PROPOSAL | OCTOBER 2012

CITY OF RAMSEY, MINNESOTA

Full Service, Year-Round Recycling Drop-off Center Analysis and Plan Development

SAIC®

Table of Contents

SECTION

APPENDIX

Organization

Project Team Credentials Promote Success

The City of Ramsey (City) desires experienced and innovative engineering and planning services to assist with analyzing the potential of a drop-off recycling center as well as plan development for such a facility. For this project, SAIC has formed a Project Team with the credentials and local understanding to ensure that the plan:

- Employs state of the art design;
- Has input and acceptance from City staff;
- Protects the environment; and
- Provides a cost effective, user friendly facility for customers and operators.

The following company and project team profiles describe the history, development, and primary areas of practice of SAIC that will fulfill integral roles as your Project Team.

SAIC

SAIC is a FORTUNE 500® scientific, engineering and technology applications company that uses its deep domain knowledge to solve problems of vital importance to the nation and the world, in national security, energy and the environment, critical infrastructure, and health. SAIC has over 40,000 people employed throughout the world providing services, engineering and logistics for major programs.

Identify of Firm	
Local Address	SAIC, Energy, Environment & Infrastructure, LLC 1380 Corporate Center Curve Suite 305 St. Paul, MN 55121
Key Contact Person and Contact Information	Mary Chamberlain Ph: 651.289.2515 Fax: 651.994.8396 mary.c.chamberlain@saic.com

SAIC has expanded its energy, environment, and infrastructure services through the acquisitions of The Benham Companies, **R. W. Beck, Inc.**, and Patrick Energy Services. The talents of these companies combine to strengthen the company's capabilities, leverage resources, and provide customer-focused solutions for the full project life cycle. **SAIC Energy, Environment and Infrastructure, LLC** is the contracting entity for this engagement and is a wholly-owned SAIC subsidiary.

SAIC Energy, Environment & Infrastructure, LLC, through predecessor firm R. W. Beck, has provided energy, environmental, and infrastructure services to utilities for more than 65 years. By combining science, engineering, and technology expertise with business and financial acumen, we address the

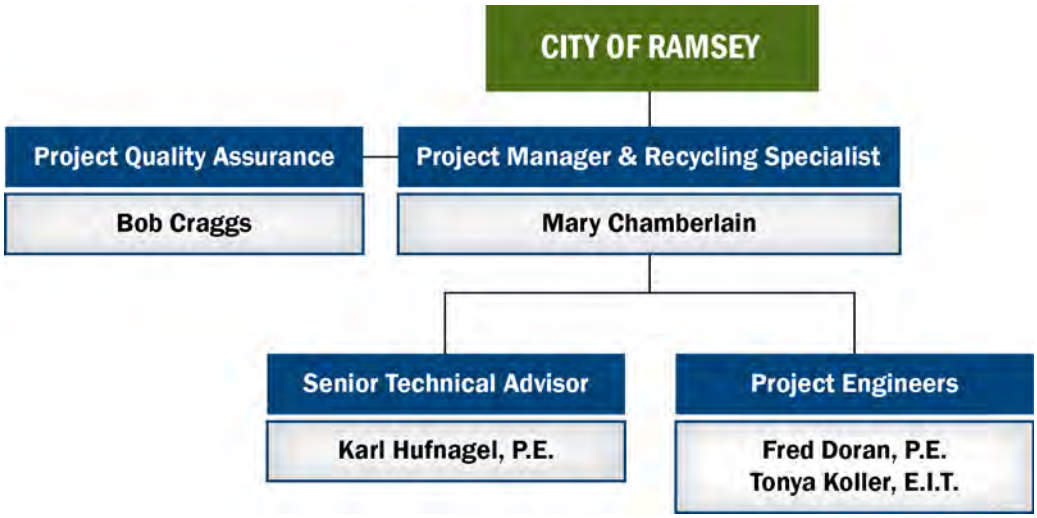
technical and business interdependencies that determine project success and provide practical, optimized advice and solutions to our clients.

Our St. Paul office includes energy, water resources, and solid waste practices. By harnessing our local and national experience in planning, design, construction, and operations for systems, programs, and facilities, we bring our clients the latest technology and up-to-date concepts. We meld this experience collaboratively working with our clients' institutional and industry knowledge to deliver a project from concept to completion. Our project teams are dedicated to finding the right blend of economically viable, environmentally sustainable, and functional solutions to meet our clients' needs.

SAIC attracts and maintains a staff of talented professionals who enjoy the challenges of solving complex problems. The result of this model is a staff whose flexibility and cross-disciplinary nature is an added benefit we pass along to our clients, and one of the reasons clients keep turning to us. We recognize the value of training, supporting staff participation in technical conferences, webinars, and classes.

Project Team

To meet the needs of the City of Ramsey, we have selected our project team based on their experience working on similar solid waste and recycling projects, as well as for their understanding of key project planning and analysis elements. The information below identifies the roles for all the key project team members and provides a summary of qualifications; full resumes of these personnel are included in Appendix A to this proposal.



Mary Chamberlain | Project Manager and Recycling Specialist

Education: University of Minnesota, B.S., Natural Resources and Environmental Studies

Ms. Chamberlain is an Environmental Analyst who focuses her assistance in the areas of solid waste management, primarily for local government agencies. Her work includes evaluating solid waste and recycling programs for efficiency and cost effectiveness, data collection and analysis, benchmarking, recommending improvements, and developing implementation plans. Ms. Chamberlain has assisted in facility and program feasibility and procurement. These projects typically involve evaluation of solid

waste technologies; conducting economic analyses involving capital, O&M, and program costs; directing a procurement process to select a preferred technology and/or vendor; and implementation of the services.

Relevant Project Experience:

- Materials Recovery Facility Options & Procurement – McLeod County, Minnesota
- HHW Collection Expansion Feasibility Study – Sarasota County, Florida
- Materials Recovery Facility Review – Dauphin County, Pennsylvania
- Technical Assistance – Ramsey County, Minnesota
- Strategic Planning and Program Review – City of Sioux City, Iowa

Bob Craggs | Project Quality Assurance

Education: University of Iowa: Juris Doctorate; M.A., Urban and Regional Planning; Augustana College: B.A., Political Science and Public Administration

Mr. Craggs serves as the Vice President and National Director of the Solid Waste Practice. With 20 years of industry experience, Mr. Craggs specializes in integrated solid waste management and approaching this service with a business planning perspective while assisting local, regional, and state governmental organizations with their solid waste management needs. To promote practical solutions, he has directed several waste characterization studies to establish program baselines.

Mr. Craggs' legal training enables him to grasp complex statutory and regulatory requirements, as well as to formulate creative approaches to integrated solid and hazardous waste management. He offers facilitation skills to foster public policy decision-making related to environmental and energy related issues. Mr. Craggs has presented at numerous national and regional solid waste management forums and conferences. In addition, he has held positions as adjunct faculty at local universities teaching solid waste and environmental studies. He is also a SWANA Member and the presently the Chair of the Planning and Management Technical Division of national SWANA.

Relevant Project Experience:

- Materials Recovery Facility (MRF) Options & Procurement – McLeod County, Minnesota
- Recyclable Materials Facility Operations and Marketing Procurement – Phoenix, Arizona
- Materials Recovery Facility Feasibility Study – San Antonio, Texas
- Materials Recovery Facility Feasibility Study – Solid Waste Authority of Central Ohio
- Household Hazardous Waste (HHW) Facility Development – Fargo, North Dakota; McLeod County, Minnesota

Karl Hufnagel | Senior Technical Advisor

Education: University of Idaho, B.S., Civil Engineering
Registrations/Certifications: Professional Engineer, WA

Mr. Hufnagel has more than 40 years of experience in management consulting and facility planning and design engineering for industrial and municipal clients. Since 1986 he has specialized in solid waste management including program analysis and planning, organizational and operations assessment, facility siting, conceptual and detailed design, environmental review, project permitting, equipment procurement, construction management, and alternative project delivery. Mr. Hufnagel has a reputation for skillfully managing multi-discipline teams of engineers, analysts, scientists, and technical staff on complex solid waste management projects throughout the United States.

Relevant Project Experience:

- Transfer Station Replacement - County of Hawai'i Department of Environmental Management, Hilo, Hawai'i
- Full Service Recycling Drop-Off and Waste Transfer Facility - City of Owasso, Oklahoma
- Bow Lake Recycling and Transfer Station - King County Solid Waste Division, Seattle, Washington
- Solid Waste Management Facility Master Planning - Snohomish County Solid Waste Management Division, Everett, Washington
- Citrus County Transfer Station and Citizen Service Area Site Master Plan - Citrus County, Florida
- Beaufort County Recycling and Transfer Station Planning - Beaufort County, South Carolina

Fred Doran, P.E. | Project Engineer

Education: University of Wisconsin: M.S., Civil and Environmental Engineering; B.S., Civil and Environmental Engineering
Registrations/Certifications: Professional Engineer, MN, SD, TX, WI; OSHA 40-hr Health and Safety; Landfill Management and Operations, MPCA

Mr. Doran is a Local Solid Waste practice Leader and Project Manager with SAIC working with public solid waste management systems. He manages projects that provide clients with innovative solutions to technical and financial challenges. His projects have won engineering awards and earned recognition within the industry. His experience includes feasibility studies, facility siting and design, permitting, hydrogeologic investigations, leachate and landfill gas system design, environmental reporting and construction management. Mr. Doran has also performed efficiency studies and financial reviews of solid waste management systems that examine the operations and financial conditions of a system and offer recommendations to assist clients in improving their competitiveness.

Relevant Project Experience:

- Facility Planning, Design & Construction: Resident's Tipping and Recycling Drop-Off – Crow Wing County, Minnesota
- North and South Transfer and Demolition Facilities – Hubbard County, Minnesota
- Landfill Expansion Planning & Permitting – Lyon County, Minnesota

- Master Planning, Design & Construction: Citizen Waste & Recycling Convenience Center – City of Sioux Falls, South Dakota
- Landfill Engineering, Permitting – East Central Solid Waste Commission, Mora, Minnesota
- Recycling Center & Transfer Station Expansion – Wadena County, Minnesota

Tonya Koller | Project Engineer

Education: South Dakota School of Mines and Technology, B.S., Civil Engineering
Registrations/Certifications: Professional Engineer-In-Training, SD; OSHA 40-hr Health and Safety

Ms. Koller is a Civil Engineer in SAIC's Solid Waste Practice. Her work is mainly focused on providing facility siting and design, cost estimating, permitting, environmental monitoring and reporting, and construction management services for municipal solid waste facilities.

Relevant Project Experience:

Facility Permitting, Design and Construction

- East Central Solid Waste Commission Landfill - Mora, Minnesota
- Lyon County Solid Waste Facility - Marshall, Minnesota
- City of Sioux Falls Municipal Landfill – Sioux Falls, South Dakota
- Crow Wing County Landfill – Brainerd, Minnesota

SECTION 2

Experience/Background

Comprehensive Solid Waste Facility Planning and Design Services

SAIC offers solid waste facilities planning, permitting, design and construction management services that seek to deliver innovation and technical expertise. From identifying areas for gaining efficiency to state-of- the-art facility design, we believe that innovation can take many forms. Our planners and designers have the experience needed to take a proposed project from initial concept through construction.

We help communities in planning, permitting and designing solid waste facilities that meet client needs today and in the future.

We tailor our approach not only to specific client needs, but also to current industry trends. Selecting from a comprehensive suite of planning and design services, SAIC has played an integral role in the planning, permitting, and design of some of the most innovative landfills, waste-to-energy facilities, material recovery facilities, transfer stations, composting facilities, and household hazardous waste facilities in the United States. Recent industry focus has involved conversion technologies for energy recovery, development of renewable energy, and reduction in greenhouse gas emissions.

Traditionally, municipally-owned solid waste facilities across the United States have been developed using the Design-Bid-Build project delivery method. With the rising trend of alternative project delivery methods, we are able to assist communities in implementing techniques that allow them to conduct fair and competitive procurements, reduce costs, save time, and share risk.

SAIC assists clients in evaluating and implementing alternative project delivery methods, such as Design-Build-Operate, for solid waste facilities. We can help clients achieve the best solution through a comprehensive assessment of alternatives in the early stages of project development, and through evaluation of the pros and cons of the several project delivery methods available.

Similar Projects

The following project descriptions highlight projects in which SAIC has provided solid waste facility planning, design, and construction management services with particular relevance to the scope items that would be provided to the City of Ramsey. We encourage the City to contact any or all of these organizations to gain further information on SAIC's approach, responsiveness, and quality of work, as it can be difficult to capture the comprehensive level of value we have provided these clients in a brief write-up. Also, note that the project descriptions provided are only a portion of the Project Team's applicable regional and national experience in solid waste facility planning, permitting, design and construction management.

We have chosen to highlight projects for several of our significant clients where services have included:

- Planning, design, and construction management of resident recycling, problem material, and waste drop-off centers;

- Feasibility evaluation of a construction and demolition material recovery, single stream recycling, refuse derived fuel, and process engineered fuel facilities;
- Master Planning, design, permitting, and construction management for integrated waste transfer, recycling, and disposal facilities; and
- Technical assistance in recycling program implementation.

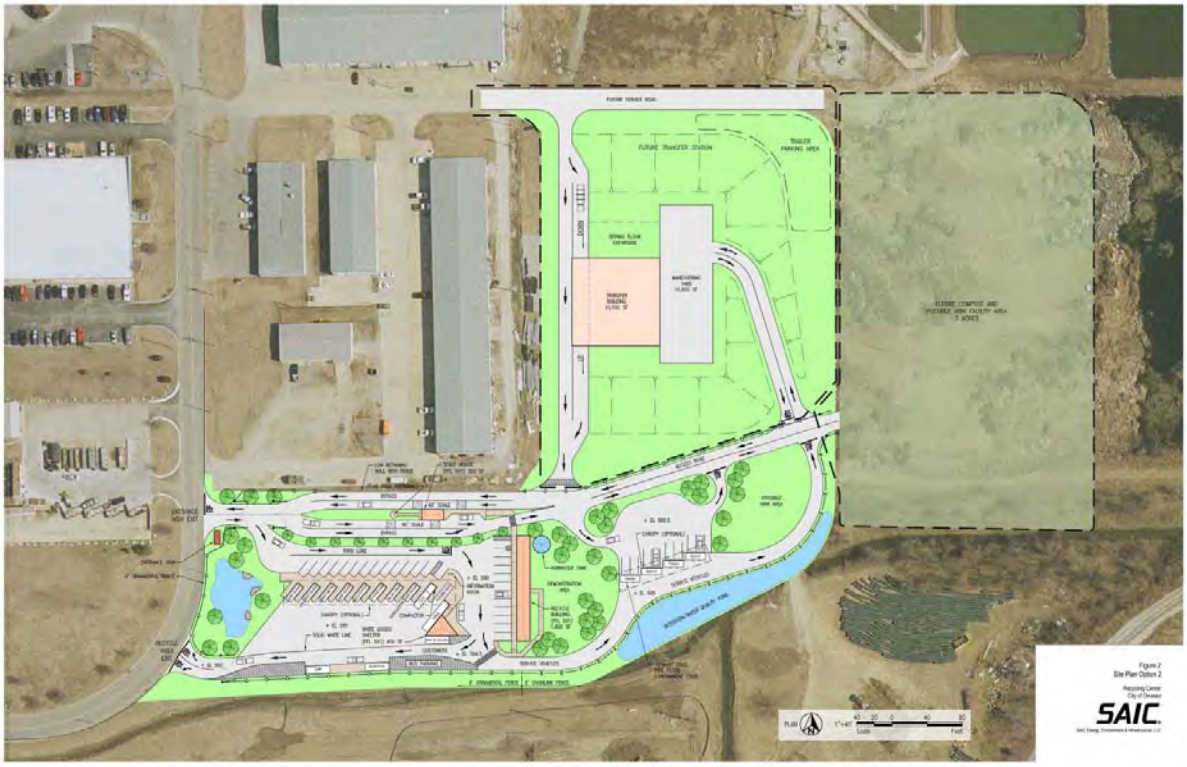
Our work for these long-term clients has been well received and provides specific, applicable experience to the recycling drop-off analysis the City is about to undertake.

Due to our involvement in facility master planning and expansion permitting for these programs, we have left our imprint on subsequent operation and financial viability. Our long-term relationship with these clients is indicative of the quality of our work, our ability to meet schedules, and our focus on controlling costs.

Full-Service Citizens' Drop-Off Center and Transfer Station

City of Owasso, Oklahoma

The City of Owasso is interested in developing a roadmap for where the City's recycling program will be in 20 years and achieving zero waste to landfill in 25 years. As part of this study, SAIC was retained to develop conceptual designs and cost estimates for a new comprehensive, full-service citizens' drop-off facility and possible commercial customer transfer station on a parcel of City-owned land near the City's current, small recycling center. SAIC first developed a facility program that identified and quantified the materials that would be received at the new facility as well as the expected customer traffic. This program covered all types of source separated self-haul recyclable materials, HHW, bulky and other special wastes, and self-haul trash and identified the City's preferred method of receiving these materials. The facility program was then translated into a series of alternative site arrangement layouts, one of which is illustrated below. Once a preferred arrangement was identified, SAIC prepared detailed planning level construction cost estimates.



Owasso Recycling Center Site Plan Option

Transfer Station Replacement

County of Hawai'i Department of Environmental Management Solid Waste Division, Hawai'i

The County of Hawai`i operates 21 transfer stations to collect self-haul residential waste, organics, and recyclables. Some of these stations are located where unpermitted "dumps" existed in the past. The transfer stations are used as an alternative to curbside collection since the island has areas of sparse populations and long haul distances.

The County has embarked on a program to upgrade its rural transfer stations to support the County's increased recycling and waste diversion goals and improve the overall operating efficiency of its solid waste management system. SAIC assisted the County with the program's first step: development of conceptual designs for the Pahoa, Glenwood, Volcano, and Waiohinu Recycling and Transfer Stations—four stations located in the southeast quadrant of the island.

These four stations were chosen because of their poor physical condition and/or safety concerns. Retaining walls were constructed from timber with significant rot and, in some cases, fire damage and broken tiebacks. Refuse chutes at these sites are distorted and corroded. Historically, the low areas of the Pahoa facility have flooded with up to a few feet of water after significant rainfall events. In February 2008, a retaining wall collapsed at the Pahoa site after excessive rainfall.

SAIC then developed detailed design documents for the improvements for the Pahoa station. This facility was completely rebuilt and returned to full service in 2011. The Pahoa Solid Waste Facility received a Solid Waste Association of North America (SWANA) 2012 Excellence Award at WASTECON in 2012. A rendering of the new facility is included below.

Pahoa Solid Waste Facility 3D Rendering

SAIC is now starting the design work on a brand new station (Ocean View) which is located in an under-served area at the south end of the Big Island. This facility will utilize many of the prototypical features developed for the four other stations. An article regarding the Pahoa station opening and dedication can be found at the following website: http://www.bigislandvideonews.com/2011/06/18/video-new-3-9-million-pahoa-transfer-station-opens/.

Bow Lake Processing/Transfer Station

King County Solid Waste Division

King County, Washington is preparing its solid waste transfer system for solid waste export when the in-county Cedar Hills landfill closes in 2016. As part of this effort, the Bow Lake Transfer/Recycling Station requires a complete replacement and upsizing to 2,500 tons per day.

As a result of our completion of the Station's initial facility master plan and subsequent updates, SAIC was selected to implement the design and construction of the replacement facility. Construction of the new facility is now entering the final year of a four-year phased construction process that was developed by SAIC so that the site could provide uninterrupted service to the County customers in that area of the county. The new 16-acre Station was designed to handle the prospective 2,500 tons per day of municipal solid waste and total annual customer traffic of 382,000 vehicles. The Station has separate recycling drop-off areas to accept scrap metal (no charge) and appliances, fluorescent lamps, wood waste, and yard waste (for a fee), as well as an area for a future household hazardous waste (HHW) facility. The Station operates 24 hours per day during the week and 12 hours per day on weekends.

The facility design emphasizes material recovery from the refuse stream and will incorporate a number of processing features not previously used in transfer stations in the Northwest. SAIC designed the new station to LEED Gold certification including the use of natural day lighting and an automatic dimming system for interior lighting, rainwater harvesting, photovoltaic power generation, and the use of both natural and mechanical ventilation. A diagram of the self-haul recycling drop off area located to the south of the main transfer building is included below along with an aerial photo of the nearly completed transfer building.

Self-haul Recycling Drop-Off Area Diagram

Bow Lake Transfer Station Aerial View

Solid Waste Management and Recycling Planning

McLeod County, Minnesota

SAIC has worked on various solid waste management and recycling projects for McLeod County over the last 18 years. SAIC updated the County's first solid waste management plan (SWMP) in 1994 and updated it again in 2000, and is currently assisting the County with their 2012 SWMP update. In addition, SAIC assisted in preparation of the County's solid waste ordinance and a county host fee provision for MSW disposal at a large, privately-owned landfill.

MRF Planning, Design, and Procurement

From 2001 through 2005, SAIC provided planning and technical assistance services to the County for the development of a County-owned and operated materials recovery facility (MRF). SAIC assisted with an initial feasibility study to project the quantities and types of recyclable materials to be collected and transported within the County for processing. Based on the feasibility study, SAIC led several workshops with the County Board of Commissioners and Solid Waste Advisory Committee to address recycling and planning issues critical to moving forward with the development of a MRF. In addition, SAIC and other project team members developed cost estimates for the construction and operation of the proposed MRF. Upon agreeing to move forward with development of the MRF, additional technical assistance included the following:

- Facilitation of the design of the MRF by collaborating with a local design engineer;
- Evaluation and development of recommendations for the specific processing equipment for materials handling within the MRF;
- Procurement of the processing equipment, including conveyors, ferrous magnet, sorting station, baler, and bunker doors;
- Oversight and administration of equipment installation; and
- Coordination of final design and construction oversight with local engineer.

The County's MRF became operational in the spring of 2004 and SAIC has assisted with MRF-related operational issues and hauler contracts for delivery of the materials since operations began.

In 2005 and again in 2012, SAIC assisted the County in the procurement of County-wide residential and institutional (schools) recyclable materials collection services and directing the materials to the County's MRF. The County and SAIC worked together to draft the scope of collection services, develop an RFP, analyze the proposals, negotiate with the selected vendor, draft a service agreement with the selected vendor, and assist with implementation of the agreement.

HHW Permanent Collection Facility Development

SAIC was retained by the County as the prime consultant as part of a project team to undertake the following:

- Develop a preliminary cost analysis for a permanent HHW collection facility;

- Provide preliminary and final designs for a permanent HHW collection facility that included receiving, product exchange, material handling and bulking, and materials storage;
- Work with the MPCA on the permit and design issues associated with the permanent HHW facility;
- Coordinate the bid process for selection of a contractor for construction of the HHW facility; and
- Provide oversight of the contractor's construction of the facility, including coordination with local building and fire officials.

Specifically, McLeod County offers one of the leading HHW programs in Greater Minnesota. The County needed a larger facility to accommodate its program needs. The County chose to purchase a building compatible for this use and retrofit the building into an HHW facility. SAIC assisted the McLeod County Solid Waste Department throughout this process. The HHW facility became operational in September 2000.

Recycling Technical Assistance

Ramsey County, Minnesota

Acting as lead consultant, SAIC provided recycling technical assistance to St. Paul – Ramsey County Department of Public Health, Ramsey County municipalities, and other public entities from 2000 to 2011. A majority of the consulting needs focused on assisting municipalities with the procurement of residential curbside recycling collection and processing services. Tasks have included:

- Developing requests for proposals (RFPs);
- Assisting cities with responses to vendor questions;
- Analyzing proposed collection costs and revenue sharing arrangements;
- Evaluating proposals; and
- Attending meetings with municipal staff, environmental committees, and city councils.

In addition to assisting municipalities, SAIC provided technical assistance to County staff by conducting workshops for municipal recycling coordinators; benchmarking recycling practices at large facilities/venues in the Twin Cities metropolitan area; providing staff with recyclable materials market index pricing; conducting research on strategies to increase residential recycling; researching options for recycling expanded polystyrene trays from cafeterias; and research of mandatory recycling ordinances.

Other key projects have included:

- Analysis of Internal Recycling Operations in Ramsey County-Owned and Leased Facilities – SAIC conducted site visits to various County buildings to assess the recycling system and gather anecdotal information about program performance and staff practices. Recommendations were provided for recycling program enhancements. The report served as a baseline of in-house recycling practices and was a starting point for management-level discussions about next steps to improve recycling at County facilities.
- Ramsey County Buildings Solid Waste and Recycling Collection Procurement – SAIC assisted County staff with developing a request for bids to establish a contract with a single vendor to provide solid waste and recycling collection services to County buildings.

- Survey of local recyclable materials haulers and processors – SAIC conducted a phone survey in December 2008 and again in March 2009 to determine the effects of the economic downturn on the recycling industry. Questions were asked of haulers and processors related to contract renegotiations, revenue sharing arrangements, market prices, storage issues, end-user specifications, and the role of County and/or State government. SAIC provided survey results and recommendations to the County.
- Saint Paul Public Schools (SPPS) Resource Management Contract Procurement - In 2006, SAIC's project team assisted SPPS staff in developing an RFP, and subsequent contract, for solid waste and recycling collection services at approximately 76 SPPS locations. The school district had implemented a food waste recovery program at certain schools and as a result, those locations required a reduction in MSW collection service. The RFP required that the collection service provider work with SPPS to gather data on the effect the food waste recovery program had on the quantities of solid waste generated based on weight. A "resource management" approach was used in which the contract has built-in incentives for the vendor to work towards reducing solid waste quantities generated and increasing recyclable materials collected. Ultimately SPPS entered into two separate contracts with different vendors for solid waste and recycling collection services, beginning in January 2007.
- Roseville Recycling Pilot Program – SAIC assisted the City of Roseville with a pilot study to help analyze the impacts that various collection methods have on the quantity and quality of residential recyclable materials collected at the curb. Specifically, we assisted with the design of the pilot; conducted a recyclable materials composition assessment; analyzed the results of the field evaluation; and produced a final recycling pilot project summary report.

Landfill Engineering, Permitting, Construction, Hydrogeology, and Reporting

Crow Wing County, Minnesota

This profile highlights the comprehensive, site-specific landfill engineering experience of the Project Team. Members of the project team have provided these services to Crow Wing County, Minnesota since 1988. Over this time period, SAIC has assisted Crow Wing County in achieving a more efficient integrated solid waste management system through siting, permitting, design, construction management, operations assistance, and regulatory reporting.

The Crow Wing County Solid Waste Management Complex is located on 564 acres owned by the County, approximately 6 miles northeast of Brainerd, Minnesota. County facilities and services have included:

- An open, composite lined, MSW Landfill that began operation in 1991;
- A closed, unlined MSW landfill that closed in 1991;
- Landfill gas control system and flaring facility;
- An unlined demolition debris

The Crow Wing County Solid Waste Complex, an SAIC client since 1988

landfill and yard waste processing area, open since 1993;

- Four leachate pretreatment ponds;
- A household hazardous waste collection, storage and processing building;
- Yard waste composting and brush collection; and
- Citizen's recycling and special waste drop off center for waste tires, white goods, batteries, electronic waste, used oil, mattresses, plastic and glass containers, mixed paper, and cardboard.

Each year, the facility receives approximately 40,000 tons of MSW, 10,000 cubic yards of demolition debris, and 5,000 cubic yards of yard waste. The County hosts considerable recreational and entertainment activities. As a result, County facilities must accommodate large swings in MSW, demolition, and problem material disposal.

Our services for the County has provided over $4 million in cost savings, financial benefit, and avoided costs. Numerous projects included the planning, design and construction oversight of the citizen's recycling and special waste drop off facility, a resident's waste drop off convenience center, and a new landfill office and scalehouse. These facilities provide a convenient option for customers that do not have access to waste/recyclable collection. Planning and design considered security and customer accountability be forcing all traffic to stop and check in at the scalehouse. The design also improved customer safety by streamlining traffic flow and separating residential traffic from commercial waste traffic.

City of Sioux Falls

Sioux Falls, South Dakota

SAIC has provided the City of Sioux Falls, South Dakota (City) with solid waste consulting services since 2003. The City has relied upon SAIC to provide high level, innovative engineering, financial, and planning assistance as the Sioux Falls Regional Sanitary Landfill (Landfill) transitioned from a conventional dry-tomb disposal facility into a City asset that provides a renewable energy fuel to a local industry. Throughout the past nine years, SAIC has performed planning, permitting, design, management and South Dakota Department of Environment and Natural Resources (DENR) documentation reporting for numerous projects that occurred at the Landfill and for the solid waste program. The size, scope and complexity of the projects have varied, but the commitment to diligent project management and compliance with state and local regulations have remained consistent throughout SAIC's project oversight. The Landfill is the first in South Dakota to have active LFG collection and a beneficial reuse. Descriptions of key projects are provided below.

Landfill Closure and Master Plan and Permit Modification – 2003

SAIC prepared a Site Master Plan and Permit Modification that:

- Relocated customer drop off facilities near the site entrance for convenience and addressed surface water management; materials addressed included white goods, tires, electronics, MSW, demolition debris, and yard waste;

- Reconfigured the cell orientation to allow for more efficient development and waste placement;
- Lowered cell base grades and increased slide slope grades to increase disposal capacity;
- Simplified leachate collection by locating all low points on one side of the landfill and reducing the number of sumps;
- Established a long-term layout for leachate and LFG management for both the unlined (dual phase wells) and lined areas (leachate collection and horizontal gas extraction wells);
- Justified a vertical expansion over the unlined portion of the Landfill; and
- Calculated applicable closure and post-closure care costs to establish financial assurance funding.

This information was then used to establish future capital improvement plans and the necessary tipping fee schedule to account for revenue streams and construction/operating expenses. This planning effort extended the life of the landfill, improved operation and development efficiency, and improved environmental protection. As you look at the Sioux Falls Landfill today, the magnitude of this Plan's success is evident. All elements of the Master Plan have been implemented and the City solid waste program is financially viable.

Construction and Demolition Material Recovery Facility Feasibility Study

SAIC conducted a Construction and Demolition (C&D) Recovery Feasibility Study to determine if it is viable to recycle materials within the existing C&D waste stream. The study began by examining the incoming C&D to determine the total amount of recyclable materials within the stream (i.e., wood waste, metal, concrete). The cost of running a recovery facility was then determined based on the probable recyclable materials stream and estimated capital and operations costs. The facility operations costs were then compared to the current incoming revenues from the waste stream to determine if the project is economically feasible. This project was conducted in conjunction with the cost of service study for the City of Sioux Falls. The City is currently funding the design and construction of a C&D material recovery facility in their 5-Year capital budget.

Solid Waste Facility Permitting, and Transfer Station Improvements Evaluation

Hubbard County, Minnesota

Our work for this County has included facility planning, siting, and permitting. Hubbard County operates a transfer station, demolition debris landfill, and materials recovery facility (MRF) in Park Rapids (South Site) and a transfer station and demolition debris landfill near Laporte. This County also has experienced growth in population, tourism and commercial development, stressing facility capacity. As a result, they evaluated expansion options.

Initially, SAIC assisted Hubbard County in evaluating improvements to the South Transfer Station in Park Rapids. At the time, the South Transfer Station was ill-equipped to handle the large number of self-haul customers, approximately 250 to 300 vehicles per day, which resulted in long waiting lines.

The County had also undergone considerable seasonal and permanent resident growth, which further stressed site use. A transfer station that was originally designed to accept 10 to 15 tons of MSW per day was forced to manage 50 to 80 tons per day. A recycling center that was originally designed to handle 150 to 200 tons per year was forced to process about 3,900 tons per year. Due to population growth, the capacity of the C&D Landfill was also being consumed at a rate greater than expected.

SAIC facilitated meetings with the County solid waste committee, the local township, and the regulatory agencies (MPCA) to identify, define, and evaluate site improvements that addressed the above concerns and allowed the County to meet their objectives for customer service, recycling, sustainability, and special material handling (i.e., HHW). A comprehensive plan for future development was provided, incorporating conceptual designs of the improvements along with planning level cost estimates and a proposed development schedule.

SAIC has completed two cycles of operating permit reissuance applications for Hubbard County's North and South Solid Waste Transfer and C&D landfill facilities. The two facilities manage MSW, recyclable material, C&D debris, waste tires, waste oil, scrap metal, batteries, concrete, yard waste, and reusable material generated by County residents and businesses. The South Landfill permit reissuance in 2002 included a significant horizontal and vertical expansion, providing an estimated life through 2038. A hydrogeologic investigation was also completed for the South Landfill in 2004 and for the North Landfill in 2009.

SAIC also worked with Hubbard County to evaluate an 80-acre site for a possible greenfield solid waste facility. Population growth and development in the Akeley area of Hubbard County had created a demand for a C&D debris disposal/MSW transfer facility in this region of the County. SAIC supported a public meeting in the City of Akeley to provide information on the potential project and the permitting process. The meeting allowed public feedback on environmental concerns.

Based on this input and our permitting experience, a Master Plan was drafted to evaluate ingress and egress for the site, building needs, customer drop-off facilities, and fill layout. A site investigation was also completed to evaluate the geologic and hydrogeologic characteristics related to its proposed use, in accordance with the solid waste rules of Minnesota.

Processed Engineered Fuel Feasibility Analysis

City Huron, South Dakota

In 2010, the City of Huron (City) retained SAIC to evaluate the feasibility of producing processing engineered fuel (PEF) and/or operating a mixed waste material recovery facility (MRF) at their current bale transfer station and demolition landfill. SAIC completed the following tasks:

- Completed a site visit to determine the space and logistics needed to retrofit the transfer station into a PEF facility, assess the site for possible building and equipment locations, and to observe typical daily waste management operations to understand how they may be impacted by a PEF/mixed waste MRF facility;
- Conducted a gate survey to estimate the types and origin of the waste to estimate a general percentage of waste that would be compatible with the production of PEF;

- Benchmarked landfills and other solid waste facilities that produce PEF or operate a MRF to gather data on equipment costs, operations and maintenance (O&M) costs, and overall advantages and disadvantages to these waste management methods;
- Contacted solid waste facilities to assess the feasibility of attracting municipal solid waste (MSW) and recyclables from the surrounding communities for the proposed PEF facility;
- Researched the potential market for the sale of PEF processed by the City;
- Developed planning level capital and operations costs estimates;
- Researched permitting requirements for PEF production and/or MRF operation; and
- Determined the compatibility of the production of PEF and operating a MRF with existing and planned City programs.

Single-Stream MRF Feasibility Study

Lyon County, Minnesota

SAIC assisted Lyon County, in southwestern Minnesota, in identifying single-stream collection options to promote cost saving benefits. The project tasks included:

- Assessing the existing residential and commercial recyclable materials collection and processing activities in Lincoln, Lyon, Pipestone, and Yellow Medicine Counties;
- Projecting quantities collected upon conversion to a single-stream recycling program;
- Characterizing the size and processing capacity of a conceptual single-stream MRF to serve the region;
- Identifying processing technology and facility operating requirements;
- Estimating planning level MRF capital and operating costs; and
- Providing a set of recommendations.

As a result of the study, Lyon County procured a contract for single-stream recycling collection. Rather than construct a new MRF, the County chose to transport the commingled recyclable materials to an existing processing facility in South Dakota.

Feasibility Study of Alternative Options for MSW Management

Lyon County, Minnesota

In 2008, Lyon County retained SAIC to evaluate the feasibility of two waste management technologies: 1) MSW shredding with subsequent landfill disposal at the Lyon County Sanitary Landfill, and 2) MSW shredding with subsequent production of refuse derived fuel (RDF) fluff or densified pellets. SAIC completed the following tasks:

- Benchmarked landfills and other solid waste facilities that shred MSW and/or produce RDF to gather data on equipment costs, operations and maintenance (O&M) costs, landfill gas (LFG) generation rates, and overall advantages and disadvantages to these waste management methods;
- Conducted site visits to landfills that shred MSW to obtain information on waste shredding operations and associated capital and O&M costs;

- Determined the compatibility of MSW shredding and the production of RDF with existing and planned County programs;
- Researched permit requirements for both options;
- Conducted greenhouse gas (GHG) emissions impact analyses for both options using the U.S. Environmental Protection Agency's Waste Reduction Model (WARM);
- Performed LFG generation modeling using a proprietary SAIC model to determine the effects each waste management option would have on current and future LFG generation from the County's landfill;
- Provided a financial analysis that included capital and operations cost estimates for implementing each option, with resulting revenue or avoided cost;
- Researched the potential market for the sale of RDF processed by the County; and
- Provided recommendations for further evaluation including discussions with other RDF facilities and RDF end-users.

References

SAIC encourages the City to contact the following representative professional references who can speak to our ability to exceed project objectives while maintaining budget and schedule.

Ed Homan

McLeod County
1065 5th Avenue SE
Hutchinson, MN 55350
320.234.4316
Ed.Homan@co.mcleod.mn.us

Norm Schiferl

Ramsey County Department of Public Health
2785 White Bear Ave N, Suite 350
Maplewood, MN 55109
651.266.1164
norm.schiferl@co.ramsey.mn.us

Terin Gloor

County of Hawai'i
25 Aupuni Street
Hilo, HI 96720
808.961.8058
tgloor@co.hawaii.hi.us

SECTION 3

Scope of Services

Project Understanding

The City of Ramsey (City) is interested in developing a full service, year-round recycling drop-off center for residents to properly dispose of standard curbside recyclable materials, appliances, compact fluorescent lamps (CFLs), electronic waste, mattresses, and other materials as new markets emerge. The City will retain a consultant to conduct an analysis and develop a non-site specific plan for the City to consider for a recycling drop-off center.

As a leading solid waste planning and recycling consultant, SAIC has assisted communities in designing, implementing, and evaluating sustainable solid waste programs. Working with some of the most sophisticated integrated solid waste management systems in the country, our professionals bring notable experience and understanding of collection, processing and financial impacts of various operations for refuse and recycling. We have experience assisting communities in the Minneapolis-St. Paul metropolitan area, Greater Minnesota, as well as nationwide and we welcome the opportunity to assist the City of Ramsey.

Scope of Services

Task 1 – Scoping Meeting, Project Initiation, and Data Request

Following receipt of the Notice to Proceed, SAIC will work with the City to schedule a scoping meeting to kick-off the project. Members of the SAIC Project Team would conduct a scoping meeting with key City staff to discuss the project work plan, key issues to be addressed, as well as confirm the timing associated with the various project tasks.

Prior to the meeting, SAIC will provide the City with a detailed preliminary data request that will encompass data needs for completing the study. The data request will itemize operational, financial, and logistical considerations that must be addressed. The data request will focus on data related to the City's current recycling programs (e.g., tonnage data from SCORE reports) and other related information such as potential sites, potential funding sources, preferred recycling vendors, current recycling contract(s), population projections, etc.

At the scoping meeting, we will discuss our initial data request provided to City staff one to two weeks prior to the meeting. SAIC will provide the agenda and any handout materials at least two days in advance of the scoping meeting.

During the meeting, we will also identify primary contacts for our Project Team and the City and establish a protocol for the exchange of information and communications during the course of the project.

Task 2 – Assess Current Recycling Program and Future Needs

The purpose of this task is to gain a better understanding of the City's existing recycling program, including quantities collected, types of materials collected, and any program gaps that a full-service drop-off center could fill. It is our understanding that the City currently contracts for residential curbside recycling collection services and the materials are collected single-stream (commingled). SAIC would assess the appropriate form of collection for the drop-off center (commingled or source-separated).

Per the City's RFP, drop-off recycling services are expected for the following materials: standard curbside recyclable materials, appliances, compact fluorescent lamps (CFLs), electronic waste, and mattresses.

Other materials may be accepted at the drop-off center as new markets emerge. Examples of potential future materials may include a broader range of plastics (e.g., shrink wrap/stretch film/plastic bags, expanded polystyrene), child car seats, textiles, carpeting, CDs/DVDs, etc. Some of these materials are currently being collected and marketed for recycling in other Minnesota communities and may be considered by the City as potential additions to its drop-off recycling program.

Some of SAIC's clients have expanded their recycling drop-off collection programs to include food and other organic waste, as well as problem materials such as construction and demolition (C&D) debris. One client, whose project description is included in Section 2 of this proposal, is the County of Hawaii. The Pahoa Transfer Station provides a wide range of services including drop-off collection of the following materials:

1. Green Waste (yard waste)
2. Bottle Bill (beverage container redemption law) Containers (glass and aluminum)
3. Non-Redemption Glass
4. Cardboard
5. Mixed Paper
6. Newspaper
7. Household hazardous waste (HHW) including oil, automotive fluids, auto batteries, CFLs, fluorescent lamps, paint, electronic waste, pesticides, etc.
8. Scrap Metal
9. Appliances
10. Reusable Items (clothing, furniture, appliances, toys, etc.)

A project team led by SAIC designed and provided the construction oversight for this facility that was completed in 2011 in Hawaii County and was recently awarded the 2012 Solid Waste Association of North America (SWANA) Bronze Award.

The non-traditional or "other" materials accepted at the City's drop-off site will largely be determined by existing local markets, processing capabilities, and other logistical issues such as transportation to processors or end-users. Often the breadth of materials accepted is negotiated with the contracted vendor.

Lastly, as part of this task, SAIC will estimate a range of the total quantities of materials that the City would expect to receive at the drop-off facility based on the selected primary material types and projected household participation. This estimate will be used in developing the facility program plan in Task 3.

Task 3 – Conduct Facility Programming for the Recycling Drop-off Center

SAIC will develop a facility programming plan for the services needed at the Recycling Center based on the evaluation of the current programs, SAIC's experience with solid waste facility development, and discussions with City staff regarding the future needs for the facility. The facility programming plan will address the various design and operating parameters of the potential drop-off facility.

Key non-site specific issues to be addressed would include, but not be limited to, the following:

- Site size and overall footprint;
- Building size and general facility layout;
- Traffic flow;
- Equipment (e.g., containers, rolling stock) needs;
- Hours of operation and staffing; and
- Other related issues.

It is anticipated that processing capabilities at the facility will be limited to the use of a baler, and will not include sorting processes or equipment.

The Pahoa Transfer Station described above incorporated innovative and sustainable concepts into the facility design by using recycled concrete from construction demolition sites in both construction and the landscaping of the site, and integrated recycled glass and shredded tires into the landscape design. These sustainability concepts could be considered as part of the facility programming for the City's recycling drop-off center.

As part of the facility programming task, SAIC will prepare a non-site specific, conceptual level drawing of the proposed recycling drop-off center. This rendering will be supported by a summary description that addresses the key facility issues listed above.

Task 4 - Evaluate Options for Implementation

This task focuses on investigating the preferred arrangement of the public-private partnership for implementing the development and long term operations of the recycling drop-off center. During the scoping meeting, we will discuss the City's preference, if any, for a public–private partnership for the implementation of the drop-off center.

This task also will involve identifying potential sites that would accommodate the proposed facility. SAIC staff will discuss with the City potential sites owned by the City and their suitability for the proposed drop-off center. In addition, potential sites identified through discussion with private vendors will be discussed for their general suitability.

The preferred facility concept would include a planning level capital and operating cost estimate (excluding land acquisition costs) as part of the recommendations.

Capital cost estimates may include, but not be limited to, costs associated with the following:

- Site preparation (surveying, grading, paving, etc.);
- Facility construction (building, electrical, water/sewer, storm drainage, permitting, etc.); and
- Rolling stock/equipment.

Operating cost estimates may include, but not be limited to, costs associated with the following:

- Labor/contract costs;
- Utilities;
- Facility maintenance; and
- Program administration.

Planning level capital and operating cost estimates associated with a full service, year-round recycling drop-off center would be developed using information from equipment manufacturers, operators of similar facilities, and SAIC's industry knowledge.

Task 5 – Draft Report and Present the Results

The information and analysis developed in Tasks 1 through 4 will be compiled into a draft report for the City to review and comment. Comments received from the City will be incorporated, as appropriate, to finalize the report. An electronic copy of the final, detailed report as well as the non-site specific plan will be forwarded to the City. SAIC will present the results in-person during a meeting with City staff.

SECTION 4

Process and Services

The process proposed by SAIC to complete the recycling drop-off center analysis and plan development is outlined in Section 3 – Scope of Services. We have organized the work into five tasks:

1. Scoping Meeting, Project Initiation, and Data Request
2. Assess Current Recycling Program and Future Needs
3. Conduct Facility Programming for the Recycling Drop-off Center
4. Evaluate Options for Implementation
5. Draft Report and Present the Results

SAIC would complete this work for the City of Ramsey using internal planning and engineering staff. We have the resources in-house to provide the program assessment, estimate future quantities of recyclable material to be collected, provide planning level cost estimates, and draft conceptual drawings. We are not proposing to use subcontractors.

We anticipate needing City staff assistance to provide the necessary program data to complete the study. As described in Task 1, SAIC will provide the City with a data request prior to the initial scoping meeting. In addition, we will need City input regarding potential sites for the proposed recycling drop-off center.

SAIC will contact brokers, markets, and end-users to determine the viability of the City accepting additional materials (in addition to the materials listed in the RFP) at the drop-off center.

During the scoping meeting, we will discuss the City's preference for a public-private partnership. SAIC will initiate discussions with potential service providers, if warranted.

The project deliverables include a draft report, a detailed report and a non-site specific plan for a full service year-round recycling drop-off center.

SECTION 5

Deliverables

SAIC will provide the City a detailed report and a non-site specific plan by December 31, 2012. The plan will include conceptual level drawings of the proposed full-service, year-round recycling drop-off center, including:

- Site size and overall footprint;
- Building size and general facility layout;
- Traffic flow;
- Equipment (e.g., containers, rolling stock);
- Hours of operation and staffing; and
- Other related issues.

In addition, SAIC will provide planning level capital and operating cost estimates.

SAIC proposes to present the final results to the City during a meeting with City staff.

SECTION 6

Timing

Per the City of Ramsey's RFP, the City will notify the selected proposer by October 24, 2012. If selected, SAIC would draft a data request and schedule a scoping meeting with the City within two weeks of receiving a notice to proceed. Based on the anticipated selection date, the following completion dates are anticipated:

Task	Completion Date
1. Scoping Meeting, Project Initiation, and Data Request	November 7, 2012
2. Assess Current Recycling Program and Future Needs	November 21, 2012
3. Conduct Facility Programming for the Recycling Drop-off Center	December 21, 2012
4. Evaluate Options for Implementation	December 21, 2012
5. Deliver Final Report and Present the Results	December 31, 2012

This schedule assumes SAIC would receive a signed agreement from the City of Ramsey by November 1, 2012.

SECTION 7

Cost

SAIC's hourly rate for services is $150 per hour; billing is invoiced in 15-minute increments. The total not-to-exceed project cost is $30,000.

The table below shows the detailed fee listing, by task, inclusive of professional services and out-of-pocket expenses.

Task	Cost
Task 1 – Scoping Meeting, Project Initiation and Data Request	$2,000
Task 2 – Assess Current Recycling Program and Future Needs	$3,000
Task 3 – Conduct Facility Programming for Recycling Drop-off Center	$15,000
Task 4 - Evaluate Options for Implementation	$5,000
Task 5 – Draft Report and Present the Results	$5,000
Total	**$30,000**

Additional Services that could be provided by SAIC include the following:

- Detailed Design – Including civil, structural, electrical, landscape and construction phasing drawings;
- Environmental Assessment, Permitting, Utility Agreements – Including local, state and federal assessments and permitting;
- Public Meetings – Including preparation of handouts and presentation materials for meetings or workshops;
- Bidding Assistance – Including bid documents, pre-bid meetings, bid analyses, and recommendations for award; and
- Construction Period Services – Including review of shop drawings and submittals, response to contractors' requests for information, field inspections, assistance with change order requests, etc.

The above examples are provided for information only and are not included in the fees proposed

APPENDIX

Project Team Resumes

SAIC®

Mary Chamberlain

Ms. Chamberlain is an Environmental Analyst who focuses her assistance in the areas of solid waste management, primarily for local government agencies. Her work includes evaluating solid waste and recycling programs for efficiency and cost effectiveness, data collection and analysis, benchmarking, recommending improvements, and developing implementation plans.

Prior to joining SAIC, Ms. Chamberlain worked for five years as the Recycling Coordinator for the City of Fargo, North Dakota. Her previous work has provided her with experience in many aspects of a municipal solid waste management utility, including operations, financial analysis, program planning, and public education. Her experience in program planning includes the construction of a permanent Household Hazardous Waste (HHW) collection facility; the implementation of a pilot curbside recycling program; the development of a commercial cardboard recycling program; and the production of a 20-minute recycling video.

Professional Experience

Feasibility and Procurement

Ms. Chamberlain has assisted in facility design and procurement involving the evaluation of solid waste technologies; conducting economic analyses involving capital, O&M, and program costs; directing a procurement process to select a preferred technology and/or vendor; and implementation of the services. Examples of these types of projects have included the following:

- **Materials Recovery Facility Options & Procurement –** McLeod County, Minnesota; provided technical assistance to the County for the development of a County-owned materials recovery facility (MRF). Assisted the County in the planning, designing, and procurement phases of constructing the MRF. Ms. Chamberlain projected quantities and types of recyclable materials to be collected and transported within the County for processing. She also evaluated and developed recommendations for specific processing equipment and assisted with procuring the equipment. The County's MRF became operational in the spring of 2004. SAIC has assisted with MRF-related issues since operations began, including assisting the County in procuring marketing/brokering services for its recyclable materials and negotiating hauling contracts.

University of Minnesota

B.S., Natural Resources and Environmental Studies

SAIC

- **HHW Collection Expansion Feasibility Study –** Sarasota County, Florida; Ms. Chamberlain assisted with this feasibility study to identify a preferred alternative for the expansion of the HHW collection infrastructure within Sarasota County. SAIC evaluated the current and anticipated participation in the HHW collection program, identified four alternatives for upgrading the existing HHW collection infrastructure, provided a conceptual facility description, and recommended a preferred HHW collection infrastructure upgrade that would serve the County's anticipated collection needs over the next ten years.

Waste Management Planning and Technical Assistance

Ms. Chamberlain has assisted local governments with an array of solid waste management planning assistance. These projects typically include reviewing solid waste programs, analyzing data, recommending changes to an existing program, developing an implementation plan, and/or assisting with procurement procedures. Solid waste planning and technical assistance projects have included the following:

- **Technical Assistance –** Ramsey County, Minnesota; between 2001 and 2011, Ms. Chamberlain assisted municipalities in Ramsey County with procurement of recyclable materials collection services including RFP development, proposal analysis, and contract negotiations. Other assistance to the County included: an analysis of internal recycling operations in County buildings; monitoring of market prices for recyclable commodities; the facilitation of a workshop for city recycling program managers to address recycling contract issues; and research on revenue sharing arrangements, multi-family recycling options, and recycling opportunities for expanded polystyrene.

  As part of the technical assistance to Ramsey County, Ms. Chamberlain assisted the City of Roseville with a pilot study to analyze the impacts of five different collection and public education methods on the quantity and quality of residential recyclable materials collected at the curb.

- **Materials Recovery Facility Review –** Dauphin County, Pennsylvania; conducted a peer review of a local engineer's design and construction specifications of a materials recovery facility (MRF). The MRF plans were evaluated on the basis of the size of the tip floor and storage area, the layout of the equipment, the flow of materials through the facility, and the technical contract provisions considered for inclusion in the procurement documents. Recommendations were made to assist the County in the design, contracting, and construction of the proposed facility.

- **Integrated Solid Waste Management Plan –** County of Kaua'i, Hawai'i. Reviewed the County's waste diversion programs including drop-off recycling, HHW, beverage container redemption, green waste collection, and waste reduction and reuse activities. Provided recommendations for the short and long-term to further increase diversion, minimize costs, promote sustainability, and increase participation in the County's solid waste management programs for the next fifteen years.

- **Stakeholder Feedback Facilitation –** Hennepin County, Minnesota; Ms. Chamberlain worked with County staff to identify key stakeholders that would most likely be affected by changes to the County's solid waste management system. Ms. Chamberlain facilitated meetings with stakeholders, discussed the County's proposed strategies to transform its solid waste system, gathered feedback, synthesized comments and drafted a report with findings and recommendations for the County to consider in its effort to increase waste diversion and recycling in Hennepin County.

- **Technical Assistance –** Washington County, Minnesota; As part of a project team, Ms. Chamberlain assisted the County in examining residential recycling activities and participation in each of the County's municipalities, including research and analysis of multi-family housing recycling services, variable rate pricing, and mandatory separation ordinances. Data was collected from City and County staff as well as from on-line records. A needs assessment was conducted and recommendations were made to the County to improve partnerships with the municipalities on recycling-related issues and to make improvements to its grant program to better distribute recycling funds to municipal programs.
- **Strategic Planning and Program Review –** City of Sioux City, Iowa; evaluated the City's solid waste, yard waste, and recyclable materials collection programs. Observed and evaluated the City's collection routes and use of equipment, staffing, scheduling, and overall program parameters. Also observed and evaluated the operations of the City's MRF. Tactical and strategic recommendations were made to improve programs and address financial deficit.
- **Regional Solid Waste Master Plan –** City of Sioux Falls, South Dakota; for the waste diversion section of the solid waste master plan, assessed regional opportunities to share diversion facilities and equipment; evaluated materials recovery, processing, and reuse programs; and evaluated the City's public education and marketing program.

Solid Waste and Recycling Efficiency

Ms. Chamberlain has evaluated local governmental solid waste and recycling programs. The evaluations include review of various services including collection, processing and disposal. Evaluation components typically include management, financial, and operations reviews; specific program recommendations; and implementation of improvements. Recent efficiency projects have included the following:

- **Solid Waste Efficiency Study –** Minneapolis, Minnesota; observed the City's solid waste and recycling collection routes and evaluated the City's use of equipment, staffing, scheduling, and overall program parameters. Assisted with the evaluation and the report of the City's solid waste and recycling collection and fleet maintenance services.
- **Solid Waste Management Plan –** St. Louis County, Missouri; as part of the development of the County's Solid Waste Management Plan, coordinated sending written surveys to facilities that dispose, process, and/or transfer solid waste and/or recyclable materials generated within the County. Also reviewed the County's household hazardous waste (HHW) collection program, conducted a benchmarking survey of HHW collection programs in other parts of the country, and evaluated various long-term HHW collection options available to the County.
- **Solid Waste Management Study –** Douglas, Arizona; funded by the North American Development Bank, this project assessed the current and future needs for municipal solid waste (MSW) collection services in this rural city on the Mexican border. Observed the City's solid waste collection routes and evaluated the City's use of collection equipment, staffing, scheduling, and overall program parameters. Financial and operational recommendations were made for possible improvements to the City's MSW collection and waste diversion programs.

- **Electronics Recycling Cost Analysis –** California Integrated Waste Management Board; reviewed a cost reporting system for the California Electronic Waste (e-waste) Recycling Program, including net cost reporting forms, a guide, and on-line training webinars. SAIC managed a study to analyze net costs based on submitted reports. Ms. Chamberlain reviewed forms completed by e-waste collectors and recyclers for completeness and accuracy. SAIC was a subconsultant of Humboldt State University.

Waste Composition and Characterization

Ms. Chamberlain assisted in the following waste characterization studies:

- **Waste Characterization Study –** City of Sioux Falls, South Dakota; Ms. Chamberlain was the Project Manager of a waste characterization of the Sioux Falls Regional Sanitary Landfill. Municipal Solid Waste (MSW) was physically sorted and construction and demolition (C&D) debris was visually assessed. SAIC estimated the types and quantities of potentially recoverable recyclable and compostable materials in the waste stream, establishing a baseline for measuring the impacts of future program activities. In addition, SAIC recommended potential diversion opportunities for some of the City's MSW and C&D waste stream.
- **Recyclable Materials Characterization Study –** Broome County, New York; as part of Broome County's Local Solid Waste Management Plan update, SAIC conducted a characterization of the County's recyclable materials stream in September of 2008. Ms. Chamberlain was the Project Manager and supervised the physical sampling and sorting of 34 residential and mixed loads into 22 recyclable material categories. SAIC estimated the types and quantities of materials currently collected for recycling, established a baseline for measuring the impacts of future program activities, and compared the County's composition results to other studies.
- **Waste Characterization and Recycling Study –** City of New York Department of Sanitation; as one of the largest studies of its kind completed to date, the study consisted of a preliminary waste characterization study, a study of residential refuse and recycling, a study of street basket waste, and a study of multi-unit apartment building recycling. During the project, 4,300 samples were sorted into 91 categories over four seasons. Specifically, Ms. Chamberlain was crew chief of recyclable materials sorting events, and she served as building surveyor for the multi-unit apartment building recycling portion of the project, which identified correlations between various physical and operational building characteristics and successful recycling, developing five statistical measures of recycling success.

Environmental Publications and Presentations

"Evolution of Municipal Household Hazardous Waste Collection Programs," American Public Works Association (APWA) Reporter, March 2005 and presentation at the 2005 APWA International Public Works Congress and Exposition, Minneapolis, MN, September 2005.

Robert W. Craggs

Mr. Craggs serves as the Vice President and National Director of SAIC's Solid Waste Section. With more than 20 years of industry experience, Mr. Craggs specializes in integrated solid waste management and approaching this service with a business planning perspective while assisting local, regional, and state governmental organizations with their solid waste management needs. To promote practical solutions, he has directed several waste characterization studies to establish program baselines.

Mr. Craggs' legal training enables him to grasp complex statutory and regulatory requirements, as well as to formulate creative approaches to integrated solid and hazardous waste management. He offers facilitation skills to foster public policy decision-making related to environmental and energy related issues. Mr. Craggs has presented at numerous national and regional solid waste management forums and conferences. In addition, he has held positions as adjunct faculty at local universities teaching solid waste and environmental studies. He is also a SWANA Member and is the past Chair of the Planning and Management Technical Division of national SWANA.

Provided below are a select set of project descriptions.

Professional Experience

Waste Management Planning

Mr. Craggs has assisted local governments with solid waste management planning. These projects typically include review of existing solid waste system, evaluation of alternative integrated solid waste management systems, directing public involvement throughout the planning process, recommending an alternative solid waste system, and development of an implementation plan. Select solid waste management plans have included the following:

- **Solid Waste Management Plan Update –** McLeod County, Minnesota; assisted this county which hosts a large regional landfill with several plan updates.
- **Regional Solid Waste Master Plan and Sustainability Plan –** City of Sioux Falls, South Dakota; as part of a project team, directed the segment of the solid waste management plan addressing waste

University of Iowa

Juris Doctorate

M.A., Urban Regional Planning, Emphasis: Environmental Policy and Planning

Augustana College

B.A., Political Science and Public Administration, Cum Laude

SAIC

diversion and facility operations assessments and recently directed the development of a City-wide sustainability plan .

- **Solid Waste Management Plan Reevaluation –** Dakota County, Minnesota; assisted one of the fastest growing counties in the United States evaluate long term solid waste processing and disposal options in the context of their solid waste management plan.
- **Integrated Solid Waste Management Plan –** County of Kaua'i Public Works Department/Lihue, Hawai'i; as project manager assisted the County develop a solid waste management plan that included identifying strategies to promote waste reduction and recycling, facility siting, evaluation of conversion technologies and ensuring long term disposal capacity, and assessment of the County's set of drop-off facilities.

Feasibility and Procurement

Mr. Craggs has directed facility feasibility studies and facility and program procurement. Examples of these types of projects have included the following:

- **Recyclable Materials Collection** - Ramsey County, Minnesota; assisted the County with the procurement of the collection and processing of commingled recyclable materials from County facilities; assisted various municipalities located in Ramsey County with procurement of recycling collection and processing services.
- **Materials Recovery Facility (MRF) Options –** McLeod County, Minnesota; assisted the County in planning, designing, and procuring a recyclable materials drop-off, processing and marketing facility.
- **Anaerobic Digestion Feasibility Study –** Cedar Rapids/Linn County Solid waste Agency; Cedar Rapids, Iowa; assisted this local solid waste agency in assessing the feasibility of managing its organic waste stream applying anaerobic digestion.
- **Recyclable Materials Facility Operations and Marketing Procurement –** Phoenix, Arizona; assisted the City of Phoenix develop an request for proposal (RFP) to operate a single stream recyclable materials processing facility, select a preferred vendor, and contract for these services.
- **Materials Recovery Facility Feasibility Study –** San Antonio, Texas; conducted a study evaluating the recyclable materials processing needs upon converting the City's two-stream recycling program to a single stream recycling program, including various public-private partnerships.
- **Household Hazardous Waste (HHW) Facility Development –** Fargo, North Dakota; McLeod County, Minnesota; assisted these two local governments to plan, design, and procure permanent HHW collection facilities.
- **Materials Recovery Facility Feasibility Study –** Solid Waste Authority of Central Ohio; assisted this regional entity to evaluate various recyclable materials processing options, including mixed waste processing, commingled materials processing, and commercial paper processing.

Solid Waste and Recycling Efficiency

Mr. Craggs has directed several evaluations of local governmental solid waste and recycling programs. These evaluations include review of various services including collection, drop-off, processing, and

disposal. Evaluation components typically include management, financial, and operations reviews; specific program recommendations; and implementation of improvements. Some of these projects have included the following:

- **Solid Waste Efficiency Study –** Minneapolis, Minnesota; evaluation of the City's collection (solid waste and recycling) services and recommendations for program improvements.
- **Pay-As-You-Throw (PAYT) Study –** Cary, North Carolina; directed an evaluation of the Town's solid waste and recycling collection programs and the potential impacts a PAYT program would have on waste diversion.
- **Solid Waste Efficiency Study –** Phoenix, Arizona; evaluation of the city's collection (solid waste, bulky, yardwaste, and recycling) and disposal services. Assisted the City with implementation of program improvements.
- **Solid Waste Efficiency Study –** Oklahoma City, Oklahoma; evaluation of the City's collection (solid waste, bulky, yardwaste, and recycling) services and implementation of program improvements.
- **Solid Waste Assessment Privatization –** Dallas, Texas; evaluation of the City's Sanitation Services landfill disposal program, business model review, and procurement of privatization options.

Presentations and Publications

"Single Stream: A Panacea for Residential Recycling" Wastecon, October 2003.

"Creating a Regional Authority Improves Operations and Reduces Costs," SWANA Planning and Management Symposium, June 2009.

"Plasma Arc Gasification and Its Applicability to MSW Management," SWANA Planning and Management Symposium, June 2009.

Numerous other presentations at state and national SWANA Conferences.

Karl Hufnagel, P.E.

Mr. Hufnagel has more than 40 years of experience in management consulting and facility planning and design engineering for industrial and municipal clients. Since 1986 he has specialized in solid waste management including program analysis and planning, organizational and operations assessment, facility siting, conceptual and detailed design, environmental review, project permitting, equipment procurement, construction management, and alternative project delivery. Mr. Hufnagel has a reputation for skillfully managing multi-discipline teams of engineers, analysts, scientists, and technical staff on complex solid waste management projects throughout the United States.

University of Idaho

B.S., Civil Engineering

Professional Registrations/ Certifications

Professional Engineer
Washington and Hawaii

Professional Experience

Transfer Station Replacement

County of Hawai'i Department of Environmental Management/Hilo, Hawai'i

Project Manager/Technical Lead. Mr. Hufnagel is technical lead for the planning and design process for replacing four of the County's 21 rural solid waste transfer and recycling stations. The new facilities have been reclassified as recycling stations to denote the emphasis being placed on resource diversion and recycling. Prototypical designs have been developed for the major elements of the stations which will allow the County to replicate these elements at other stations in the future. Individual site master plans were developed for the initial four sites. Construction at the first site was completed in 2011 and received the SWANA 2012 Excellence Bronze award for transfer stations. Design for the second facility is now underway.

Full Service Recycling Drop-Off and Waste Transfer Facility

City of Owasso, Oklahoma

Facility Design Lead. The City of Owasso is interested in developing a new full service recyclables drop-off and waste transfer facility that includes provisions for collection of household hazardous waste and other hard to handle materials such as appliances, tires and bulky wastes. Mr. Hufnagel worked with the City to develop a detailed program of facility requirements and then prepared alternative site arrangements and designs for the new facility and prepared detailed cost estimates.

Site Master Planning

Kent County, Michigan

Facility Design Lead. Kent County is considering implementation of a flow control ordinance which would direct approximately 700,000 tons of municipal solid waste to the County's waste-to-energy facility, transfer station and landfill. Mr. Hufnagel led an assessment of the throughput

SAIC

capacity of the County's facilities to determine the impact of flow control ordinance on facility operations and to ascertain whether additional facilities and/or facility improvements are needed. As part of this effort he developed facility master site plans for a new "greenfield," campus-style solid waste management facility and for the County's existing North Kent waste management site.

Solid Waste Management Facility Master Planning

Snohomish County Solid Waste Management Division, Washington

Project Manager. Mr. Hufnagel managed the master planning process for the County's existing North County Recycling and Transfer Station site. As part of this process the planning team developed six separate alternative site master plans that adapted the existing facilities and added new facilities including a public convenience center, household hazardous waste (HHW) facility, transfer building, and support facilities.

Citrus County Transfer Station and Citizen Service Area Site Master Plan

Citrus County/Florida

Project Manager/Facility Planner. Mr. Hufnagel managed and was the primary facility planner, for a new 600 TPD solid waste transfer station and a 100 TPD citizen service area on a 17-acre parcel located adjacent to the county's central landfill. Mr. Hufnagel developed and analyzed current waste stream and site data, in addition he worked with the county operating staff to develop a comprehensive facility program. The site master plan was then used in a design-build alternative delivery process for the new facilities.

Bow Lake Recycling and Transfer Station

King County Solid Waste Division/Washington

Project Manager. Mr. Hufnagel is managing the master planning, design and construction for this major new facility. Applying a 25-year planning horizon, the project addresses issues of capacity, service, and environmental impacts for this station, which handles nearly 35 percent of the County's waste stream. Specific design requirements include the addition of compactors to prepare the station for waste export, improved vehicle access and reduced queuing, increased recycling functions, and upgrades to the scale facilities. The design of a 2,500 TPD recycling and transfer station developed under the U.S. Green Building Council's LEED sustainable design and construction program (LEED Gold rating).

Household Hazardous Waste Program Expansion

Sonoma County Waste Management Agency/California

Project Manager/Technical Lead. Mr. Hufnagel assisted Sonoma County with a phased evaluation and expansion of their HHW program. The expanded program evaluated included two new full service receiving and processing facilities and up to three satellite receiving facilities to supplement their single full service facility. The new facilities would replace most of their current collection event program, as well as part of the toxic rover program. The initial phase of the work involved a life cycle financial analysis of the benefits of the proposed new facilities.

Beaufort County Recycling and Transfer Station Planning

Beaufort County, South Carolina

Lead Planner. Mr. Hufnagel assisted the County with siting and site master planning for one, or possibly two, campus-style waste management facilities that will include a transfer building, public convenience dropoff center, HHW facility, scale facility, and cardboard processing facility.

Airport Road Recycling and Transfer Station

Snohomish County Solid Waste Management Division/Washington

Project Manager. Mr. Hufnagel was the project manager for the $25 million project for siting, environmental review, conceptual and detailed design, permitting, and construction of a 1,500 TPD solid waste transfer station and recycling facility. He managed the 10-firm team of consultants whose efforts resulted in the October 2003 opening of this world-class facility. The transfer facility included two of the latest preload compactors for MSW and a top-load bay that is used for yard waste and hard-to-handle waste as emergency backup for the compactors. Under Mr. Hufnagel's management, the team was able to deliver the completed ARTS facility in 37 months.

Publications, Awards & Recognition

Coauthor. Skagit County Resource Recovery Facility, *Design of a 2,500-kW Waste-to-Energy Plant*, with Arthur J. Butler, 1989.
The Changing Role of Transfer Stations, R. W. Beck, Summer 1993.
Recent Transfer Station Siting Efforts in King County Washington, co-author with Neil Fujii and Erik Colville, 1995.
Integration of Material Recovery and Transfer Station Operation in a Rural County Setting, co-author with Delroy Cox, 1995.
ARTS: Snohomish County Washington Moves to the Forefront in Waste Transfer Facilities, MSW Management, November/December 2003.
Coauthor. *The Challenges of Tipping Floor Design and Siting a Solid Waste Facility at a Commercial Airport: A Case Study,* with Jeffrey P. Kelley-Clarke, SWANA WASTECON 2004 Conference, September 2004
Coauthor. *Follow That Sign: Getting Through A Waste Handling Facility Safely and Efficiently,* with James Engelhardt, SWANA WASTECON 2005 Conference, September 2005
Site Savvy, Waste Age, September 2005
Coauthor. *Comparative Evaluation of Conversion Technologies and Waste Export Disposal Options in King County Washington,* with Kevin Kiernan, SWANA WASTECON 2007 Conference, October 2007
Innovative Transfer Station Design – A Case Study in King County Washington, SWANA WASTECON 2010 Conference, August 2010
Transfer Station Seeks the Best of Both Worlds, Waste Age, January 2012
Coauthor, *Exploring Mixed Waste Processing Opportunities in Boulder Colorado: Evaluating the Business Case for a Dirty MRF,* SWANA WASTECON 2012 Conference, August 2012
Coauthor, *Pahoa Recycling and Transfer Station*, SWANA WASTECON 2012 Conference, August 2012
Solid Waste Association of North America 2012 Excellence Award for Transfer Stations Pahoa Solid Waste Facility

Affiliations & Registrations

Chairman, The Solid Waste Association of North America's Transfer Station Committee on Transfer Station Development and Design, 2004-2005
Founder and past President, Puget Sound Professional Chapter of Engineers Without Borders – USA 2005-2007
Secretary, Evergreen Chapter of the Solid Waste Association of North America,
Certified instructor of the Solid Waste Association of North America's Transfer Station Manager's Course

Fred Doran, P.E.

Mr. Doran is a Local Solid Waste practice Leader and Project Manager with SAIC working with public solid waste management systems. He manages projects that provide clients with innovative solutions to technical and financial challenges. His projects have won engineering awards and earned recognition within the industry. His experience includes feasibility studies, facility siting and design, permitting, hydrogeologic investigations, leachate and landfill gas system design, environmental reporting and construction management. Mr. Doran has also performed efficiency studies and financial reviews of solid waste management systems that examine the operations and financial conditions of a system and offer recommendations to assist clients in improving their competitiveness.

Mr. Doran is successful in keeping complex and multi-phase projects on schedule due to regular contact with the client, regulatory agencies and all other interested parties in a project. Mr. Doran is also a frequent speaker at environmental engineering conferences and seminars and has published articles in trade journals.

Professional Experience

Facility Permitting, Design, and Construction

Mr. Doran has managed projects to close existing landfills, as well as perform all the steps needed to construct and expand landfill facilities. These projects have included closure, groundwater monitoring, annual reporting, applications for solid waste, air quality and water quality permits, liaison with state regulatory agencies, Environmental Impact Reports (EIR), Environmental Assessment Worksheets (EAW), design of lined and unlined landfill cells, financial assurance requirement calculations and preparation of leachate management plans.

- **Crow Wing County MMSW and Demolition Landfills, Minnesota –** Permit work included EAWs, permit applications, plans and specifications for cell construction and closure, and annual reporting.
- **East Central Solid Waste Commission, Minnesota –** Directed development of a permit application for a vertical expansion, implementing 3:1 slopes and final cover removal to increase capacity over existing footprint. Prepared plans and specifications and documented construction of composite lined cell. Developing

University of Wisconsin, Madison

M.S., Civil and Environmental Engineering

B.S., Civil and Environmental Engineering

Professional Registrations/ Certifications

Professional Engineer Chemical: SD, MN, WI

OSHA 40-hr Health and Safety

Landfill Management and Operations, MPCA

SAIC

environmental and permit documents for 40 acre expansion, including wetland mitigation.

- **Lyon County Regional Landfill, Minnesota –** Currently providing technical review and quality assurance for an expansion permit as well as cell construction plans and specifications. The cell design incorporates an inward gradient system to maximize airspace.
- **McCommas Bluff Landfill, Dallas, Texas –** Successfully managed a permit modification for one of the largest public landfills in the US to incorporate bioreactor technology. Work included benchmarking, community outreach, academic involvement, air permitting, conceptual design, slope stability, and the permit application.
- **Scepter Industries Industrial Waste Landfill, Bicknell, Indiana –** Directed design of composite liner with leachate collection, provided quality assurance on construction and managed development of landfill expansion plans, as part of permit modification.
- **North and South Transfer and Demolition Facilities, Hubbard County, Minnesota –** Permitting of transfer stations and recycling center, and design of demolition debris landfill expansions.
- **Tellijohn Sanitary Landfill, Inc. –** Le Sueur, Minnesota; responsible for closure, groundwater monitoring and annual reporting activities for this one million cubic yard landfill.
- **Woodlake Sanitary Landfill, Medina, Minnesota –** Developed closure plan, including clay cover design, slope stability analysis and combined leachate-gas extraction system design, reviewed documentation and certification report for closure, designed environmental monitoring system as part of permit application.
- **Northeast Otter Tail Sanitary Landfill, Minnesota –** Design of a lined ash and MSW landfill, closure of existing facilities, draft EAW, industrial waste management plan, financial assurance calculation, and leachate management plan.
- **Wadena County Recycling Center & Transfer Station –** Minnesota; assisted in design of recycling center to manage 1,000 tons per year of recyclables and transfer of over 6,000 tons per year of municipal solid waste.
- **Southeast Missouri Solid Waste Management District –** Perryville, Missouri; developed geologic and regulatory criteria required for landfill siting, identified preferred sites, and provided cost estimates for construction, operation and closure.
- **Adams County Landfill –** Wisconsin; performed geotechnical requirements for initial site report for lined landfill and prepared site report.
- **Marinette County Landfills –** Wisconsin; developed test program at several potential borrow sources for clay liner soils for landfills, documented investigations and collected soil samples, provided QA/QC and developed groundwater monitoring program.
- **Pierce County Landfill –** Wisconsin; designed clay liner that incorporated a groundwater collection underdrain. Documented soil borings and groundwater monitoring well installation.
- **Lake Area Disposal Landfill –** Sarona, Wisconsin; completed conceptual design, life-cycle cost estimate, groundwater monitoring plan and engineering report for lined expansion.

Facility Efficiency and Financial Evaluation

Mr. Doran managed projects to evaluate the efficiency of several solid waste management systems' delivery of solid waste services, including transfer and landfill operations. His work included field observations and benchmarking of major cost and revenue components compared to peer communities. His recommended modifications regarding use of system personnel, equipment, operations, funding methods and waste delivery quantities have contributed to a reversal in the decline of a regional solid waste management system and improved efficiencies in other systems. His financial reviews also included regional market tipping fee analysis in the face of competition between multiple landfills and an evaluation of needed capital improvements and operations & maintenance programs of a system consisting of an RDF plant, landfill and nine transfer stations.

- **Crow Wing County MMSW and Demolition Landfills –** Minnesota; permit work included EAWs, permit applications, plans and specifications for cell construction and closure, and annual reporting.
- **East Central Solid Waste Commission –** Mora, Minnesota; directed development of a permit application for a vertical expansion, implementing 3:1 slopes and final cover removal to increase capacity over existing footprint. Prepared plans and specifications and documented construction of composite lined cell.
- **Scepter Industries Industrial Waste Landfill –** Bicknell, Indiana; directed design of composite liner with leachate collection, provided quality assurance on construction and managed development of landfill expansion plans, as part of permit modification.
- **Solid Waste Management Efficiency Study –** City of Phoenix, Arizona; led this landmark evaluation study of the City's service delivery efficiency, including field observations and benchmarking of the collection systems and landfill operations. Recommended specific changes and overall strategies for cost savings, service improvements and contracting opportunities.
- **Gregory Canyon Landfill –** San Diego County, California; completed due diligence review of facility permit and design documents on behalf of the developer to secure project financing.
- **LandComp Landfill Valuation –** LaSalle County, Illinois; provided review of permit, design documents, and proposed operating budget. Developed operations cost model for use in calculating facility value for financing.
- **Fountain County Solid Waste Management System –** Indiana; evaluated six alternatives to manage waste, including transfer station, county or regional landfill, or direct haul out of county. Included costs for closure of existing landfill and all cost categories for constructing a new landfill.
- **Landfill Valuation –** Kent County, Michigan; developed operations cost model used in calculating value of MSW combustor ash and MSW by-pass landfills.
- **Regional Market Tipping Fee Analysis –** Private Company; Midwest; reviewed costs for landfill cell development, operations, financial assurance and environmental monitoring and the impact of these costs on tipping fees of landfills competing with the client landfill. Compared the tipping fees of these competing landfills with market information on regional tipping fees.

- **Mixed Municipal Solid Waste Landfill Capacity Assessment –** Dakota County, Minnesota; performed literature research on landfill cover, materials compaction and landfill settlement to assess quantity of materials projected to be landfilled.
- **Landfill Development & Operations Cost Independent Review –** SDDS, Inc.; South Dakota; review of cost estimates, using a landfill cost model, to independently estimate costs over 20 year period to verify SDDS internal estimates. Completed permitting due diligence and provided expert testimony for the proposed design.
- **Landfill Efficiency Study –** City of Dallas, Texas; completed field observations and provided recommendations to allow cost savings in landfill design, operation, and capital funding.
- **Landfill Development Independent Review –** Garnet, Inc.; King George County, Virginia; managed independent engineering review of proposed 4000 TPD landfill, including review of operating agreements, cost estimates and permitting documents and preparation of consulting engineer's report of the project's capital financing.
- **Operations and Financial Review –** Roanoke Valley Resource Authority; Roanoke, Virginia; reviewed financial and operations aspects of system consisting of transfer station and landfill and recommended changes to improve efficiency and reverse decline in waste delivery.
- **Annual Operations and Capital Budget Review –** Southeastern Public Service Authority; Virginia; annually completes site observations and reviews proposed capital budget and maintenance improvements for the Authority's transfer and disposal system.
- **Fond Du Lac County Landfill –** Wisconsin; performed life-cycle cost estimate to determine whether to expand landfill or haul waste to another location.

Publications and Presentations

Facility Efficiency and Financial Review

- Doran, Fred J. 1998 Competitive Assessment: Are You Operating at Your Full Potential. Proceedings of the 20th International Madison Waste Conference, Madison, Wisconsin.
- Doran, Fred J., Blake Van Leer and Bill Hardigg. 1996 The Non-Madness of King George: Its Public/Private Solid Waste Partnership. Waste Age, Volume 27, No. 1.
- Doran, Fred J., Blake L, Van Leer and Bill Hardigg, 1995 An Innovative Public/Private Solid Waste Management Partnership: King George County, Virginia and Garnet, Inc. Proceedings of WASTECON 1995, Baltimore, MD Solid Waste Association of North America.

Tonya L. Koller

Civil Engineer

Ms. Koller is a Civil Engineer in SAIC's Solid Waste Practice. Her work is mainly focused on providing facility siting and design, cost estimating, permitting, environmental monitoring and reporting, and construction management services for municipal solid waste landfills.

Professional Experience

Facility Design and Construction

East Central Solid Waste Commission Landfill, Minnesota

Project Engineer. Developed specifications, drawings, and construction cost estimates for Phase 1-4 Partial Closure, Leachate Pond 2 Construction, and Phase 6A Cell Construction. Provided on-site engineering construction oversight during expansion of the landfill gas collection and control system (GCCS), partial closure construction, and leachate pond construction.

Lyon County Solid Waste Facility, Minnesota

Project Engineer. Developed specifications, drawings, and construction cost estimates for Phase 7 Closure and developed quantities estimate for landfill gas collection and control system. Provided on-site engineering construction oversight during installation of the geomembrane liner for MSW cell and leachate treatment ponds.

City of Sioux Falls Municipal Landfill, South Dakota

Project Engineer. Developed specifications, drawings, and construction cost estimates for Cell 3, Leachate Pond 3 Construction, and leachate and landfill gas expansion systems. Provided project management services including submittal review, project oversight, pay application review and approval, and review of quality assurance testing.

Facility Permitting and Regulatory Requirements

Crow Wing County MMSW Landfill, Minnesota

Project Engineer. Prepared industrial stormwater pollution prevention plan as required by the MPCA. Prepared permit reissuance required by the MPCA for landfill operation and expansion including phasing plans, leachate management plans, liner and cover design.

East Central Solid Waste Commission Landfill, Minnesota

Project Engineer. Prepared various regulatory documents required for continued operation, including permit reissuance required by the Minnesota Pollution Control Agency (MPCA) for landfill operation and expansion including phasing plans, leachate management plans, liner and cover design, and quarterly leachate recirculation reports mandated by the MPCA.

South Dakota School of Mines and Technology

B.S., Civil Engineering,

Professional Registrations/ Certifications

Engineer in Training

OSHA, 40-hour Health & Safety

Key Expertise

- Solid waste facility design and construction
- Leachate recirculation technology design, construction and operations
- Financial analysis for landfill closure and post-closure

SAIC

Lyon County Solid Waste Facility, Minnesota

Project Engineer. Prepared quarterly and annual leachate recirculation reports mandated by the MPCA. Prepared leachate demonstration closeout report for the County.

City of El Paso, McCombs MSW Landfill, Texas

Project Engineer. Prepared a major permit modification for the Texas Commission on Environmental Quality for a vertical expansion of the landfill including phasing, landfill gas management, leachate management, and liner and cover design plans.

Facility Operations Evaluation

City of Coolidge, Arizona

Provided financial assurance calculations for City landfill Closure and Post-Closure funds. Provided assistance for development of Cost-of-Service study to allocate costs to the appropriate cost centers and determine associated costs.

Collier County, Florida

Provided financial assurance review for county landfill Closure and Post-Closure funds.

Madison County, Indiana

Provided financial assurance calculations for Closure and Post-Closure trust fund review.

Lyon County, Minnesota

Completed tipping fee model to provide the County with next twenty years review of revenues and expenses along with year-end projections and tipping fee recommendations.

City of Huron, South Dakota

Developed a feasibility analysis for the potential for the City to operate a materials recovery facility and/or production of processed engineered fuel at the City's transfer station.

City of Sioux Falls, South Dakota

Conducted benchmark surveys for review of tipping fee rates. Completed tipping fee model to provide the City with review of revenues and expenses encumbered to date along with year-end projections. Completed Cost-of-Service study to allocate costs to the appropriate cost centers and determine associated costs.