City of Raleigh

Public Utilities Department
Organizational Analysis and Development Study

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Presented by Raftelis Financial Consultants, Inc.

RAFTELIS
FINANCIAL CONSULTANTS, INC.

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RFC Assignment

In March 2012, the City of Raleigh contracted Raftelis Financial Consultants, Inc. (RFC) to conduct a comprehensive organizational analysis and development study for the City's Public Utility Department within a 20-week time frame. For several years, the City has been discussing whether to relocate its stormwater utility from the Public Works Department to the Public Utilities Department. The move could have far-reaching effects on the relationship between stormwater and transportation, the efficiency of planning, design and engineering activities, regulatory compliance, and customer service management. The RFC team, with extensive knowledge of and experience in the field of surface water management, was asked to compile, measure, and analyze the costs and benefits of relocating the utility. As this data would inevitably be presented in both qualitative and quantitative formats, RFC was asked to incorporate this duality into the overall analysis. Finally, RFC was to report its findings to the leadership of Public Utilities, Public Works, and the City of Raleigh.

Summary of Recommendation

After extensive review of the relevant qualitative data and cost projections over a 20-year planning period, RFC recommends retaining the Stormwater Utility Division's current physical and organizational location within the Public Works Department rather than shifting it to the Public Utilities Department. The commonalities between the Stormwater Utility and the water and wastewater utilities—that were initially recognized by City stakeholders and sparked this study—lend themselves to improvements in long term planning and regulatory compliance activities. With a concerted effort on the part of both entities, collaboration will create cost saving opportunities in an increasingly complex regulatory environment. RFC recommends formalized structured collaboration, through specific, documented work plans and interdepartmental agreements focused around regulatory compliance, planning, and public education.

Process

Per its March 2012 task order, RFC worked to incorporate a great amount of stakeholder input into the data collection and analysis process. This section offers an overview of RFC's process in obtaining that input and developing its recommendation.

The project officially began in mid-March with a kickoff meeting for the City project team. At this meeting, the project team reviewed and discussed the draft project plan presented by RFC. The project plan was implemented as submitted in RFC's proposal. The only change was to the schedule for the project report, which was compressed by two weeks. The kickoff meeting also served as a forum for the group to discuss some of the factors that would be investigated further during the project and briefly review some of the data that were collected prior to the meeting. During this phase of the project, data collection was focused on the structure and service delivery processes of both the stormwater utility division and the Public Utilities Department to establish baseline organizational and financial statuses of each. Following the kickoff meeting, RFC met with staff from Public Utilities, the Stormwater Utility

Division, and Public Works to review the data gathered, ask clarifying questions, and gather additional interview data.

All of the data were synthesized internally in order to construct a meaningful foundation upon which to build the input from a wider group of stakeholders. This foundation was reviewed with a small group of staff from Public Utilities and Public Works and then, with some revisions, was presented at the first formal roundtable in late April facilitated by RFC. Approximately 15 people were present at this meeting, and the group focused on identifying factors of success as well as opportunities and challenges associated with moving the utility. The first exercise drew upon the standing vision for each group and was well aligned with RFC's independent factors for success. The second activity took into account much of the initial input from the City project team and was focused around six categories: service provision, customer relationship/image, efficiencies, regulatory compliance, planning, and externalities. In small groups, participants were encouraged to share any potential outcome that came to mind. Again, the data were synthesized by RFC to accurately but concisely reflect the opinions of the group. The following five components of the definition were gleaned from the specific goals of the team, and act as overarching guidelines over the course of the project.

1) Meet changing regulatory requirements
2) Be recognized as 'best in class'
3) Practice financial stewardship
4) Provide exceptional customer service
5) Provide effective public education

Two weeks after the first stakeholder roundtable, a second was held in which participants were given the opportunity to clarify their earlier contributions and suggest additional considerations. The primary activity of the second roundtable was focusing costs and benefits of the potential move into time frames. In addition to this, the facilitator conducted series of multi-votes to prioritize the previously discussed opportunities and challenges. Topping the opportunities list are 1) providing a 'total water' focus for the City, which reflects the overlap between water supply and watershed protection and the concept of stormwater as a water resource; 2) providing for regulatory teamwork; and 3) possible financial savings through shared resources and staff time. On the challenges side, the team had concerns about 1) limited efficiency gains; 2) establishing a compelling case for the move; and 3) detracting from the existing synergy with the streets maintenance program. The complete notes from this meeting (which can be found in Appendix A) formed the framework for the analyses and subsequent recommendations.

Immediately following a meeting with the Water Utility Advisory Task Force (WUTAT) and the Stormwater Management Advisory Commission (SMAC), a third roundtable was held with these and the original stakeholders to gain final feedback on the analyses approach and methodology. Notes from this roundtable are included as Appendix B. With approval from these groups on the alternatives, the methodology and the draft results, analyses were finalized in early June. This draft report is presented to City staff prior to the final report being submitted to the City Manager's office.

Stormwater Utility

The City of Raleigh established a stormwater utility and stormwater enterprise fund in 2003 (Ordinance No. (2003)-537), at which time it was placed under the purview of the Public Works Department (DPW). Under the DPW's leadership, the stormwater utility became an effective vehicle for many valued public services, most apparent to the City's citizens being the sweeping and drainage maintenance to approximately 1,050 miles of City streets. Through this and other services, the utility embodies its mission, as stated:

> The Stormwater Utility Division's focus is to partner with the citizens of Raleigh to effectively manage flood control and environmental protection in our water bodies, ultimately the Neuse River, by using proactive management techniques to plan, identify, maintain, monitor, design, inspect and construct drainage systems to alleviate structural flooding and preserve water quality. Protecting our waterways provides for the future well being of our environment.

An important aspect of a successful stormwater utility is its connection to—and support from—the customer base. Raleigh's utility has several programs that promote this connection. Within the stormwater division, there is one public education specialist whose focus is to promote the understanding of stormwater as a valuable resource. The City has created a Stormwater Management Advisory Commission (SMAC) to review and provide recommendations to Council and staff on stormwater policy. The Commission consists of 10 members appointed by the City Council. It holds monthly meetings to which the public is invited. The public is also encouraged to become involved through several volunteer and education outreach programs.

Budget and Services

With an annual budget of about $15 million, the stormwater utility offers three primary services—a stormwater maintenance program, a capital improvement program, and management services. The first of these is at the forefront of both public awareness and public health and safety, as it preserves clear roadways for citizens' travel. Drainage maintenance, street sweeping, leaf collection and other stormwater maintenance services are primarily the responsibility of the Stormwater Drainage System Maintenance Program located in the Street Maintenance Division.

The capital improvement program includes elements of design, engineering, planning, and drainage system replacement. Customers rely directly on this component of the program in resolving cases of property flooding. The program management component covers the remainder of stormwater services such as budget management, customer service, regulatory compliance, and oversight. The success of these three areas so far is reflected in the City's continued support for the stormwater utility.

Organization

As it is currently organized, the utility contains 48 positions, including the Program Manager, two senior project engineers, a development supervisor, and a staff analyst. The latter four supervise other areas, as shown in the organizational chart below (see

Figure 1). In addition to these, 42 more positions are funded within the Stormwater Drainage System Maintenance Program located in the Street Maintenance Division of the Public Works Department. Positions are also partially funded for staff in the GIS and Finance Departments. The stormwater program is funded entirely by the utility fee as paid by the City's utility customers and property owners.

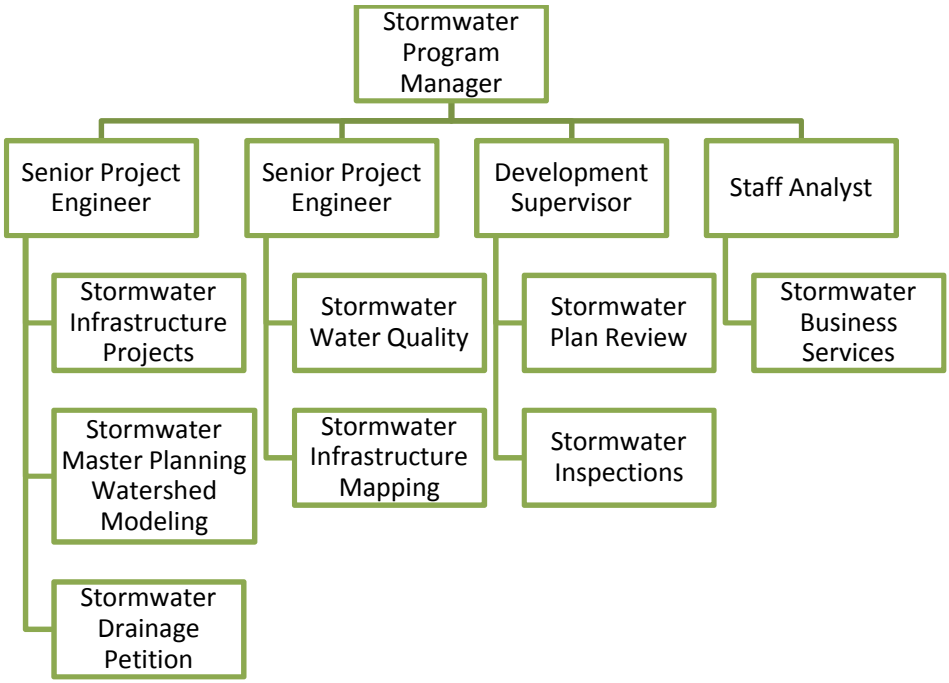

Figure 1. Stormwater Utility Organizational Chart

Public Utilities Department

Budget and Services

As opposed to the stormwater division, which provides services within the City limits, the City of Raleigh Public Utilities Department provides water and sanitary sewer service to approximately 450,000 people in Raleigh and surrounding areas. This includes distribution and collection system maintenance, treatment, capital improvement programs, billing, and customer service. In addition to providing these services, the Department also concentrates resources on public education and conservation initiatives, including the research and development of a water reuse system.

A vast majority of the revenue supporting the Department's $174 million budget comes from ratepayers within the City of Raleigh (approximately $138 million).

Organization

At present, the Public Utilities Department is comprised of 586 employees who are overseen by one director and four assistant directors. The largest staffing areas are water distribution and sewer maintenance, each of which employs over 100 individuals. The water and wastewater treatment plants

employ approximately 85 people each, and a further 25 make up the capital improvements group. The following figure displays the organizational structure of the PUD.

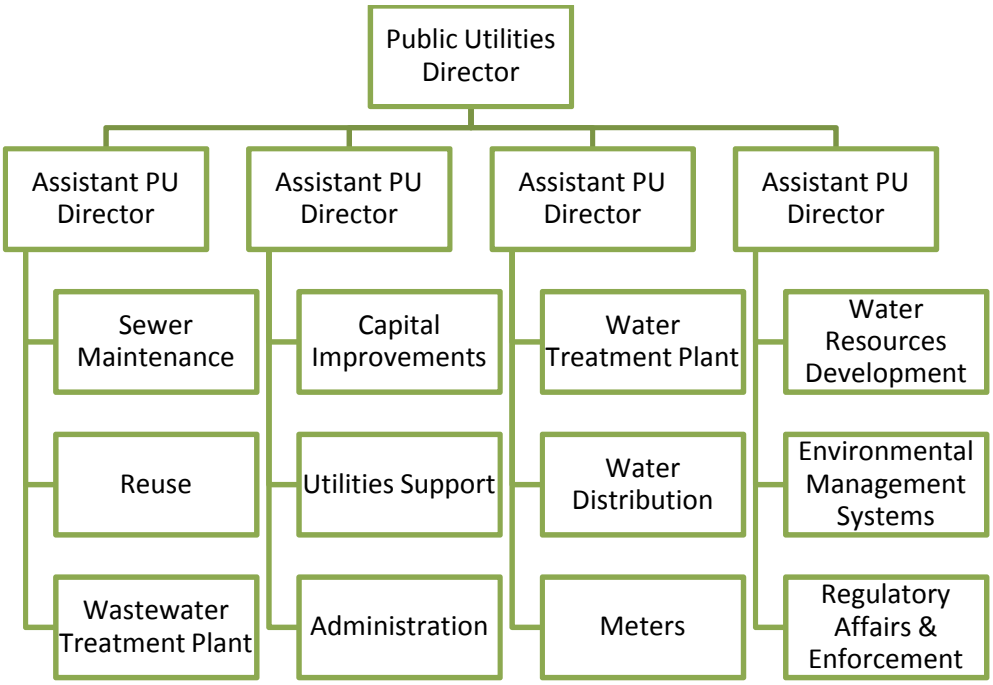

Figure 2. Public Utilities Department Organizational Chart

Public Works Department

Budget and Services

The City of Raleigh's Public Works Department upholds citizen safety and welfare through its transportation- and construction-based services. With its annual budget of approximately $46 million, the Department provides five primary services in addition to the stormwater utility. These services are:

- design and construction of streets, bridges, sidewalks, and other public improvement projects
- capital projects relating to City-owned buildings
- management of City transportation infrastructure, public transit, and parking facilities
- maintenance and inspection of 2,350 lane miles of streets and 1,881 miles of curb and gutter
- maintenance of the City's vehicle fleet

These programs are funded out of the General Fund, the Transit Fund, the Parking Fund, and the Stormwater Fund, as appropriate.

Organization

Apart from the stormwater utility, the DPW is staffed by 301 permanent positions and six grant positions. Street Maintenance and General Public Works employ the most individuals, with 96 and 85 staff members respectively. The Department is organized in the following fashion:

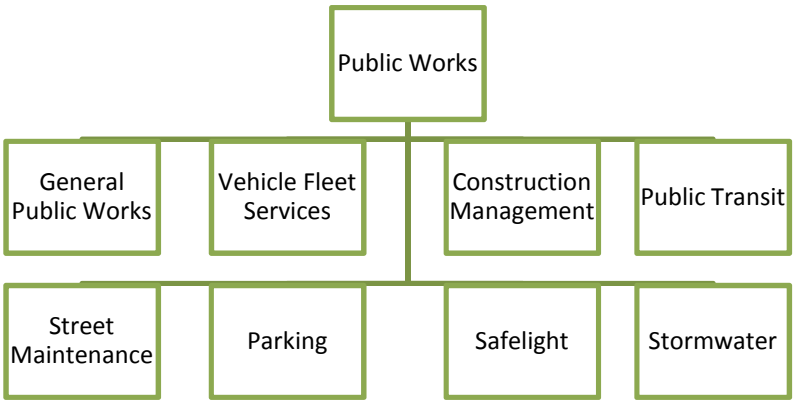

Figure 3. Public Works Department Organizational Chart

Together, the Public Utilities Department, the Public Works Department, the Stormwater Utility, and other City leaders have contemplated moving the stormwater utility under the same umbrella as the water and sewer utilities—the Public Utilities Department—to create a comprehensive water supply and quality entity. This conversation formed the basis for RFC's analysis.

Significant Issues

From the many rounds of collaborative brainstorming and stakeholder input, a list emerged of potential issues that could arise in moving the Stormwater Utility. Through prioritization exercises and open-ended discussions, City staff and stakeholders subsequently made clear that two issues in particular were of greatest importance: the link with street maintenance and regulatory coordination. The degree to which these overshadowed other issues allowed them to shape the alternatives being considered in this analysis.

A stormwater utility is unique from other utilities in that its infrastructure exists mostly as drainage systems along roadways. This facet of the Stormwater Utility Division drives its relationship with the Street Maintenance Program. The City of Raleigh has this relationship well established, with positions in the latter being funded for drainage maintenance activities. The link between stormwater services and streets based on drainage maintenance is quite strong, so attempting to remove that function from the Street Maintenance Program and supplant it in the Public Utilities Department is could result in redundancy of travel, equipment, and staff time. Therefore, of the original alternatives considered by RFC, that of transplanting the entire stormwater utility and severing this important link was eliminated from the analysis. Alternatives considered leveraging the existing relationship to benefit the stormwater program as a whole, and this issue was a critical component to the analysis going forward.

The other primary significant issue in this analysis is that of long-term planning and regulatory coordination. The EPA has already begun promoting integrated stormwater and wastewater management planning initiatives for local governments, and the City of Raleigh is poised to take advantage of the opportunities created under this approach. These plans should "provide for meeting water quality standards and other CWA obligations by utilizing existing flexibilities in the CWA and its implementing regulations, policies, and guidance."[1] Integrated planning will ensure adequate financial coverage for water quality compliance and allow for the inclusion of stakeholder input throughout the planning process. In the future, wastewater and stormwater permitting may be integrated as well (under municipal NPDES permits). Recognition of and preparation for this possible shift in the regulatory environment will be highly beneficial to the City.

Alternatives Considered

With these significant issues in mind and a broad understanding of the current state of affairs, RFC developed two alternatives with which to analyze the data. The alternatives evaluated by RFC were as follows:

Alternative A

Alternative A represents an organizational move for the stormwater utility. In this scenario, the regulatory and administrative arms of the utility would shift into a new organizational arm under PUD to facilitate planning, long-term regulatory compliance, and the comprehensive water focus. Depending on space availability and other issues, this group may be physically relocated to shared space within the PUD, and this might maximize gains based on staff collaboration and cross-training.[2] However, the drainage maintenance service provision component of the utility would remain under the purview of the Streets Maintenance Division in the Public Works Department to retain the efficiencies associated therein. In this model, the stormwater utility (managed under PUD) would hire a mid- or upper- level employee to facilitate this relationship and it would continue to fully fund the DPW's stormwater maintenance service activities.

Alternative B

Alternative B represents no physical or organizational move to the Public Utilities Department. Rather, the stormwater utility would remain under the Public Works umbrella as a single unit. This would preserve the current relationship between the Stormwater Utility and the Streets Maintenance Program. To take advantage of additional efficiencies, mechanisms would be put in place to improve collaboration with Public Utilities on issues relevant to all utilities, such as capital improvements planning and programming, regulation and public education. This model includes structured, significant staff time in collaboration between the stormwater utility and

[1] "Integrated Municipal Stormwater and Wastewater Planning Approach Framework," EPA. May 2012.
[2] Note that, as described in a later section, increased or changed rental costs for relocated staff were not incorporated into costs, only moving costs.

the PUD. While collaboration is currently occurring informally, a more formalized mechanism is needed to maximize benefits.

Status Quo

Both alternatives suggest a shift from the stormwater utility's current organization. As such, the status quo, representing no change in the organizational structure and a continuation of the current level of cooperation between the Department of Public Works and the Stormwater Division, has been included in the analysis for comparative purposes.

Qualitative Assessment

Considerations

For many pieces of information that were brought to light during the data collection period, it was not possible to monetize them as and benefits in a meaningful, representative way. RFC determined that this set of variables would be analyzed in a qualitative manner and founded its interpretation of the data on both its own subject area expertise and the knowledge of City staff.

Assessment and Outcomes

Though stormwater services have been provided for many years, the stormwater utility is a relatively young organization within the City of Raleigh. As such, there is a greater requirement for constructing a strong case for a move to the Public Utilities Department than there is for retaining the current organization. On the other hand, strong interest in incorporation of the stormwater program into PUD has been expressed by some parties, so a recommendation of "no move" also requires a compelling case.

At this early stage in the Stormwater Utility's existence, moving to PUD could have negative effects on the program's identity. The Public Utilities Department operates with a budget more than 12 times that of the Stormwater Utility. In addition to its sheer size, the Public Utilities Department is already fully occupied with the day-to-day operation of the water and wastewater utilities, and is further consumed with the process of implementing its recently-completed strategic plan, which focuses the PUD on exceptional delivery of its existing services. Folding the stormwater utility into the PUD may lead to the former receiving less attention than it requires, and the stormwater level of service provided could decline as a result.

One of the concerns that initially sparked this study was the potential use of stormwater as a water resource. In the future, the cost of water supply from existing resources will likely become high enough—and water availability will become limited enough—to make alternative supplies economically feasible. A previous Water Utility Advisory Task Force (WUTAT) study estimated that the City of Raleigh would need to bring a new water resource online by the year 2025 (see the *Water Utility Advisory Task Force (WUTAT): Final Report* published in early 2012).

The cost of implementing the widespread usage of cisterns to capture stormwater will be high, but it will be mostly a one-time cost that allows for two major benefits: 1) reduced peak discharge from impervious areas (which will reduce the maintenance demand on drainage systems and could aid in future regulatory compliance), and 2) water supply for non-potable uses such as irrigation. The largest savings in this area will be created with appropriate timing of widespread cistern use. Taking into consideration costs associated with stormwater regulations as well may make the appropriate time even sooner. Collaboration between the Stormwater Utility and the PUD will allow for making this transition as soon as the traditional supply costs and other relevant costs are high enough. Without this coordination, widespread cistern use will likely happen much later and significant cost will have been accrued in the meantime. Both Alternative A and Alternative B will allow for the appropriate timing of this shift. The status quo, on the other hand, is likely missing this key consideration.

Understanding the relationship between stormwater, water quality, and water supply, the Public Utilities Department and the Stormwater Utility Division have established a strong working relationship over the past 10 years. Ultimately, both entities report to the same senior management—specifically, the City Manager—and work toward very similar goals. There are relatively few barriers to collaboration efforts, so RFC is confident that they can be achieved without an organizational shift.

City staff was interested in benchmarking its organizational structure model against other stormwater utilities. RFC considered a variety of programs within the state, as well as peer cities or cities of interest outside of the state. Overall, these example stormwater utilities are a testament to the idea that optimal organizational structure is unique to each municipality. Each utility structure is shaped by specific drivers, which in most cases include the local government's specific landscape on the same significant issues (described in the Significant Issues section) that were encountered in the City of Raleigh case. Those were: link with street maintenance and long-term regulatory compliance. Additional issues often include organizational capacity and, related to the first two issues, the make-up of the stormwater system itself (combined versus separated sewer) and attendant regulatory and operational concerns.

Within North Carolina, a common model is for the stormwater utility to be housed organizationally in a manner similar to the Raleigh Stormwater Utility. The exact place or department name that the utility falls under varies. For example, some are housed within Public Works, which contains Engineering, and the utility is either directly under Public Works or within Engineering (i.e. Jacksonville). In other cases, Engineering has been separated from Public Works (or Public Services) and the utility is housed within one or the other of these two separate departments (i.e. Kernersville). In most cases though, the relationship between stormwater management and streets is supported through the organizational structure and the funding relationship between the utility and drainage maintenance personnel demonstrates this important link. In addition to the North Carolina examples, Jacksonville, Florida and Greenville, South Carolina exhibit this model.

The organizational model reflects a mere evolution of funding mechanism from property taxes to user fees. The advent of the utility does not alter a longstanding understanding of the integral relationships

among stormwater drainage maintenance, transportation network integrity, and proper design of transportation features (through development permitting or through actual design of features by municipal engineers). In all North Carolina cities and in most of the south, the stormwater drainage system is separate (except in the case of wrongly plumbed or improperly connected systems) from sanitary sewer infrastructure. As in the case of Raleigh, this tends to mean that the relationship between drainage and transportation features is pre-eminent over the relationship between drainage and sanitary sewer infrastructure (and thus, the sanitary sewer organization within the local government).

By contrast, in local governments where combined sewers make up a portion of or all of the sanitary infrastructure, the stormwater utility finds a more natural home within the sanitary sewer organization. This is driven both by the fact that the utility is managing one set of pipes and by the regulatory structure that governs the utility. The sanitary sewer utility historically will have spent money on the infrastructure that carries stormwater and although the funding structure may evolve (from one fee for both concerns) the organizational structure continues to reflect the historic relationship between the two systems. For example, in Philadelphia, which has a significant portion of its sanitary and stormwater sewer infrastructure as a combined system, the stormwater fee is a charge of the Philadelphia Water Department (the water, sanitary sewer, and stormwater utility organization). As mentioned above, the Department has a significant regulatory driver to manage stormwater in that it is responsible for reducing combined sewer overflows.

However, some exceptions to these general patterns exist—some here within North Carolina. In both Greensboro and in Burlington, neither of which has combined sewer infrastructure, the stormwater utility is housed organizationally with water and sanitary sewer utilities. In Greensboro, the stormwater utility originally was housed in Public Works, but was moved. In Burlington, the relatively young stormwater utility is managed by the Operations Director for the water utilities. In both cases, the arrangement reflects the significant organizational capacity within these two utility organizations and the strong leadership of individuals. Another example, Metro Nashville Davidson County, bucks the rules in various ways. The stormwater utility is housed within Metro Water Services, which is also the water and sanitary sewer utility organization. Combined sewers are not the primary driver though: the CSS area in Metro makes up a relatively small proportion of the stormwater service area. In addition stormwater services were integrated into Metro Water Services before a separate stormwater utility fee was implemented. In Metro, responsibility for stormwater infrastructure is divided between Public Works and MWS in that infrastructure at street level is Public Works' responsibility, while below street level (as well as natural drainage) infrastructure is MWS's responsibility.

These exceptions demonstrate the importance of organizational culture and individual leadership in organizational decisions on stormwater utilities. Although they are exceptions, they make evident the fact that there is no single best practice for locating stormwater in a certain organizational home. Rather, organizational decisions should be reflective of the municipality's disposition on the most significant issues of: the transportation and drainage relationship, regulatory drivers, leadership and organizational capacity, and stormwater infrastructure composition.

Utility	Organizational Home
Asheville, NC	Public Works
Charlotte, NC*	Engineering & Property Management
Winston-Salem, NC*	Independent department, with Erosion and Sedimentation Control Program
Fayetteville, NC*	Engineering & Infrastructure
Durham, NC*	Public Works
Greensboro, NC*	Water Resources Department (with water and sewer utilities)
Kernersville, NC	Engineering Department
Jacksonville, NC	Engineering Department
Jacksonville, FL	Public Works
Greenville, SC	Public Works
Metro Nashville and Davidson County, TN	Metro Water Services (with water and sewer utilities)
Philadelphia, PA	Philadelphia Water Department (with water and sewer utilities)

*Phase I jurisdictions which serve as the best benchmarks for the City of Raleigh. Note that only one of five administers the stormwater utility with water and sewer utilities.

With the information presented, there seems to be no compelling reason to reorganize CORPUD to include the Stormwater Utility Division. With the appropriate intentional collaborative framework, the working relationship between PUD and the Stormwater Utility can continue, and improve, without this reorganization.

Quantitative Analysis

Considerations

RFC is confident in its qualitative assessment of the organizational shift. However, there are many variables to which monetary values could be assigned. A cost benefit analysis of these variables added robustness to the overall analysis and strengthened the recommendation. The following table lists the stakeholder input deemed by RFC as monetizable. For each potential cost, an explanation of its determination is included.

Table 1. Cost categories included in quantitative analysis

Cost	Reasoning
Integration	Integration covers the staff time associated with becoming involved with a new department and a new group of people. Most of this time is spent in formal meetings (training senior staff to manage stormwater concerns, updating work plans, reworking budgets, etc.), but it also takes into account the informal channels of becoming acquainted with a new set of colleagues. It was assumed that this cost 10 senior staff 20% of the year, 20 mid-level staff 10% of the year, 40 lower-level staff 2% of their year, and 8 administrative staff 20% of the year for the year in which integration took place.
Establishing a collaborative framework	In lieu of full integration, establishing a collaborative framework would require slightly less staff time. This time is spent almost entirely in formal meetings, at first creating the structure for collaboration and then carrying out the collaborative plan. Significant, structured time spent in meetings is the cornerstone of this consideration as all the benefits of collaboration will only be reached if all relevant work in both organizations is discussed systematically and regularly. It was assumed that this cost 10 senior staff 10% of the year, 5 mid-level staff 10% of the year, and 2 administrative staff 10% of the year.
Consultant Fees	At the discretion of the City, the implementation of either alternative could be assisted by bringing in an outside consultant. It is assumed that the consultant fees associated with integrating the Stormwater Utility Division under PUD would be about five times higher than those associated with creating the collaborative framework ($150,000 and $35,000 respectively). These fees would cover the cost of facilitating meetings, conducting training sessions, drafting work plans and charters, reviewing budgets, conducting regular assessments, and any other tasks deemed necessary by the City.
Staff time associated with move	Embedded in the cost of physically moving from one location to another is the opportunity cost of staff time. While packing their offices, cleaning, moving and unpacking, staff members are spending time that could otherwise have been put toward fulfilling their typical duties. Though there are inherent differences in the value of time at different staff levels, the amount of time spent is likely to be higher at lower levels, so a flat cost of $1,000 was assumed per person.
Moving costs	The cost of moving office furniture, files, equipment and other belongings was assumed to be $500 per person.
Public outreach & information	The Stormwater Utility Division and PUD are conscientious about their relationships with the City's citizens. Making an organizational shift would require some level of effort to reach out to citizens and inform them of the new organization and any other relevant changes. It is expected that the majority of this cost covers updating the City of Raleigh website, but a small amount may be used for press releases, billing inserts, setting up a hotline, or other forms of communication.

Cost	Reasoning
Letterhead/ business cards	Though relatively small, there is still a cost for purchasing new office supplies (specifically letterhead and business cards) to reflect a new organizational structure.
Payroll transition process	The payroll transition process would be a one-time cost to make changes within the payroll software that reflect the Stormwater Utility Division's shift under PUD. Under this cost, time is also allotted for updating the allocation of PUD and Stormwater Utility costs to the City. This has been assumed to take approximately 15 hours for one administrative staff member.
Increased volume of customer calls	Though the organization of the Stormwater Utility Division is in question, in either case customers will receive the same bill. RFC considers it unlikely that the volume of customer calls will increase significantly. Therefore, the cost for this is assumed to be zero and it is excluded from the analysis.
Differences in job grading	Any differences in job grading between the Stormwater Utility Division and the Public Utilities Department will require resolution. However, this cost is not attributable to a merger, in that it is an issue that would require resolution by the City whatever the organizational decisions are, so it is excluded from the analysis.
Additional training needed for CSR	RFC expects that little additional training will be necessary for the customer service departments within either organization. A protocol for handling questions related to all three utilities already exists, so there is no additional cost related to customer service management.
Additional training for senior management	Senior management within the Public Utilities Department may not have strong backgrounds in stormwater management, and training may be required to bring everyone up to speed. This cost is covered under *Integration* (above).
Code enforcement coordination	City stakeholders and RFC discussed the possibility of saving staff time and equipment in cross-training on-the-ground staff to enforce regulations relevant to water, wastewater, and stormwater. In the short term, the efficiencies gained by this coordination will be offset by the costs associated with training. Therefore, there is a zero cost for code enforcement coordination in the short term. In the longer term, however, a merger could lead to efficiency gains and a slightly improved level of service across the board. This has been estimated as 5% of time for 5 mid-level and 10 lower-level staff.
Up-fit new space for stormwater	Moving into a new office space requires at least a minimal level of up-fitting to ready the space for its new occupants and new use. Alternative A includes $2,000 per person for the Stormwater Utility Division personnel to repair and prepare their new office space.
Track time and resources, tool	Under Alternative A, the diversity of work performed by both management and on-the-ground staff requires that it be accurately tracked so costs for each utility are reflected in the rates customers pay. A one-time cost of $500,000 covers the purchase of time and resource tracking software.
Training collaboration	RFC does not anticipate any costs or savings associated with training collaboration.

Cost	Reasoning
Watershed planning (contracts)	Effective collaboration and planning could lead to savings in watershed planning contracts through expanding the scope of planning rather than duplicating the entire effort. RFC estimates the opportunity to save 10% on two million dollars worth of contracts annually.
Capital Improvement Plan coordination	Similarly, capital improvement plans can be better coordinated with PUD to avoid redundancy in the work and administration. Currently, roadway and bridge capital projects are optimized through coordination within DPW. This is not expected to decrease under either alternative. Alternatives A and B are expected to save 0.2% and 0.18% of the stormwater CIP budget, respectively.
Coordination with PW Streets	Without the physical and organizational connection to Street Maintenance that exists in the current organizational structure, Alternative B relies on the hiring of a mid-level staff member to oversee this coordination. This would be the new staff member's primary responsibility, so his entire cost (salary, benefits, office space, etc.) are allocable to the move.
Reduced capital improvement bids	Increasing the scale of capital projects work will lead to slightly lower construction bids. Alternatives A and B are both expected to save 0.1% of the CIP budget.
Capital project administration	Increasing the scale of capital projects work will also lead to less staff time spent on administrative activities such as scheduling, submitting payments, and reporting. Alternatives A and B are expected to save 0.2% and 0.1% of the project administration budget, respectively.
Track time and resources, staff	Under Alternative A, the diversity of work performed by both management and on-the-ground staff requires that it be accurately tracked so costs for each utility are reflected in the rates customers pay. This continuing cost has been estimated as 1% of time for 2 senior, 2 mid-level, 275 lower-level, and 20 administrative staff.
Plan review coordination	It is expected that development plan reviews can be streamlined with increased collaboration. For 2 lower-level staff members, this could save 5% of time under Alternative A and 4% under Alternative B.
Decreased staff turnover	The increased diversity of work available to staff under a reorganization (Alternative A) could lead to decreased staff turnover, and subsequent savings in training and other new hire activities. This savings was estimated at 18,000 annually under Alternative A.
Rent	Rent costs are not likely to differ greatly from one space to another. City staff expect the overall rent cost to remain comparable. For this reason, it has been excluded from the analysis. Thus, note that Alternative A includes moving costs only and no additional or incremental rent costs.
Operational efficiencies	Operational efficiencies are expected to be minimal, based on input from PUD and Stormwater Utility staff. Any efficiencies to be gained have been captured under regulatory and planning categories. This particular cost has been excluded from the analysis.
Enterprise funds managed together	There is no clear advantage to managing the utility enterprise funds together as different individuals would still be responsible for the transactions of each. This cost was excluded from the analysis.

Cost	Reasoning
Water resource planning	By leveraging stormwater compliance efforts, permitting costs are likely to decrease. Coordinating this effectively is expected to lead to savings of $7 million every 5 years, or 20% of water quality permitting costs.
Regulatory coordination	Assuming the state permitting agency moves toward integrated permitting, there is a likely benefit to both the Stormwater Utility and Public Utilities in coordinating regulatory compliance efforts. This figure has been estimated at $80,000 annual savings for both, and includes all tasks associated with understanding regulations, tracking development, reporting, negotiating permit terms, participating in audits, and tracking compliance.
Evolving regulations and other unknowns	Due to the long planning period and relatively quick evolution of regulations, there are many regulatory unknowns to consider. However, these will be applicable under any scenario and provide nothing to distinguish Alternatives A and B from the status quo. It has been excluded from the analysis.
Evolving customer needs	Similarly, evolving customer needs will be applicable under any scenario, regardless or organizational factors. This has been excluded from the analysis.
Customer service coordination	Customer service coordination is already well done within both the PUD and Stormwater Utility. As discussed, RFC expects that few changes will be necessary to preserve this coordination, so there is no additional cost.
Regional water quality function	The Stormwater Utility has a smaller geographic footprint than either the water or wastewater utilities. Eliciting stormwater compliance (and consequent improved water quality) throughout the region will rely on effective water resource planning. This cost is already accounted for in *Water resource planning* (above).
Scaling up stormwater services	RFC and City staff do not expect to see significant scaling up of stormwater services to include outlying communities. The costs of doing so would increase at a faster rate than the benefits (larger rate base) due to the less dense populations in these areas. This consideration has been excluded from the analysis as it is unlikely to occur under any scenario.
Nutrient offsets	In the future event that permitting allows for nutrient offsets—such that one utility can reduce nutrient discharge beyond the regulatory limit while another reduces less than required to meet the overall limits in the most efficient manner—the organization of the utilities will not have an impact. This option will be easily recognized and considered under any scenario in an effort to save money for the City as a whole. It has been excluded from the analysis.

Methods

Working from the list of costs and benefits (collectively referred to as 'costs') discussed in the Roundtable 2 as well as some additional costs determined by RFC to be relevant to the parties, monetary values were estimated for all costs. In addition to our best estimates (Table 3 columns labeled "Alternative A Cost Estimate" and "Alternative B Cost Estimate" and Table 4 "Alt. A Best" and "Alt. B Best"), RFC established expected variability (as a factor of the original estimate) for each cost (Table 3

column labeled "Variability Factors". Assigning the expected variability to each cost allowed RFC to develop "best" and "worst" case scenarios, that is, the cases of least cost (or, as it could also be described, greatest benefit) and greatest costs (or least benefit). In Table 4 the best cases (least cost, greatest benefit) are labeled "Alt A. Low" and "Alt. B Low" while the worst cases (greatest cost, least benefit) are labeled "Alt. A. High" and "Alt. B. High." In the results, this variability factor represents the level of risk associated with each alternative and ultimately makes the analysis more robust.

Each cost was categorized as being either a monetary or opportunity cost. The former represents actual money spending or saving that would have to occur under a certain scenario while the latter represents staff time or a changing level of service, which has a cost in the form of a trade-off (staff time doing some new activity replaces staff time fulfilling a current responsibility). There is no difference in the value of a given monetary cost from that of the same given opportunity cost. Costs were also divided into time and recurrence categories according to the following table:

Table 2. Time categories assigned to each cost

Category	Years
Start-up	1
One-time, Year 2	2
Continuing	2-20
One-time, Future	15
Future	10-20

Table 3 shows the estimate, categorizations (described in Table 1 in narrative format), and variability for each cost.

Table 3. Preliminary cost estimates and categorizations

Cost Category	Time Horizon	Cost Type	Alternative A Cost Estimate	Alternative B Cost Estimate	Variability Factors
Letterhead/ business cards	One-time, Y1	Monetary	$ 840	$ -	0.5 to 3
Staff time associated with move	One-time, Y1	Opportunity	$ 42,000	$ -	0.3 to 1.5
Moving costs	One-time, Y1	Monetary	$ 21,000	$ -	0.5 to 2
Consultant Fees	One-time, Y1	Monetary	$ 150,000	$ 35,000	0.5 to 1.5
Integration	One-time, Y1	Opportunity	$ 785,920	$ -	0.4 to 1.2
Establishing collaborative framework	One-time, Y1	Opportunity	$ -	$ 266,240	0.5 to 1.3
Payroll transition process	One-time, Y1	Opportunity	$ 358	$ -	0.5 to 1.5
Public outreach & information	One-time, Y1	Opportunity	$ 4,000	$ -	0.8 to 4

Cost Category	Time Horizon	Cost Type	Alternative A Cost Estimate	Alternative B Cost Estimate	Variability Factors
Up-fit new space for stormwater	One-time, Y1	Monetary	$ 84,000	$ -	0.5 to 1.2
Coordination with PW Streets	Continuing, Y2-20	Monetary	$ 128,000	$ -	0.8 to 1.5
Capital project administration	Continuing, Y2-20	Opportunity	$ (30,000)	$ (15,000)	0 to 2
Position consolidation	Continuing, Y2-20	Monetary	$ (51,200)	$ -	0 to 1
Maintenance savings	Continuing, Y2-20	Monetary	$ (150,000)	$ (150,000)	0 to 2
Reduced bids	Continuing, Y2-20	Monetary	$ (106,000)	$ (106,000)	0 to 2
CIP coordination	Continuing, Y2-20	Monetary	$ (212,000)	$ (190,800)	0 to 2
Code enforcement coordination	Continuing, Y2-20	Opportunity	$ (144,000)	$ -	0 to 1.5
Plan review coordination	Continuing, Y2-20	Opportunity	$ (8,000)	$ (6,400)	0 to 1.5
Watershed planning	Continuing, Y2-20	Monetary	$ (200,000)	$ (200,000)	0 to 1.3
Decreased staff turnover	Continuing, Y2-20	Opportunity	$ (18,000)	$ -	0 to 1.5
Track time and resources, tool	One-time, Y2	Monetary	$ 500,000	$ -	0.8 to 3
Track time and resources, staff	Continuing, Y2-20	Opportunity	$ 126,640	$ -	0.8 to 3
Water resource planning	Continuing, Y10-20	Monetary	$ (1,400,000)	$ (1,400,000)	0 to 1.5
Regulatory coordination	Continuing, Y10-20	Monetary	$ (80,000)	$ (80,000)	0.5 to 1.5

These costs were applied over a twenty year planning period and escalated to account for inflation, rising salaries, future construction costs, and other considerations. After assigning these costs to the appropriate year, a discount rate was used to obtain the net present value of each alternative.

Table 4 shows the costs estimated in each year of the planning period for both alternatives and the low and high costs once variability factors were applied as described previously.

Table 4. Costs over the 20 year planning period

Year	Alt. A Low	Alt. A Best	Alt. A High	Alt. B Low	Alt. B Best	Alt. B High
1	$ 458,267	$ 1,088,118	$ 1,392,962	$ 150,620	$ 301,240	$ 584,980
2	$ (987,243)	$ (169,497)	$ 2,134,078	$ (1,228,996)	$ (688,246)	$ -
3	$ (1,441,220)	$ (705,032)	$ 606,750	$ (1,265,866)	$ (708,893)	$ -
4	$ (1,484,457)	$ (726,183)	$ 624,952	$ (1,303,842)	$ (730,160)	$ -
5	$ (1,528,990)	$ (747,968)	$ 643,701	$ (1,342,957)	$ (752,065)	$ -
6	$ (1,574,860)	$ (770,407)	$ 663,012	$ (1,383,246)	$ (774,627)	$ -
7	$ (1,622,106)	$ (793,519)	$ 682,902	$ (1,424,743)	$ (797,866)	$ -
8	$ (1,670,769)	$ (817,325)	$ 703,389	$ (1,467,485)	$ (821,802)	$ -
9	$ (1,720,892)	$ (841,845)	$ 724,491	$ (1,511,510)	$ (846,456)	$ -
10	$ (4,669,115)	$ (2,798,164)	$ 694,035	$ (4,453,452)	$ (2,802,914)	$ (52,191)
11	$ (4,809,189)	$ (2,882,109)	$ 714,856	$ (4,587,055)	$ (2,887,001)	$ (53,757)
12	$ (4,953,464)	$ (2,968,573)	$ 736,302	$ (4,724,667)	$ (2,973,611)	$ (55,369)
13	$ (5,102,068)	$ (3,057,630)	$ 758,391	$ (4,866,407)	$ (3,062,820)	$ (57,030)
14	$ (5,255,130)	$ (3,149,359)	$ 781,142	$ (5,012,399)	$ (3,154,704)	$ (58,741)
15	$ (23,563,861)	$ (12,319,378)	$ 804,577	$ (23,313,848)	$ (12,324,884)	$ (60,504)
16	$ (5,575,168)	$ (3,341,155)	$ 828,714	$ (5,317,654)	$ (3,346,826)	$ (62,319)
17	$ (5,742,423)	$ (3,441,389)	$ 853,575	$ (5,477,184)	$ (3,447,230)	$ (64,188)
18	$ (5,914,695)	$ (3,544,631)	$ 879,183	$ (5,641,500)	$ (3,550,647)	$ (66,114)
19	$ (6,092,136)	$ (3,650,970)	$ 905,558	$ (5,810,745)	$ (3,657,167)	$ (68,097)
20	$ (6,274,900)	$ (3,760,499)	$ 932,725	$ (5,985,067)	$ (3,766,882)	$ (70,140)

To test the analysis' sensitivity to changes in escalation and discount rates, these figures were each varied from 2% to 5%, and the model was run again with no significant change in the results. The analysis is insensitive to changes in these assumptions.

The full cost benefit analysis can be found in Appendix C.

Results

Based on the best assumptions made for each cost, Alternative B is expected to lead to greater cost savings than Alternative A over the 20 year planning period (see Table 5).

Table 5. Summarized annualized net present value results

	Low	Best Estimate	High	Spread
Alternative A	$ (4,004,163)	$ (2,159,971)	$ 910,297	$ (4,914,461)
Alternative B	$ (3,845,909)	$ (2,258,933)	$ 14,760	$ (3,860,670)

In the best case scenario, Alternative A may lead to slightly higher cost savings, but it is also much riskier (based on the high cost estimate (worst case scenario)). Since the quantitative analysis is founded in part

on assumptions, risk is an important factor to consider and the worst case scenario is considered more strongly than the best case scenario. Overall, Alternative B is shown to lead to the best financial results. Results of the quantitative analysis are in full agreement with those of the qualitative assessment, and the consulting team feels confident in its recommendation to pursue Alternative B.

Recommendation

After extensive review of the relevant qualitative data and cost projections over a 20-year planning period, RFC recommends retaining the Stormwater Utility Division's current physical and organizational location within the Public Works Department rather than shifting to the Public Utilities Department. This element of the recommendation satisfies the original objective of the study (deciding whether or not to move). However, based on the stakeholder input, RFC developed refined alternatives for analysis and consequently has additional components to the recommendation. The commonalities between the Stormwater Utility and the water and wastewater utilities—that were initially recognized by City stakeholders and sparked this study—lend themselves to improvements in long term planning and regulatory compliance activities. These will likely lead to cost savings in capital improvements project and regulatory compliance as well as through improved interdepartmental collaboration.

Alternative B

Alternative B represents no physical or organizational move to the Public Utilities Department. Rather, the stormwater utility would remain under the Public Works umbrella as a single unit. This would preserve the current relationship between the utility and the Streets Maintenance Program. To take advantage of additional efficiencies, mechanisms would be put in place to improve collaboration with Public Utilities on issues relevant to all utilities, such as capital improvements programming, regulation and public education. This model includes spending structured, significant staff time in collaboration between the stormwater utility and the PUD. While collaboration is currently occurring informally, a more formalized mechanism is needed to maximize benefits.

Structured Collaborative Framework

There are many topics around which water, wastewater, and stormwater can expect to have overlapping interests in years to come. Currently, there is a strong spirit of cooperation between the Public Utilities Department and the Stormwater Division. The recommended framework will improve upon the current situation by identifying the most important topics of collaboration (and those with the most potential financial savings), incorporating these into ongoing strategic planning, and establishing working team charters around these topics.

RFC suggests focusing collaboration on three primary topics: regulatory compliance, long-term capital improvement planning, and public outreach and education. Customer service falls squarely in the third category as a means of educating the public on water, wastewater, and stormwater services. Capital improvement planning requires collaboration in both episodic and ongoing flows to reflect the cycles of decision-making for project -specific and long-term priorities and processes. Similarly, regulatory

compliance coordination must take place on an episodic basis as new regulations or compliance plans are developed and implemented, and on an ongoing basis to ensure that compliance with existing regulations is maintained.

Every year, each department and the City as a whole establish a budget and update strategic planning materials to realign with the changing environment within which they are developed. For the water, wastewater, and stormwater utilities, the capital improvement plans are tools to implement the utilities' strategic plans, which in turn are reflective of the City's long-term goals and priorities. An important component of the collaborative framework is ensuring the alignment of long-term planning between the City and the utilities. Done successfully, this will incorporate the input of important stakeholders such as the Water Utility Advisory Task Force, the Stormwater Management Advisory Commission, elected officials and their constituents, and it will effectively support the 'one water' goals of the City and stakeholders.

The strategic plans for the Public Utilities Department and the Stormwater Division should reflect these goals through formalizing the collaborative processes, and name sponsors for teams focused on each of the three primary topics of collaboration (regulatory compliance, long-term capital improvement planning, and public outreach and education) to provide legitimacy and guidance to the teams. Outside the strategic planning process, team charters can be developed to describe the purpose, membership, processes, and success factors for collaborative efforts. RFC suggests the following organizational components for chartered teams.

- Team charters should focus on areas where identified cost savings or opportunities for collaboration exist. For example, the CIP team should produce an integrated prioritization schedule as well as integrated procurement guidance. The public outreach team should produce an integrated public education strategy that addresses identified gaps in the public knowledge base, including any education needed about the roles of the utilities themselves.
- To take advantage of all possible opportunities, each group should meet no less than once per quarter. During times of rapid regulatory change or high activity, meeting with greater frequency should be expected.
- Each of the groups should be vertically integrated to capture the expertise and perspective of individuals in different levels of each organization. Importantly, the regulatory compliance team should include the City's legal representation on environmental issues. To ensure the ongoing viability of teams, executives representing both the Public Utilities Department and the Stormwater Division need to be active members of the teams.

By incorporating collaborative efforts into all levels of governance and formalizing the details of the collaborative process, the Public Utilities Department and the Stormwater Division will be able to reach their goals of uncovering opportunities for increased efficiencies across both groups.

Next Steps

With approval from the City Council, RFC recommends that the Public Utilities Department and the Stormwater Utility Division begin work immediately to construct a framework for collaboration. By 2013, the collaborative process should be finalized in order to effectively navigate the changing regulatory environment. Though this organization is strongly recommended for the 20-year planning period, there may be new developments in the longer term that shift some of the original assumptions or considerations. RFC additionally supports the Water Utility Transition Advisory Taskforce's recommendation of conducting a Public Utility Department governance study in 2024. By this point, two full EPA stormwater permit cycles will have occurred, and there will have been adequate opportunity for the Stormwater Utility Division to reach a steady state. At that time, changes in organization can be re-evaluated.

Appendix A. Notes from Roundtables 1 & 2

What defines a successful stormwater utility? (Entire Group)

1) Meet changing regulatory requirements

2) Be recognized as 'best in class'
   - Benchmarked
   - Raleigh-specific
   - Clean water/mission
   - Hire and retain best employees
   - World class
   - Utility City

3) Practice financial stewardship
   - Pay fair share/ Pay full cost
   - Value
   - Triple Bottom Line
   - Efficient- Minimize Rate Increases
   - Segregated funds, spend on stormwater

4) Provide exceptional customer service
   - Flood abatement before flooding
   - Inspections
   - Maintenance
   - CIP
   - Regulatory
   - Services requested
   - Addressing past issues – CIP

5) Provide effective public education
   - Importance of stormwater services
   - Identity
   - Understanding value = gaining financial and political support

Opportunities & Challenges (Compiled from 3 Groups)

Ranked by number of votes in multi-vote

Opportunities

1. May provide a watersheds or "total water" focus, which reflects the overlap between water supply provision and watershed protection, as well as the direction of clean water regulations
    a. Stormwater as potential water resource (either drinking water or non-potable uses)
        i. $48-65 per gal to sub cisterns for reservoir
2. May provide for regulatory teaming and take advantage of Public Utilities' experience as a regulated entity to help stormwater as stormwater regulations evolve
3. Could provide financial savings through efficiencies, including:
    a. Shared resources
    b. Cost allocation in a united fund may be less burdensome
    c. May provide benefit to streets budget
    d. Equipment could be shared
    e. Get more favorable bond terms
    f. Infrastructure location is similar
4. Could provide for better coordination between stormwater and water/wastewater. Possible coordination items include:
    a. administration
    b. communication
    c. capital projects
    d. long term planning
    e. development regulation
    f. public education
    g. customer service management
5. Merging could provide for additional staff development opportunities (including growth paths and cross-training)
    a. Some staff (such as those individuals already cross-training with streets) may have fewer opportunities
6. May be easier for customers to understand and allow customers to benefit
    a. Public education around water quality
7. Different service area footprints may provide an opportunity for broader impact for improving surface water quality
8. May provide an opportunity for modifying current approach so that the City is conveying the full cost of water services, greater "truth in billing"

Challenges

1. Efficiency gains may be limited because
    a. Both utilities are short of people
    b. A certain irreducible amount of equipment is needed
    c. Even if equipment can be shared, crossover may be limited due to regulatory constraints
2. "If it ain't broke, don't fix it"
    a. If the study doesn't show compelling efficiency or financial gains, then what's the point of doing it?
    b. Want this to be conclusive so it's answered once and for all.
3. Service provision for stormwater if there is a move is a thorny question:
    a. Need synergy with streets
    b. Where do current DPW equipment and people reside if there is a move?
    c. What happens to bridge program?
4. Tracking time and resource use among the utilities is a challenge, especially given differing footprints
    a. This is a management issue
    b. Unrelated to where the utility is placed
5. Different or competing priorities among the utilities may pose regulatory and other challenges such as:
    a. rate increase timing
    b. bond servicing resources
    c. achieving full cost recovery in both utilities
    d. regional partnership relationships
    e. This may not be a big issue because:
        i. They already deal with it for water and sewer systems
        ii. Need to put the full cost of services on the table for council
6. Negative impacts to Public Utilities may include
    a. Increased workload
    b. Difficulty of coordinating a new "arm"
    c. Increased administration costs
7. Role of council
    a. Predisposed to be in favor of the move because of who's advising them
    b. Russell will have to approve before it goes to the Council
8. Value of stormwater may become hidden and image may be lost. Customers may be confused.
    a. This is already a challenge

Other Notes

Incorporate best practices from around the state

Temporary loss of productivity in the move

Costs and Benefits (Compiled from 3 Groups)

	Benefits	Costs
Start-up		- Letterhead/business cards (minimal) - Increased volume of customer calls - Staff time/consultant fees associated with move - Payroll transition process - Changing housing for staff/equip - Differences in job grading - Additional training needed for CSR (utility billing) -Additional training needed for senior management team since they know little about stormwater
Continuing	- Project administration - Operational efficiencies - Improved bidding - Code enforcement coordination - Regulatory - Enterprise funds together - Training collaboration - Capital Improvement Plan - Plan review coordination - Watershed planning	- Transfer to PW for streets work (leaf, etc.)
Future	- Coordinated regulatory battle - Water resource planning - Customer coordination - Multifaceted staff - Watershed master planning - Maintenance savings - Regulatory coordination *** - Regional water quality function	- Evolving regulations and unknowns - Evolving customer needs

Appendix B. Notes from Roundtable 3

Introductions

WUTAT members were, in majority, not able to attend.

In attendance: SMAC, WUTAT, Staff from both groups, consultants, interest groups (American Rivers, Wake Up! Wake County)

Defining Stormwater Utility Success (feedback):

SMAC member: Public safety component of stormwater is lacking in the staff generated list.

Key Issues (feedback):

American Rivers representative: The first one seems to perpetuate the idea that "stormwater" is a waste product.

K. Readling: This is not the intent of that statement – could be restated to take away that sense.

Alternatives (feedback):

M. Senior: Thinks that alternative A's hiring an employee seems like a band-aid; thinks bullet one would compel you to move the drainage maintenance over to PUD. (He misunderstood the bullet).

C. Dawson: Under the Street Maintenance program there are two programs – streets proper (pavement, etc) and drainage maintenance. Those two groups work together closely and that's the linkage we're talking about right now. Rather than separate those two, have PUD purchase those services the same as the way that they purchase patching today.

SMAC member: Clarified that this is the same as today, basically. Why would we need another new employee to help with that existing linkage?

C. Dawson: This helps with connectivity that we've worked to build over time.

SMAC member: A lot of people call me since I'm on SMAC – people don't know the difference between stormwater and other issues and I think that even a consolidated place to call would help – along with some education.

K. Waldroup: we've talked about this and have posited that that could be accomplished through a one call type solution (implied: not reorg)

SMAC member: Seems to me, with Alternative A, collaboration is primary, "holding it together" is secondary and it's the opposite with Alternative B.

K. Readling: That's putting words in my mouth a little bit – explained that you can achieve almost as good collaboration with B

WUTAT member (to D. Bowden): I don't know a whole lot about your work but I wonder if it's generated from work orders versus other stuff. Is it just enough perhaps to have this person facilitate the relationship, to help it be effective?

D. Bowden: Explains program

K. Readling: Clarifying remark

D. Bowden: We send work to streets and they rarely send stuff back to us unless they've performed their work to a certain level of service and it needs a CI project.

WUTAT: That won't decrease over time, it's just more that water quality is growing a lot (faster than quantity)

SMAC member: Are there efficiencies (which I would think could be monetized easily) to working together?

K. Readling: Yes, gives a few examples.

SMAC member: What about the issue of who owns this versus who owns that? Her point was that there is a tug of war – what about just, we have the competencies, whose job is this?

SMAC chair: I'm interested in Alternative A, what happens with feedback between streets and stormwater between office and field?

D. Bowden: It's kind of people dependent.

SMAC chair: I agree but what happens when it breaks down? How high do you have to go?

K. Waldroup: Market incentives

M. Senior: Clarified that today all goes to C. Dawson but under A, it would have to go up to Russell; also posited the question of whether J. Carman would like it if maintenance for PUD went under C. Dawson.

C. Dawson: When the utility was formed, 8 years ago, decision made to keep drainage maintenance where it is…

K. Readling: Also think about how drainage maintenance might evolve (LID, etc.).

D. Bowden: We are at some point going to be in the private area.

SMAC member: This doesn't happen with drainage petition projects now though. So how is it that we get to that point [meaning, where we are working on and owning things in private property]?

D. Bowden: described drivers.

SMAC member: Discussed that BMPs are difficult to enforce upon.

D. Bowden: [disagreeing] We do have enforcement abilities – also have assessment if something breaks.

M. Yip: But there isn't a proactive maintenance program.

M. Senior: we do have an annual inspection program.

Michelle: but that's after work has occurred and doesn't apply to things before 2001.

K. Readling: described the cost benefit analysis approach approach

D. Bowden & Z. Esquivel: not operating with an organizational model.

Cost Benefit Analysis (feedback):

SMAC member: looking at the potable supply graph, there's a cost to jumping in with two feet, too early. The SWU is young and just getting its feet under it. What problem are we trying to solve here?

J. Carman: Conservation committees 1 and 2 recommended it and WUTAT recommended the study; PUD is paying for the study; "Irreversible decisions with inadequate information."

WUTAT: There should be a distinction between B and status quo – has staff talked about what those things are.

D. Bowden: Regular meetings; education process; etc.

Z. Esquivel: Just because you change organizations, doesn't mean those things improve.

K. Waldroup: building business process maps and improving those maps would be a start

C. Dawson: Development services process reorganization is an example of how this can work – single group; right now it's informal (not haphazard) but needs to be more disciplined.

Additional Feedback

SMAC chair: Agrees to collect and compile comments within a week and send to RFC through D. Bowden. Reaction to the report is a separate thing.

WUTAT comments through go through Ed B.

WUTAT member (who has been on all the committees): The main thing is that the moment for optimal collaboration should not be missed

RFC will distribute presentation to all.

Appendix C. Cost Benefit Analysis

Cost Category	Time Horizon	Status Quo	Alternative A	Alternative B	Units	Alt. A Cost	Alt. B Cost	Cost Type (O/M)	Alt. A Low Factor	Alt. A High Factor	Alt. A Low Cost	Alt. A High Cost
Letterhead/business cards	S1	-	20	-	per person	840	-	M	0.5	3	420	2,520
Increased volume of customer calls	S1	-	-	-		-		M	0.5	1.5	-	-
Staff time associated with move	S1	-	1,000	-	per person	42,000	-	O	0.3	1.5	12,600	63,000
Moving costs	S1	-	500	-	per person	21,000	-	M	0.5	2	10,500	42,000
Consultant Fees	S1	-	150,000	35,000	total	150,000	35,000	M	0.5	1.5	75,000	225,000
		-		-								
Integration	S1				total	785,920	-	O	0.4	1.2	314,368	943,104
Senior	*10*		*20%*								-	-
Mid	*20*		*10%*								-	-
Low	*40*		*2%*								-	-
Admin	*8*		*20%*								-	-
Establishing collaborative framework	S1	-	-		total	-	266,240	O	0.5	1.3	-	-
Senior	*10*			*10%*							-	-
Mid	*5*			*10%*							-	-
Low				*2%*							-	-
Admin	*2*			*10%*							-	-
Payroll transition process	S1	-		-	total	358	-	O	0.5	1.5	179	538
Senior											-	-
Mid											-	-
Low											-	-
Admin	*1*		*0.70%*								-	-
Differences in job grading	S1	-	-	-		-	-		0.5	1.5	-	-
Additional training needed for CSR	S1	-	-	-		-	-		0.5	1.5	-	-
Additional training for senior management	S1	-	-	-		-	-		0.5	1.5	-	-
Public outreach & information	S1	-	4,000	-	total	4,000	-	O	0.8	4	3,200	16,000
Code enforcement coordination	S1	-	-	-	total	-	-		0.5	1.5	-	-
Up-fit new space for stormwater	S1	-	2,000	-	per person	84,000	-	M	0.5	1.2	42,000	100,800
Rent	CA	-	-	-	per person	-	-	M	0.9	1.5	-	-
Coordination with PW Streets	CA	-		-	annually	128,000	-	M	0.8	1.5	102,400	192,000
Senior											-	-
Mid	*1*		*100%*								-	-
Low											-	-
Admin											-	-
Capital project administration	CA	-	-2%	-1%	ct Admin Bud	(30,000)	(15,000)	O	0	2	(60,000)	-
Operational efficiencies	CA										-	-
Position consolidation	CA	-		-	annually	(51,200)	-	M	0	1	(51,200)	-
Senior											-	-
Mid											-	-
Low											-	-
Admin	*1*		*-100%*								-	-
Maintenance savings	CA	-	(150,000)	(150,000)	annually	(150,000)	(150,000)	M	0	2	(300,000)	-
Reduced bids	CA	-	-0.1%	-0.1%	CIP	(106,000)	(106,000)	M	0	2	(212,000)	-
Capital Improvement Plan coordination	CA	-	-0.2%	-0.18%	CIP	(212,000)	(190,800)	M	0	2	(424,000)	-
Code enforcement coordination	CA	-		-	annually	(144,000)	-	O	0	1.5	(216,000)	-
Senior											-	-
Mid	*5*		*-10%*								-	-
Low	*10*		*-10%*								-	-
Admin											-	-
Enterprise funds managed together	CA	-	-	-					0.5	1.5	-	-
Training collaboration	C1	-	-	-					0.5	1.5	-	-

Cost Category		Time Horizon	Status Quo	Alternative A	Alternative B	Units	Alt. A Cost	Alt. B Cost	Cost Type (O/M)	Alt. A Low Factor	Alt. A High Factor	Alt. A Low Cost	Alt. A High Cost
Plan review coordination		CA	-			annually	(8,000)	(6,400)	O	0	1.5	(12,000)	-
Senior												-	-
Mid												-	-
Low	*2*			*-5%*	*-4%*							-	-
Admin												-	-
Watershed planning (contracts)		CA	-	-10%	-10%	ıed Planning C	(200,000)	(200,000)	M	0	1.3	(260,000)	-
Decreased staff turnover		CA	-	(18,000)	-	annually	(18,000)	-	O	0	1.5	(27,000)	-
Track time and resources, tool		C1	-	500,000	-	total	500,000	-	M	0.8	3	400,000	1,500,000
Track time and resources, staff		CA	-		-	annually	126,640	-	O	0.8	3	101,312	379,920
Senior	*2*			*1%*								-	-
Mid	*2*			*1%*								-	-
Low	*275*			*1%*								-	-
Admin	*20*			*1%*								-	-
Evolving regulations and other unknowns		FA	-	-	-							-	-
Evolving customer needs		FA	-	-	-							-	-
			-	-20%	-20%								
Water resource planning		FA				r Quality Perm	(1,400,000)	(1,400,000)	M	0	1.5	(2,100,000)	-
Stormwater as potential water resource		F1	-	(6,000,000)	(6,000,000)	total	(6,000,000)	(6,000,000)	M	0	2	(12,000,000)	-
Customer service coordination		FA	-	-	-					0.5	1.5	-	-
			-	(80,000)	(80,000)								
Regulatory coordination		FA				annually	(80,000)	(80,000)	M	0.5	1.5	(120,000)	(40,000)
Nutrient offsets		FA	-	-	-					0.5	1.5	-	-
Regional water quality function		FA	-	-	-		-	-		0.5	1.5	-	-
			-	-	-								
Scaling up stormwater services		FA					-	-		0.5	1.5	-	-

Cost Category	Alt. B Low Factor	Alt. B High Factor	Alt. B Low Cost	Alt. B High Cost	Explanation
Letterhead/business cards	0.5	3	-	-	
Increased volume of customer calls	0.5	1.5	-	-	same bill, customers don't notice
Staff time associated with move	0.3	1.5	-	-	opportunity cost; senior 16, mid 8, admin 32
Moving costs	0.5	2	-	-	moving people, not equip
Consultant Fees	0.5	1.5	17,500	52,500	
Integration	0.4	1.2	-	-	impacted: 10 senior staff 20% of year, 8 admin 20%, 20 mid 10%, 40 low 2%; includes refinagling budget
Senior			-	-	
Mid			-	-	
Low			-	-	
Admin			-	-	
Establishing collaborative framework	0.5	2	133,120	532,480	significant, but less, effort
Senior			-	-	
Mid			-	-	
Low			-	-	
Admin			-	-	
Payroll transition process	0.5	1.5	-	-	direct assignment
Senior			-	-	
Mid			-	-	
Low			-	-	
Admin			-	-	
Differences in job grading	0.5	1.5	-	-	not caused by the move
Additional training needed for CSR	0.5	1.5	-	-	not needed
Additional training for senior management	0.5	1.5	-	-	covered in integration
Public outreach & information	0.8	4	-	-	mostly for website; less for public information, press releases, biling inserts, etc.
Code enforcement coordination	0.5	1.5	-	-	cost of training = efficiencies
Up-fit new space for stormwater	0.5	1.2	-	-	
Rent	0.9	1.5	-	-	
Coordination with PW Streets	0.8	1.5	-	-	
Senior			-	-	
Mid			-	-	
Low			-	-	
Admin			-	-	
Capital project administration	0	2	(30,000)	-	2% of project admin budget; slightly more coordination for HL
Operational efficiencies			-	-	
Position consolidation	0	1	-	-	1 admin/low level person
Senior			-	-	
Mid			-	-	
Low			-	-	
Admin			-	-	
Maintenance savings	0	2	(300,000)	-	5% of 3m
Reduced bids	0	2	(212,000)	-	2% of total CIP
Capital Improvement Plan coordination	0	2	(381,600)	-	money saved by not duplicating work
Code enforcement coordination	0	1.5	-	-	improved level of service; worth 10% of current sw code enforcement costs
Senior			-	-	
Mid			-	-	
Low			-	-	
Admin			-	-	
Enterprise funds managed together	0.5	1.5	-	-	n/a
Training collaboration	0.5	1.5	-	-	

Cost Category	Alt. B Low Factor	Alt. B High Factor	Alt. B Low Cost	Alt. B High Cost	Explanation
Plan review coordination	0	1.5	(9,600)	-	staff time
Senior			-	-	
Mid			-	-	
Low			-	-	
Admin			-	-	
Watershed planning (contracts)	0	1.3	(260,000)	-	assume 2m
Decreased staff turnover	0	1.5	-	-	lower turnover
Track time and resources, tool	0.8	3	-	-	in alt b, less diversity of work
Track time and resources, staff	0.8	3	-	-	IT project plus
Senior			-	-	
Mid			-	-	
Low			-	-	
Admin			-	-	
Evolving regulations and other unknowns			-	-	under all scenarios
Evolving customer needs			-	-	increased cost true under all scenarios; unrelated to org factors
Water resource planning	0	1.5	(2,100,000)	-	7m every 5 years (dec permitting costs, leverage sw compliance efforts); externalize comp costs for sw bc dev community is paying for it (included)
Stormwater as potential water resource	0	2	(12,000,000)	-	
Customer service coordination	0.5	1.5	-	-	already well done
Regulatory coordination	0.5	1.5	(120,000)	(40,000)	includes: understand regs and track dev, reporting, negotiate permit terms, participate in audits, track compliance; ben to both sw and pu; assume permitting agency moved toward integrated permitting
Nutrient offsets	0.5	1.5	-	-	represents offsetting one util with another; nothing about the move is relevant
Regional water quality function	0.5	1.5	-	-	demand sw compliance from areas where w/s are provided (see Water resource planning)
Scaling up stormwater services	0.5	1.5	-	-	costs will inc more than bens; outlying communities are less dense and have been run poorly in the past; not required so leave it out

O Escalation Rate:	3.00%
Discount Rate:	4.00%

		Alt. A Low	Alt. A Best	Alt. A High	Alt. B Low	Alt. B Best	Alt. B High
1	1-Jul-13	330,347	832,278	1,022,642	133,120	266,240	532,480
2	1-Jul-14	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
3	1-Jul-15	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
4	1-Jul-16	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
5	1-Jul-17	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
6	1-Jul-18	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
7	1-Jul-19	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
8	1-Jul-20	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
9	1-Jul-21	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
10	1-Jul-22	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
11	1-Jul-23	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
12	1-Jul-24	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
13	1-Jul-25	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
14	1-Jul-26	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
15	1-Jul-27	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
16	1-Jul-28	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
17	1-Jul-29	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
18	1-Jul-30	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
19	1-Jul-31	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
20	1-Jul-32	(213,688)	(73,360)	379,920	(39,600)	(21,400)	-
Net Present Value:		(2,475,593.40)	(131,012.95)	6,011,377.29	(386,868.24)	(14,763.75)	532,480.00
Annualized Value:		($182,158.50)	($9,640.16)	$442,327.66	($28,466.44)	($1,086.34)	$39,180.81

With escalation:

Power	Alt. A Low	Alt. A Best	Alt. A High	Alt. B Low	Alt. B Best	Alt. B High
1	330,347.20	832,278.40	1,022,641.60	133,120.00	266,240.00	532,480.00
1.03	(220,098.64)	(75,560.80)	391,317.60	(40,788.00)	(22,042.00)	-
1.0609	(226,701.60)	(77,827.62)	403,057.13	(42,011.64)	(22,703.26)	-
1.092727	(233,502.65)	(80,162.45)	415,148.84	(43,271.99)	(23,384.36)	-
1.12550881	(240,507.73)	(82,567.33)	427,603.31	(44,570.15)	(24,085.89)	-
1.159274074	(247,722.96)	(85,044.35)	440,431.41	(45,907.25)	(24,808.47)	-
1.194052297	(255,154.65)	(87,595.68)	453,644.35	(47,284.47)	(25,552.72)	-
1.229873865	(262,809.29)	(90,223.55)	467,253.68	(48,703.01)	(26,319.30)	-
1.266770081	(270,693.57)	(92,930.25)	481,271.29	(50,164.10)	(27,108.88)	-
1.304773184	(278,814.37)	(95,718.16)	495,709.43	(51,669.02)	(27,922.15)	-
1.343916379	(287,178.80)	(98,589.71)	510,580.71	(53,219.09)	(28,759.81)	-
1.384233871	(295,794.17)	(101,547.40)	525,898.13	(54,815.66)	(29,622.60)	-
1.425760887	(304,667.99)	(104,593.82)	541,675.08	(56,460.13)	(30,511.28)	-
1.468533713	(313,808.03)	(107,731.63)	557,925.33	(58,153.94)	(31,426.62)	-
1.512589725	(323,222.27)	(110,963.58)	574,663.09	(59,898.55)	(32,369.42)	-
1.557967417	(332,918.94)	(114,292.49)	591,902.98	(61,695.51)	(33,340.50)	-
1.604706439	(342,906.51)	(117,721.26)	609,660.07	(63,546.37)	(34,340.72)	-
1.652847632	(353,193.70)	(121,252.90)	627,949.87	(65,452.77)	(35,370.94)	-
1.702433061	(363,789.52)	(124,890.49)	646,788.37	(67,416.35)	(36,432.07)	-
1.753506053	(374,703.20)	(128,637.20)	666,192.02	(69,438.84)	(37,525.03)	-
Net Present Value:	(3,360,053.07)	(434,651.72)	7,583,875.14	(550,773.58)	(103,338.85)	532,480.00
Annualized Value:	($247,238.59)	($31,982.43)	$558,034.81	($40,526.88)	($7,603.85)	$39,180.81

	M Escalation Rate:	3.00%					
	Discount Rate:	4.00%					
		Alt. A Low	**Alt. A Best**	**Alt. A High**	**Alt. B Low**	**Alt. B Best**	**Alt. B High**
1	1-Jul-13	127,920	255,840	370,320	17,500	35,000	52,500
2	1-Jul-14	(744,800)	(91,200)	1,692,000	(1,153,600)	(646,800)	-
3	1-Jul-15	(1,144,800)	(591,200)	192,000	(1,153,600)	(646,800)	-
4	1-Jul-16	(1,144,800)	(591,200)	192,000	(1,153,600)	(646,800)	-
5	1-Jul-17	(1,144,800)	(591,200)	192,000	(1,153,600)	(646,800)	-
6	1-Jul-18	(1,144,800)	(591,200)	192,000	(1,153,600)	(646,800)	-
7	1-Jul-19	(1,144,800)	(591,200)	192,000	(1,153,600)	(646,800)	-
8	1-Jul-20	(1,144,800)	(591,200)	192,000	(1,153,600)	(646,800)	-
9	1-Jul-21	(1,144,800)	(591,200)	192,000	(1,153,600)	(646,800)	-
10	1-Jul-22	(3,364,800)	(2,071,200)	152,000	(3,373,600)	(2,126,800)	(40,000)
11	1-Jul-23	(3,364,800)	(2,071,200)	152,000	(3,373,600)	(2,126,800)	(40,000)
12	1-Jul-24	(3,364,800)	(2,071,200)	152,000	(3,373,600)	(2,126,800)	(40,000)
13	1-Jul-25	(3,364,800)	(2,071,200)	152,000	(3,373,600)	(2,126,800)	(40,000)
14	1-Jul-26	(3,364,800)	(2,071,200)	152,000	(3,373,600)	(2,126,800)	(40,000)
15	1-Jul-27	(15,364,800)	(8,071,200)	152,000	(15,373,600)	(8,126,800)	(40,000)
16	1-Jul-28	(3,364,800)	(2,071,200)	152,000	(3,373,600)	(2,126,800)	(40,000)
17	1-Jul-29	(3,364,800)	(2,071,200)	152,000	(3,373,600)	(2,126,800)	(40,000)
18	1-Jul-30	(3,364,800)	(2,071,200)	152,000	(3,373,600)	(2,126,800)	(40,000)
19	1-Jul-31	(3,364,800)	(2,071,200)	152,000	(3,373,600)	(2,126,800)	(40,000)
20	1-Jul-32	(3,364,800)	(2,071,200)	152,000	(3,373,600)	(2,126,800)	(40,000)
	Net Present Value:	(35,652,993.57)	(19,960,630.70)	4,077,824.72	(36,263,581.90)	(21,392,324.43)	(203,458.09)
	Annualized Value:	($2,623,409.67)	($1,468,738.14)	$300,053.48	($2,668,337.83)	($1,574,084.68)	($14,970.80)

With escalation:

Power	**Alt. A Low**	**Alt. A Best**	**Alt. A High**	**Alt. B Low**	**Alt. B Best**	**Alt. B High**
1	127,920.00	255,840.00	370,320.00	17,500.00	35,000.00	52,500.00
1.03	(767,144.00)	(93,936.00)	1,742,760.00	(1,188,208.00)	(666,204.00)	-
1.0609	(1,214,518.32)	(627,204.08)	203,692.80	(1,223,854.24)	(686,190.12)	-
1.092727	(1,250,953.87)	(646,020.20)	209,803.58	(1,260,569.87)	(706,775.82)	-
1.12550881	(1,288,482.49)	(665,400.81)	216,097.69	(1,298,386.96)	(727,979.10)	-
1.159274074	(1,327,136.96)	(685,362.83)	222,580.62	(1,337,338.57)	(749,818.47)	-
1.194052297	(1,366,951.07)	(705,923.72)	229,258.04	(1,377,458.73)	(772,313.03)	-
1.229873865	(1,407,959.60)	(727,101.43)	236,135.78	(1,418,782.49)	(795,482.42)	-
1.266770081	(1,450,198.39)	(748,914.47)	243,219.86	(1,461,345.97)	(819,346.89)	-
1.304773184	(4,390,300.81)	(2,702,446.22)	198,325.52	(4,401,782.81)	(2,774,991.61)	(52,190.93)
1.343916379	(4,522,009.83)	(2,783,519.60)	204,275.29	(4,533,836.30)	(2,858,241.36)	(53,756.66)
1.384233871	(4,657,670.13)	(2,867,025.19)	210,403.55	(4,669,851.39)	(2,943,988.60)	(55,369.35)
1.425760887	(4,797,400.23)	(2,953,035.95)	216,715.65	(4,809,946.93)	(3,032,308.25)	(57,030.44)
1.468533713	(4,941,322.24)	(3,041,627.03)	223,217.12	(4,954,245.34)	(3,123,277.50)	(58,741.35)
1.512589725	(23,240,638.60)	(12,208,414.19)	229,913.64	(23,253,949.39)	(12,292,514.18)	(60,503.59)
1.557967417	(5,242,248.76)	(3,226,862.11)	236,811.05	(5,255,958.88)	(3,313,485.10)	(62,318.70)
1.604706439	(5,399,516.23)	(3,323,667.98)	243,915.38	(5,413,637.64)	(3,412,889.65)	(64,188.26)
1.652847632	(5,561,501.71)	(3,423,378.02)	251,232.84	(5,576,046.77)	(3,515,276.34)	(66,113.91)
1.702433061	(5,728,346.76)	(3,526,079.36)	258,769.83	(5,743,328.18)	(3,620,734.63)	(68,097.32)
1.753506053	(5,900,197.17)	(3,631,861.74)	266,532.92	(5,915,628.02)	(3,729,356.67)	(70,140.24)
Net Present Value:	(51,057,840.06)	(28,920,060.76)	4,787,370.59	(51,716,390.26)	(30,596,307.28)	(331,873.98)
Annualized Value:	($3,756,925.24)	($2,127,988.69)	$352,263.11	($3,805,382.52)	($2,251,329.84)	($24,419.87)

With O & M Costs

Discount Rate: 4.00%

With escalation rate:

		Alt. A Low	Alt. A Best	Alt. A High	Alt. B Low	Alt. B Best	Alt. B High	Alt. A Low	Alt. A Best	Alt. A High	Alt. B Low	Alt. B Best	Alt. B High
1	1-Jul-13	458,267	1,088,118	1,392,962	150,620	301,240	584,980	458,267	1,088,118	1,392,962	150,620	301,240	584,980
2	1-Jul-14	(958,488)	(164,560)	2,071,920	(1,193,200)	(668,200)	-	(987,243)	(169,497)	2,134,078	(1,228,996)	(688,246)	-
3	1-Jul-15	(1,358,488)	(664,560)	571,920	(1,193,200)	(668,200)	-	(1,441,220)	(705,032)	606,750	(1,265,866)	(708,893)	-
4	1-Jul-16	(1,358,488)	(664,560)	571,920	(1,193,200)	(668,200)	-	(1,484,457)	(726,183)	624,952	(1,303,842)	(730,160)	-
5	1-Jul-17	(1,358,488)	(664,560)	571,920	(1,193,200)	(668,200)	-	(1,528,990)	(747,968)	643,701	(1,342,957)	(752,065)	-
6	1-Jul-18	(1,358,488)	(664,560)	571,920	(1,193,200)	(668,200)	-	(1,574,860)	(770,407)	663,012	(1,383,246)	(774,627)	-
7	1-Jul-19	(1,358,488)	(664,560)	571,920	(1,193,200)	(668,200)	-	(1,622,106)	(793,519)	682,902	(1,424,743)	(797,866)	-
8	1-Jul-20	(1,358,488)	(664,560)	571,920	(1,193,200)	(668,200)	-	(1,670,769)	(817,325)	703,389	(1,467,485)	(821,802)	-
9	1-Jul-21	(1,358,488)	(664,560)	571,920	(1,193,200)	(668,200)	-	(1,720,892)	(841,845)	724,491	(1,511,510)	(846,456)	-
10	1-Jul-22	(3,578,488)	(2,144,560)	531,920	(3,413,200)	(2,148,200)	(40,000)	(4,669,115)	(2,798,164)	694,035	(4,453,452)	(2,802,914)	(52,191)
11	1-Jul-23	(3,578,488)	(2,144,560)	531,920	(3,413,200)	(2,148,200)	(40,000)	(4,809,189)	(2,882,109)	714,856	(4,587,055)	(2,887,001)	(53,757)
12	1-Jul-24	(3,578,488)	(2,144,560)	531,920	(3,413,200)	(2,148,200)	(40,000)	(4,953,464)	(2,968,573)	736,302	(4,724,667)	(2,973,611)	(55,369)
13	1-Jul-25	(3,578,488)	(2,144,560)	531,920	(3,413,200)	(2,148,200)	(40,000)	(5,102,068)	(3,057,630)	758,391	(4,866,407)	(3,062,820)	(57,030)
14	1-Jul-26	(3,578,488)	(2,144,560)	531,920	(3,413,200)	(2,148,200)	(40,000)	(5,255,130)	(3,149,359)	781,142	(5,012,399)	(3,154,704)	(58,741)
15	1-Jul-27	(15,578,488)	(8,144,560)	531,920	(15,413,200)	(8,148,200)	(40,000)	(23,563,861)	(12,319,378)	804,577	(23,313,848)	(12,324,884)	(60,504)
16	1-Jul-28	(3,578,488)	(2,144,560)	531,920	(3,413,200)	(2,148,200)	(40,000)	(5,575,168)	(3,341,155)	828,714	(5,317,654)	(3,346,826)	(62,319)
17	1-Jul-29	(3,578,488)	(2,144,560)	531,920	(3,413,200)	(2,148,200)	(40,000)	(5,742,423)	(3,441,389)	853,575	(5,477,184)	(3,447,230)	(64,188)
18	1-Jul-30	(3,578,488)	(2,144,560)	531,920	(3,413,200)	(2,148,200)	(40,000)	(5,914,695)	(3,544,631)	879,183	(5,641,500)	(3,550,647)	(66,114)
19	1-Jul-31	(3,578,488)	(2,144,560)	531,920	(3,413,200)	(2,148,200)	(40,000)	(6,092,136)	(3,650,970)	905,558	(5,810,745)	(3,657,167)	(68,097)
20	1-Jul-32	(3,578,488)	(2,144,560)	531,920	(3,413,200)	(2,148,200)	(40,000)	(6,274,900)	(3,760,499)	932,725	(5,985,067)	(3,766,882)	(70,140)
Net Present Value:		(38,128,586.97)	(20,091,643.65)	10,089,202.01	(36,650,450.14)	(21,407,088.18)	329,021.91	(54,417,893.14)	(29,354,712.48)	12,371,245.73	(52,267,163.84)	(30,699,646.13)	200,606.02
Annualized Value:		($2,805,568.17)	($1,478,378.31)	$742,381.14	($2,696,804.27)	($1,575,171.02)	$24,210.01	($4,004,163.83)	($2,159,971.12)	$910,297.91	($3,845,909.40)	($2,258,933.70)	$14,760.94

Summary

Alt. A Low Cost	Alt. A Best	Alt. A High Cost	Alt. B Low Cost	Alt. B Best	Alt. B High Cost
($4,004,163.83)	($2,159,971.12)	$910,297.91	($3,845,909.40)	($2,258,933.70)	$14,760.94
Alt. A Low Cost	**Alt. A Best**	**Alt. A High Cost**	**Alt. B Low Cost**	**Alt. B Best**	**Alt. B High Cost**

	Best Case	Estimate	Worst Case	Spread	Average
Alternative A	$ (4,004,163.83)	$ (2,159,971.12)	$ 910,297.91	$ (4,914,461.74)	$ (1,085,884.78)
Alternative B	$ (3,845,909.40)	$ (2,258,933.70)	$ 14,760.94	$ (3,860,670.34)	$ (1,518,830.30)