to the minute current news. Not only do people consume this news, they have the ability to comment and engage with it. The digital medium is so versatile; it has even expanded into mobile devices with more than four in ten American adults owning a smartphone and one in five owning a tablet (Journalism). In today's fast-paced world, the internet provides a resource for news press to provide easily accessible, reliable, and up-to-date information to the public. In fact, though many people still get their news from traditional forms of press such as television, newspapers, magazines and radio, at the end of 2010, more people relied on internet based articles than from newspaper articles and according to Nielsen Online monthly unique users that accessed top news sites in 2011 increased 17%, a similar increase from 2009 to 2010 (Journalism). Because of this most major national and local television, print, and radio outlets have an online presence. While many news websites carry the same name as a major print or television outlet, this does not mean that the same editors and reporters work for both. For example, you could successfully get a story placed on CNN.com that never airs to the CNN cable television station. In addition, some print outlets will report a story on their website, but will choose not to publish it in the print edition.

Influenced Messaging through Community Outreach

Health Community Advisory Committee

If $Risk = Hazard + Outrage$ is taken literally, then making a risk fairer, more familiar, and more voluntary does indeed make the risk smaller, just as reducing hazard makes it smaller. Similarly, efforts to share power, such as establishing and assisting community advisory committees, or supporting third party

research, audits, inspections, and monitoring, can be powerful means for making a risk more acceptable (Covello & Sandman, 2001).

Community Advisory Committees (CAC) are an effective way to ensure the community feels engaged in the process since a representative of their community is speaking on their behalf. CACs are typically made up of members of the community and are designed to serve as a focal point for the exchange of information among the local community and the Parks Department. The CAC provides a forum for representatives to discuss their concerns about the Park, how to help the Park thrive, and to learn from each other. The Parks Department provides administrative support for the CAC and often presents information at CAC meetings, and in return, learns from the group members' experiences and observations (Community Advisory Group Toolkit, n .d.).

The Parks Department has already utilized a successful community advisory group comprised of stakeholders representing local and regional recreational, environmental, cultural and youth organizations that helped to plan the development of the park. Membership in the CAC should reflect the target audience and be primarily composed of community influencers and residents that live near Freshkills. Representatives should include public health and environmental science experts knowledgeable about the health risks and mitigations association with the landfill; local environmental or public interest groups; local academic groups; local government units; and local businesses leaders. The Team recommends referring to the Community Advisory Board members that helped design the Park; however new members may be required in order to ensure health topics are met with proper representation. Meetings should be held quarterly to assess progress and discuss any new concerns. The Parks Department should test messaging with the CAC when applicable.

Appendix O: Best Practices with News Press

When to engage the News Press

There will be two circumstances in which the news press will distribute the Parks Department related information:

- **The Parks Department requested press coverage:** newsworthy events, research, or opinionated views that the Parks Department wishes to be disseminate to the public;
- **Press coverage requested from the Parks Department:** a crisis or a story that directly or indirectly relates to the Parks Department will have journalists reaching out to the Parks Department staff to get an expert opinion.

Who to engage in the News Press

In general, Freshkills Park should cultivate contacts at local press who report on topics related to:

- Environmental Science;
- Public Health;
- Entertainment and Recreation;
- Staten Island;
- Editorial Board;
- Events;
- Real Estate.

The Parks Department's current engagement with News Press

- Press Requests/Tours;
- Members of the press can request access to the site through the Parks Department Press Office;
- Freshkills Park Press Kit;
- Two pages discussing the technology related to the Landfill Systems

- Press
- Close working relationship with the Parks Department Press Office

How to engage News Press

Building Relationships

Working with the press presents a unique challenge in that the message cannot be controlled. Ultimately the decision of whether a story is published and what exactly is said in that story is decided by journalists and producers. Because of this, establishing ongoing relationships between an organization and the news press is vital. One way to ensure a positive working relationship with press personnel is to become deeply familiar with their regular coverage or "beats" and areas of interests.

News press personnel prefer a source that provides reliable, verifiable information, regardless of whether the news is positive or negative. Therefore the Parks Department should be available to reporters at their request and not be evasive despite the story that's produced. This will create a connection that can be utilized through for the Parks Department's benefit.

There are no small interviews

If providing an interview, whether it is with a campus newspaper, an association bulletin, an industry trade magazine or a major metropolitan daily the same attention and care should be provided no matter the size of the audience. Published information can be shared amongst reporters, for example if a New York Times reporter sees an article in a trade magazine and decides it fits into a trend piece of their publication, a low distribution article is now being spotlighted in a high distribution article. In the new digital era, almost all news stories are accessible on the Web.

Deadlines

Journalists are often under extreme pressure to meet deadlines. If the Parks Department has become a resource for a news story, be sure to accommodate their deadlines otherwise they will find other sources and information regarding health concerns should only come from the Parks Department experts. Also, tardiness does not help in establishing connections.

Carefully Designed Message

Although the message within the article is ultimately decided upon by the journalist and producer, they cannot publish incorrect or false information. Therefore as long as the Parks Department prepares for situations by anticipating difficult questions and repeating carefully designed talking points, journalists will publish stories that convey the proper message.

Crisis Press Management

If suspense, uncertainty and danger are part of the picture, there will be news press covering it. As noted in the reaction of Mt. Trashmore associates demonstrated that candidly discussing bad news when it first surfaces can drastically minimize the coverage it receives. Denial or refusing to comment only raises further questions which indicate a larger story is under the surface. This can cause a simple story to be overly exposed creating dramatic coverage that would not normally be considered as such. (EPA Superfund Community Press)

A threat to health, safety, or the environment - actual, perceived, or potential - can pose both danger and opportunity in risk communication. The Agency for Toxic Substance and Disease has prepared a list of Do's and Don'ts which the Parks Department can reference to properly address risk communication:

Do:

- Plan now: Develop a crisis communications plan before the need arises
- Respond impressately: The first 24 hours are critical. Don't let the rumor mill and unauthorized sources fuel a story
- Respond straightforwardly: Use credible and transparent information
- Appoint a spokesperson: A high-level staff member should be proactive about distributing the Parks Department's point of view

Don't:

- Hope a crisis never comes
- Let the issue be defined by someone else
- Think that keeping a lid on the story will prevent the public from seeking information

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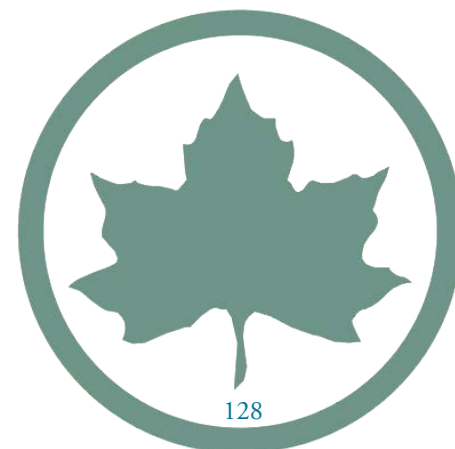
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11. Tables and Figures

Table 1

Contaminant location	Contaminant Type	Contaminant	Leachate Indicator?	Maximum Concentration Recorded ³ (mg/L1, ug/kg2)	Relevant Standard ³ (mg/L1, ug/kg2)	Percentage standard exceeded by
Surface Water	-	Ammonia	Yes	0.85	*	n/a
	-	Dissolved Oxygen	Yes	2.3	>3.0**	23%
	Metals	Copper	Yes	0.0191	0.0079	142%
		Mercury	No	0.0002	0.000005	3900%
Sediment	Poly-Chlorinated Biphenyls	Aroclor-1242*	No	320	22.7***	4129%
		Aroclor-1254*	No	480	22.7***	4129%
		Aroclor-1260*	No	160	22.7***	4129%
	Metals	Arsenic	No	34300	8200	318%
		Cadmium	No	5400	1200	350%
		Chromium	No	129000	81000	59%
		Copper	No	366000	16000****	2188%
		Lead	No	231000	31000	645%
		Mercury	No	4140	150	2660%
		Nickel	No	61000	16000****	281%
	Polycyclic Aromatic Hydrocarbons	Anthracene	No	140	85	65%
		Benzo(a)anthracene	No	1300	230	465%
		Benzo(a)pyrene	No	1300	430	202%
		Benzo(b)fluoranthene	No	1100	200	450%
		Benzo(k)fluoranthene	No	1400	220	536%
		Chrysene	No	1300	500	160%
		Dibenzo(a,h)anthracene	No	250	63	297%
		Phenanthrene	No	2400	240	900%
		Pyrene	No	1400	665	111%
	Pesticides	Alpha-Chlordane	No	43	0.045***	171011%
		Gamma-Chlordane	No	34	0.045***	171011%
		4,4'-DDD	No	160	1.58	10027%
		4,4'-DDE	No	120	2.2	5355%
		4,4'-DDT	No	520	1.58	32811%
		Heptachlor Epoxide	No	14	2	600%

1= Concentration in surface water samples

2= Concentration in sediment samples

3= Sourced from Shaw 2010 Surface Water and Sediment Monitoring Report

*= Ammonia's standard is dependent upon pH, Temperature and Salinity and is only exceeded if the concentration stays above this level for a longer time than measurements were conducted. Therefore entering a single value here is meaningless

**= Criteria given is the Acute standard that Dissolved Oxygen must not fall below over any given 24 hour period.

***= For these chemicals, the criteria applies to the aggregate of similar contaminants; i.e. the Aroclor criteria applies to the sum of all Aroclors and the Chlordane criteria to the sum of all Chlordanes.

****= Nickel and Copper exceeded both Freshwater and Saltwater criterion; the criteria given here is the lower of the two, the Freshwater Sediment Criterion.

Table 2

Freshkills Park Primary Current Communication Tactics and SWOT Analysis								
	Current Communication Tactic	Frequency/Last used or updated	Estimated Reach	Includes Infrastructure Info	Includes Health & Monitoring Info	Strengths	Weaknesses	Threats
Community Outreach	Presentations to Community Boards & civic organizations	Not available	Not available	Yes, basic description	Not available	-Can attract media attention		_Attract several stakeholders for a speaker series _Train other trusted community members on Freshkills health concerns _Presentations could all be made available in one online source (i.e. YouTube) for the public _Messaging must be kept consistent in each presentation
						-Quality face to face interaction with influential individuals		
	"Sneak Peek" annual events	Once a year; last event October 2nd, 2011	2000 visitors in 2011 (Freshkillspark, 2011a)	Yes, basic description	Not available	_Can attract media	_ Rare frequency of event	_Opportunity to reach large audiences for little money _Can address concerns on person-person basis _Messaging must be kept consistent in each presentation
						attention		
						_Showcases all FKP endeavors _Gives visitors a chance to experience the new site's identity _Able to control messaging through tour guides		
Park Tours (bus tours, kayaking, birding, talks, etc.)	Available all Spring, Summer and Fall; about 12 events in 2011	1600 visitors in 2011 (Foderaro, 2011)	Some tours likely include a basic description	Not available	Not available	_Very effective way to educate Staten Islanders and those interested about the site _Gives visitors a chance to experience the new site's identity _Able to control messaging through tour guides	_ Rare frequency of event	_Can effectively integrate health information into tour _Messaging must be kept consistent in each presentation
Print-Based	Freshkills brochures	Distributed at events	Not available	Yes, basic description	No	_Can reach older audience that does not utilize web	_Can be expensive to print _ Difficult to constantly update content	_Can integrate detailed health and infrastructure info as follow-up to personal interaction

	Current Communication Tactic	Frequency/Last used or updated	Estimated Reach	Includes Infrastructure Info	Includes Health & Monitoring Info	Strengths	Weaknesses	Opportunities	Threats
Web-based	Flickr	Last photo set posted: Oct-11	15 members & unknown number of non-member visitors	Yes, some photos of infrastructure visible from surface	No	_ Informal visual channel _ A way for people to experience the site without visiting	_ Mostly visual content, limited text	_ If regularly updated and well organized, there is great potential to showcase what site looks like and document its transformation over time	_ Potential for negative feedback to be visible to all
	YouTube	NYC Parks Department has one video about Freshkills posted in March, 2010	1400 views	Yes, basic description	No	_ Effective way to present a consistent & controlled message	_ Little to no reference to health concerns or monitoring in posted video	_ Potential for highly cost-effective expansion of informational video resources _ Over 800 million unique users visit YouTube each month (Statistics, n. d.)	_ Potential for critics of FKP to disrupt any clear messaging via unofficial videos or commentary
	Twitter	Last Tweet: September, 2011; 11 tweets since 2010	50 followers	No	No		_ Currently not utilized as a consistent communication tactic	_ If managed and used frequently, could be good tool for sharing events, links and news on the park _ Trending information can reach audiences faster	_ No control of negative feedback or commentary
	Facebook	Current content, 1-30 posts/month	About 600 fans	No	No	_ Well-managed and informative _ Integrates FB users who "like" page into online community		_ Can be managed by applications _ Opportunity for greater interaction with users	_ Potential for negative feedback to be visible to all
	Freshkills Park Blog	Current content, 1-30 posts/month, primarily same content as blog	Not available	No, infrastructure-related info is not about Freshkills but about other similar projects	No	_ Great resource for news and events _ Well managed and consistently updated		_ Potential for including more content specific to Freshkills and Staten Island	
	Wikipedia	Last Revised: March, 2012	Not available	No	Limited	_ Well-managed and informative _ Links to other Freshkills sites	_ Requires maintenance and oversight to ensure accuracy _ Limited information on health and safety & no infrastructure description	_ Can integrate more health & infrastructure messaging	_ Content is not controlled; anyone can update
	NYC Parks website	Last posting: Winter/Spring Newsletter, 2012	NYC Parks website gets over 80,000 unique visitors/month (Know where you stand, n. d.)	Yes. "About the Site" section describes landfill engineering for gas, leachate, mound caps, and layers inside mounds	Yes. "About the Site" section explains regulations for landfill mitigation/control, air quality, soil standards & water quality; states that FK has met all landfill regulations, but no info given on condition of air, soil	_ Very comprehensive _ Large potential reach _ Focal point for all other web-based tactics	_ Content controlled by NYC Parks Department _ Some information is out of date	_ Best channel for incorporating detailed health and monitoring information	_ May be difficult to keep content current if have to go through the main Parks Department office
	Freshkills Newsletters "Fresh Perspectives" & news alerts	2 long newsletter per year and short updates every two weeks	About 5000 (C. Grassi, personal communication, April 18, 2012)	Yes, basic description	No	_ Polished and informative newsletter for consistent coverage _ Provides in-depth coverage of park ongoing	_ Newsletter cannot be hyperlinked: in PDF format	_ Can be disseminated in print _ Opportunity for more frequent publication	_ If used too often, will be ineffective as spam
	Environmental Impact Statement	Published in 2009	Not available	Yes, extensive	Yes, extensive	_ The most detailed publicly available health, safety, and infrastructure information	_ Some outdated information possible		

Table 3

Key	Categories (abbreviated)	Categories
A	Convenient	Convenient to visit the park
B	Park for family time	Think the park would be a good place to spend time with family
C	Asset for Staten Island	Park is an asset for Staten Island and the local community
D	Park is desirable	Expressed general interest in having a park and looking to take advantage of what it will offer
E	Demands for the park to provide	Demand that the park have particular features
F	Neighborhood concerns	Concerned about negative impact to surrounding areas such as additional traffic or limited parking
G	Mistrust	Mistrust towards government and the reports about the park
H	Disinterest	Disinterest in the existence of the park or think that it should not be a municipal priority
I	Health concerns	Concerned about individual health or health of family due to visiting the park
J	Physical wellbeing	Age, Health, Frailty impediments or concerns
K	Inconvenient	Inconvenient to access via public or private transportation and parking concerns
L	Curiosity of outcome	Curiosity to see the outcome and how money was spent

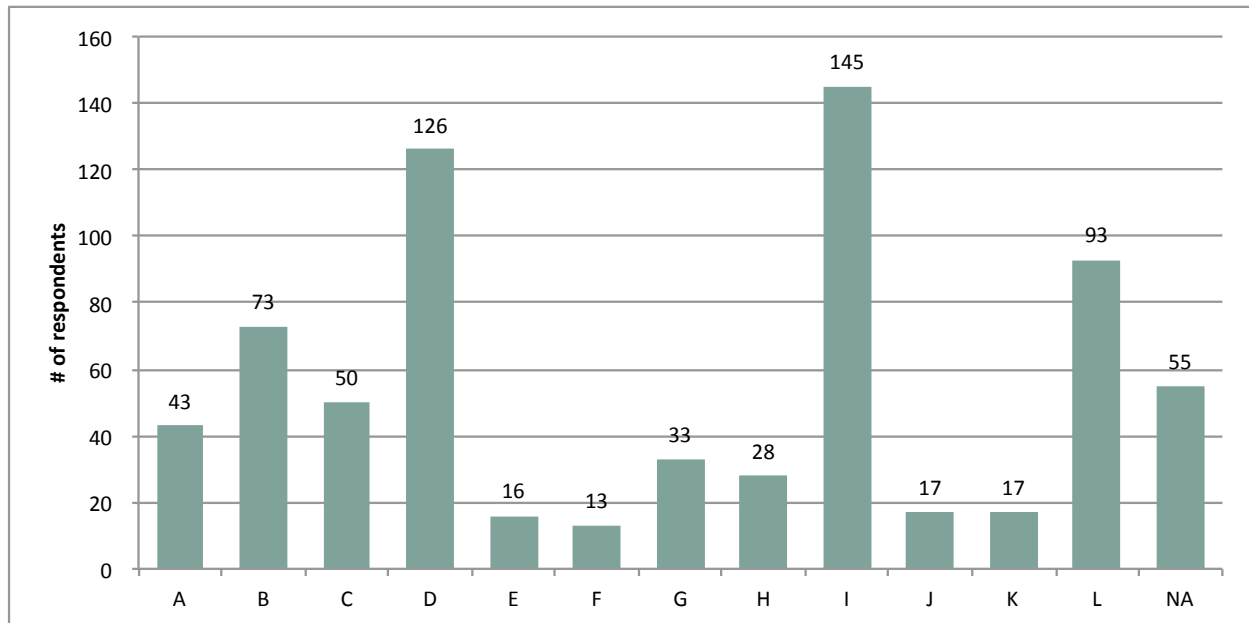


Figure 1: Number of respondents for each of the twelve themes identified through the process of “open coding” from the free response data

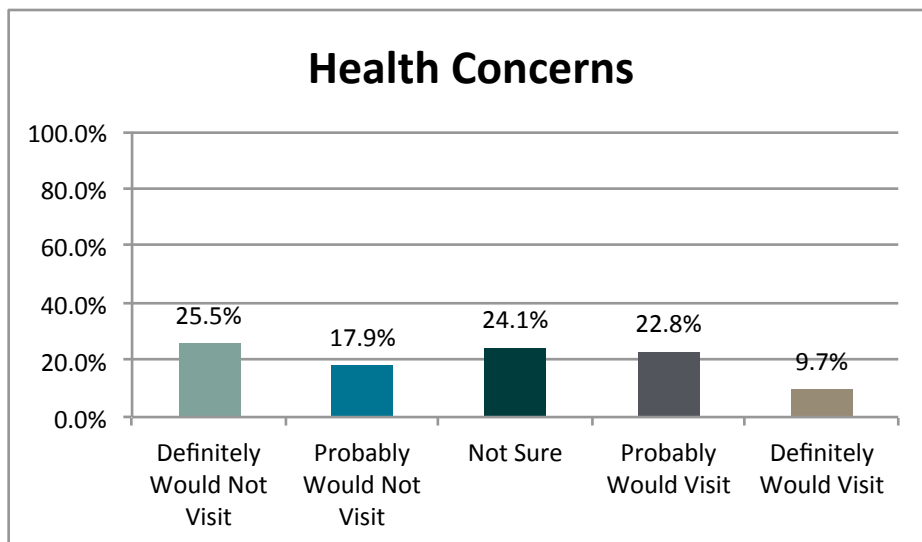


Figure 2: Percentage of respondents by visiting preference who indicated health concerns in the free response data

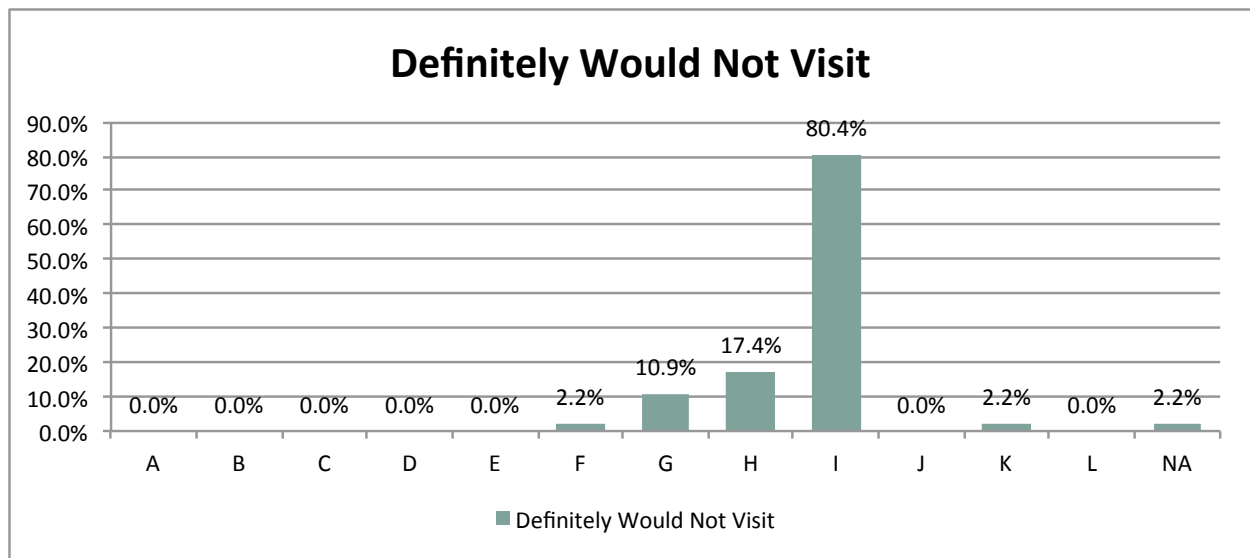


Figure 3: Percentage of respondents by category who selected “Definitely Would Not Visit”

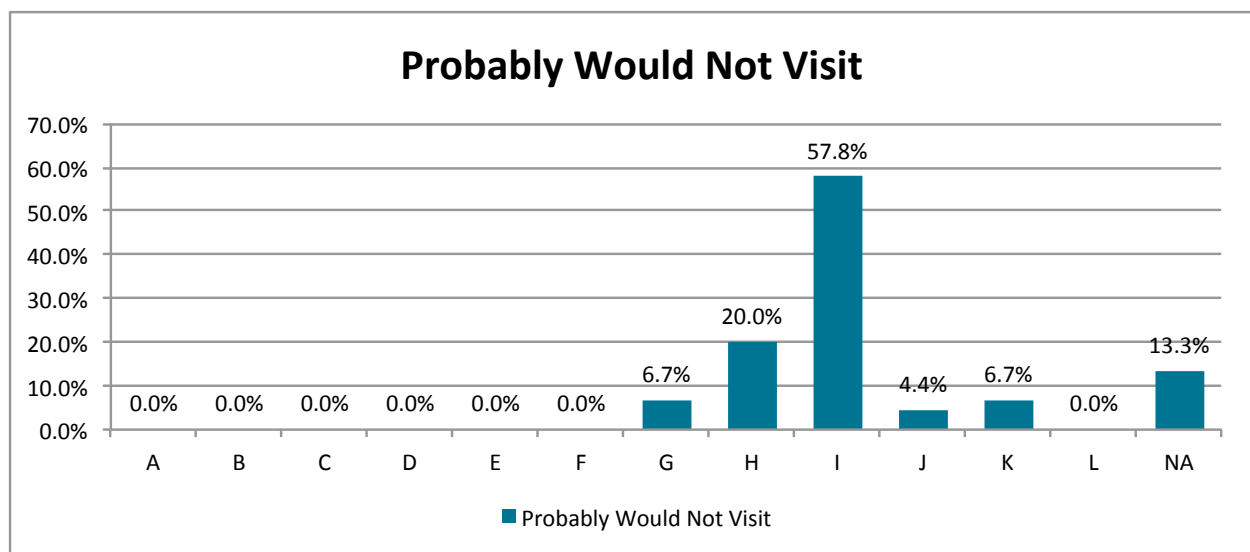


Figure 4: Percentage of respondents by category who selected “Probably Would Not Visit”

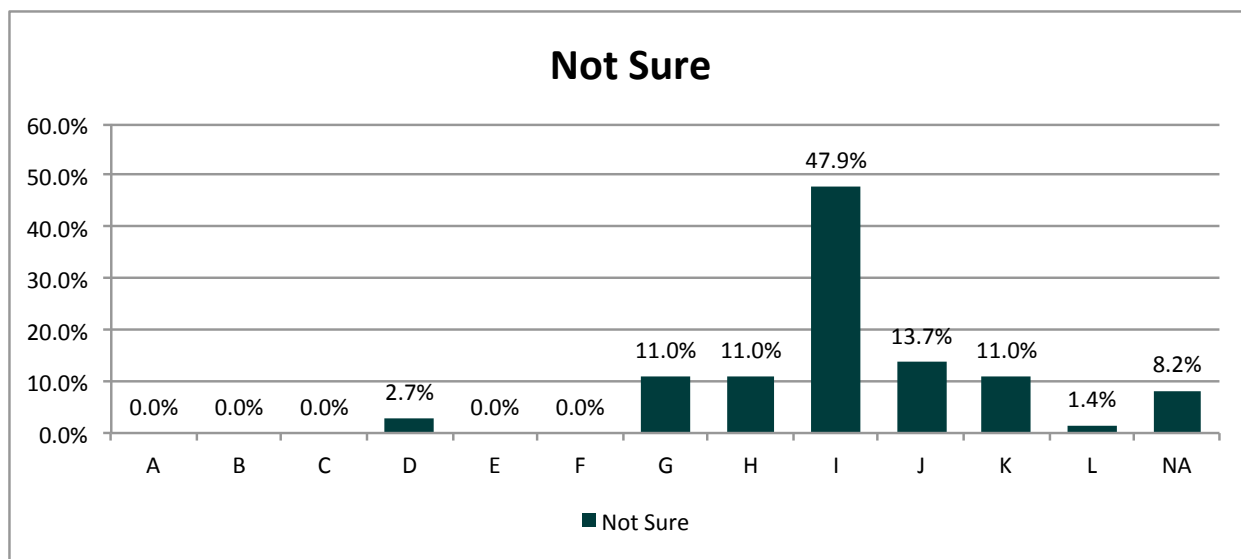


Figure 5: Percentage of respondents by category who selected “Not Sure”

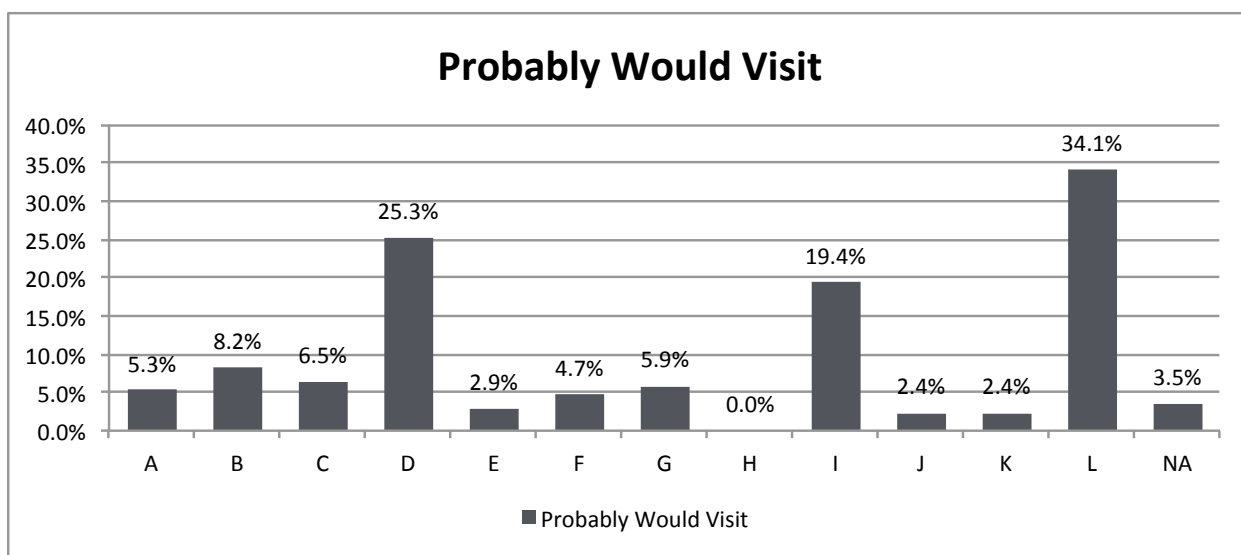


Figure 6: Percentage of respondents by category who selected “Probably Would Visit”

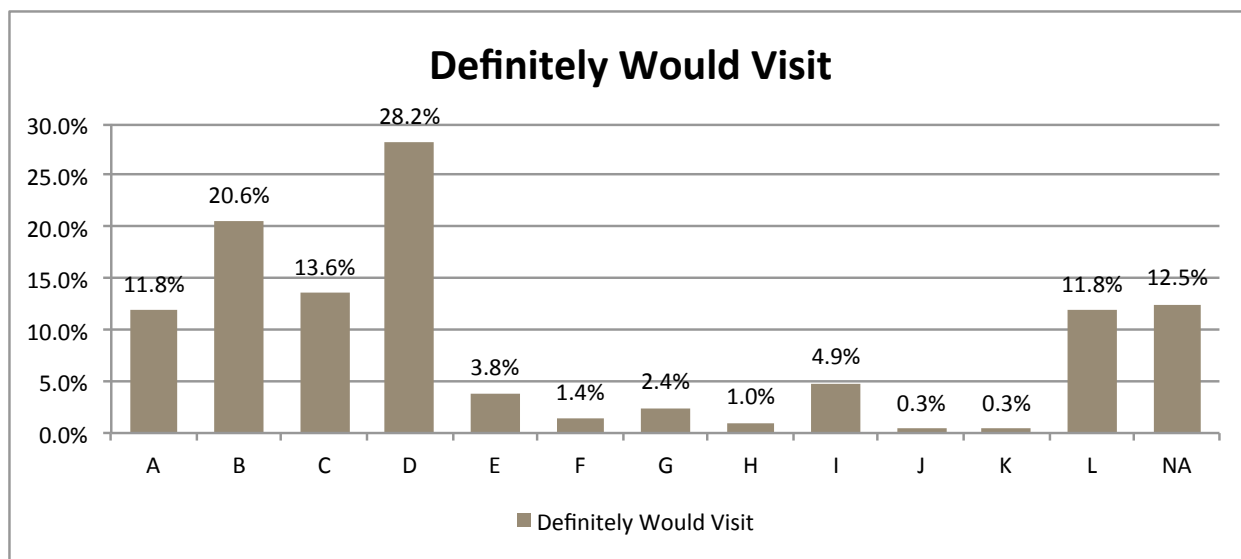


Figure 7: Percentage of respondents by category who selected “Definitely Would Visit”

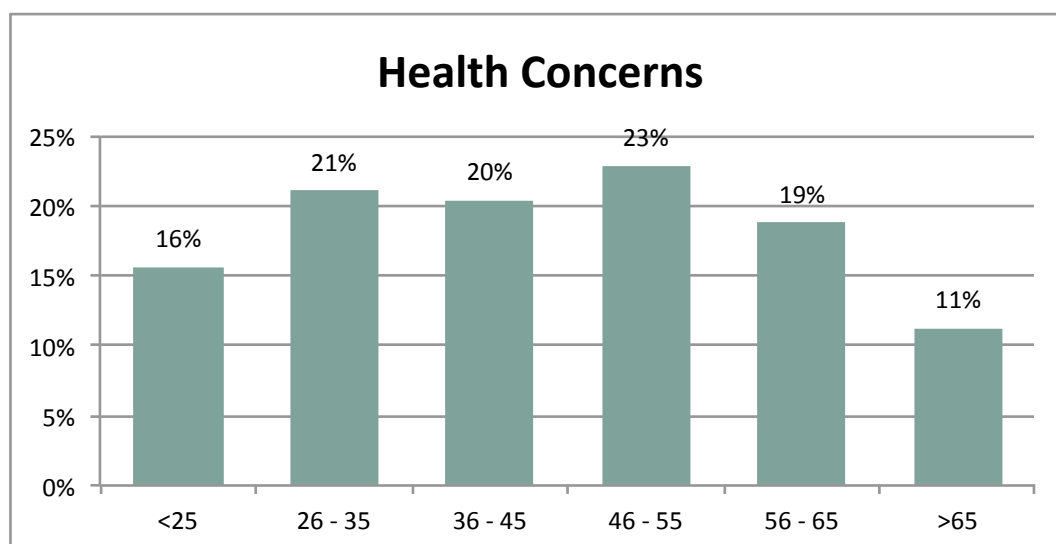


Figure 8: Percentage of respondents by age group who indicated health concerns in free response data

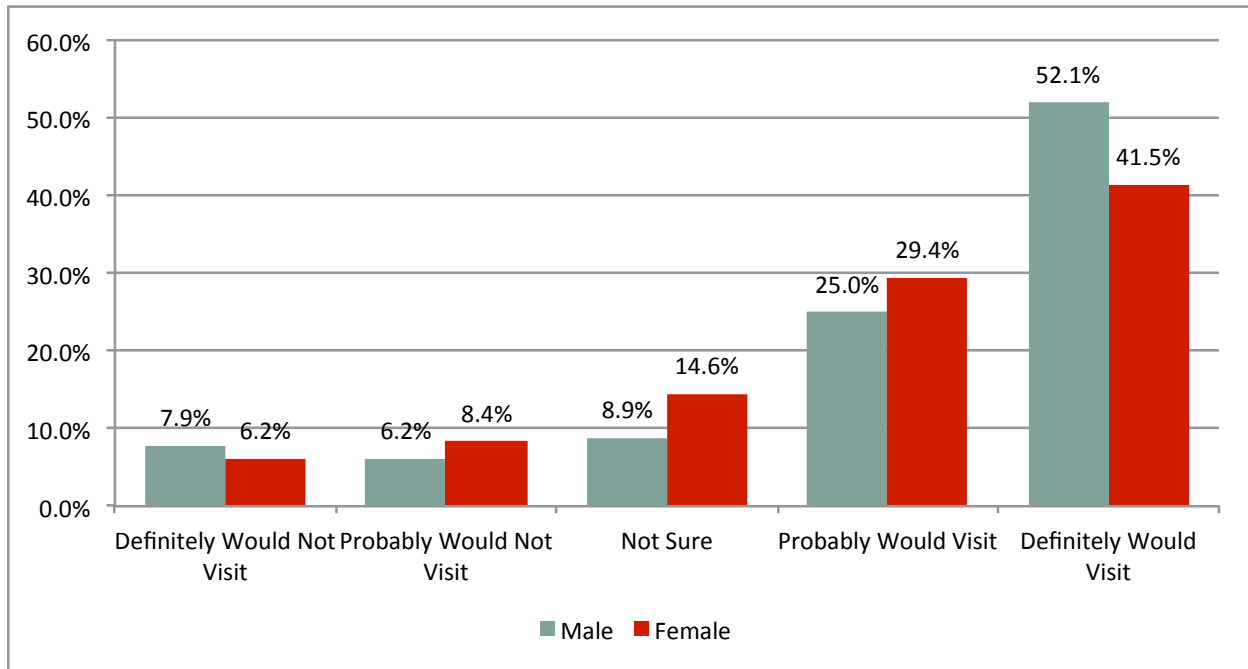


Figure 9: Percentage of respondents by visiting preference and gender

	Within 2 Miles of FK	2-4 Miles from FK	4+ Miles from FK
Definitely Would Not Visit	13.0%	45.7%	41.3%
Probably Would Not Visit	35.6%	31.1%	33.3%
Not Sure	11.0%	42.5%	46.6%
Probably Would Visit	25.9%	40.0%	34.1%
Definitely Would Visit	33.1%	36.9%	30.0%

Figure 10: Percentage of respondents visiting preferences by distance from Freshkills

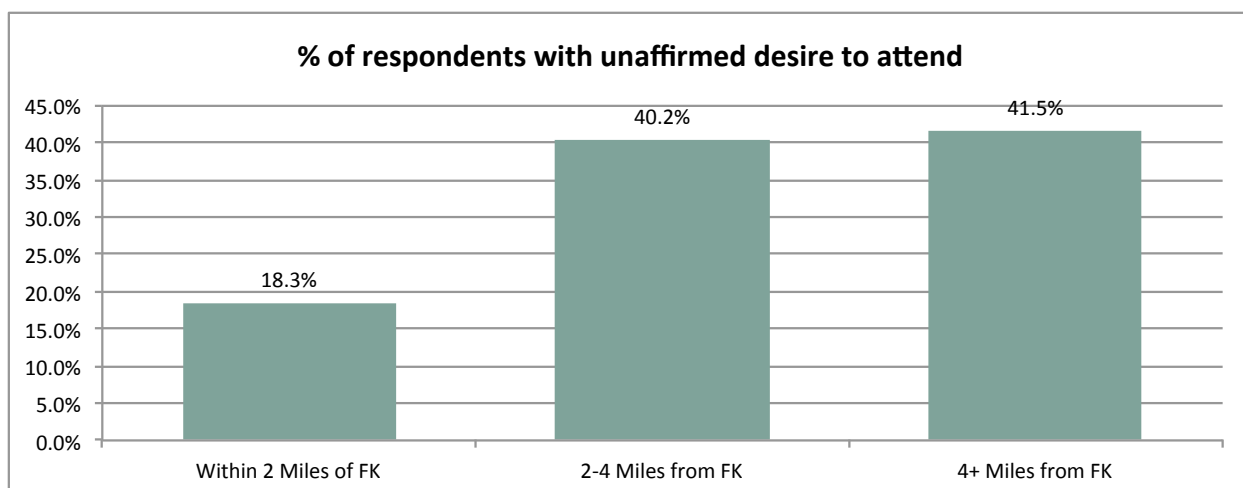


Figure 11: Percentage of respondents who selected “Not Sure,” “Probably Would Not Visit,” and “Definitely Would Not Visit” by distance to Freshkills

compound	concn (ppmv)	compound	concn (ppmv)
methane	55.63%	<i>o</i> -ethyltoluene	3.43
carbon dioxide	37.14%	<i>p</i> -diethylbenzene	2.67
oxygen	0.99%	<i>m</i> -ethyltoluene	2.49
total NMOC	438.09	<i>t</i> -2-pentene	2.37
ethane	222.61	<i>o</i> -xylene	2.17
total unidentified VOCs	134.55	<i>o</i> -dichlorobenzene	2.17
limonene	35.38	<i>n</i> -propylbenzene	2.09
toluene	14.57	styrene	2.02
<i>n</i> -decane and <i>p</i> -dichlorobenzene	13.97	1-undecene	2.02
<i>p</i> -isopropyltoluene	13.14	<i>p</i> -ethyltoluene	2.01
propane	13.03	1,2,3-trimethylbenzene	1.90
isobutane	8.24	benzyl chloride and <i>m</i> -dichlorobenzene	1.88
α -pinene	7.85	1,3,5-trimethylbenzene	1.76
3-methylpentane	7.75	<i>n</i> -butylbenzene	1.50
acetone	6.09	<i>m</i> -diethylbenzene	1.46
<i>p</i> -xylene + <i>m</i> -xylene	5.97	dichlorodifluoromethane	1.27
<i>n</i> -undecane	5.50	chlorobenzene	1.15
1,2,4-trimethylbenzene and <i>t</i> -butylbenzene	5.06	dichlorotoluene	1.15
ethylbenzene	4.71	<i>n</i> -octane	0.99
1,3-butadiene	3.98	<i>n</i> -pentane	0.97
<i>n</i> -butane	3.80	benzene	0.93
isopentane	3.76	<i>n</i> -hexane	0.92
<i>n</i> -nonane	3.57	isobutene + 1-butene	0.92

^a Values are given for all compounds detected above an average concentration of 0.90 ppm or greater in the landfill gas collection system headers.

Figure 12: Average Landfill Gas Composition in Parts Per Million by Volume

Source: Ekland, Anderson, Walker, & Burrows, 1998

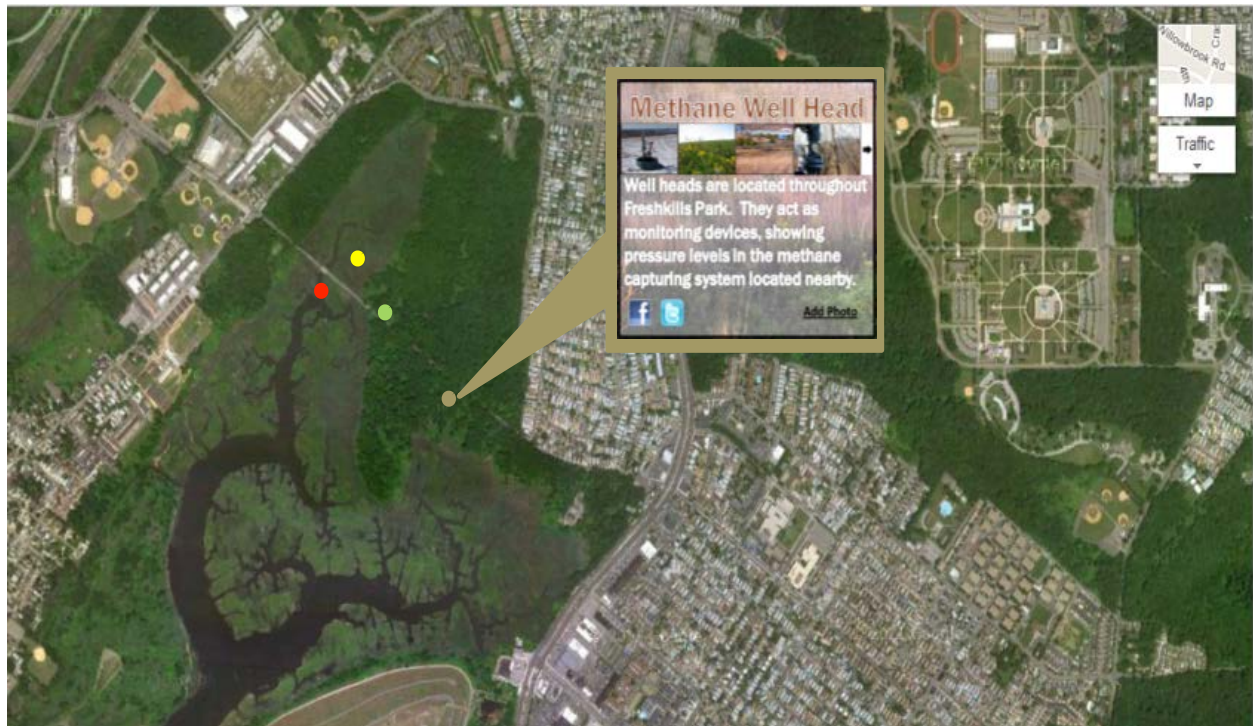


Figure 13. A design concept of the aerial view of Freshkills

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