August 2008

Solid Waste Plan Appendices

BELL & Associates, Inc.

Kodiak Solid Waste Plan Appendices

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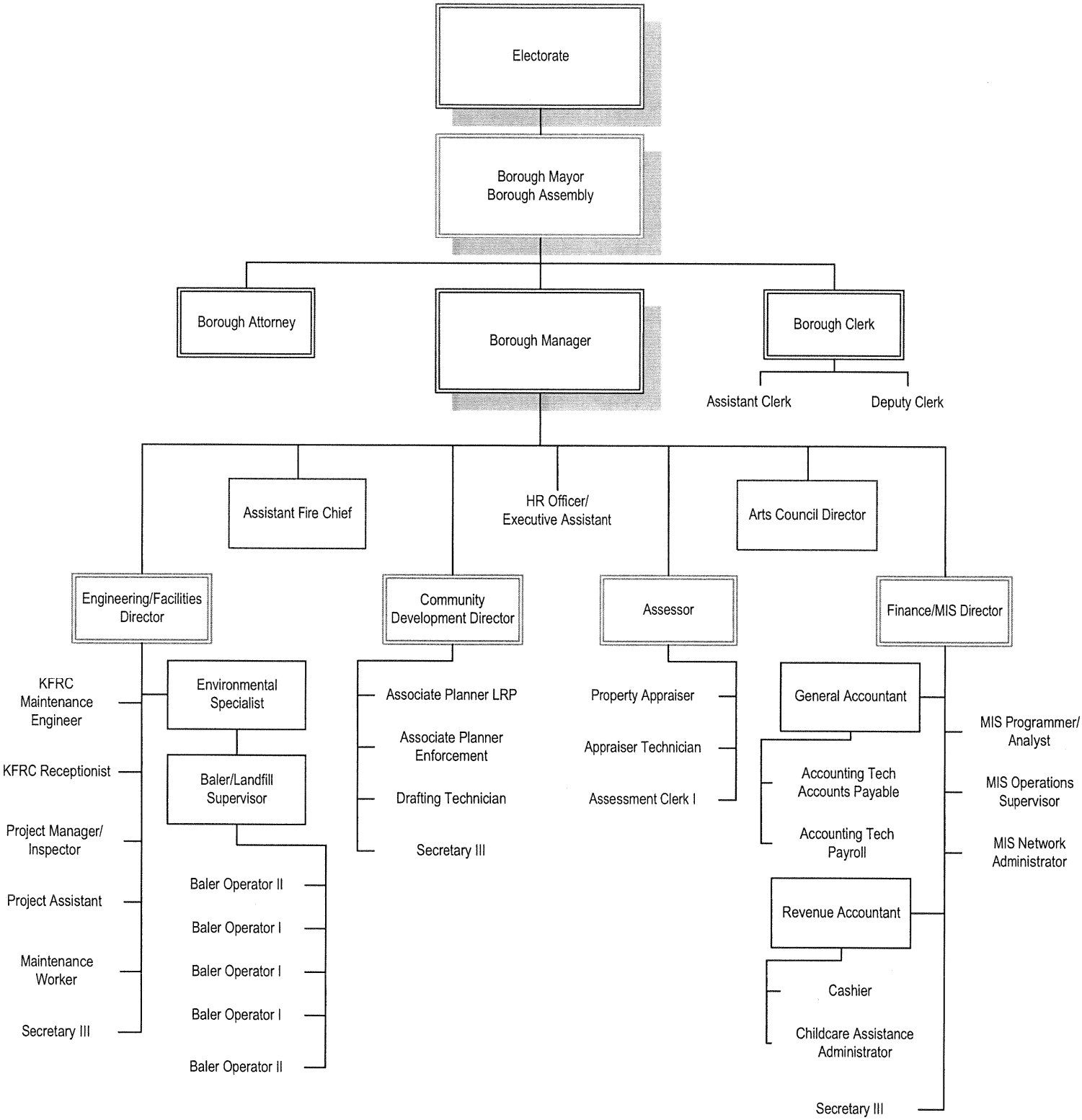
Appendix A
KIB Organizational Chart

Kodiak Island Borough
2007-2008



Appendix B
Kodiak Waste Characterization Study

SOLID WASTE COMPOSITION - KODIAK ISLAND BOROUGH - ESTIMATED TONS PER YEAR

	WASTE COMPONENTS (TPY)																								
	PAPER							PLASTIC					GLASS			METALS										
WASTE GENERATOR	TOTAL PAPER	Newspaper	White Office	Computer	Magazine	Corrugated	Other Paper	Total Plastic	Recycable Products (#1,2)	Film Plastics	Net Rope	Other	TOTAL GLASS	Recyclable	Non-Recyclable	TOTAL METALS	Aluminum Cans	Tin Cans	Other Metal	DIAPER	FOOD WASTE	YARD WASTE	LUMBER & WOOD	LEAD ACID BATTERIES	ALL OTHER	TOTAL
City Curbside	743	56	13	6	74	170	426	227	33	84	0	110	209	209	0	246	40	64	142	64	496	45	184	0	571	2785
Rural Residential	441	31	0	2	78	151	180	128	19	50	6	53	67	67	0	129	18	28	83	24	203	70	113	10	434	1619
Other Commercial	930	64	27	0	55	491	294	247	22	115	0	110	143	108	35	358	34	34	291	0	266	193	109	8	542	2796
Commercial Retail	548	24	5	2	56	191	270	172	15	77	0	80	56	56	0	85	17	22	47	12	278	8	132	0	211	1502
Canneries	132	4	0	0	2	86	40	40	5	16	0	19	4	4	0	37	3	3	30	0	41	3	47	0	41	345
MARPOL	20	3	0	0	2	9	6	22	2	2	9	8	4	4	0	14	1	2	11	0	1	5	44	2	33	145
Coast Guard Residential	244	19	3	0	32	75	116	56	10	24	0	23	54	54	0	31	9	16	6	64	93	27	9	0	83	661
Coast Guard Commercial	371	11	16	3	4	192	144	79	10	37	0	32	28	28	0	56	15	9	31	0	141	15	173	0	132	995
TOTAL (TPY)	3429	212	64	13	303	1365	1476	971	116	405	15	435	565	530	35	956	137	178	641	164	1519	366	811	20	2047	10848

TPY= TONS PER YEAR

DATA FROM 1992/93 WASTE CHARACTERIZATION STUDY

Appendix C: Kodiak Collection System

The KIB is authorized to operate as a public utility as defined by AS 42.05.701 (2)(f) for the purpose of furnishing refuse services under the Certificate of Convenience and Necessity No. 222. As such, the KIB maintains exempt status under AS 42.05.711(b), and is therefore not subject to Regulatory Commission of Alaska (RCA) oversight. This gives the Borough the ability to contract for collection services and set collection rates. The Borough currently provides mandatory waste collection services to both residents and businesses through a collection contract with Alaska Waste.

Residential waste within the City limits is collected from the curb on a weekly basis using either a customer provided can or a hauler provided roll cart. In addition to the non mandatory curbside collection of waste, the Borough provides several unattended community (public) dumpsters and roll off containers (drop boxes) located along the road system to provide supplementary opportunities for disposal of waste. Business customers are serviced primarily by front load commercial dumpsters ranging in volume from 2 cubic yards up to 6 cubic yards or by roll off drop boxes up to 20 cubic yards. Container sizes are determined by the businesses based on the amount of waste generated. Areas outside of the City of Kodiak such as Chiniak and Pasagshak are serviced community drop boxes. Front load containers and drop boxes are available to both residential and business customers on an as needed basis for construction and demolition as well as occasional household clean-up projects. Collection of bulky items such as old furniture and appliances is offered on a monthly basis as part of the current contract with AK Waste along Kodiak's road system.

Collection of recyclable materials at the curb or place of business is not offered as a service through the Borough; however, the Borough does provide the opportunity to recycle through a finite number of cardboard collection containers located at commercial/institutional and public locations. Collected cardboard is delivered to Threshold Recycling for processing and transportation to markets in Seattle.

Invoicing for collection services is accomplished by the City and the KIB. The City invoices residential customers on a combined sewer, water, and garbage bill. This includes all residential customers within the city limits as well as the customers located within Service District #1. The KIB is responsible for all businesses and residential customers other than those invoiced by the City.

Collection Rates

Revenue generated by the collection rates are reviewed by the KIB Finance Director during the annual budget process. When the projected revenues are less than anticipated expenses, the rates are recalibrated to eliminate the budget shortfall. The budget and updated user fee schedule is then presented to the Assembly for approval.

The four primary components of the Residential collection rates in the 2007/08 fiscal year for the KIB are as follows:

Rate Component	City of Kodiak	Kodiak Borough
Collection	$ 13.82	$ 18.38
Administration	4.41	4.41
Disposal	15.06	15.06
Cost of Service	**$ 33.29**	**$ 37.85**

Collection Cost is the contracted rate charged by AK Waste

Billing is the Borough's cost for invoicing and customer service
Disposal is based on a set out weight of 68 pounds a week[1]

Collection rates for customers requiring a container are set based on the volume of the container and frequency of collection. The following table details the components that comprise the rates in the 2007/08 fiscal year for various containers collected once a week.

Container Volume	Container Rent	Collection Rate	Disposal Cost	Billing	Cost of Service	System Fee	Monthly Rate
2.0 yards	$5.00	$12.10	$12.71	$4.41	$116.84	$138.32	$255.16
2.6 yards	5.00	15.20	16.52	4.41	146.78	108.38	255.16
3.0 yards	5.00	20.70	19.07	4.41	181.60	103.57	285.17
3.6 yards	5.00	20.70	22.88	4.41	198.11	87.06	285.17
4.0 yards	5.00	25.50	25.42	4.41	229.90	104.54	334.44
5.0 yards	5.00	25.50	31.78	4.41	257.42	107.33	364.75
5.5 yards	5.00	25.50	34.95	4.41	271.18	93.57	364.75
6.0 yards	5.00	30.00	38.13	4.41	304.42	76.33	380.75
10 yards	20.00	60.00	63.55	4.41	559.39	(15.09)	544.30
15 yards	20.00	150.00	95.33	4.41	1,086.69	472.46	1,559.15
20 yards	20.00	150.00	127.10	4.41	1,224.28	594.98	1,819.26

Container Volume determines the collection method. Containers from 2 yards to 6 yards are collected by a front load truck whereas containers 10 yards or larger are collected by a roll off truck.
Container Rent is the rent amount charged to the KIB by AK Waste for use to the containers for the storage and collection of waste.
Collection Rate is the contracted amount charged to the KIB by AK Waste each time the container is picked up and dumped (tipped) into the collection truck.
Disposal Cost is the cost per pick-up, assuming a average container weight of 125 pounds per yard. The disposal cost for the 2 yard container per pick up is calculated as follows:
2 (yards) x 125 (pounds) / 2,000 (pounds per ton) x $101.68 (disposal cost per ton) = $ 12.71
Billing is the Borough's cost for invoicing and customer service
Cost of Service is the sum of Container Rent + (Collection Rate x 4.33[2]) + (Disposal Cost x 4.33) + Billing Cost = Cost of Service.
System Fee is the difference of the **Monthly Rate** and the **Cost of Service**. This difference subsidizes the current system.
Monthly Rate is the current collection rate for weekly service.

[1] The weight is calculated by dividing the estimated community dumpster tons by the number of customers per month.
[2] The value of 4.33 is derived by dividing 12 months into 52 weeks. This is the frequency of collection multiplier used to set monthly rates.

Community Dumpsters

The cost of the community dumpsters in the Kodiak metropolitan area was calculated from January 2007 to December 2007 using the billing records submitted by Alaska Waste. The following table summarizes the cost of the program for the calendar year 2007.

Community Dumpster Summary Costs	
Container Rent	$ 4,146
Collection Cost	$ 325,065
Total Estimated Disposal Tons	2,656
Disposal Cost	$ 270,072
Total Cost for KIB Community Dumpsters	$ 599,283

Container Rent and Collection Costs are the amounts billed to the Borough by Alaska Waste. Disposal Costs were calculated by assuming an average container weight of 100 pounds per cubic yard, multiplied by the container volume, divided by 2,000 pounds. The tonnage amount was multiplied by the landfill disposal cost of $102. It was assumed that the container was full when dumped.

One of the goals for this project is to reduce the amount of waste currently being dumped at the landfill because the costs of all future disposal alternatives will be expensive. The most effective way to reduce the amount of waste is to assign the responsibility of the waste to the individual or entity that generated it in the first place.

Appendix D
Alaska Waste Contract and Rates

2006-39

AGREEMENT

Solid Waste Collection Services
for the
Kodiak Island Borough

Kodiak Island Borough
710 Mill Bay Road
Kodiak, Alaska 99615
(907) 486-9343

May 2006

AGREEMENT FOR SOLID WASTE COLLECTION SERVICES

This Agreement, executed this 18 day of July, 2006, by and between the Kodiak Island Borough (hereinafter referred to as "KIB") and Alaska Pacific Environmental Services Anchorage, LLC., d.b.a. Alaska Waste/Kodiak Sanitation (hereinafter referred to as "Contractor").

1. General Provisions and Information

Contractor shall collect all garbage, rubbish, and trash placed or deposited for collection by individuals, residences, commercial businesses, and public agencies located on the regularly maintained public road system (Road System) connected to the City of Kodiak, in accordance with Chapter 8.20 of the Kodiak Island Borough Code (KIB Code) unless otherwise specified. For purposes of this contract, the term "commercial" is used herein to designate commercial, business, industrial, institutional, and public agency customers and to distinguish these entities from residential customers.

Contractor shall perform all work in compliance with applicable requirements and recommended procedures of 40 CFR 243 – "Guidelines for the Storage and Collection of Residential, Commercial and Institutional Solid Waste".

Contractor shall collect all residential solid waste from residences, dwellings, and commercial entities on the Road System of KIB. The general area of service extends from the Kodiak Island Borough Landfill/Baler Facility to Chiniak and the Rocket Launch Facility. Service is not provided on the road to Anton Larsen Bay.

Approximately 13,000 Borough residents are served by this contract. The USCG base is not served by this contract.

Types of Service: KIB Code requires that the following types of services be provided to residential and commercial customers. Contractor shall provide these services as defined in KIB Code 8.20.041, Services Available.

- Weekly Residential Can or Bag Service
- Residential Carryout Service
- Residential Dumpster Service
- Commercial Can Service
- Commercial Dumpster Service

Weekly door-to-door collection is required within the City of Kodiak. For areas where Contractor deems it unsafe to provide door-to-door service, Contractor will provide dumpsters. Contractor will not be compensated for dumpsters within city limits. Residential dumpsters are utilized outside the City of Kodiak.

Contractor shall haul and deliver all collected garbage, rubbish, and trash to the Landfill/Baler Facility located at mile point 6.1 on Monashka Bay Road, Kodiak.

Residential garbage shall be collected no less than once per week, unless otherwise directed by KIB. Collection shall occur at hours that are reasonable and not disruptive to the community. Collection in residential areas shall not occur prior to 7:00 a.m.

Solid waste collected shall be the property of KIB, subject to the right of a customer to claim lost property of value.

Authority to Operate as a Public Utility: KIB is authorized to operate as a public utility as defined by AS 42.05.701 (2) (f) for the purpose of furnishing refuse services under Certificate of Convenience and Necessity No. 222.

2. Duration of Agreement

The term of this Agreement is - two (2) years with two (2), one (1) year optional extensions. The Agreement will start on July 1, 2006.

3. Weekly Residential Door-to-Door Service

Contractor shall divide the areas of the City of Kodiak into routes. Collections shall be made from residences on a regular schedule on the same day every week for each route. Contractor shall show on a map the routes and the day of the week that the waste will be collected for each route. Contractor shall provide KIB with a current copy of this route map. It will be Contractor's responsibility and at Contractor's expense to obtain the map. Contractor may change the day of collection by giving notice to KIB and the customer affected at least fourteen (14) calendar days prior to the effective date of the change. The form of notice to the customer shall be subject to the approval of KIB. It will be Contractor's responsibility and at Contractor's expense for obtaining the notification information (names and addresses) if the approved notification requires United States Postal Service (USPS) mailings.

When the day of regular collection falls on a legal holiday, Contractor may reschedule the regular collection to the earliest succeeding workday. Saturday collections will be permitted to collect solid waste collected regularly on a Friday, had such collection not been deferred because of the holiday. Contractor shall notify KIB in writing by January 15th of each year of the contract, of those holidays that Contractor will not work for said year.

When snow or ice is on the streets, roadways providing access are closed, or other disruption beyond Contractor's control prevents collection on the scheduled day, Contractor shall make collection on the earliest succeeding workday when collection becomes possible. If such conditions continue for an entire collection cycle, or more, Contractor shall collect all the solid waste amassed for collection. The collection that resumes scheduled service shall take bags, boxes, and other secure wrappers and shall empty temporary receptacles, limited to a maximum weight of sixty (60) pounds that customers have used when the regular cans and containers have been filled.

For other than the reasons noted in the immediately preceding paragraph, if Contractor fails to collect a customer's solid waste during a regular collection, KIB may:

- Require Contractor to make a special make-up collection within 24 hours after an oral make-up order is given; which collection shall include excess solid waste accumulated during the interval between the scheduled collection day and the special collection;
- Authorize Contractor to defer the collection; and authorize the customer to place a proportionally larger amount at such customer's next scheduled collection day without any additional charge, and to accommodate such a disposal, allow the customer to use a bag or temporary containers as well as additional bundles;

- Authorize Contractor to forego collection for the interval altogether; and make a compensatory reduction in the billing to the customer, and an equal reduction in the amount payable to Contractor; or
- Take any combination of the actions specified above.

4. Residential and Commercial Dumpsters

Refuse containers (dumpsters), except for individual household or commercial can service containers; will be made available by Contractor. These refuse containers must be designed and maintained for convenient use and disposing of appropriate solid waste materials. Dumpsters shall be designed to withstand wind loads typical of the area. Dumpsters shall be metal, either painted, galvanized, or aluminum.

Contractor shall furnish additional dumpsters within two (2) days of a request by KIB. Contractor shall maintain a minimum inventory of dumpsters of each capacity at all times for such requests.

Residential waste dumpsters will be located on sites determined by KIB. Contractor will review the site for safety and operational purposes prior to the final determination of location by KIB.

Residential dumpsters placed within the City of Kodiak, where door-to-door service is not possible, shall be located on sites approved by City of Kodiak and KIB.

Contractor shall maintain a map showing the locations of all residential dumpsters and another map showing the locations of all commercial dumpsters. Contractor shall provide KIB with a current copy of these maps which will not be provided by KIB free of charge.

Commercial customers will request service directly with KIB to set up account. KIB will notify Contractor of new commercial customer. Commercial customer and Contractor will determine size of dumpster and type of service.

The specifications regarding Residential and Commercial Dumpsters shall apply to the roll offs. KIB must approve of the design of such alternative equipment. KIB shall approve of any locations for Residential use.

Frequency of Emptying Dumpsters: All dumpsters shall be emptied at least once per week, unless otherwise directed by KIB. Contractor shall record the number of dumpsters tipped each day at each location.

Residential dumpsters and roll off containers shall be at least two-thirds full when emptied. Contractor shall notify KIB of dumpsters which are under-utilized or where additional dumpsters are possibly needed to handle the volume of wastes.

Contractor shall determine frequency of emptying commercial dumpsters with commercial entity, but dumpsters shall be emptied at least once per week unless otherwise directed by KIB.

Contractor shall verify that all dumpsters/containers owned by commercial establishments and for which Contractor has agreed to empty shall meet the requirements of the KIB Code and 40 CFR 243. For any such dumpsters not meeting KIB requirements, Contractor shall issue, in writing to KIB, a notice of such deficiency, with a copy sent to the commercial customer.

Signage on Containers: Contractor shall provide signage, approved by KIB, on residential and commercial dumpsters, as follows:

- Identify, in large letters, minimum of 3 inches high and placed on the front and back of the dumpster, either as a "Residential Waste Only" dumpster or "Private/Commercial Use Only" dumpster;
- "Keep lids closed";
- "No Used Oil or Batteries – Take directly to landfill";
- Useable volume of dumpster, in cubic yards;
- Name and phone number of the Contractor;
- On residential dumpsters only – "No Commercial Wastes – Minimum $300 fine, report violators to KIB at 486-9343"; and
- Sign to "Be Bear Aware" on Residential Waste dumpsters.

Condition and Design of Dumpsters: Dumpsters shall be structurally sound, well maintained, and attractive in appearance. Most dumpsters are in public view and their appearance is important. All dumpsters must have lids to keep rain and snow out. Bear-proof lids will be required in some outlying areas where bears may frequent dumpsters. Lid design shall have lids return to closed position when not in use. Residential dumpsters must be easily useable by the public with lid handles located no more than four (4) feet above ground level. KIB will have the authority to require the replacement of any dumpster considered being in unsuitable condition or appearance. All dumpsters furnished by Contractor shall be steam-cleaned or pressure washed by Contractor at least once each year at Contractor's expense. Contractor shall be responsible for all repairs to residential and commercial dumpsters; unless dumpster is owned by commercial entity.

Cleaning Up Around Residential Dumpsters: At least twice weekly, Contractor shall pick up around each residential dumpster and provide all labor and equipment for this service. The intent of the clean up around the dumpsters is to gather all refuse that may have fallen out of dumpsters, been set near dumpsters, and/or scattered from the dumpster location. If refuse has fallen out of dumpsters, been set near dumpsters, and/or scattered from the dumpster location at the time the dumpster is tipped, clean up must occur immediately. Contractor is to provide a map and schedule for twice weekly cleanup. This will not be compensated for under the conditions of this contract. Contractor shall do this same clean up around residential dumpsters placed within the City of Kodiak at no additional charge, with the cost to be included in the monthly rate for door-to-door residential service. KIB may request additional clean up if complaints are received. Contractor shall be paid for this additional service for residential dumpsters located outside the City of Kodiak on the basis of an hourly rate established in the Bid Schedule. Each month with its invoice information, Contractor shall provide KIB with detailed documentation of the time invoiced for this service. Contractor shall do this same clean up around residential dumpsters placed within the City of Kodiak at no additional charge, with the cost to be included in the monthly rate for door-to-door residential service.

Locking Lids: Contractor shall make lockable lids available for commercial dumpsters. Lids should be capable of being unlocked by both the commercial entity and Contractor. Contractor may charge an extra fee for lockable lids at the amount listed in the Bid Schedule.

5. Trucks and Equipment

All trucks and equipment which are used by Contractor in the collection, hauling and disposal of garbage and refuse shall be kept clean and maintained in a safe operating condition and conform with requirements and recommended procedures of 40 CFR 243 – "Guidelines for the Storage

and Collection of Residential, Commercial and Institutional Wastes". KIB may require Contractor to clean any collection equipment, including residential and commercial dumpsters. Contractor will provide documentation with the invoice information that cleaning has occurred and on which dumpsters.

Vehicles used to collect garbage from door-to-door, commercial can, or dumpster services shall be all metal, watertight, completely enclosed "packer" type bodies that are designed and manufactured for the collection of solid waste.

The number, capacity, and type of collection vehicles furnished and used by Contractor shall be sufficient to effectively perform the work and render the services required by this contract.

All vehicles used on this contract shall be operated in conformity with state traffic laws and traffic codes. The proper authority will be notified if weight of truck exceeds gross vehicle weight on the certified landfill scales.

Used collection vehicles and dumpsters proposed for use on this contract shall be completely reconditioned, repainted, and subject to KIB approval prior to such use.

Service areas for parking, repair, or cleaning of vehicles or equipment shall be located in areas zoned for such activities. Washwater shall be properly contained and legally disposed of at Contractor's expense.

6. Use of Landfill/Baler Facility

Contractor shall deliver all collected garbage and refuse to the Landfill/Baler Facility located at milepost 6.1 of Monashka Bay Road. The baler/landfill facility is owned and operated by the KIB.

Contractor's trucks shall enter scales for weighing before emptying loads. KIB staff will record weights. If the Contractor delivers solid waste to the tipping floor when KIB staff is not present, Contractor shall read and record weights. Empty trucks shall be weighed for tare purposes at the request of either KIB staff or Contractor.

The Contractor shall empty its trucks on the tipping floor where directed by Landfill/Baler Facility staff. Contractor needs to use safe operating procedures around the Baler Facility and follow KIB rules and staff direction. Contractor's equipment must be designed for the clearances available at the Baler Facility. Baler building door openings are 16 feet wide by 22 feet high. Trucks shall be emptied in the Baler Building in a manner that allows all trash to be deposited in the building with no waste being placed outside the building.

Contractor will be provided with access to the Baler Facility before and during normal operating hours, six days a week, Monday through Saturday. No more than four (4) loads may be placed on the tipping floor when KIB staff is not present. The Landfill/Baler Facility is open a half-day on holidays. Contractor shall make arrangements acceptable to KIB for delivery of waste on holidays. KIB holidays are: New Year's Day, Martin Luther King, Jr. Birthday, President's Day, Seward's Day, Memorial Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day, the day after Thanksgiving Day and Christmas Day.

There are no truck washout facilities available at the landfill. Contractor must provide its own truck washing facilities.

In order for KIB staff to clean the Landfill/Baler Facility, all loads of refuse must be tipped on the Baler floor by 2:00 p.m. each afternoon, unless KIB approves other arrangements. No dumping of any other waste type will be allowed at the Landfill/Baler Facility between the hours of 3:00 p.m. and 4:00 a.m. without KIB approval.

When the baler is not operational, the trucks will be directed to the active face of the landfill for open dumping (conventional landfilling operations) of the garbage and refuse. In addition to an occasional repair, routine maintenance is performed on the baler each year, with the baler not being operational for up to two (2) or three (3) weeks. The Landfill/Baler Facility staff will give Contractor one week notice of scheduled baler shutdowns and will notify Contractor as soon as possible for unplanned shutdowns. During periods of conventional landfill operations, Contractor shall arrange with Landfill/Baler Facility staff for timing of trucks to minimize the litter problem and control the compaction. Landfill/Baler Facility staff must be present during conventional landfilling periods unless KIB approves other arrangements.

No construction/demolition waste may be dumped at the Landfill/Baler Facility during high winds, i.e., gusts exceeding fifty (50) miles per hour. Contractor should contact KIB if wind conditions are questionable in order to avoid being turned away at the gate.

Contractor will be totally responsible for its equipment and employees while operating at the Landfill/Baler Facility.

7. Construction and Demolition Debris

Contractor shall provide separate dumpsters or roll-offs to commercial customers, such as building contractors, for construction and demolition wastes. Such wastes shall be collected separately for disposal by open dumping in the C&D portion of the landfill. Such wastes shall not contain putrescible solid waste and shall not be co-mingled with other residential or commercial wastes. Commercial customers will be charged for such wastes by weight; therefore, if roll offs are not utilized by customer, where weights can be determined on the landfill certified scale, then each individual customer/haul shall be weighed on a certified scale and that certification ticket must be accompanied with load brought to the landfill and correspond with customer and tips for that day. A log of customers, project location, date, and weight will be submitted each day of collection via fax to 486-9394; and a copy will also be left at the landfill on the day of collection. Contractor will be paid per the unit price established in Bid Schedule for rental and pickup of C&D waste dumpsters.

8. Collection of Bulky Items from Residential Customers

Contractor shall collect bulky items, such as water heaters, major appliances, furniture, and similar household items from residences. These items shall be collected a minimum of once each month. Only households within the City of Kodiak and on the road system between the Baler Facility and Salonie Creek are eligible for this service.

Contractor shall be paid for this service on the basis of an hourly rate established in the Bid Schedule. Contractor shall provide all labor and equipment for this service. Each month with its invoice information, Contractor shall provide KIB with documentation on the time spent, addresses from which bulky wastes were collected, and type of wastes collected.

Residents will make arrangements for use of this service directly with Contractor.

Contractor shall provide to KIB information by the 15th of each month on the specific dates of pick-up for KIB to incorporate in KIB's notices in the local newspaper and/or radio.

9. Loading and Transport

Care shall be taken in the loading and transporting of solid waste, so none of the material collected is scattered or spilled either on private property or on streets or alleys. Should any garbage or rubbish be spilled, or if any refuse falls out of, has been set near, and/or scattered from the dumpster location, this waste shall be immediately cleaned up. A broom and shovel shall be carried on each truck at all times for this purpose. If Contractor fails to clean the same, KIB may cause such work to be done and deduct the cost thereof from the monthly payments due Contractor.

10. Wastewater Sludge

Contractor is not responsible to collect or dispose of wastewater sludge or other residue generated by the City of Kodiak Wastewater Treatment Plant.

11. Liquids, Special Wastes and Hazardous Wastes

Disposal of liquids is not allowed in the landfill. Contractor shall not knowingly transport liquids to the landfill mixed with the solid wastes. Containers containing liquids found in or around dumpsters should be delivered separately to the landfill (not mixed with the trash in the packer trucks). Used oil and paint are commonly found. Contractor shall inform KIB of the dumpsters where such liquids are found. Contractor shall notify KIB of any 55-gallon drums of liquids found near or in dumpsters. KIB will pick up the 55-gallon drums with liquids from around dumpsters.

Should any lead-acid batteries be observed in or around dumpsters, they shall be separated from the trash and delivered separately to the Landfill/Baler Facility.

Contractor shall not knowingly collect, transport, or deliver to the Landfill/Baler Facility any toxic waste or any materials classified as hazardous wastes by local, State, or Federal agencies. KIB will refuse to accept loads that contain hazardous materials brought to the Landfill/Baler Facility for disposal. KIB will work with Contractor to remedy hazardous materials not knowingly delivered to the Landfill/Baler Facility. This will be accomplished by Contractor working with KIB to notify and hold accountable customers who are disposing of hazardous materials. KIB will accept used oil and household hazardous wastes retrieved from residential wastes. KIB can not accept hazardous wastes from commercial entities.

Contractor shall not knowingly collect, transport, or deliver to the Landfill/Baler Facility, any metal waste. This waste type is considered a special waste and KIB will refuse to accept loads that contain greater than 10% metal brought to the baler facility for disposal. KIB will work with Contractor to remedy metals not knowingly delivered to the Landfill/Baler Facility. This will be accomplished by Contractor working with KIB to notify and hold accountable customers who are disposing of metal waste. Commercial entities which generate metal waste as part of their business will require a separate dumpster for such waste to be transported and disposed of at the landfill. Contractor shall provide separate dumpsters or roll-offs to customers, such as canneries and auto repair shops, for metal waste. Such waste shall be collected separately for disposal by open dumping in the metal portion of the Landfill/Baler Facility. Such waste shall not contain putrescible solid waste and shall not be commingled with other residential or commercial waste. Customers will be charged for such waste by weight; therefore, if roll offs are not utilized by

customer, where weights can be determined on the landfill certified scale, then each individual customer/haul shall be weighed on a certified scale and that certification ticket must be accompanied with load brought to the landfill and correspond with customer and tips for that day.

12. Recycling

Contractor shall actively promote recycling and cooperate with KIB's efforts to encourage recycling.

Contractor shall supply equipment and containers to collect cardboard (OCC) for recycle. The Borough will compensate Contractor for cardboard dumpster rental and delivery of cardboard (OCC) to the Recycle Center at the rate set forth in the Bid Schedule. Contractor shall cooperate with Threshold, the operator of the Recycle Center, in its recycling endeavors.

Contractor shall furnish six (6) dumpsters specifically designed to receive cardboard that has been flattened. The dumpsters shall be designed to keep rain and snow from entering. Cardboard dumpsters shall be painted red in color and provided with highly visible signage explaining that the dumpsters are for cardboard only. Dumpsters need to have openings that allow for easy filling.

Contractor shall place the cardboard dumpsters in locations designated by KIB. Contractor shall pick up dumpsters when at least two thirds full, transport them to the Recycle Center, and empty them inside the recycle building. Contractor will need to arrange times for emptying the cardboard dumpsters with the operator of the Recycle Center. Dumpsters are to be emptied during normal open hours for the Recycle Center.

13. Contractor's Office

Contractor shall maintain within the Road System of KIB, an office provided with telephones and such attendants as may be necessary to take care of the complaints, orders for service, and instructions from KIB.

14. Handling Customer Complaints

Contractor shall maintain a log of all customer complaints and the actions taken by the Contractor to rectify the situation. A copy of the log shall be provided to KIB each month with the invoicing documentation.

15. Contractor's Employees

Contractor shall require all its employees to be courteous at all times, not to use loud or profane language, and to do their work as quietly as possible.

Employees, in collecting solid waste, shall follow the regular walks for pedestrians while on private property. They shall also replace all garbage cans and covers and close all gates opened by them.

Employees shall not trespass, loiter, cross property to adjoining premises, or meddle with property that does not concern them in the performance of this work.

Employees shall not loiter at the Landfill/Baler Facility when delivering solid wastes.

No "scavenging" shall be allowed. Scavenging means sorting through solid waste collected looking for items of possible value or picking out individual pieces for re-use while loading or unloading; it excludes searches by owners for valuables accidentally misplaced or that may be lost.

KIB has the right to request the dismissal of any employee of Contractor who violates any provision hereof, or who is wanton, negligent, or discourteous in the performance of their duties.

Contractor should provide suitable operating and safety training for all its personnel and provide a site specific safety plan to KIB.

Contractor shall comply with all provisions of Equal Employment Opportunity regulations.

16. Invoicing Customers for Collection Services:

Collection of the solid waste collection fees from residential and commercial customers will be the responsibility of KIB. Providing the necessary documentation for KIB to invoice the commercial customers shall be the responsibility of Contractor.

Invoicing for Collection of garbage collection fees for residents and commercial/business/industrial/governmental customers will be the responsibility of KIB. Information required to invoice commercial/business/industrial/governmental customers shall be supplied to KIB by Contractor each month. There will be a 5% administration fee charged by KIB for this service. Invoicing information for residential dumpsters, commercial entities served, and other dumpster activities will be supplied by Contractor in a form acceptable to KIB.

KIB will establish by resolution the rates that the public shall be charged for collection and disposal of garbage, rubbish, and trash. KIB reserves the right to change these rates provided, however, that if any resolutions, changes in KIB ordinances, or changes to other laws and regulations result in increased expenses to Contractor, the payments made to Contractor under the Bid Schedule will be increased by an amount equal to the increase in expenses.

Contractor shall provide documentation on all services provided to all customers each month. The cut-off date for invoice documentation shall be the second to the last Saturday of each month and the invoice documentation shall be delivered to KIB's Engineering & Facilities Department by the following Wednesday morning.

Contractor shall not provide any commercial customer with reduced-cost or free services.

Any new customer, residential or commercial, will make arrangements directly with KIB for services. Commercial customers must also make credit/payment arrangements with KIB prior to receiving services. Contractor shall direct new commercial customers to KIB Finance Department for credit arrangements.

17. Compensation

A. Unit Price Work Items:

Compensation will be made to Contractor for the following unit price work items:

Weekly Residential Door-to-door Can or Bag Service: Within existing city limits of Kodiak, Contractor will be paid for weekly residential door-to-door collection service based on the

number of residential units served, multiplied by Contractor's monthly unit price for such service. Contractor will not receive payment for dumpsters placed in the City of Kodiak to receive wastes where door-to-door service can not be provided.

Residential Carry Out Service: This is a monthly fee added to regular residential door-to-door collection for customers requesting carry out service.

Residential Dumpsters: On the Road System outside the city limits of Kodiak, Contractor will be paid for the monthly rental of residential waste dumpsters requested by KIB, such rates being determined by Contractor's unit price Bid Schedule. Contractor will receive a tip fee for each time Contractor tips (empties) a residential dumpster. Contractor will present unit prices for dumpsters located between the Landfill/Baler Facility and Salonie Creek and separate unit prices for dumpsters located beyond Salonie Creek.

Cleaning up Around Residential Dumpsters: At least twice weekly, Contractor shall pick up around each residential dumpster; and provide all labor and equipment for this service. The intent of the clean up around the dumpsters is to gather all refuse that may have fallen out of dumpsters, been set near dumpsters, and/or scattered from the dumpster location. If refuse has fallen out of dumpsters, been set near dumpsters, and/or scattered from the dumpster location at the time the dumpster is tipped, cleanup must occur immediately. Contractor is to provide a map and schedule for twice weekly cleanup. This will not be compensated for under the conditions of this contract. Contractor shall do this same clean up around residential dumpsters placed within the City of Kodiak at no additional charge, with the cost to be included in the monthly rate for door-to-door residential service. KIB may request additional clean up if complaints are received. Contractor shall be paid for this additional service for residential dumpsters located outside the City of Kodiak on the basis of an hourly rate established in the Bid Schedule. Each month with its invoice information, Contractor shall provide KIB with detailed documentation of the time invoiced for this service.

Commercial Dumpster Service: Contractor will be paid for the monthly rental of ~~residential~~ commercial waste dumpsters requested by commercial customers. Contractor will receive a tip fee for each time Contractor tips a commercial dumpster. Contractor will present unit prices for dumpsters located between the Landfill/Baler Facility and Salonie Creek and separate unit prices for dumpsters located beyond Salonie Creek.

Commercial Can Service: Contractor will receive a monthly fee for one (1) pick up of a maximum of four (4) 30-gallon bags or cans per week.

Home Business Service within Kodiak City Limits: Contractor will be paid a monthly fee for one (1) pick up of four (4) 30-gallon bags or cans per week. This fee is for the combination of the residential fee and the business fee.

Lockable Lids: Contractor will be paid a monthly fee for providing lockable lids on Commercial dumpsters, if requested by the commercial customer.

Construction and Demolition (C&D) Wastes Services: Contractor shall receive compensation for the rental of the container and a fee for each time the container is picked up and delivered/tipped at the Landfill/Baler Facility. Customers will also be charged on the basis of weight (per ton) delivered to the Landfill/Baler Facility (which is not a compensable contract item). Therefore, if roll offs are not utilized by customer, where weights can be determined on the landfill certified scale, then each individual customer/haul shall be weighed on a certified scale and that certification ticket must be accompanied with load brought to the landfill and correspond with

customer and tips for that day. A log of customers, project location, date, and weight will be submitted each day of collection via fax to 486-9394; and a copy will also be left at the Landfill/Baler Facility on the day of collection.

Pick-up of Bulky Household Items: Contractor will be paid for the pick-up of bulky household items from residences on an hourly cost basis. The hourly rate is to include all costs for this service (labor and equipment).

Special Waste - Metal: Contractor shall receive compensation for the rental of the container and a fee for each time the container is picked up and delivered/tipped at the Landfill/Baler Facility. Customers will also be charged on the basis of weight (per ton) delivered to the Landfill/Baler Facility (which is not a compensable contract item). Therefore, if roll offs are not utilized by customer, where weights can be determined on the landfill certified scale, then each individual customer/haul shall be weighed on a certified scale and that certification ticket must be accompanied with load brought to the Landfill/Baler Facility and correspond with customer and tips for that day.

Recycle Dumpsters for Cardboard: Contractor will be paid for the monthly rental of cardboard container and a tipping fee for each time a container is picked up and tipped at the Recycle Center.

Temporary Dumpster Delivery/Pick-Up: Contractor will be paid a fee each time a dumpster is located for a temporary period of time. The fee shall include both initially locating the dumpster and retrieving it at the end of the temporary period.

B. Documentation

Contractor shall maintain throughout the duration of the Agreement plus three (3) years, documentation on all of the services provided. Contractor shall maintain records to substantiate all work performed and fees requested. Such records shall include, but not be limited to, daily records on the number and size of dumpsters rented and tipped for each customer using dumpster service; pick-ups of commercial can service for commercial customers using such services, changes in customer requests for services, time sheets by employee for all hourly-rate items, etc. Copies of portions of this documentation may be requested by KIB to be supplied with Contractor's monthly requests for payment.

C. Payment

For performance under this Agreement, Contractor will be paid on the basis of the established unit prices set forth in the Bid Schedule.

Contractor shall submit a request for payment to KIB not more frequent than once per month. Contractor shall be paid monthly by KIB based on documentation provided by Contractor for the actual unit price work items completed. This is the same documentation required by KIB for invoicing customers for all work completed by Contractor in which the five (5) percent administration fee for this service will apply. Documentation shall include all quantities for each customer for each of the unit price fee items in the Bid Schedule

KIB will issue payment to Contractor within thirty (30) days of receipt of invoice and required documentation.

D. Adjustments to Compensation

Negotiated Payment Adjustment: Compensation to Contractor will be modified by negotiation between Contractor and KIB under the conditions stated within this section, Adjustments to Compensation.

Except as noted in this section, Contractor will not be allowed an adjustment in contract prices, since Contractor should have established the prices in the contract bid based upon Contractor's estimate of Contractor's costs over the two (2) year life of the contract and the two (2), one (1) year optional extensions. For a change in the Contractor's bid price to be approved, the Contractor must submit clear documentation to KIB showing the change in costs. If the change in costs is clearly shown, KIB will adjust the compensation accordingly. A change will be allowed only if one of the following conditions exists:

- The scope of work of the Agreement is modified;
- A state or federal ruling modifies the existing regulations affecting Contractor's operations;
- The location of the solid waste disposal site is moved to another site;
- Contractor's price for fuel changes by more than twenty percent; and/or
- The tonnage delivered to Contractor changes by more than fifteen (15) percent, in which case, KIB will request Contractor to submit cost documentation and shall adjust the bid price accordingly. For purposes of this contract, an initial rate of 10,000 tons per year is assumed.

Should any of the changes listed above result in similar reduced costs to Contractor, Contractor shall agree to reduce the appropriate unit prices by the actual costs of such reduction.

Payments or credits for additional work shall be no greater than Contractor's actual costs for performing the work plus ten (10) percent of the actual costs.

E. Payment Upon Change in Law

Upon petition of Contractor and approval by KIB under the limitations, conditions and procedures of this section, KIB shall pay one hundred (100) percent of Contractor's reasonable, actual increased costs of performing the contract if the increased costs result from a change in law or regulation and the change was adopted after the deadline for submission of bids leading to this Agreement, providing the costs result from applying the least costly means of ensuring full compliance with the relevant change. Contractor must fully demonstrate and document the need for the requested reimbursement to KIB's satisfaction and approval. Should the Change in Law result in a reduction in costs to Contractor, Contractor shall agree to reduce the appropriate unit prices by the reasonable, actual decreased costs of performing the contract.

F. Withholding Payments

KIB shall have the right to withhold from payments due Contractor such sums as necessary, in KIB's sole and exclusive opinion, for the purposes listed below in this section. Action taken under this section shall not affect other rights or remedies of KIB granted by other provisions of this agreement or by law; and do not relieve Contractor from the consequences or liabilities arising from Contractor's acts or omissions.

- To protect KIB against any loss or damage that may result from the events listed in this section and any other negligence or unsatisfactory work by Contractor;
- Failure of Contractor to perform or abide by an obligation under the contract;
- Claims against Contractor of KIB related to Contractor's performance of work;
- Damages by Contractor to others not adjusted;
- Failure of Contractor to make proper payment to Contractor's employees, material suppliers, or subcontractors; and
- Probable filing of a claim against KIB or Contractor.

18. Compliance with Laws

Contractor shall comply with all federal, state and local laws, rules, and regulations that apply under this contract and future amendments to these laws and rules. Contractor shall secure permits and licenses required by law to conduct activities undertaken by Contractor.

19. Bonds

Performance Bond: A performance bond shall be required of Contractor. It shall be executed yearly by a surety company licensed to do business in Alaska and be in the amount of $650,000 the first year. Thereafter, the performance bond shall be renewed annually for each succeeding year in an amount equal to fifty (50) percent of the total compensation paid in the past year. Said bond shall be obtained within ten (10) days of the execution of the initial contract and prior to January 1 of each year of the contract thereafter.

Payment Bond: A payment bond will be required of Contractor. It shall be executed by a surety company licensed to do business in Alaska and be in an amount of $650,000. The bond shall be conditioned to guarantee the payment of all wages and costs of materials, supplies, and insurance premiums incurred by Contractor in fulfilling the terms of the agreement. Insurance premiums include, but are not limited to, worker's compensation, liability insurance, and bonds. The payment bond will need to be delivered to KIB within ten (10) days of the execution of the contract. The payment bond must be in place during the entire term of the contract.

Any cost incurred by Contractor for required bonds shall be borne by Contractor.

20. Insurance Requirements

A. General Insurance Provisions:

Contractor shall not commence with work under this contract until it has obtained the insurances required under this section. Contractor shall supply KIB with two (2) copies of certificates.

All coverage shall be with insurance carriers licensed and admitted to do business in the State of Alaska.

All coverage shall be with insurance carriers acceptable to KIB.

Proof of Insurance Coverage: Contractor shall provide KIB, at the time the contract is returned to it for execution, certified copies of Certificate of Insurance and/or policies, acceptable to the KIB, for all insurances required herein.

Continuation of Coverage: If any of the above coverages expire during the term of this contract, Contractor shall deliver renewal certificates and/or policies to KIB at least ten (10) days prior to the expiration date.

B. Specific Insurance Provisions:

Workers Compensation and Employers Liability: Contractor shall procure and maintain during the life of this contract, Workers Compensation Insurance including Employers Liability Coverage, in accordance with all applicable statutes of the State of Alaska. This coverage must include statutory coverage for States in which employees are engaging in work and employer's liability protection not less that $1,000,000 combined single limits per occurrence.

Commercial General Liability Insurance: Contractor shall procure and maintain during the life of this contract, Commercial General Liability Insurance on an "Occurrence Basis" with limits of liability not less than $3,000,000 per occurrence and/or aggregate combined single limit, Personal Injury, Bodily Injury, and Property Damage. Coverage shall include the following extensions: (A) Contractual Liability; (B) Products and Completed Operations; (C) Independent Contractors Coverage; (D) Broad Form General Liability Extensions or equivalent at; (E) Per contract aggregate; and (F) Deletion of Environmental Pollution Exclusions.

Motor Vehicle Liability: Contractor shall procure and maintain during the life of this contract, Motor Vehicle Liability Insurance, including applicable No-fault coverages, with limits of liability of not less than $3,000,000 per occurrence combined single limit Bodily Injury and Property Damage. Coverage shall include all owned vehicles, all non-owned vehicles, and all hired vehicles.

Owners and Contractors Protective Liability: Contractor shall procure and maintain during the life of this contract, a separate Owner & Contractors Protective Liability Policy with limits of liability not less than $3,000,000 per occurrence and/or aggregate, combined single limit, Personal Injury, Bodily Injury, and Property Damage. KIB shall be "Named Insured" on said coverage. Sixty (60) days Notice of Cancellation shall apply to this policy.

Additional Insured: The following shall be Additional Insureds on Commercial General Liability and Vehicle Liability insurances: KIB, including all elected and appointed officials, all employees, and volunteers.

This coverage shall be primary to the Additional Insureds, and not contributing with any other insurance or similar protection available to the Additional Insureds, whether other available coverage is primary, contributing, or excess.

Cancellation Notice: Workers Compensation Insurance, Commercial General Liability Insurance, and Motor Vehicle Insurance, as described above, shall include an endorsement stating the following:
"Sixty (60) days Advance Written Notice of Cancellation, Non-renewal, Reduction and/or Material Change shall be sent to: Finance Director, Kodiak Island Borough, 710 Mill Bay Road, Kodiak, Alaska 99615".

21. Indemnification

Contractor shall indemnify and hold KIB, its elected officials, officers, and employees free and harmless from all losses, damages, expenses, judgments, liens, claims, demands, or liabilities of any kind, including reasonable attorneys' fees, for injury or death to persons, or loss, or damage

to property arising out of Contractor's performance of this contract. Such indemnity shall not cover losses, damages, expenses, judgments, liens, claims, demands, or liabilities that are caused by the sole negligence of KIB.

Contractor shall be given notice of any suit, claim, or demand within a reasonable time after KIB acquires knowledge thereof, and shall be authorized to defend the same without cost to KIB (saving that KIB shall pay its own counsel fee if it wishes to have separate representation in any suit). Contractor shall be given all information and assistance that it may reasonably require to defend the action. No compromise or settlement of any such suit, claim, or demand shall be entered into until the written notice of Contractor has been given to KIB.

22. Non-assignment of Contract

Contractor shall not assign any of its rights under this contract without the written consent of KIB. However, subcontracting portions of the project shall not be considered an assignment for the purposes of this section.

23. Independent Contractor

It is expressly understood and agreed that Contractor is an independent contractor and KIB shall not be liable for any of Contractor's acts or omissions in the performance of the work.

24. Subcontractors

Contractor agrees to provide a list of subcontractors to KIB for written approval, which approval shall not be unreasonably withheld. Contractor agrees to bind all subcontractors by the terms of this contract and submit to KIB proof of insurance coverage of the subcontractors. Contractor shall accept all responsibility for the acts of the subcontractors related to this work.

25. Right to Audit

Contractor shall maintain complete and accurate records, kept in accordance with generally accepted accounting standards, of all of Contractor's costs that are chargeable to KIB and shall retain such records for at least four (4) years after completion of the contract. Contractor shall also maintain records of customers served. KIB shall have the right, at any reasonable time, to inspect and audit those records during the course of work and throughout the four (4) year retention period. Contractor shall accommodate such review at no additional cost. Contractor shall incorporate this requirement in all contracts with third parties to which this work may be subcontracted.

26. Correcting Deficiencies and Dispute Resolution

Correcting Deficiencies: A deficiency in Contractor's work that is noted by KIB shall immediately be corrected to the satisfaction of KIB. KIB's interpretation or decision is binding on Contractor, subject to the following dispute resolution provisions of this Agreement.

Dispute Resolution: The Borough Manager shall at the request of Contractor, decide any dispute arising under this contract which is not disposed of by agreement between Contractor and KIB's Environmental Specialist. The Borough Manager shall reduce their decision to writing and furnish a copy to Contractor. The Borough Manager reserves the right to make a written request to Contractor at any time for any additional information needed to make their decision. The decision of the Borough Manager shall be final and conclusive unless, within thirty (30) days

from the date of receipt of such copy, Contractor mails or otherwise furnishes to the Kodiak Island Borough Assembly, a written appeal. The Notice of Appeal shall include specific exceptions to the Borough Manager's decision, including specific provision of the contract relied upon. General assertions that the Borough Manager's decision is contrary to law or to fact are not sufficient. The decision of the Kodiak Island Borough Assembly shall be rendered within one hundred twenty (120) days of the Notice of Appeal. The decision shall be final and conclusive unless determined by a court of competent jurisdiction to have been fraudulent, or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith.

27. Default

Either party shall have the right to terminate this agreement upon notice in writing to the other party. Notices are to be mailed to: Office of the Borough Manager, 710 Mill Bay Road, Kodiak, Alaska 99615 (for notices to KIB) and Alaska Pacific Environmental Services Anchorage, LLC, 6301 Rosewood Street, Anchorage, Alaska 99518 Attn: Bobby L. Cox (for notices to Contractor) upon the occurrence of any of the following events:

- Should the other party be declared insolvent or bankrupt, or make an assignment for the benefit of creditors, or in the event that a receiver is appointed or any proceeding is demanded by, for, or against that party under any provision of the Federal Bankruptcy Act or any amendment thereof;
- Should the other party default in the performance of any agreement made under this agreement and such default shall not be remedied to the noticing party's satisfaction within ten (10) calendar days of the demand. It is understood that significant environmental harm or danger to person or property may result by any failure of performance under this agreement and therefore time is of the essence in this provision for termination; and
- Should the business of Contractor be sold, leased, or for any reason pass from the actual supervision or control of its principal agents as of the date of this agreement.

Contractor shall not discontinue required service under this agreement without ninety (90) days notice to KIB.

The failure of either party to exercise any of its rights under this Agreement for a breach of an obligation created by this Agreement shall not be deemed to be a waiver of such rights nor shall the same be deemed to be a waiver of any subsequent breach. No custom or practice of the parties at variance with the terms of this agreement shall constitute a waiver of any right to demand exact compliance with the terms of this Agreement.

In the event suit is filed to enforce any of the terms or conditions of this agreement, the prevailing party shall be entitled to reasonable attorney's fees.

In the event of default Contractor shall allow KIB to use its equipment in order to continue collection services for a period of up to six (6) months. All contracts, leases, or other documents encumbering or limiting Contractor's interest in such property shall contain this provision.

28. Choice of Law

This Agreement shall be deemed to be a contract under the laws of Alaska and for all such purpose shall be governed by and construed in accordance with the laws of such state.

29. Entire Agreement

This Agreement contains the entire agreement of the parties and is intended to replace and supersede all prior negotiations, understandings, and agreements between the parties. No modification of the terms and conditions of this Agreement will be valid or binding on the parties unless made in writing after the date hereof and signed by an authorized representative of each of the parties.

KODIAK ISLAND BOROUGH

By: _____

Rick L. Gifford
Borough Manager

By: _____

Bud Cassidy, Director
Engineering and Facilities

ATTEST: _____ 07/18/06
Nova M. Javier, CMC
~~Judith L. Neilsen~~
Borough Clerk

ALASKA PACIFIC ENVIRONMENTAL SERVICES ANCHORAGE, LLC

By: _____

Bobby L. Cox
General Manager

KODIAK ISLAND BOROUGH ALASKA ★ 1963

Bid Schedule

B. ADDENDUM ACKNOWLEDGEMENT, SITE VISIT ACKNOWLEDGEMENT, BID SCHEDULE, AND BIDDER'S STATEMENT

Solid Waste Collection Services
for the
Kodiak Island Borough

Addendum Acknowledgement:

If any addenda are issued by the KIB, please acknowledge receipt of Addenda by recording the **Addendum Date** in the appropriate space provided below:

#1 4/5/06 #2 4/7/06 #3 4/10/06 #4 4/12/06

Site Visit Acknowledgement:

Required Community Visit Acknowledgement:

Dates of Required Visit: 4/7, 2006

Person(s) Attending Visit: Bobby Cox Title: General Manager
Jeff Riley Sr Operations Manager
Caroll Mahoney Title: Site Manager

Bid Schedule:

PLEASE NOTE: Before completing this Bid Schedule, read carefully all items in this Invitation for Bids and include all costs for all work described therein. All Borough ordinances that regulate bidding procedures are incorporated into these specifications by reference, and are applicable.

Bid Item No. 1 Weekly Residential Door-to-Door Can or Bag Service	**Bid:** $ 11.95 per residential unit.	**Option Year 1** **Bid:** $ 17.33	**Option Year 2** **Bid:** $ 17.85

Bid Item No. 2 Residential Carry-Out Service	**Bid:** $ 10.00 per month in addition to Door-to-Door Can or Bag Service	**Option Year 1** **Bid:** $ 14.50	**Option Year 2** **Bid:** $ 14.94

Bid Item No. 3A Residential Dumpsters located between Landfill and Salonie Creek	Dumpster Capacity, Cubic Yards	**Bid:** Monthly Rental Fee; $/month each dumpster	**Bid:** Fee to empty and deliver to landfill, $/tip	**Option Year 1**	**Option Year 2**
	2.0-2.4	5.00	12.10	7.25/17.55	7.47/18.07
	2.5-2.9	5.00	15.20	7.25/22.04	7.47/22.70
	3.0-3.4	5.00	20.70	7.25/30.02	7.47/30.92
	3.5-3.9	5.00	20.70	7.25/30.02	7.47/30.92
	4.0-4.4	5.00	25.50	7.25/36.98	7.47/38.08
	4.5-4.9	5.00	25.50	7.25/36.98	7.47/38.08
	5.0-5.4	5.00	25.50	7.25/36.98	7.47/38.08
	5.5-5.9	5.00	25.50	7.25/36.98	7.47/38.08
	6.0-6.5	5.00	30.00	7.25/43.50	7.47/44.81
Roll - off Containers	10	20.00	60.00	29.00/87.00	29.87/89.61
	15	20.00	150.00	29.00/217.50	29.87/224.03
	20	20.00	150.00	29.00/217.50	29.87/224.03
Bid Item No. 3B Residential Dumpsters located beyond Salonie Creek - includes Chiniak	Capacity, Cubic Yards	**Bid:** Monthly Rental Fee; $/month each dumpster	**Bid:** Fee to empty and deliver to landfill, $/tip	**Option Year 1**	**Option Year 2**
	2.0-2.4	5.00	16.00	7.25/23.20	7.47/23.90
	2.5-2.9	5.00	20.00	7.25/29.00	7.47/29.89
	3.0-3.4	5.00	23.50	7.25/34.08	7.47/35.10
	3.5-3.9	5.00	23.50	7.25/34.08	7.47/35.10
	4.0-4.4	5.00	28.00	7.25/40.60	7.47/41.82
	4.5-4.9	5.00	28.00	7.25/40.60	7.47/41.82
	5.0-5.4	5.00	28.00	7.25/40.60	7.47/41.82
	5.5-5.9	5.00	28.00	7.25/40.60	7.47/41.82
	6.0-6.5	5.00	35.00	7.25/50.75	7.47/52.27
Roll - off Containers	10	20.00	200.00	29.00/290.00	29.87/298.70
	15	20.00	200.00	29.00/290.00	29.87/298.70
	20	20.00	200.00	29.00/290.00	29.87/298.70

Bid Item No. 4A Commercial Dumpsters located between Landfill and Salonie Creek	Dumpster Capacity, Cubic Yards	**Bid:** Monthly Rental Fee; $/month each dumpster	**Bid:** Fee to empty and deliver to landfill, $/tip	**Option Year 1**	**Option Year 2**
	2.0-2.4	5.00	12.10	7.25/17.55	7.47/18.07
	2.5-2.9	5.00	15.20	7.25/22.04	7.47/22.70
	3.0-3.4	5.00	20.70	7.25/30.02	7.47/30.92
	3.5-3.9	5.00	20.70	7.25/30.02	7.47/30.92
	4.0-4.4	5.00	25.50	7.25/36.98	7.47/38.08
	4.5-4.9	5.00	25.50	7.25/36.98	7.47/38.08
	5.0-5.4	5.00	25.50	7.25/36.98	7.47/38.08
	5.5-5.9	5.00	25.50	7.25/36.98	7.47/38.08
	6.0-6.5	5.00	30.00	7.25/43.50	7.47/44.81
Roll - off Containers	10	20.00	60.00	29.00/87.00	29.87/89.61
	15	20.00	150.00	29.00/217.50	29.87/224.03
	20	20.00	150.00	29.00/217.50	29.87/224.03
Bid Item No. 4B Commercial Dumpsters located beyond Salonie Creek	Capacity, Cubic Yards	**Bid:** Monthly Rental Fee; $/month each dumpster	**Bid:** Fee to empty and deliver to landfill, $/tip	**Option Year 1**	**Option Year 2**
	2.0-2.4	5.00	16.00	7.25/23.20	7.47/23.90
	2.5-2.9	5.00	20.00	7.25/29.00	7.47/29.87
	3.0-3.4	5.00	23.50	7.25/34.08	7.47/35.10
	3.5-3.9	5.00	23.50	7.25/34.08	7.47/35.10
	4.0-4.4	5.00	28.00	7.25/40.60	7.47/41.82
	4.5-4.9	5.00	28.00	7.25/40.60	7.47/41.82
	5.0-5.4	5.00	28.00	7.25/40.60	7.47/41.82
	5.5-5.9	5.00	28.00	7.25/40.60	7.47/41.82
	6.0-6.5	5.00	35.00	7.25/50.75	7.47/52.27
Roll - off Containers	10	20.00	200.00	29.00/290.00	29.87/298.70
	15	20.00	200.00	29.00/290.00	29.87/298.70
	20	20.00	200.00	29.00/290.00	29.87/298.70

Bid Item No. 5 Commercial Can Service	**Bid:** $ 16.00 per tip	**Option Year 1** **Bid:** $ 23.20	**Option Year 2** **Bid:** $ 23.90

Bid Item No. 6 Service to Home Business within the City of Kodiak	**Bid:** $ 16.00 per month each Home Business	**Option Year 1** **Bid:** $ 23.20	**Option Year 2** **Bid:** $ 23.90

Bid Item No. 7 Clean up around Residential Dumpsters	**Bid:** $ 65.00 per hour for labor and equipment.	**Option Year 1** **Bid:** $ 94.25	**Option Year 2** **Bid:** $ 97.08

Bid Item No. 8 Monthly Fee for Lockable Lid on Commercial Dumpster	**Bid:** $ 10.00 per month	**Option Year 1** **Bid:** $ 14.50	**Option Year 2** **Bid:** $ 14.94

Bid Item No. 9A Construction and Demolition Wastes (C&D) Services	Dumpster Capacity, Cubic Yards	**Bid:** Monthly Rental Fee; $/month each dumpster	**Bid:** Fee to empty and deliver to landfill, $/tip	**Option Year 1**	**Option Year 2**
	2.0-2.4	10.00	12.10	14.50/17.55	14.94/18.07
	2.5-2.9	10.00	15.20	14.50/22.04	14.94/22.70
	3.0-3.4	10.00	16.90	14.50/24.51	14.94/25.24
	3.5-3.9	10.00	19.20	14.50/27.84	14.94/28.68
	4.0-4.4	10.00	22.45	14.50/32.55	14.94/33.53
	4.5-4.9	10.00	24.10	14.50/34.95	14.94/35.99
	5.0-5.4	10.00	25.50	14.50/36.98	14.94/38.08
	5.5-5.9	10.00	25.50	14.50/36.98	14.94/38.08
	6.0-6.5	10.00	30.00	14.50/43.50	14.94/44.81
Roll - off Containers	10	40.00	100.00	58.00/145.00	59.74/149.35
	15	40.00	160.00	58.00/232.00	59.74/238.96
	20	40.00	160.00	58.00/232.00	59.74/238.96

Bid Item No. 9B Construction and Demolition Wastes (C&D) Services – Beyond Salonie Creek	Dumpster Capacity, Cubic Yards	**Bid:** Monthly Rental Fee; $/month each dumpster	**Bid:** Fee to empty and deliver to landfill, $/tip	**Option Year 1**	**Option Year 2**
Roll - off Containers	10	40.00	200.00	58.00/290.00	59.74/298.70
	15	40.00	200.00	58.00/290.00	59.74/298.70
	20	40.00	200.00	58.00/290.00	59.74/298.70

Bid Item No. 10 Collection of Bulky Items from Residential Customers	**Bid:** $ 65.00 per hour for labor and equipment	**Option Year 1** **Bid:** $ 94.25	**Option Year 2** **Bid:** $ 97.08

Bid Item No. 11 Roll – off Containers for Cardboard Recycling	**Bid:** $ 20.00 per month rental each unit	**Option Year 1** **Bid:** $ 29.00	**Option Year 2** **Bid:** $ 29.87
	Bid: $ 100.00 per each pickup and tip at Recycle Center	**Option Year 1** **Bid:** $145.00	**Option Year 2** **Bid:** $ 149.35

Bid Item No. 12 Temporary Dumpster Delivery/Pick-up Fee	**Bid:** $ 45.00 combination of delivery and pick-up	**Option Year 1** **Bid:** $ 65.25	**Option Year 2** **Bid:** $ 67.21

End of Bid Schedule

ADDENDUM #1 – ATTACHMENT B
ADDITIONAL BID ITEMS

Bid Item No.13A Special Waste - Metal	Dumpster Capacity, Cubic Yards	**Bid:** Monthly Rental Fee; $/month each dumpster	**Bid:** Fee to empty and deliver to landfill, $/tip	**Option Year 1**	**Option Year 2**
	2.0-2.4	10.00	16.34	14.50/23.69	14.94/24.40
	2.5-2.9	10.00	20.52	14.50/29.75	14.94/30.65
	3.0-3.4	10.00	22.82	14.50/33.09	14.94/34.08
	3.5-3.9	10.00	25.92	14.50/37.58	14.94/38.71
	4.0-4.4	10.00	30.31	14.50/42.95	14.94/45.27
	4.5-4.9	10.00	32.54	14.50/47.18	14.94/48.60
	5.0-5.4	10.00	34.43	14.50/49.92	14.94/51.42
	5.5-5.9	10.00	34.43	14.50/49.92	14.94/51.42
	6.0-6.5	10.00	40.50	14.50/58.73	14.94/60.49
Roll - off Containers	10	40.00	100.00	58.00/145.00	59.74/149.35
	15	40.00	187.00	58.00/271.15	59.74/279.28
	20	40.00	187.00	58.00/271.15	59.74/279.28

Bid Item No. 13B Special Waste – Metal Beyond Salonie Creek	Dumpster Capacity, Cubic Yards	**Bid:** Monthly Rental Fee; $/month each dumpster	**Bid:** Fee to empty and deliver to landfill, $/tip	**Option Year 1**	**Option Year 2**
Roll - off Containers	10	40.00	210.00	58.00/304.50	59.74/313.64
	15	40.00	210.00	58.00/304.50	59.74/313.64
	20	40.00	210.00	58.00/304.50	59.74/313.64

End of Bid Schedule

ADDENDUM #2 – ATTACHMENT D
ADDITIONAL BID ITEMS

Bid Item No.14 Bear Resistant Dumpsters	Dumpster Capacity, Cubic Yards	**Bid:** Monthly Rental Fee; $/month each dumpster	**Bid:** Fee to empty and deliver to landfill, $/tip	**Option Year 1**	**Option Year 2**
	4.0-4.4	36.00	28.00	52.20/40.60	53.77/41.82
	4.5-4.9	40.00	28.00	58.00/40.60	59.74/41.82
	5.0-5.4	40.00	28.00	58.00/40.60	59.74/41.82
	5.5-5.9	40.00	28.00	58.00/40.60	59.74/41.82

End of Bid Schedule

AMENDMENT NO. 1
TO CONTRACT 2006-39
BETWEEN KODIAK ISLAND BOROUGH AND ALASKA PACIFIC ENVIRONMENTAL SERVICES ANCHORAGE, LLC
REVISION TO CONDITIONS OF CONTRACT

This amendment becomes part of the solid waste collection contract, 2006-39, between the Kodiak Island Borough and Alaska Pacific Environmental Services Anchorage, LLC dated May 2006.

Residential dumpsters, located within City limits, will remain in place and the Kodiak Island Borough will compensate Alaska Pacific Environmental Services Anchorage, LLC at the increased City residential rate of $13.82 (as proposed by Alaska Pacific Environmental Services Anchorage, LLC) and will be retroactive to July 1, 2006. This cost will replace the cost of $11.95 in the Bid Schedule which is incorporated as part of the agreement.

All other language in the contract as it relates to residential dumpsters in the City limits is still applicable.

KODIAK ISLAND BOROUGH

By: _____
Rick L. Gifford
Borough Manager

ALASKA PACIFIC ENVIRONMENTAL SERVICES ANCHORAGE, LLC

By: _____
Bobby L. Cox
General Manager

By: _____
Bud Cassidy, Director
Engineering & Facilities

ATTEST: _____
Nova M. Javier, CMC
Borough Clerk

KODIAK ISLAND BOROUGH ALASKA ★ 1963

AMENDMENT #2
CONTRACT 2006-39
BETWEEN KODIAK ISLAND BOROUGH AND ALASKA PACIFIC ENVIRONMENTAL SERVICES ANCHORAGE, LLC
EXTENSION OF CONTRACT
TO ENTER INTO OPTION YEAR ONE
JULY 1, 2008 – JUNE 30, 2009

This amendment becomes part of the solid waste collection contract between the Kodiak Island Borough and Alaska Pacific Environmental Services Anchorage, LLC dba Alaska Waste.

1. Exercise Option Year One in the contract agreement from July 1, 2008 – June 30, 2009. Compensation for contract will be as per bid specifications column titled Option Year 1 included as part of original contract agreement with an average monthly deduction of $6,250 applied after administrative fee.
2. Contractor may deliver loads of municipal solid waste to the Landfill/Baler facility on Sundays ; no more than four (4) loads may be delivered when KIB staff is not present.

KODIAK ISLAND BOROUGH

By: _____
Rick L. Gifford
Borough Manager

Date: 5/5/08

By: _____
Woody Koning, Director
Engineering & Facilities

Date: 5/5/08

ALASKA PACIFIC ENVIRONMENTAL SERVICES ANCHORAGE, LLC

By: _____
Bobby L. Cox
General Manager

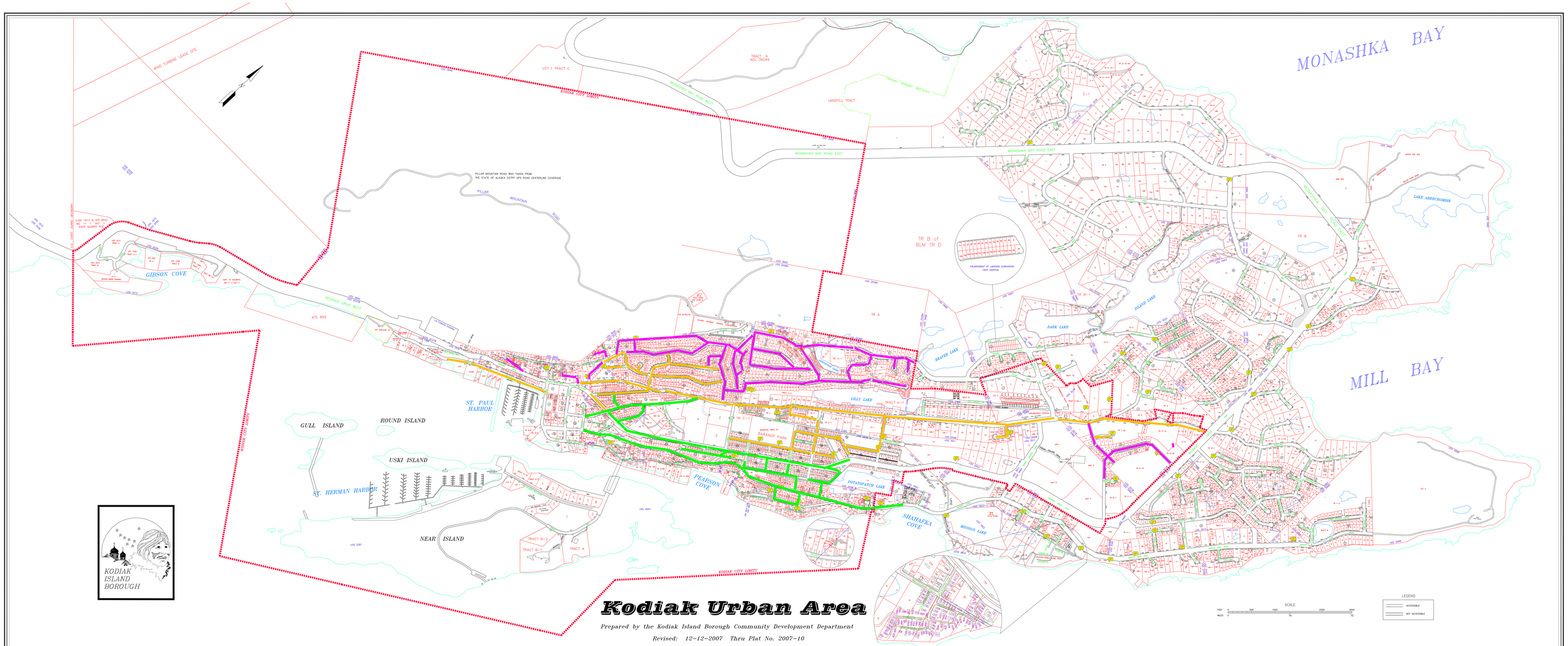
Date: _____

ATTEST: _____
Nova M. Javier, CMC
Borough Clerk

Date: 5/7/08

KODIAK ISLAND BOROUGH ALASKA ☆ 1963

Appendix E
Solid Waste Service Area Map


MONASHKA BAY
MILL BAY
GIBSON COVE
ST. PAUL HARBOR
ST. HERMAN HARBOR
GULL ISLAND
ROUND ISLAND
USKI ISLAND
NEAR ISLAND
PEARSON COVE
POTATOPATCH LAKE
SHAHAFKA COVE
LILLY LAKE
BEAVER LAKE
DARK LAKE
ISLAND LAKE
LAKE ARRECHOMBIE
MISSISSIPPI LAKE
BARANOF PARK
MONASHKA BAY ROAD EAST
MONASHKA BAY ROAD WEST
REZANOF DRIVE WEST
PILLAR MOUNTAIN ROAD
PILLAR MOUNTAIN ROAD WAS TAKEN FROM THE STATE OF ALASKA DOTPF GPS ROAD CENTERLINE COVERAGE
WIND TURBINE LEASE SITE
KODIAK CITY LIMITS
KODIAK ISLAND BOROUGH
Kodiak Urban Area
Prepared by the Kodiak Island Borough Community Development Department
Revised: 12-12-2007 Thru Plat No. 2007-10
SCALE
FEET 0 500 1000 2000 2640
MILES 0 1/4 1/2 3/4
LEGEND
ACCESSIBLE
NOT ACCESSIBLE

Appendix F
Threshold Recycling Services Contract

Contract #2007-32

PROFESSIONAL SERVICES AGREEMENT

THIS AGREEMENT made this 27th day of FEBRUARY 2007, by and between the Kodiak Island Borough (KIB) and Threshold Services, Inc. (Threshold), hereinafter called the Contractor.

W I T N E S S E T H:

That the KIB and Contractor for the consideration hereinafter recited agree as follows:

1. **Project.** The Contractor agrees to perform all services necessary for the processing and shipment of recyclable materials within the city and borough limits, as identified in the Contractor's proposal dated October 2006, made part of this contract.

2. **Job Commencement and Performance.** The contractor will commence work on this project on the 1st day of OCTOBER 2007 MC MJ Bud

3. **Project Manager.** The project manager shall be the Director of Engineering and Facilities Department of the Kodiak Island Borough or his designee.

4. **Compensation.** The Kodiak Island Borough agrees to pay to the Contractor as compensation for services under the following payment schedule:

   $9,000 per month, up to 30,000 lbs; and
   $ .15 per lb over 30,000.

5. **Payment.** All requests for payment shall be for work completed unless otherwise agreed to by KIB and Threshold. The Contractor shall provide any additional information to KIB which may be reasonable in support of any payment request. Monthly invoices and shipment backup shall be delivered to KIB no later than the end of the month and shall be paid within thirty (30) days from the date of the invoice unless KIB shall notify the Contractor in writing of its reason for not making payment of the sums requested. A service charge of one and one half percent (1.5%) per month may be charged on balances not paid by KIB within the terms stated above.

6. **Indemnification.** The Contractor specifically obligates himself to the Kodiak Island Borough in the following respects to wit: (i) to indemnify the Kodiak Island Borough against, and save it harmless from any and all claims, suits, or liability, on account of any negligent act or omission of the Contractor, or any of his officers, agents, employees or servants; (ii) to pay for all materials furnished and services performed under this Agreement.

7. **Insurance.** (a) Contractor shall at all times, at its own expense, keep in force the following described insurance for protection against the claims of employees or other persons, insuring both the Contractor and the Kodiak Island Borough against liability that my accrue against them or either of them in connection with Contractor's performance under this assignment;

   (1) Insurance in at least the required statutory amounts, covering claims under Worker's Compensation, disability benefits and other similar employee benefit acts; and
   (2) Public Liability Insurance covering bodily injury, death, and property damage with combined single limit of not less than $1 million.

(b) If Contractor fails to comply with the insurance requirements of this Agreement, the Kodiak Island Borough may terminate the Agreement with ten (10) days written notice;
(c) Contractor covenants to maintain all insurance policies required in this Agreement for the period of time in which a person may commence a civil action as prescribed by the applicable statues of limitations. The coverage required by this Agreement shall over all claims arising in connection with the performance of Contractor under this Agreement, whether or not asserted during the term of this Agreement and even though judicial proceedings may not be commenced until after the expiration of this Agreement;

(d) If Contractor is self-insured the Kodiak Island Borough will require a statement to that effect;

(e) Certificate of Insurance for liability and errors and omissions insurance, especially for Contractor acting as agent (n/a if self insured); and

(f) Kodiak Island Borough must be name as "Additionally Insured".

8. **Claims.** (a) Partial payments for work performed under this Agreement will equal the value of the work done by the Contractor at the agreed price, less the sum of previous payments as provided above; provided that the Contractor is not indebted to the Kodiak Island Borough or anyone else for professional services, fringes, taxes, supplies, materials, equipment, rental or other proper charges against the services covered by this Agreement. The Contractor will, upon completion of the Scope of Services and before final payment, furnish the Kodiak Island Borough with reasonable evidence that all services, labor, materials and equipment have been paid for in full. (b) The Contractor must notify the Kodiak Island Borough or its agent of any and all claims for costs in excess of the contract amount within ten (10) days of incurring such cost.

9. **Changes and Modifications.** (a) The Kodiak Island Borough may, at any time by written order signed by the Project Manager of the Kodiak Island Borough, make changes in the specifications for services hereunder or in the project schedule. Any additions or reductions to the amount of this Agreement resulting from authorized changes whether initiated by Contractor or the Kodiak Island Borough must be agreed upon in writing by both parties hereto, subject to the contract and sale provisions of the Kodiak Island Borough Code. (b) The cost or credit to the Kodiak Island Borough resulting from a change in the services or in the project schedule shall be determined as follows:

(1) by mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation; or
(2) by the hourly fees stated in the Contract Documents or subsequently agreed upon.

10. **Prosecution of Work.** The Contractor shall prosecute the work in a prompt and diligent manner whenever such work or any part of it becomes available, in order to promote the general progress of the entire Project. Upon written request by the Kodiak Island Borough, the Contractor shall furnish to the Kodiak Island Borough such evidence as the Kodiak Island Borough may require relating to the ability of the Contractor to complete the Project.

11. **Delays.** In the event the Contractor's performance is delayed or interfered with by acts of the Kodiak Island Borough, or any other justifiable cause beyond the control of the Contractor, he may request an extension of time for the performance of same.

12. **Approvals.** The Contractor shall obtain and pay for all permits, licenses and official inspections made necessary by his work, and shall comply with all laws, ordinances and regulations bearing on his work and the conduct thereof.

13. **Stop Work.** (a) If the Contractor fails to correct defective services as required herein or persistently fails to carry out the project in accordance with the Contract Documents, the Kodiak Island Borough, by a written order signed personally or by an agent may order the Contractor to stop work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the Kodiak Island Borough to stop work shall not give rise to any duty on

the part of the Kodiak Island Borough to exercise this right for the benefit of the Contractor or any other person or entity. (b) If the Contractor defaults or neglects to carry out the work in accordance with the Contract Documents and fails within fourteen (14) days after receipt of written notice from the Kodiak Island Borough to commence and continue correction of such default or neglect with diligence and promptness, the Kodiak Island Borough may, after seven (7) days following receipt by the Contractor of an additional written notice and without prejudice to any other remedy it may have, make good such deficiencies but use its best efforts to mitigate the cost of curing such default. In such case an appropriate change order shall be issued deducting from the payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for the Project Manager's additional services made necessary by such default, neglect or failure.

14. Payments Withheld. (a) The Kodiak Island Borough may withhold payments from the Contractor for any of the following reasons:

(1) The application for payment misstates the amount of services completed;
(2) Defective services not remedied;
(3) Third party claims filed or reasonable evidence indicating probable filing of such claims;
(4) Failure of the Contractor to make payments properly to consultants and subcontractors or for professional services, materials or equipment;
(5) Reasonable evidence that the project cannot be completed for the unpaid balance of the contract sum;
(6) Reasonable evidence that the Project will not be completed within the contract time; or
(7) Persistent failure to perform the services in accordance with the contract documents.

15. Time. (a) Definitions:

1. unless otherwise provided, the contract time is the period of time allotted in this Agreement for substantial completion of the project.

2. the date of commencement of the project is the date established in this Agreement as set forth above.

3. the date of substantial completion of the project or designated portion thereof is the date certified by the Project Manager when the project is sufficiently complete, in accordance with the Contract Documents, so the Kodiak Island Borough can utilize the project or designated portion thereof for the use for which it is intended.

4. the date of final completion is the date that the Kodiak Island Borough certifies either orally or in writing that the project is finished.

5. the term "day", as used in the Contract Documents, shall mean calendar day unless otherwise specifically designated.

a. all time limits set forth herein are of the essence in this Agreement.

16. Final Completion and Final Payment. When project is complete as determined by the Kodiak Island Borough, the Kodiak Island Borough will cause a final payment to issue and make payment to the Contractor within thirty (30) days from the date that the project was certified as finally complete on the conditions set forth below.

17. Termination and Default. (a) If the Contractor is adjudged a bankrupt entity, or if he makes a general assignment for the benefit of his creditors, or if a receiver is appointed on account of his insolvency, or if he refuses or fails, except in cases for which extension of time is provided, to supply enough properly skilled professionals or proper services, or if he fails to make prompt payment to subcontractors or for materials or labor, or persistently disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or otherwise is guilty of a

violation of a provision of this Agreement, then the Kodiak Island Borough may, without prejudice to any right or remedy and after giving the Contractor seven days' written notice, terminate the employment of the Contractor and take possession of all materials and documents prepared by the Contractor in connection with the Project, and may finish the work by whatever method it may deem expedient. In such case, the Contractor shall not be entitled to receive any further payment until the work is finished. (b) If the unpaid balance of the contract sum exceeds the costs of finishing the Project, including compensation for the Project Contractor's additional services made necessary thereby, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the Kodiak Island Borough. The amount to be paid to the Contractor or to the Kodiak Island Borough, as the case may be, shall be certified by the Project Manager, upon application, and this obligation for payment shall survive the termination of the Contract.

18. **Assignment.** This Agreement shall not be assigned by operation of law or through negotiated Agreement by the Contractor without the written permission of Kodiak Island Borough. However, subcontracting portions of the Project to be performed pursuant to this Agreement shall not be considered an assignment for the purposes of this Agreement.

19. **Waiver.** Failure of the Kodiak Island Borough or the Contractor to enforce a specific section of this Agreement against one another or to enforce a particular demand of the Kodiak Island Borough or the Contractor made pursuant to the terms of this Agreement shall not effect a waiver of any of the Kodiak Island Borough's or the Contractor's rights and powers as set forth in this Agreement.

20. **Written Notice.** Written notice shall be deemed to have been duly served if delivered in person to the individual or member of the firm or entity or to an officer of the corporation for whom it was intended, or if delivered at or sent by registered or certified mail to the last business address known to him who gives the notice.

21. **Integration.** The Agreement and the referenced documents represent the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral.

22. **Notice.** Written notice pursuant to this Contract shall be deemed delivered to either party if hand delivered to a superintendent or officer of a party or mailed to the parties at the following addresses:

Kodiak Island Borough	Threshold Services, Inc.
Office of the Manager	323 Carolyn Street, Suite 101
710 Mill Bay Road	Kodiak, Alaska 99615
Kodiak, Alaska 99615-6398	Attn: Matt Jamin

23. **Kodiak Island Borough Furnished Data.** Kodiak Island Borough will provide to the Contractor all data in Kodiak Island Borough's possession relating to the Contractor's services on the Project. The Contractor will reasonably rely upon the accuracy, timeliness, and completeness of the information provided by Kodiak Island Borough.

24. **Reuse of Project Documents.** All reports, documents and other deliverables of the Contractor, whether in hard copy or in electronic form, are instruments of service for this Project, whether the Project is completed or not. Reuse on another project, change, or alteration by Kodiak Island Borough or by others acting through or on behalf of Kodiak Island Borough of any such instruments of service without the written permission of the Contractor will be at Kodiak Island Borough's sole risk.

25. **Litigation Assistance.** The Scope of Services does not include costs of the Contractor for required or requested assistance to support, prepare, document, bring, defend or assist in litigation undertaken or defended by Kodiak Island Borough. All such Services required or requested of the Contractor by Kodiak Island Borough, except for suits or claims between the parties to this Agreement, will be reimbursed as mutually agreed, and payment for such

Services shall be in accordance with Section 5, unless and until there is a finding by a court or arbitrator that the Contractor's sole negligence caused Kodiak Island Borough's damage.

26. <u>Certification.</u> The Contractor certifies that it is not debarred, suspended, proposed for debarment or declared ineligible for work with the State of Alaska. Contractor shall notify the Kodiak Island Borough within five (5) working days of any such action brought against the Contractor during the term of this Agreement.

The terms of this Agreement shall be from 10/1/06 to 6/30, 20~~07~~08.

KODIAK ISLAND BOROUGH

By: Charles E. Cassidy Jr. A.O. for
Rick L. Gifford, Borough Manager

By: Charles E. Cassidy Jr.
Charles E. Cassidy, Director
Engineering and Facilities Department

CONTRACTOR

By: Matthew DeAmond

Title President

ATTEST:

Jessica Bassel for Nova M. Javier

Nova M. Javier, CMC
Borough Clerk

Appendix G
Threshold Recycling Services Budget

THRESHOLD RECYCLING PLANT - PROPOSED BUDGET FOR 9/06 - 8/07

Item		Oct	2006 Nov.	Dec.	January	Februar	March	April	2007 May	June	July	August	Sept	Total	Note
INCOME															
Donations					2,000									2,000	
KIB - core payment		9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	108,000	KI B to pay $9,000 minimum for up to 30,000 lbs recycled per month
KIB - Occassional payment		1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	18,000	$.15 per lb over 30,000 lbs
Coast Guard - core payment		9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	108,000	CG to pay $9,000 minimum for up to 30,000 lbs recycled per month
CG - Occasional payment			4,500			4,500			4,500			4,500		18,000	anticipate an extra van of about 30,000 lbs each 3 months
business pickup fees		200	200	200	200	200	200	200	200	200	200	200	200	2,400	
Smurfitt receipts		1,000	1,000	1,500	1,500	1,000	1,500	1,500	1,000	1,500	1,500	1,000	1,500	15,500	**$500 per van**
Kodiak Sanitation Contract															none at present
Total Income		20,700	25,200	21,200	23,200	25,200	21,200	21,200	25,200	21,200	21,200	25,200	21,200	271,900	
EXPENSE															
Personnel															
	plant manager	3,132	3,132	3,132	3,132	3,132	3,132	3,132	3,132	3,132	3,132	3,132	3,132	37,584	manager @ $18.00/hr, @ 174 hrs / month
	plant payroll	7,500	8,500	7,500	7,500	8,500	7,500	7,500	8,500	7,500	7,500	8,500	7,500	94,000	increased personnel cost when increased product
	fica @ .0765	813	890	813	813	890	813	813	890	813	813	890	813	10,066	
	esc @ .0176	172	188	172	172	188	172	172	188	172	172	188	172	2,132	
	work comp @ .23	2,445	2,675	2,445	2,445	2,675	2,445	2,445	2,675	2,445	2,445	2,675	2,445	30,264	
	travel/training	100	100	100	100	100	100	100	100	100	100	100	100	1,200	
Rent	plant	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	25,200	
Utilities	electricity	600	600	600	600	600	600	600	600	600	600	600	600	7,200	
	tel & net	275	275	275	275	275	275	275	275	275	275	275	275	3,300	
vehicles	gas and fuel	700	700	700	700	700	700	700	700	700	700	700	700	8,400	
	maint veh & forklift	400	400	400	400	400	400	400	400	400	400	400	400	4,800	
	ins - trucks & lift	600	600	600	600	600	600	600	600	600	600	600	600	7,200	
Other	misc off supplies	200	200	200	200	200	200	200	200	200	200	200	200	2,400	
	recycle supplies	400	400	400	400	400	400	400	400	400	400	400	400	4,800	boxes and wire
	Horizon charge for vans	900	1,350	1,350	900	1,350	1,350	900	1,350	1,350	900	1,350	1,350	14,400	**$450 per van**
	freight	50	50	50	50	50	50	50	50	50	50	50	50	600	
	accounting	433	433	433	433	433	433	433	433	433	433	433	433	5,196	
	officers' insurance	120	120	120	120	120	120	120	120	120	120	120	120	1,440	
	general liability	150	150	150	150	150	150	150	150	150	150	150	150	1,800	
	bank fees	10	10	10	10	10	10	10	10	10	10	10	10	120	
	legal	0	0	0	0	0	0	0	0	0	0	0	0	0	
	advertsiing	100	100	100	100	100	100	100	100	100	100	100	100	1,200	
	equipment	200	200	200	200	200	200	200	200	200	200	200	200	2,400	
	postage	10	10	10	10	10	10	10	10	10	10	10	10	120	
Total Expense		21,411	23,184	21,861	21,411	23,184	21,861	21,411	23,184	21,861	21,411	23,184	21,861	265,822	check
Monthly Net Cash Flow		-711	2,016	-661	1,789	2,016	-661	-211	2,016	-661	-211	2,016	-661		
		-711	1,305	644	2,434	4,450	3,789	3,578	5,594	4,933	4,722	6,739	6,078		

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Appendix H
Threshold Recycling Services Letter

Threshold Services, Inc.
323 Carolyn Street, Suite 101
Kodiak, AK 99615
Phone: (907) 486-6024
Fax: (907) 486-6112

March 27, 2008

Chris Bell
Bell & Associates, Inc.
1628 NW 33rd Way
Camas, WA 98607

Dear Chris:

Thanks for your recent call (and the prior letter to Rick) relating to information on Threshold Services' current costs. A subcommittee of our board met last night to discuss how we might best assist you in your efforts on behalf of the borough to determine how to deal with solid waste.

As you know, our current model uses a significant component of challenged employees to handle recycled materials, in collection, sorting, processing and shipping. Indeed, one of our avowed goals is to provide work and training for persons with disabilities. About 15% of our current personnel costs are for challenged employees.

We understand that your principal interest is in projecting, from the current costs per unit which Thresholds charges the borough, to what the costs would be if a substantially larger recyclable stream were diverted from the land fill. Our best judgment is that while we might be able to move twice as much material through our current plant, we certainly could not use that facility to process the more that 10 times the current amount of recyclable materials that could be diverted. Instead, we would have to develop a different facility, with substantial more automation that is currently involved in our processing. We also assume that, while we would want to continue to use our current challenged employees in any larger operation, the percentage of personnel costs associated with their efforts would be substantially smaller.

Thus we don't think that projecting from current costs is a very helpful task because the approach would be substantially different. We certainly would hope to achieve significant economies of scale with a larger, more mechanized operation.

Nor are we sure that the "Horizon connection" would continue to be available if our throughput increased dramatically. Right now Horizon charges us $475 per van to move product from our plant to Smurfit. But we understand that we are receiving that rate in part because of Horizon's commitment to assist the community with recycling, but also in part to assist us in providing a work environment for disabled

workers. We are not sure that if we had 4 or 10 times the amount of throughput, that rate would continue to be available.

We continue to hope that Threshold can perform a significant role for the benefit of the borough's citizens and for our employees as a more efficient solid waste plan is developed.

Sincerely,

THRESHOLD SERVICES, INC.

Matthew D. Jamin
Secretary

cc:
Edward Mahoney, President
Carol Tracey, Vice President
Ellen Simeonoff, Treasurer
Rick Pillans, Plant Manager
Maggie Rocheleau, Accountant

MDJ/ker

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Appendix I
Refuse Collection Alternatives

Appendix I
Residential Trash Collection

One of the three primary objectives of this project is to procure collection services for the KIB. Before the services are requested to potential vendors, the following questions on the future solid waste and recycling collection system need to be considered, and a decision reached by the members of the Assembly. Once a decision has been reached, Borough managers and the Project Team will develop the Request for Proposals (RFP) that incorporates the policy direction provided by the Assembly.

1. Should Kodiak implement a cart system for residential (and small business) garbage and recyclables?

The existing manual method of residential collection is labor-intensive, out-of-date, inefficient, and unsafe. Waste is set out for collection at the curb in cans, carts, bags, boxes, or loose. Collection crews of two or three people; one driving the truck and the other(s) collecting the waste by hand, pick up the trash and throw it into the rear of the truck. There are two ways to collect waste using the cart based system: semi-automated and fully automated.

Semi-Automated
Trash is collected using standardized roll carts and dumped into the truck with a hydraulic cart tipper. Crew size for a semi-automated collection route is one. The truck is equipped with a steering wheel on the right side of the cab so the driver can stand while driving from house to house. Rather that picking up various containers or bags by hand, the driver rolls the cart onto the tipper affixed to the truck where the mechanized lift dumps the materials into the hopper. The primary advantage of semi-automated over manual is the tipper dumps the cart rather than the driver. The other is the use of standardized containers for waste. Some residents have roll carts with a capacity of 60 gallons that are dumped by way of a cart tipping mechanism affixed to the rear of the truck.

Fully Automated
Trash is collected in the same carts as semi-automated; however, the trucks are equipped with a mechanical arm that picks up the cart. The driver operates the mechanical arm from inside the cab of the truck. There are two big advantages of a fully automated route: driver safety and increased productivity (collected carts). Since the mechanical arm picks up and dumps the cart, the driver's risk of injury is greatly diminished. The second advantage is the mechanical arm can pick up and dump a cart in about 15 seconds; therefore increasing the number of carts collected over a semi-automated and manual route.

Other reasons for moving to cart based collection system:

- Standardized Collection Sizes: Carts may range in volume from 20 gallons up to 96 gallons.
- Customer convenience and reduction of litter and garbage in the streets
- Rate Stability: Collection rates over the long-term (5 to 10 years), fluctuate less for automated when compared to other methods of collection
- Future Services: Automated collection trucks can pick up carts designated for residential recycling and yard debris, so the KIB can add additional services in the future at a lower cost due to fleet / cart standardization
- Commercial Collection Tubs: Fully automated trucks can also be fitted with universal arm gripper to collect 300 and 450 gallon commercial collection tubs[1]

Bears
One of the Borough's primary concerns of moving to a fully automated system is the use of collection carts that are not resistant to bears. The current collection system along the road system is not designed to address the bear issue although roll off containers currently used are bear resistant. Trash day in the City of Kodiak offers any bear t a wide selection of dining choices because waste is set out in open cans, bags,

[1] 300 gallon tub is equal to 1.5 yard container and a 450 gallon tub is equal to a 2.25 yard container.

and any other method residents choose to place waste out on the curb. Some community dumpsters located along the road system are not resistant to bears or other vectors and the doors on bear resistant dumpsters are consistently and routinely left open by the public. As of the writing of this report, there are no roll carts that are compatible with a fully automated collection system; however, there are roll carts that are compatible with semi-automated collection systems. Our recommendation is to provide carts to all residential customers in the populated areas that currently receive regular collection at the curb. In the areas just outside the city, we would recommend the use of the bear resistant roll carts.

Hybrid System

There are three manufacturers that build a collection body and system to collect carts either fully automated, semi-automated, or manually. This gives the waste collector the flexibility to utilize one truck for various circumstances. For example, collection in town could be fully automated and in the remote areas that would use bear resistant carts, the driver could move to semi-automated.

2. Should rates be variable, that is a Pay-As-You-Throw structure that is based on the size of the cart / container and the frequency of collection?

Pay-As-You-Throw (PAYT) is a method of setting collection rates based on the amount of waste set out for collection. This method creates a direct economic incentive to recycle more and/or to generate less waste. Two key considerations for PAYT on Kodiak are rate equity and economics. PAYT treats garbage collection the same as other utilities in that customers pay for the services they consume. Secondly, PAYT would eliminate waste generators that are currently subsidized in the current system by setting rates at a cost of service for both residential and commercial services. This is a fair and equitable approach to collection and disposal rates.

3. If a cart collection program is implemented, should the KIB discontinue the utilization of community dumpsters?

Kodiak is one of a few jurisdictions in the United States that offer duplicative services: residential curbside collection of waste and local dumpsters for additional disposal. While the community dumpster program is popular with many residents, it's also expensive and wasteful. As noted earlier, the cost of the program in 2007 for the 37 containers located within the metropolitan area was estimated at $599,284. Revenue generated from Borough customers @ $31 per month covers $555,396, leaving a shortfall of $43,887. Many of the items disposed in the community dumpster are large, bulky items such as televisions and furniture that normally would be self hauled to the landfill. The community dumpsters provide an ideal way for individuals to avoid the responsibility of paying for disposal while ensuring increased costs to the system.

The system that could be implemented to replace the community dumpsters may include a "call-to-haul" for bulky items such as old furniture or appliances, a drop off deport for household hazardous waste, and larger garbage carts (up to 95 gallons). A new system will be implemented over time; dumpsters will not simply disappear without implementation of a new system.

Elimination of the community dumpsters puts the burden of disposal expense on the generator of the waste; would greatly reduce the commercial subsidy necessary to fund the program and; be compatible with a PAYT rate structure.

4. Should the next collection contract be a long-term? (7-10 year term of contract, 7 years to amortize equipment with a 3 year extension as incentive)

Collection operations are capital intensive ventures. An automated garbage truck will cost approximately $220,000. A roll cart for garbage storage and collection will cost $55 each, plus shipping costs. This is equipment that, while expensive, will last seven to ten years with regular care and maintenance. For a hauler, making a large capital investment in this equipment is more feasible with a long – term contract. It will allow for ample time to recover the capital costs, provide a longer period for distributing rate increases, and provide greater control over rising rates.

5. **Should the collection company be responsible for billing all residential and commercial customers?**

6. **Should the collection company be responsible for customer service?**

There is a duplication of efforts and costs under the current system. KIB provides the contractor with a detailed monthly billing register which the contractor fills in to reflect the account activity for that billing period. The contractor generates a detailed monthly billing register and submits the invoice to the KIB for payment. All information on that register/invoice is then keyed in by the KIB to generate invoices that are mailed out to KIB residential and commercial customers. The City invoices residential customers that are hooked up to water and sewer. In addition to the billing, a high percentage of customer calls are handled twice: first by the Borough, and then by the contractor (or vice versa). If the customer's question can't be answered by Borough staff, that individual or Borough staff calls the contractor to relay the question or issue for resolution.

The Borough budgets $20,000 for the billing and customer service function alone, which is low considering the person completing this task spends over 50% of their time to billing and customer service. The contactor already generates the activity for the billing register and answers all the customer complaints that come through the Borough, so their costs are being paid for in the rates. The only item that the contractor is not paying for is the cost of mailing out the invoice.

Turning over the duties of billing and invoicing will not relieve the Borough of its responsibility as the manager of the collection system. If a customer has a complaint, whether it is billing or customer service related, and it is not addressed by the contractor in a manner that is satisfactory to the customer, their next call would be to the Borough program manager for final resolution.

Consultant's Recommendation: Yes to all six collection questions and issues.

Projected System Costs

What would a cart based system based on the previous six recommendations cost the residential ratepayers? The tables on the following pages detail assumptions used to project collection costs of the three collection systems (manual – status quo, semi-automated, and fully automated)[2]. It must be noted that the following costs are planning level only and actual rates will vary depending on the specific collection services outlined in the contract, various cost including fuel, equipment, and labor, as well as any rate incentives and program costs.

Assumption Note: Total Can / Cart customers: 2,768 with no community dumpsters

[2] Manual – status quo system assumes no community dumpsters in the City or the metropolitan area of the Borough.

Collection System Cost Comparison				
Solid Waste Collection	**Manual**	**Semi-Auto**	**Full Auto**	**Notes**
Cans/Carts per Hour	70	55	70	A
Weekly Collection Hours	40	50	40	B
Crew Size	2	1	1	C
Truck Cost	$175,000	$200,000	$235,000	D
Truck Interest Cost @ 8% / 7 yr	$54,117	$61,848	$72,672	E
Required Frontline Trucks	1	1	1	F
Labor Cost per Hour	$70	$35	$35	G
Truck Cost per Hour	$17	$19	$22	H
Truck Op Cost per Hour	$35	$40	$45	I
Operations Costs	$40	$40	$40	J
Collection Cost per Hour	$162	$134	$142	K
Weekly Collection Cost	$6,396	$6,743	$5,620	L
Annual Collection Cost	$332,566	$350,639	$292,254	M
Annual Cost per Customer	$120.15	$126.68	$105.58	N
Monthly Cost per Customer	$10.01	$10.56	$8.80	O
Cart Costs ($75 each)	N/A	$228,360	$228,360	P
Monthly Cart Cost @ 8% / 7 years		$1.17	$1.17	Q
SW Disposal				
Mo. Wt (48 gal cart @ 40 lbs per set out)	173	173	173	R
Disposal Cost @ $105 per ton	$9.09	$9.09	$9.09	S
Mo. Wt (90 gal cart @ 60 lbs per set out)	260	260	260	T
Disposal Cost @ $105 per ton	$13.64	$13.64	$13.64	U

Estimated Solid Waste Monthly Residential Collection Rate				
48 gallon cart	**Manual**	**Semi-Auto**	**Full Auto**	**Notes**
SW Collection	10.01	10.56	8.80	O
SW Cart	-	1.17	1.17	Q
SW Disposal	9.09	9.09	9.09	S
Administrative Costs @ $4.50	4.50	4.50	4.50	V
Hauler Profit Margin @ 10%	2.36	2.53	2.36	W
City Tax @ 6% of cost	1.56	1.67	1.55	X
Total Estimated Collection Rate	$ 27.52	$ 29.52	$ 27.47	Y
90 gallon cart	**Manual**	**Semi-Auto**	**Full Auto**	
SW Collection	10.01	10.56	8.80	O
SW Cart	-	1.17	1.17	Q
SW Disposal	13.64	13.64	13.64	U
Administrative Costs @ $4.50	4.50	4.50	4.50	V
Hauler Profit Margin @ 10%	2.82	2.99	2.81	W
City Tax @ 6% of cost	1.86	1.97	1.86	X
Total Estimated Collection Rate	$ 32.82	$ 34.82	$ 32.77	Y

Table Notes

A: Assumed collection productivity
B: Customers divided by cans/carts per hour
C: Workers per collection truck
D: Approximate cost for a new truck
E: Interest cost on borrowed capital
F: Number of trucks needed to service Kodiak
G: Labor is $25 per hour plus 40% for taxes and benefits

H: Hourly cost for the collection truck
I: Truck operational costs (fuel, tires, R&M)
J: Operational Costs (cart delivery, equipment, back-up collection vehicle)
K: Sum of items G through J
L: Item K multiplied by Item B
M: Item L multiplied by 52 weeks
N: Item M divided by 2,768 can/cart customers
O: Item N divided by 12 months
P: Cart cost of $75 multiplied by can cart customers (2,768) plus 10% inventory
Q: Monthly cart cost assuming 8% borrow rate with a 7 year life
R: Monthly garbage weight 40 pounds multiplied by 4.33 (52 weeks / 12 months = 4.33)
S: Disposal cost of 173 pounds per week at $105 per ton for landfill disposal
T: Monthly garbage weight 60 pounds multiplied by 4.33 (52 weeks / 12 months = 4.33)
U: Disposal cost of 260 pounds per week at $105 per ton for landfill disposal
V: Administrative cost at $4.50 per customer (management, billing, overhead, etc.)
W: Profit at 10% on the sum of items O, Q, S or U, and V
X: Sales tax on the sum of items O, Q, S or U, V, and W
Y: Sum of items O, Q, S or U, V, W, X to arrive at the monthly collection rate

Residential Recycling Collection

Program performance would be primarily dependant on collection system, rates, frequency of collection, policy, and outreach and education. Jurisdictions with established recycling programs, such as the City of Mercer Island, Washington report as much as 1,000 pound per customer using a 65 gallon roll cart whereas the City of Boise report 214 pounds per customer using a 14 gallon bin. Each city offers recycling, but all the variable factors contribute to the program performance. The table below gives an indication of the potential material that could be diverted from the 2,768 can and cart customers on Kodiak.

Diversion Percentage Table	**0%**	**5%**	**10%**	**15%**	**20%**	**25%**	**30%**	**35%**	**40%**
Estimated SW Tons	3,239	3,077	2,915	2,753	2,591	2,441	2,267	2,105	1,943
Projected Curbside Recycling Tons	0	162	324	486	648	798	972	1,133	1,295
Annual Pounds per Resident	0	117	234	351	468	585	702	819	936

To maximize the amount of material collected and to keep truck costs low, the best approach for curbside recycling is to use a cart. Most of the cart recycling programs in Washington and Oregon that utilize carts for collection report annual pounds per customer over 500 pounds.

- Collect recyclable materials in a comingled stream with the exception of glass
- Cart based recycling programs yield more materials per household than bin programs
- Use the same truck to collect solid waste and recyclables to reduce collection costs
- Carts keep the materials dry and reduce litter
- The comingled stream would be baled and shipped to Seattle for processing
- Collection could be either weekly or every other week (EOW)

Using the same approach as the Collection System Cost Table on the previous page, the additional collection cost for a curbside program is detailed below. The notable exception is the carts per hour is 100 for weekly collection since participation is assumed to be 70% of garbage collection.

Residential Recycling Collection System Cost Comparison			
Recycling Collection	**Weekly**	**Every-Other-Week**	**Notes**
Carts per Hour	100	88	**A**
Annual Collection Hours	1,439	822	**B**
Crew Size	1	1	**C**
Truck Cost (full auto)	$235,000	$235,000	**D**
Truck Interest Cost	$72,672	$72,672	**E**
Required Trucks	1	1	**F**
Labor Cost per Hour	$35	$35	**G**
Truck Cost per Hour	$32	$54	**H**
Truck Op Cost per Hour	$45	$45	**I**
Other Op Cost per Hour	$10	$10	**J**
Collection Cost per Hour	$122	$144	**K**
Weekly Collection Cost	$3,364	$4,569	**L**
Annual Collection Cost	$174,935	$118,800	**M**
Annual Cost per Customer	$63.20	$42.92	**N**
Monthly Cost	$5.27	$3.58	**O**
Cart Costs ($75 each)	$228,360	$228,360	**P**
Monthly Cart Cost @ 8% / 7 years	$1.17	$1.17	**Q**
Estimated Residential Recycling Collection	**Semi-Auto**	**Full Auto**	
Recycling Collection	5.27	3.58	**O**
Recycle Cart	1.17	1.17	**Q**
Recycling Processing	2.50	2.50	**R**
Administrative Costs @ $1	1.00	1.00	**S**
Hauler Profit Margin @ 10%	0.99	0.82	**T**
City Tax @ 6% of cost	0.66	0.54	**U**
Total Estimated Collection Rate	11.59	9.62	**V**

Table Notes

A: Assumed collection productivity
B: Customers divided by cans/carts per hour and multiplied by 52 or 26 weeks
C: Workers per collection truck
D: Approximate cost for a new truck
E: Interest cost on borrowed capital
F: Number of trucks needed to service Kodiak
G: Labor is $25 per hour plus 40% for taxes and benefits
H: Hourly cost for the collection truck
I: Truck operational costs (fuel, tires, R&M)
J: Operational Costs for recycling (cart delivery, equipment)
K: Sum of items G through J
L: Item K multiplied by Item B and divided by 52 or 26 weeks
M: Item L multiplied by 52 weeks or 26 weeks
N: Item M divided by 2,768 can/cart customers
O: Item N divided by 12 months
P: Cart cost of $75 multiplied by can cart customers (2,768) plus 10% inventory
Q: Monthly cart cost assuming 8% borrow rate with a 7 year life
R: Estimated processing cost (from recycling section at 25% diversion rate)
S: Additional administrative cost for recycling
T: Profit at 10% on the sum of items O, Q, R and S

U: Sales tax on sum of items O, Q, R, S, and T
V: Sum of items O, Q, R, T, and U to arrive at the monthly collection rate

Assembly Expectations
What are the expectations of the Assembly when the collection contract is put out to bid? The following questions need to be addressed by the Assembly:

1. What services do the citizens expect?
2. What are the service expectations of the hauler?
3. Are the expectations of service and the associated rates compatible?
4. At what point are the rates considered too high? (range of rates)
5. Does the Assembly have a plan in case the services and rates do not meet expectations (rates too high)?

These five questions need to be answered prior to moving forward with the RFP process to provide Borough mangers with clear direction. In the event that a contractor cannot be secured, what is the next step? Eagle Pass, Texas was put into this situation last year. The collection contractor proposed rates that were higher than the city council was willing to pay. The public works department took over collection operations from Waste Management in July 2007. While many on the Assembly have publicly stated that the Borough should not be in the garbage business, the Borough needs to have a back-up plan ready to implement in the event that terms can't be reached for the necessary collection services.

Appendix J
Costs for Processing Recyclable Materials

Appendix J: Projected Costs to Process a Comingled Recycling Stream

	Residential Customers	2,768								
	Projected Residential Tons	3,598								
	Commercial Customers	494								
	Projected Commercial Tons	5,102								
	Diversion Percentage	**0%**	**5%**	**10%**	**15%**	**20%**	**25%**	**30%**	**35%**	**40%**
A	Residential Customers	2,768								
B	Estimated Residential SW Tons	3,239	3,077	2,915	2,753	2,591	2,441	2,267	2,105	1,943
C	Projected Curbside Recycling Tons		162	324	486	648	798	972	1,133	1,295
D	Annual Pounds per Resident		117	234	351	468	585	702	819	936
	Commercial Customers	494								
E	Estimated Commercial SW Tons	5,102	4,847	4,592	4,337	4,082	3,845	3,571	3,316	3,061
F	Projected Commercial Rec. Tons		255	510	765	1,020	1,257	1,531	1,786	2,041
G	Total Projected Recycling Tons		417	834	1,251	1,668	2,055	2,502	2,919	3,336
	Processing Costs									
H	Annual Compactor Cost (fixed)	$20,000								
I	Compactor Annual R&M (fixed)	$10,000								
J	Facility & Equipment Cost (fixed)	$100,000								
K	Processing Cost per Ton (variable)	$25								
L	Shipping @ $1,200 per Container	$1,200								
M	Material Tons per Container	22								
N	Material Value per Ton	$(40)								
	Per Unit Processing Costs									
O	Compactor per Ton		$48	$24	$16	$12	$10	$8	$7	$6
P	Compactor R&M Cost per Ton		24	12	8	6	5	4	3	3
Q	Facility Cost per Ton		240	120	80	60	49	40	34	30
R	Processing Cost		25	25	25	25	25	25	25	25
S	Shipping Cost per Ton		55	55	55	55	55	55	55	55
T	Material Value per Ton		(40)	(40)	(40)	(40)	(40)	(40)	(40)	(40)
U	Total Processing Cost per Ton		351	195	143	117	103	92	84	79
V	Total Material Processing Cost		146,492	162,983	179,475	195,966	211,276	228,949	245,441	261,932
W	Avoided Disposal Cost @ $90 ton		37,533	75,065	112,598	150,130	184,972	225,195	262,728	300,260
X	Added Landfill Life (in days) per Year		10	21	31	42	51	63	73	83
Y	Recycling Cost per pound		$0.18	$0.10	$0.07	$0.06	$0.05	$0.05	$0.04	$0.04
Z	Monthly Recycling cost per resident		$1.71	$1.91	$2.10	$2.29	$2.50	$2.68	$2.87	$3.06

Table Notes

A: Customer count as of December 2007
B: Tons calculated by multiplying customer count by 40 pounds per week multiplied by 52 weeks and divided by 2,000 pound per ton
C: Curbside tons are calculated by multiplying the estimated residential tons (item A) by the sliding diversion percentages
D: Projected curbside tons divided by the customer count
E: Estimated collected commercial tons
F: Commercial tons are calculated by multiplying the estimated commercial tons (item E) by the sliding diversion percentages
G: Total projected tons is the sum of residential tons (item C) and commercial tons (item F)
H: Compactor cost $200,000 purchase price amortized over 10 years
I: Compactor service and repairs
J: Annual cost of building and equipment
K: Variable costs such as labor, insurance, utilities, etc.
L: Current rate paid by the Borough to move metal to Seattle using Horizon lines
M: Amount of baled materials that can be loaded and transported using an intermodal container
N: Value of the recyclable materials
O: Annual compactor cost ($20,000) divided by total projected recycling tons (item G)
P: Compactor R&M ($10,000) divided by total projected recycled tons (item G)
Q: Facility cost ($100,000) divide by total projected recycled tons (item G)
R: Processing cost is assumed to be consistent with tons
S: Shipping cost per container ($1,200) divided by 22 tons
T: Material value is assumed to be consistent with tons
U: Sum of items O through T
V: Total processing cost per ton (item U) multiplied by total projected recycling tons (item G)
W: Total projected recycling tons (item G) multiplied by the landfill disposal cost
X: Total projected recycling tons divided by the number of tons (40) delivered to the landfill daily.
Y: Total processing cost (item V) divided by total projected recycling pounds (item G x 2,000 pounds per ton)
Z: Recycling cost per pound multiplied by annual pounds per resident (item D)

Appendix K: Composting

1 INTRODUCTION

Composting is the breakdown of organic material through the action of microbes, molds, fungi, and other microorganisms. In the U.S., composting is a popular method of diverting green waste (lawn clippings, leaves, shrub and tree trimmings, etc.) from landfill disposal. Biosolids (sewage sludge), a waste that is difficult to dispose of, can be added to green waste that is being composted. While biosolids composting is less prevalent than yard waste composting, it a useful alternative to either land applying or incinerating biosolids. Composting of municipal solid waste (MSW) is even less common in the U.S., for various reasons discussed below.

The goals of all composting programs are to:

- Reduce the amount of material being landfilled.
- Convert the waste material into a useful soil amendment product with viable markets.
- Perform waste collection, composting, and marketing of compost products in a cost-effective manner.

Most people are familiar with backyard composting, where green waste is left in a pile to decompose, sometimes in the open, more often in a container with air holes to promote aeration of the pile. Occasional turning or agitation of the pile is necessary to ensure that air/oxygen contacts all the material to promote aerobic conditions (where oxygen is present). Anaerobic conditions encourage different microorganisms that produce unpleasant odors. Fruit and vegetable waste can be added to yard waste, but meat and dairy products contain fat and will cause odors and attract rodents and other pests. Backyard composting is “low-tech”, relatively low cost, and prevents the waste from entering the garbage collection system, saving the cost of hauling. However, it requires yard space and some manual labor to reduce the green matter to a suitably small size and to aerate the pile. Furthermore, waste does not compost well as temperatures approach freezing.

Composting on a municipal scale requires the collection of significant amounts of green waste. Generators must either drop off yard waste at central depots, or a curbside collection system (similar to garbage collection) must be implemented. It is preferable not to accept yard waste in plastic bags; these must be opened manually or with special machinery, and residual pieces of plastic in the final compost result in a product that virtually no one will purchase. Automated curbside collection of yard waste, wherein wheeled totes are emptied into the collection vehicle by a mechanical arm, avoids the problem of plastic bag contamination and the tearing of bags as they are lifted. Automated collection is also more efficient, since larger quantities of yard waste can be collected more rapidly than by manually picking up plastic bags.

2 THE COMPOSTING PROCESS

Once the raw materials have been collected, the composting process consists of four basic steps: 1) separation and preparation of the feedstock, 2) decomposition, 3) curing, and 4) finishing or preparation of the end product.

2.1 Feedstock Preparation

Organic materials suitable for composting include grass, leaves, tree trimmings, fruit and vegetable waste, land clearing debris, and untreated/unpainted wood, various types of paper, and cardboard. The materials are usually shredded to roughly uniform size using a device such as a tub grinder. A bulking agent is a material added to the raw materials mix to help maintain aerobic conditions by forming voids that ensure adequate flow of air through the compost pile. Wood waste (bark, tree limbs, scrap wood and unpainted lumber) that has been chipped can be used as a bulking agent. Sometimes, tire chips shredded into approximately 2-inch squares are used as a bulking agent. They must later be removed from the finished product by screening.

In municipal-scale composting operations, shredded and mixed organic materials are typically placed in long piles called windrows that have a trapezoidal shape in cross-section. A machine called a compost turner travels the length of the windrow, using its blades or paddles to lift, turn, and aerate the mix periodically.

Alternatively, the materials can be placed in “vessels”. For small operations, the vessels may be fully enclosed shipping containers modified to include an aeration system where pressurized air is introduced through numerous small orifices in the floor of the container. These enclosed vessels do not utilize any mechanical agitation. For larger operations, the vessels may be indoor concrete troughs similar to parallel swimming pools; a large mixing machine travels on rails down the length of the trough, using blades or paddles to stir up, turn over and the mix. Another type of in- vessel composting utilizes special large diameter plastic tubes filled with the mix and subjected to forced aeration but not agitation.

2.2 Decomposition

This is the critical step.

- The mesophilic, or moderate temperature lasts for a few days as the microbes rapidly break down the soluble, readily degradable compounds and raise the temperate of the compost to 105° F.

- The thermophilic, or high temperature phase, can last from a few days to several months as the microbes increase the compost temperatures to between 130° and 148° F., breaking down proteins, fats, and carbohydrates and also destroying many of the human and plant pathogens. During the thermophilic phase, compost managers use aeration and compost turning to keep temperatures below 150° F. because above

150°F, most of the microbes are killed and the rate of decomposition greatly diminishes. When that occurs, the compost mixture may produce odors.

2.3 Curing

Cooling and maturation involves a reduced level of biological activity. Curing can take several weeks to months and produces a stable end product.

2.4 Finishing and Preparation of the End Product

This can include:

- Screening to create a relatively uniform end product size by removing large bulking agents such as wood or tire chips;
- Fine grinding to reduce oversized materials
- Blending with various additives such as soil and sand
- Bagging
- Storage in outdoor piles for bulk sales
- Shipment.

3 COMPOSTING BIOSOLIDS

Biosolids complicate the composting process. First, they have unpleasant odors and are aesthetically quite different from handling “clean green” yard wastes. Second, because they contain large amounts of water (up to 80 or 90 percent), they must be processed on a non-porous floor or pad. They are messy to handle unless significant quantities of bulking agents are added to absorb the excess moisture and create voids in the mixture that promote aeration.

Third, although biosolids can be composted in an exposed pile (windrow), this is not recommended because of the odors and the tendency for biosolids to attract flies and other insects. Fourth, because the biosolids are derived from sewage and contain human pathogens, the composting process has more stringent requirements than yard waste composting. The most important standard to be met is PFRP (Process for Further Reduction of Pathogens), as required by US EPA 503 Biosolids rules. One method of meeting PFRP is to maintain the compost mix at 131 deg. F. for 72 hours. A process called Vector Attraction Reduction (VAR) is also required, wherein the compost mix is maintained at 104 deg. F for 14 days.

Biosolids composting requires extensive documentation of each batch to demonstrate that the time and temperature requirements have been met. Biosolids compost requires frequent sampling and testing to ensure that it meets the PFRP standards, with an emphasis on pathogen levels. Without certification that the standards have been met, the product may be unsafe and will not likely find any buyers.

4 COMPOSTING MSW

The organic fraction of the MSW stream can be composted. The tonnage that would qualify as organic from the Borough is approximately 53% of the total MSW tons, or 5,880 tons of the 11,030 tons landfilled in 2007. The difficulty lies in separating that organic fraction from the non-compostable fraction in a cost-effective manner. Manual separation of organics is obviously unpleasant, difficult, and prohibitively expensive. Many types of mechanical equipment are available to separate out non-compostable waste based on characteristics such as size, density, magnetic properties, etc. For example, trommels are rotating inclined drums with holes that pass small (e.g. less than 2-inch) items such as stones and broken glass. Disk screens remove large items such as newspaper and cardboard and let smaller items such as cans and bottles fall through the spaces between disks. Ballistic separators vibrate lighter materials up an incline, while heavier items such as bottles roll downhill. Ferrous magnets attract iron and steel. Eddy current magnets eject aluminum itemsand air knives blow light or low-density plastic items out of the waste stream. Unfortunately, this separation equipment is expensive and does not remove all the contaminants. For example, although the pieces of compostable organic material are typically small in size, attempting to separate organics solely by size will result in a feedstock that contains small bits of metal, glass, plastic, stones, and other undesirable matter. Because metal, glass, and plastic are not decomposed during the composting process, they will remain in the final compost product and render it virtually unmarketable.

The sort line required for this operation as well as the in-vessel compost units range in cost from $6 million to $12 million in the Continental US. In addition, this equipment would require a new building, thereby adding $5 to $7 million to the cost. Figure 1 on the following page details a typical processing line for MSW and the necessary equipment.

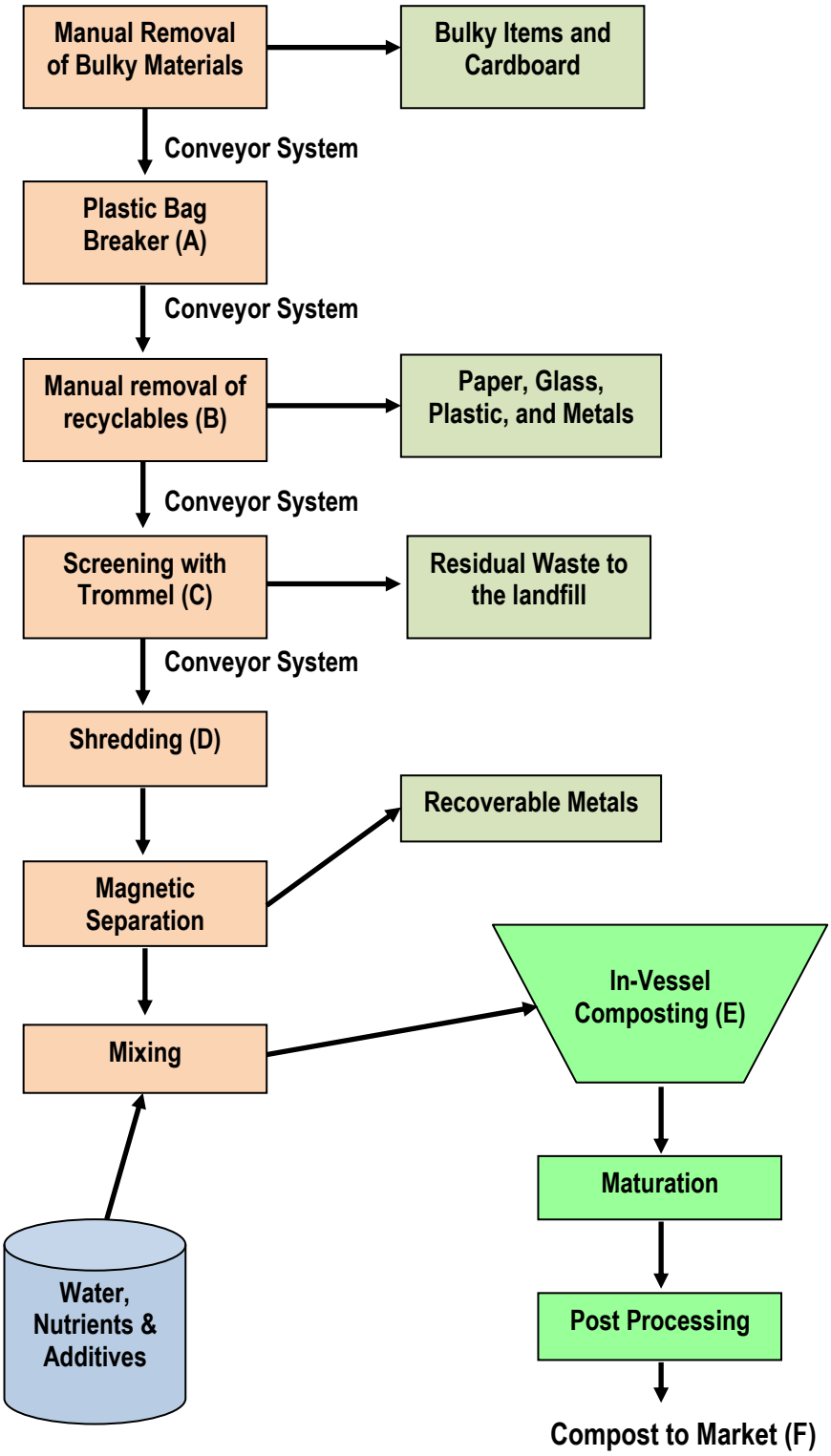
There are only 13 facilities in the United States that process and compost MSW. Of those 13, two have recently stopped accepting MSW and have restricted the waste stream to source separated materials such as paper, food scraps, and yard debris. The quality of compost at four of the facilities is so poor that the material is provided free of charge and another facility uses the material as alternative daily cover at the landfill. Ironically, the members of the SWAB were given a presentation in February about the “success” of composting MSW at the Pinetop facility in Lakeside, Arizona. In November 2007, this facility was transitioned from accepting MSW to only paper, cardboard, and biosolids. The primary reason was the compost contained a high amount of glass and other inorganic contaminants that greatly reduced the value farmers and contractors were willing to pay for the product.

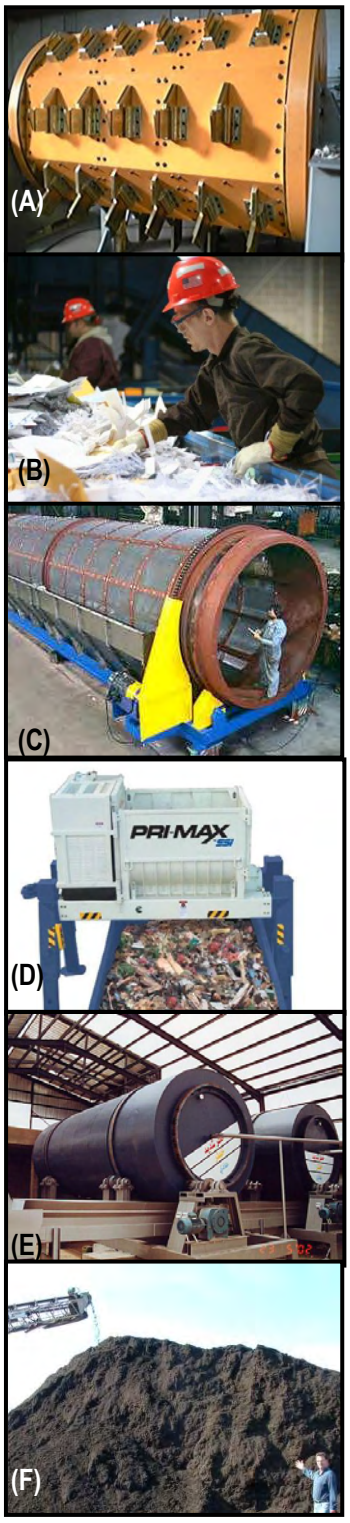
While composting is an alternative to disposal for organic material in the waste stream, it is not the sole disposal option for the Borough. Assuming a best case scenario of 100% of organic material being composted, the remaining 5,145 tons of inorganic and residual waste will still need to be disposed. Kodiak will still need to maintain the landfill. A composting operation would extend the landfill’s life an additional 6 years at an

additional cost of approximately $150 per ton. Given the high capital cost of the facility and the low volume of waste, composting MSW is not a viable disposal alternative to be considered by the Borough.

[comments on Fig 1: Note that other types and combinations of equipment can be used to accomplish the functions shown below. For example, a trommel with internal teeth can be used to break open plastic bags. For separation based on size, disk screens (rows of toothed wheels) “float” large items like newspaper and cardboard, while allowing containers, cans, and smaller items to fall through the spaces between the disks. Some degree of manual sorting is typically required, but it is dusty, repetitive work.]

Figure 1. Typical Process Flow Diagram for the Composting of MSW





References

William D. Robinson, *The Solid Waste Handbook*, Wiley-Interscience, 1986

George Tchobanoglous, Frank Kreith, *Handbook of Solid Waste Management*, Second Edition, McGraw Hill, 2002

Cornell University, College of Science and Engineering, www.css.cornell.edu

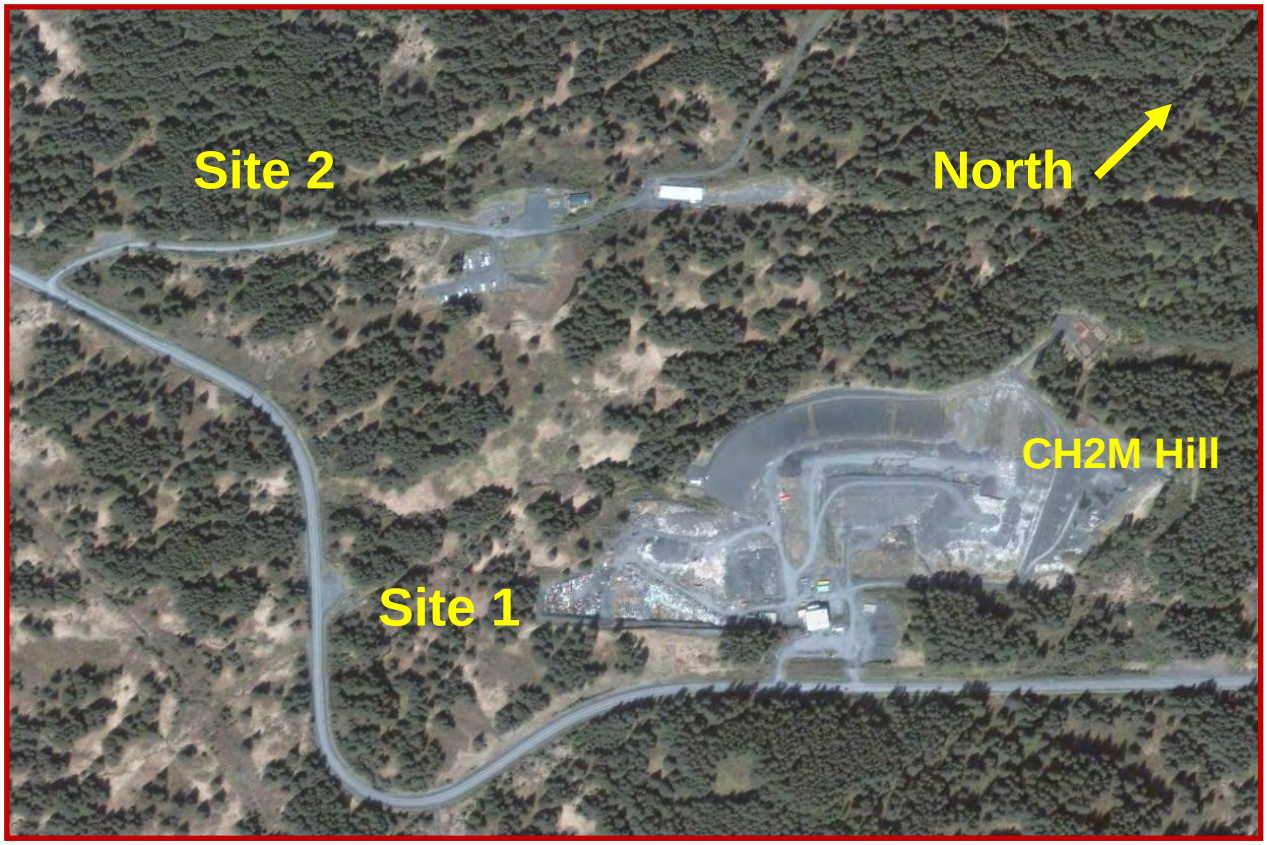
BioCycle (2007) "Mixed MSW Composting in Transition," BioCycle November 2007, vol 48, No. 11, pp 22-30

Appendix L:
Kodiak Disposal Alternatives

1.0 / Landfill Analysis

The purpose of this analysis is to generally describe the elements of permitting, design, and construction necessary to develop a modern municipal solid waste landfill. The target facility is one capable of managing and disposing approximately 11,500 tons of municipal solid waste, and 2,100 tons of construction and demolition waste annually on Kodiak Island, Alaska for the Kodiak Island Borough (KIB). Included is a general description of the process, estimated costs associated with each element of the process, and an estimated time frame for completing the process.

Figure 1: The following overview of the Kodiak Landfill exhibits the two sites referenced in Section 1.1 plus the initial site researched by CH2M Hill



The analysis is applied to two potential sites being considered as new landfill sites in Kodiak. Site 1 is located directly south of the existing KIB Landfill. This site covers approximately 22 acres and is essentially dissected by a non-anadromous (salmon) stream.

Site 2 is located directly west of the existing landfill and is currently being used by the VFW for a shooting range. This site covers approximately 56 acres and is located on a ridge line.

The analysis includes:

- A cost estimate to permit, design and construct a facility that has approximately 5 years of disposal capacity. This estimate essentially applies to both sites.

- An estimate of refuse disposal capacity for both sites when fully developed.
- An estimate of annual operating costs.
- An estimate of annual costs to fund closure and post – closure activities.

1.1 / Municipal Solid Waste Landfill Basics

By law (Federal Resource Conservation and Recovery Act, Subtitle D), modern municipal solid waste landfills (MSWLF) and construction and demolition (C&D) waste landfills must be designed and operated to prevent impacts to air quality, groundwater quality, and surface water quality. Generally this is accomplished by placing MSW and C&D waste into containment areas commonly called cells. In general, these cells are lined with a composite liner system that separates waste placed in the cell from underlying soil and groundwater. The composite liner is covered with a leachate collection and removal system (LCRS) that removes leachate captured by the composite liner system. The collected leachate must then be treated, and in a wet climate environment like Kodiak, this treatment is typically accomplished in a wastewater treatment plant before it is discharged. As waste is placed into cells, interim and final cover systems are placed over the waste to prevent surface water and rain water from contacting the waste. In some cases systems are installed to remove landfill gases generated in the waste so that air quality is protected.

Occasionally, a separately permitted, designed and constructed facility is developed for disposal of C&D wastes. In the state of Alaska, a C&D landfill may be permitted without a liner and leachate collection system. It is likely that waste placed into the unlined landfill would be limited to inert wastes, which are noncombustible, non-dangerous solid wastes that are likely to retain their physical and chemical structure under expected conditions of disposal, including resistance to biological attack and chemical attack from acidic rain water. Examples include asphalt and concrete. If the inert wastes include organic waste such as wood and sheet rock, or others products that are not likely to retain their physical and chemical structure, then it is common practice to co-mingle the C&D waste with MSW in a composite-lined facility. This analysis assumes that C&D waste will not be co-mingled with MSW waste in a composite lined landfill.

The permitting, design, and construction process leading up to eventual operation of a new MSWLF and/or C&D landfill is complex. The process generally includes the following steps:

1. Site selection;
2. Preparing a solid waste management plan;
3. A fatal flaw analysis of the selected site or sites;
4. Site characterization including geologic, hydrogeologic and geotechnical investigations;
5. Land use permitting such as a conditional use permit;
6. Wetlands mitigation permitting, where applicable;
7. Wastewater treatment plant permitting, design and construction, if none are available to serve the new facility;
8. Air quality permits such as new source performance standards (NSPS) permits and Title V permits;
9. Solid waste operating permits;
10. General building permits and other permitting related to utilities and supporting infrastructure;
11. Preparation of construction documents;
12. Bidding and award of a construction contract;
13. Construction itself;

14. Construction management, construction quality assurance, and construction certification.

In the case of Site 1, the process would also include work to mitigate impacts to the stream that dissects the site. These mitigation measures could include designs to re-route the stream, or designs to develop the landfill around the stream.

1.2 / MSWLF Permit, Design, and Construction Process

Site Selection
As discussed above, the KIB is considering two potential sites for developing a single new MSWLF and C&D Landfill. Consideration of these two sites should take into account the complex and potentially costly nature of permitting, designing, constructing and operating a modern solid waste disposal facility. The following information is a general synopsis of what may be involved in this process.

Solid Waste Management Plan
Alaska solid waste regulations require that an applicant for a solid waste permit demonstrate that all reasonable solid waste management options have been considered, and that the permit is consistent with the waste management hierarchy established in AS 46.06.021. The permit application information must be accurate and complete and ensure that the applicant is proposing a waste management system consistent with the hierarchy of source reduction, recycling, treatment, and disposal wherever economically feasible. If the solid waste management plan includes a proposal for a new landfill, the solid waste management plan must be submitted to and approved by the ADEC before a landfill permit application will be considered complete under Alaska state regulation 18 AAC 60.210.

The solid waste management planning process is currently under way in the KIB.

Land Use Permit Application
Permitting a solid waste landfill typically includes a land use permitting process, such as the process to receive a conditional use permit, or some similar type of land use permit. The land use permitting process will require a relatively detailed description of how the land will be used. For this reason, much of the information prepared to obtain a solid waste disposal permit (hydrogeologic report, design report, design drawings, operating plans, closure plans) can also be utilized to apply for and obtain a land use permit. Because of this common use of information, the land use permitting and waste disposal permitting processes can often proceed on a parallel path.

Both the solid waste permitting and land use processes include public participation. Public reaction to a new landfill is difficult to predict, but history indicates that some form of negative response can be expected. Because of this negative response, a plan for public awareness and education regarding the design and operation of landfill may be just as important to the process as the design itself. The land use permitting process may require participation of a public affairs consultant and will almost certainly require the services of a land use attorney.

In the case of the KIB, each of the two preliminary sites has a clear land use issue. Site number 1, located directly south of the existing landfill, has a non-anadromous stream running through the center. Even if a design were possible to re-route the stream, public perception of impacts to a stream may be severe. If the site were developed around the stream, the total developable area would be significantly impacted as would the total refuse capacity of the site.

On the surface, Site 2 would seem like the best choice for the following reasons:

- Site 2 is larger, which would result in a larger refuse airspace volume (design capacity).

- Site 2 appears to be located on a ridge line, therefore controlling storm water run-on to the facility would be less of an engineering problem than Site 1, which is essentially located in a valley.

- Site 2 does not have a stream running through it, so all of the acreage could be developed as a landfill.

However, Site 2 has been leased to the Veterans of Foreign Wars (VFW), and breaking the lease agreement may involve some legal matters.

1.3 / Waste Disposal Permit Application

Fatal Flaw Analysis
The first step in obtaining a waste disposal permit from the ADEC is typically a fatal flaw analysis of the selected site or sites. This work should be accomplished immediately following site identification and before significant time and effort are spent on permitting efforts.

By rule (18 AAC 60), solid waste landfills cannot be sited where the following location restrictions exist:

- Located within 10,000 feet of an airport runway used by turbojet aircraft or within 5,000 feet of any airport runway end used by only piston-type aircraft

- Located in a 100-year flood plain

- Located within a wetland

- Located within 200 feet of a fault visible at the surface or shown on a published topographical or geological map, that has had displacement in Holocene time

- Located in a seismic impact zone

- Located in an unstable area that more likely than not will result in differential settling or ground failure under static conditions or during an earthquake, which pose a potential risk to the integrity of containment structures

Although procedures exist to mitigate against these location restrictions, one or all of them could stop a solid waste permitting process for any given site. Therefore, completing this analysis very early in the process is essential.

Site Characterization and Hydrogeologic Report
The next step in the solid waste permitting process is a thorough site characterization. This includes a combination of records research and site-specific subsurface investigations. The goal of the work is to characterize the geologic, hydrogeologic, and geotechnical aspects of the site with respect to the site's compatibility with MSWLF design standards. The work commonly involves the installation of groundwater monitoring wells that are utilized to define aquifer conditions and to determine background groundwater quality. In Kodiak this effort may include the determination on whether or not an aquifer of resource value exists at the site. Assuming one does, then a groundwater monitoring system must be installed. Sampling and analysis may be required over an eight-quarter period (2 years) to determine background water quality, and groundwater gradient conditions prior to use of the site.

Subsurface investigations are also performed to determine the geotechnical aspects of the site. These conditions include soil and bedrock stability, soil and bedrock characteristics, foundation characteristics, and the availability of materials that can be utilized to construct, operate and close the landfill. Based on our site visit to the existing landfill, subsurface conditions for either Site 1 or Site 2 appear to include a thin mantel of soil over hard bedrock. Therefore site development would likely include significant amounts of drilling and shooting to develop the lined landfill configuration.

Design Report

The design report provides critical design information regarding site analysis, landfill design, and landfill closure. Its primary purpose is to document design methodology and design results that demonstrate the proposed landfill meets all design standards of the solid waste regulations. Critical elements and components of the landfill that would be described in the design report may include:

- Demonstration regarding compliance with location restrictions;
- Climate conditions at the site;
- Proposed site classification;
- Summary of the hydrogeologic and geotechnical aspects of the site;
- Foundation analysis related to subsurface conditions at the site;
- Landfill design capacity, and site life information;
- Site soil balance;
- Composite liner design;
- Composite liner stability analysis;
- Leachate collection and removal system design;
- HELP modeling;
- Leachate treatment design;
- Phasing plan for site development and closure;
- Closure design;
- Final cover stability analysis;
- Landfill gas collection and control system design;
- Storm water run-on and run-off control designs;
- General operational guidelines;
- Waste types that are accepted.

Design Drawings

Design drawings are prepared that complement the design report. They graphically present how the landfill will be constructed, operated and closed. Typical drawings included in a permit application include:

- Cover sheet
- Regional site plan and vicinity plan
- Site plan and current topographic information
- Landfill subgrade plan indicating the base grades of the entire proposed landfill footprint before composite liner construction
- Composite liner and LCRS plan indicating the limits of composite liner and components of the LCRS

- Landfill cross sections indicating the relationship between original ground surface, groundwater contours, composite liner surface, and final cover surface
- Landfill phasing plan that indicates the sequence of cell development, waste fill placement, and final closure over the entire life of the landfill
- Sections and details for the composite liner, LCRS, final cover, and landfill gas collection and control system
- Sections and details of the storm water management systems

Designing composite liners and leachate collection systems has become common and designing these systems for the new KIB landfill would not pose any significant problems. However, designing a cost-effective system to treat leachate that is collected on the composite liner will pose some engineering challenges.

Construction Quality Control and Quality Assurance Plan
The purpose of the construction quality control (QC) and quality assurance (QA) plan is to guide third party observation, testing, and documentation during construction. The goal is to have a plan in place that results in a demonstration that the landfill is constructed and closed in substantial accordance with the design report, design drawings and permit conditions.

Contents of a typical QC/QA plan include the following information:

- An introduction that defines the format of the document and provides definitions specific to terms used in the document
- Definition of personnel and organizations that will be implementing the plan and their roles
- Information regarding various project related meetings
- Definition of general QC/QA procedures including items such as project reporting, data collection, record keeping, project filing, etc.
- Testing program specific to interface shear testing of composite liner and final cover system components
- QC/QA procedures related to earthwork construction
- QC/QA procedures related to geosynthetics manufacturing and installation
- QC/QA procedures for mechanical components such as leachate pumping and piping systems, and landfill gas collection systems

Plan of Operation
The Plan of Operation defines how the landfill will be operated over the life of the facility. Elements of the plan can include:

- Description of personnel and equipment necessary to operate the facility
- Site access controls, and systems for accepting and/or rejecting waste that arrives at the facility
- Procedures for placing the various types of waste accepted at the landfill
- Procedures for placing special wastes such as sewage sludge, asbestos, medical waste, or industrial wastes
- Procedures for constructing and maintaining temporary storm water and snow management systems
- Procedures for controlling odor, dust, litter, noise, vectors, birds
- Operating procedures during severe weather events

- Emergency and site safety procedures
- Procedures for operating, inspecting, maintaining and repairing the LCRS
- Procedures for operating, inspecting, maintaining and repairing interim landfill gas collection and control systems
- Procedures for inspecting, maintaining and repairing final cover systems that are sequentially installed while other portions of the landfill remain active
- Procedures for operating, inspecting, maintaining and repairing leachate treatment systems
- Record-keeping and reporting procedures

Closure, Post-Closure Plan and Financial Assurance Plan
The Closure and Post-Closure Plan (C/PCP) presents plans to close, perform post-closure monitoring and maintenance, and provide closure and post-closure financial assurance for a MSWLF.

The closure plan contains a planned approach to close the landfill and incorporates design information provided in the design report.

The post-closure plan describes tasks that will be performed during the post-closure period including environmental monitoring, plans to perform post-closure inspections, maintenance, and repair, and procedures for decommissioning leachate treatment systems.

The financial assurance plan describes how the owner will fund future closure and post-closure activities.

Related Permitting Requirements
In addition to land use and solid waste permit applications, other permits may be required to construct and operate landfill systems and support infrastructure. Recent regulations now consider landfills a new emission source under federal and state air quality regulations, and for that reason air quality permitting may be required. These permitting requirements become more stringent if the landfill has a design capacity greater than 2.5 million metric tons. A leachate treatment system will be required to develop a new landfill for the KIB. This will likely require a permitting and land use process similar in nature to the landfill permitting process. If an existing wastewater treatment system were used to treat landfill leachate, upgrades and additional permitting for an existing system may be required.

Construction Documents
Construction documents include bidding requirements, contract forms, contract conditions, technical specifications, and drawings. Design information provided in the design report is typically used as the basis to prepare specific technical specifications and construction drawings for each phase of development, including the initial phase.

Once all design and permitting efforts are complete, then construction documents are prepared. These documents will define construction of the initial cell development, and any support infrastructure necessary to bring the landfill on line. In the case of the KIB facility, we assumed that a 4-acre lined landfill would provide up to 6 years of operating capacity before lateral expansion into a new lined area was required. However, it is possible that a smaller cell (3-acres) would provide the required refuse capacity, so our initial cost estimate could be high. We also assumed that the existing baler facility would serve the new landfill.

Construction, Construction Management and QC/QA
This first phase of construction for a new landfill is typically the most diverse and expensive phase of development, because in addition to constructing the first lined landfill cell, support infrastructure, much of which will be in place for the entire life of the landfill, must also be constructed.

Besides retaining a contractor to build the facility, consultants are often retained to assist the owner with construction management and QC/QA services.

1.4 / MSWLF Permit Design and Construction Cost Estimates

Permitting, Design, and Construction Costs
The cost to permit, design and construct a new MSWLF can vary dramatically from site to site. Two major factors drive the costs during permitting: 1) The complexity of site conditions, and 2) Public acceptance of the facility.

Design costs are typically driven by site conditions. For example, if groundwater is very deep below the surface, then the cost of installing a monitoring system may be very high. If the site is located in an exceptionally severe climate, designs to control storm water and to minimize leachate production are emphasized and become costly, as is the case for the KIB. If new leachate treatment systems are required, then an entire set of design obstacles exist that increase engineering and project costs.

Construction costs are generally driven by the complexity of the site, availability of natural resources (such as clay for liner system, and gravel for LCRS), and geographic location. For example, if a double liner system is required, obviously the cost of the liner system would increase. While the unit costs of installing composite liner and leachate collection systems components can be reasonably estimated, costs for leachate treatment are difficult to estimate until designs are nearly complete. The geographic location of a site also impacts costs as they relate to labor, mobilizing equipment, and shipping materials.

Given these cost variables, developing a new MSWLF in Kodiak, Alaska is likely to cost much more than other landfills in the lower 48 states that have drier climates. Factors that may lead to these high costs include the following:

- Public perception
- Site characterization costs
- Complexity of site conditions and terrain
- Severe weather conditions
- Leachate treatment
- Geographic location

The following table summarizes an estimated range of costs to complete the permitting, design and construction of a new MSWLF in Kodiak. Costs are summarized by the major elements described above. These costs are limited to those that would be incurred to permit, design and construct an operating MSWLF that is approximately 4 acres in size with approximately eight years of disposal capacity for 11,500 tons of MSW and 2,100 tons of C&D waste. Beyond the eight years, additional engineering and construction costs would be required to expand the lined area of the landfill and its operating life.

Table 1
Landfill Cost Estimates for Kodiak

PROCESS ELEMENT	LOW ESTIMATE	HIGH ESTIMATE
Cell Design and Waste System Layout	$ 75,000	$ 95,000
ADEC Class I Landfill Permit and Stormwater Plan	$ 85,000	$ 105,000
Misc. Related Permit Applications	$ 20,000	$ 40,000
Landfill Construction Documents	$ 12,000	$ 18,000
Landfill Construction Management and CQA	$ 230,000	$ 270,000
Site Preparation, Earthwork, and Construction	$ 3,500,000	$ 3,700,000
Liner and Leachate Pipe System	$ 150,000	$ 180,000
Leachate Treatment System Construction Documents	$ 15,000	$ 25,000
Leachate Treatment System Construction	$ 500,000	$1,000,000
TOTAL	**$ 4,587,000**	**$ 5,433,000**

Leachate Treatment
In the absence of even a conceptual leachate treatment system design, our leachate treatment cost estimate is limited to estimating leachate production, and estimating treatment costs on a per gallon basis.

Leachate production estimates are based on a 4-acre active cell, and either 50 percent of precipitation hitting the cell becoming leachate, or 90 percent of precipitation hitting the cell becoming leachate.

Kodiak receives approximately 68 inches of precipitation annually. Based on 50 percent of the annual precipitation hitting the 4-acre landfill and becoming leachate, annual leachate production would be approximately 3,692,944 gallons. If 90 percent of the precipitation hitting the 4-acre cell became leachate, annual leachate production would be 6,647,299 gallons.

The following table summarizes potential annual leachate treatment costs.

Table 2
Estimated Cost of Leachate Treatment

Assumed Treatment Cost Per Gallon	Assumed Annual Leachate in Gallons	Annual Cost
$.05 per Gallon	3,692,944	$184,647
$.05 per Gallon	6,647,299	$332,365
$0.15 per Gallon	3,692,944	$553,942
$0.15 per Gallon	6,647,299	$997,095

Design Capacity
Design capacity is defined as the volume of waste and daily cover soil that can be placed in a landfill, and it excludes the volume of liner and final cover systems. Gross estimates of design capacity were made for Sites 1 and 2. Assumptions used in the estimates follow.

Site 1

- The site is generally rectangular in shape with the four sides having the following dimensions 1,087' x 945' x 1012' x 919';
- A 100-foot setback from all four sides to the edge of waste would be required;
- Re-routing the stream or avoiding development near the stream would consume 50 percent of the developable area;
- Developing the lined landfill configuration would include excavating an average of 20 feet below existing ground surface;
- Perimeter waste slopes would be no steeper than 4 horizontal to 1 vertical (4H:1V)

Based on these assumptions, the estimated design capacity of Site 1 would be 600,000 cubic yards or approximately 400,000 tons. Assuming that the annual fill rate at the landfill was 20,000 cubic yards, Site 1 could potentially provide 30 years of disposal capacity.

Figure 2: Overview of the Kodiak Landfill looking north

Site 1

Figure 3: Overview of the Kodiak Landfill looking south

This is the view of the landfill from the south with Site 1 outlined in white. The photo details the contours of the ridge that runs north to south, separating the existing landfill (left side of the photo) from the land used by the VFW (right side of this photo).

Site 2

- The site is generally rectangular in shape with the four sides having the following dimensions: 2024' x 966' x 2360' x 1269';
- A 100-foot setback from all four sides to the edge of waste would be required;
- Developing the lined landfill configuration would include excavating an average of 20 feet below existing ground surface;
- Perimeter waste slopes would be no steeper than 4 horizontal to 1 vertical (4H:1V)

Based on these assumptions, the estimated design capacity of Site 2 would be 4,500,000 cubic yards or approximately 3,000,000 tons. Assuming that the annual fill rate at the landfill was 20,000 cubic yards, Site 2 could potentially provide 225 years of disposal capacity.

If leachate treatment systems and other infrastructure had to be constructed on site, this would reduce the available design capacity for both sites. Without any details for this infrastructure, we estimate the design capacity reduction for both sites would be approximately 20 percent.

Figure 4: Overview of the area leased to the VFW, Kodiak landfill to the east

Closure and Post-Closure Funding

Funding for closure and post-closure costs should be built into the cost of operating a landfill, because collection of money to fund closure and post-closure must be included in rates charged to the facility users. Closure of landfills can cost just as much as installing base liner systems. Based on this, closure of a landfill in Kodiak could cost $150,000 to $250,000 per acre. Assuming Site 2 is constructed, when fully developed it would cover approximately 42 acres, meaning closure costs would be between $6,300,000 and $10,500,000. Post-closure inspection, maintenance, repair and environmental monitoring can cost approximately $100,000 to $150,000 per year for a 30-year period, which adds $3,000,000 to $4,500,000 to the funding requirement. This means that the total closure and post-closure funding requirement could be between $9,300,000 and $15,000,000.

Based on Site 2 receiving approximately 3,000,000 tons of waste during its active life, disposal rates would have to include a $3.10 to $5.00 surcharge to cover closure and post-closure costs. Although this is a simple estimate that doesn't include factors such as interest on deposits and inflation, it does point out the importance of at least estimating these costs when estimating the total cost of operating a modern landfill.

Projected Disposal Fees

Considering all the previously mentioned costs to permit and construct a lined cell, the projected tip fee based on 11,500 tons of MSW and 2,100 tons of C&D debris will range in cost from $212 per ton to $258 per ton. The complete details of the landfill costs and projected life are detailed at the end of this report.

Recommendation

Landfilling of waste is a widely accepted and proven technology for the disposal of waste. The KIB should give full consideration to expanding the landfill for future disposal.

2.0 / Incineration Analysis

Introduction
Incineration is a waste treatment technology that involves the combustion of organic materials and/or substances. Incineration and other high temperature waste treatment systems are described as "thermal treatment". Incineration of waste materials converts the waste into ash, flue gases, particulates, and heat, which can in turn be used to generate electricity. The flue gases are cleaned for pollutants before they are dispersed in the atmosphere.

The purpose of using incineration as a waste disposal method in the KIB would be to reduce the amount of MSW (municipal solid waste) requiring landfill disposal. However, approximately 10-25% by weight of the waste stream would still need to be landfilled. This waste would consist of non-combustibles that will not burn at all, such as glass, metal, concrete, soil; ash, meaning combustible material that passes through the incinerator but does not burn completely; and bulky waste that is too large to fit into the incinerator.

2.1 / Waste Streams Used as Feedstocks

What types of wastes are suitable for incineration?

In general the following types of wastes are suitable for incineration:

- Garbage, trash, or refuse generated by residences, offices, businesses and similar institutions. This includes paper, plastic, food waste, cardboard, leather, textiles, wood and similar materials that are not in a suitable condition for recycling or re-use because they are broken, dirty or otherwise contaminated.
- Small amounts of metals, glass, dirt, rocks, concrete, and other non-combustible materials mixed in with solid waste. These materials do not burn; furthermore, they cause wear and damage to incineration equipment. However, they are tolerated because it is generally not practical to sort out and remove such materials from the waste stream.
- Automobile and pickup truck tires can be burned, but the rate at which tires are fed to the incinerator must be carefully controlled to minimize air emissions from the tires.

What types of wastes are not suitable for incineration?

The following types of wastes are not suitable for incineration:

- Chemical and hazardous wastes, whether from residential, commercial, or industrial sources.
- Large tires such as from earth-moving equipment are generally not suitable for burning.
- Bulky wastes such as couches, mattresses, and other items that are too large to fit into the incinerator feed hopper.
- Wastes containing large amounts of metal, glass, or other non-combustible materials.
- Wastes that could otherwise go to a landfill permitted to receive inert waste. Examples of these materials are tree stumps, concrete, rubble, broken asphalt, bricks, and gypsum wallboard.
- Yard wastes such as lawn clippings, leaves, tree and shrub trimmings contain too much moisture to burn efficiently and will generally decrease the efficiency of incineration.

What about medical wastes?

Modular incinerators are still used to burn medical waste in the U.S., although other methods of disposing of medical waste have become more popular. The existing Kodiak incinerator is currently used to burn medical waste and pathological waste (animal carcasses) and could continue to be used for these wastes. It could potentially serve as a back-up to a new MSW incinerator, although there are a number of reservations:

1. The existing unit was designed for batch processing, not continuous burning.
2. Because its throughput capacity is quite small (on the order of 1-2 tons per day), it should probably be used to burn only the most putrescible and odor-causing waste.
3. A modification to its medical waste permit may be required to allow burning of MSW.
4. Regulators may require the existing unit to be connected to the new air pollution control system associated with the new MSW incinerator.
5. Regulators may allow the new MSW unit, which is likely to be more efficient, to also burn medical and pathological waste. The existing unit would only be used in emergencies as a back-up.

Figure 1: KIB Incinerator

How are materials separated prior to burning?

- It is difficult to separate suitable from unsuitable materials. A skid-steer loader (such as a "Bobcat") may be used to push relatively large, unsuitable materials such as furniture and metal objects off to one side of the facility tipping floor.
- Manual separation is inefficient, unpleasant, and exposes workers to health and ergonomic hazards. Manual separation should be minimized.
- Vehicles carrying yard, construction / demolition, and bulky wastes such as couches and mattresses can be required to unload in an area that does not receive solid waste for burning. This is an effective way to keep these unsuitable materials out of the incinerator feedstock, but may be an inconvenience to customers, especially if the materials are mixed in a single load.

How do seasonal waste fluctuations affect incineration?

In most geographic areas solid waste experiences some seasonal fluctuations. For example, more waste is typically generated during warmer months than colder months, except for the Christmas holiday period. During the holidays there are surges in shopping, consumption, and resultant refuse disposal. Tonnage spikes are also attributed to spring and fall cleanups. During periods of significant rainfall, the waste may contain more moisture and therefore not burn as well as during drier periods. An incineration facility could adjust its operating hours to match seasonal fluctuations in waste tonnage.

2.2 / Incinerator Technologies

What types of incineration technology have been used in the United States?

The following incineration technology has been used in the United States for MSW:

- Controlled-air, modular (factory-fabricated) units are suitable for a facility with a total capacity of up to about 150 Tons per Day (TPD). At about 45 to 50 TPD, Kodiak would fall into this category.
- Mass burn, field-assembled facilities of 500 to 3,000 TPD are used to serve large urban areas. This technology will not be suitable or cost-effective for the KIB due to the relatively small quantity of solid waste projected over the next 30 years.
- Refuse-derived fuel (RDF) field-assembled units are suitable only for areas with high waste generation. They require shredding of MSW and removal of non-combustibles prior to burning. There are very few operating RDF facilities in the United States. Like mass burn, this technology is not applicable to the KIB due to the small amount of disposed tonnage.
- Rotary kiln and fluidized bed units utilize different technology to promote clean burning. This technology does not have an established history of operation in the U.S.

Since the 1970s, the vast majority of small (less than about 150 TPD capacity) U.S. incineration facilities have employed controlled-air, modular units. While mass burn incinerators are more efficient at generating electricity, they are not the appropriate choice of technology for areas with relatively small waste streams such as the KIB. Most waste-to-energy (WTE) facilities currently operating in the U.S. and Europe utilize mass burn technology; Spokane, Washington and Marion County (in Brooks) Oregon are two examples.

How does a modular incinerator work?

The term “modular incinerator” is synonymous with “controlled-air incinerator.” A modular incinerator uses a three-step process to heat and dry the waste, release volatile combustible gases, and finally burn the gases. Waste is loaded into a feed hopper and then pushed into the primary chamber by a hydraulic ram. The waste sits on a stair-step series of stationary hearths. A hydraulic ram pushes the waste across each hearth and tumbles it down to the next lower level hearth, promoting burnout of the waste. The primary chamber uses the principle of pyrolysis to burn waste with less than the amount of oxygen required for complete combustion (called sub-stoichiometric conditions). By using less air in the primary chamber, less particulate matter is carried into the secondary chamber by the hot gases. Burners fired with oil or natural gas maintain the primary chamber temperature at about 1,600 degrees F.

An ash ram pushes the residue through an opening at the far end of the primary chamber, where it drops into a water-filled tank for quenching (cooling). A chain conveyor is typically used to drag the ash up an incline and into a dump truck or container, for subsequent disposal in a landfill that is specifically designed and permitted to receive ash.

Volatile gases flow from the primary to the secondary (oxidizer) chamber where more combustion air is added to consume carbon monoxide, particulate matter, and volatile organics. State regulations require that the gases be exposed to elevated temperatures for at least 1-2 seconds, which may require a third (tertiary) chamber. Fossil fuel-fired burners maintain secondary and tertiary chambers at a temperature required by local regulations, typically 1,800 degrees F.

The basic design elements and layout of a typical modular incinerator are presented in the following diagram.

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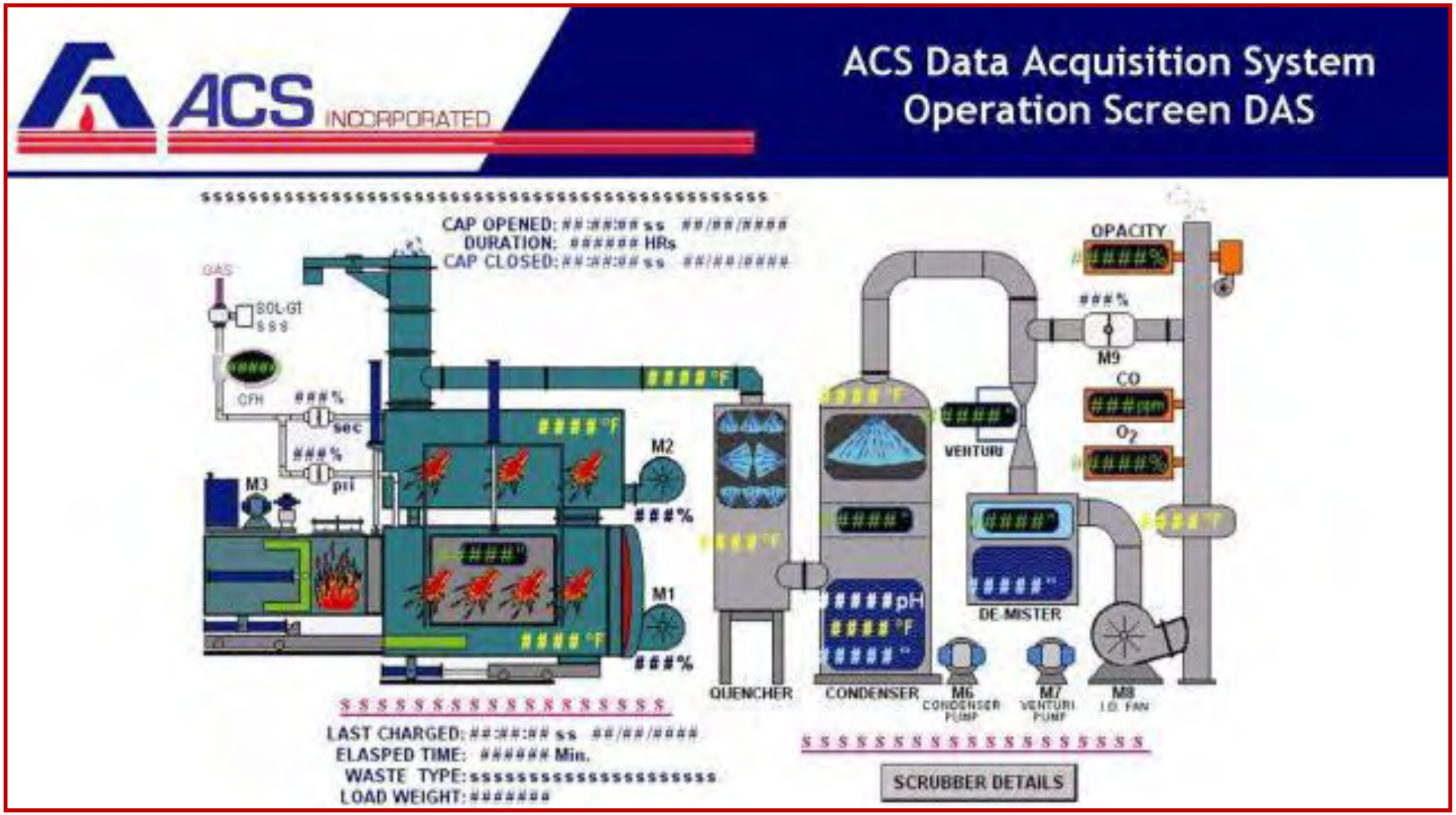

Schematic of Modular Incinerator
(Courtesy of ACS, Inc.)

2.3 / Air Pollution Control

What are the regulations for incinerator air pollution?

The numerous Federal, state and local regulations for air emissions from incinerators address a wide variety of air pollutants including particulate matter, acid (corrosive) gases, and compounds that are toxic or otherwise hazardous to the health of humans, animals, and plants.

Incinerators in the capacity range of 35 to 250 TPD (the range of interest to the KIB) are governed by Federal regulations 40 CFR Part 60, "New Source Performance Standards for New Small Municipal Waste Combustion Units; Final Rule", promulgated on December 6, 2000 and its subsequent subpart EEEE "Other Solid Waste Incineration Units, Final Rule" Dec. 16, 2005. The air pollutants covered under these regulations include dioxins/furans, cadmium, lead, mercury, particulate matter, opacity, sulfur dioxide, hydrogen chloride, nitrogen oxides, carbon monoxide, and fugitive ash. These regulations are comprehensive and cover the following major aspects of an incineration system:

- Pre-construction requirements
- Materials separation plan
- Siting analysis
- Good combustion practices
- Operator training
- Operator certification
- Operating requirements
- Emission limits
- Monitoring (automated continuous emissions monitoring for carbon dioxide, sulfur dioxide, nitrogen oxides and carbon monoxide)
- Stack testing
- Record – keeping and reporting

Figure 2: Incinerator & Scrubber System

As a minimum, a 50 TPD incinerator in the KIB will need to meet the Federal air emissions limits of 40 CFR Part 60 and subpart EEEE (the NSPS regulations cited above). Furthermore, State of Alaska and local officials have the option of making the limits even more stringent. Emissions requirements would not be finalized until a permit application was actually submitted to state and local authorities.
A Title I (Federal) permit application, based on the anticipated performance of the incineration and air pollution equipment, would be necessary to begin construction. Within one year after facility startup, a Title V (Federal) permit application is required to demonstrate that the installed equipment actually meets emissions and operational requirements.

It may be possible to claim exemption from some of the Federal 40 CFR 60 subpart EEEE regulations by meeting both of these criteria:

- The unit must be "rural", defined as being located at least 50 miles from a city listed as a Metropolitan Statistical Area (MSA). (Kodiak is over 300 miles from Anchorage, the nearest MSA).
- The incinerator must be located in an area "where alternative disposal options are not available or are economically infeasible."

If Kodiak's new incinerator were granted a rural exemption, it would have to re-apply for that exemption every 5 years. The uncertainty of permitting conditions as described above poses some degree of implementation risk for an incinerator.

What is the trend for regulation of small incinerators?

In general, the trend over the last 15 years has been to make air pollution regulations more stringent, thus decreasing the level of air emissions allowed. Operating conditions and operator training requirements have become tougher as well. Gaining a rural exemption under subpart EEEE could reduce the cost of building and operating a new incinerator in Kodiak. However, there is still some risk that the exemption might not be renewed because of a change in regulations.

How is incinerator air pollution controlled?

Hot gases from an incinerator are treated in a scrubber to remove particulate matter, acid gases, and toxic compounds. First, the gases must be cooled from about 1,800 degrees F down to less than about 400 degrees F. This can be accomplished by sending the gases through a boiler or heat exchanger to remove heat and lower the temperature. Alternatively the gases can be sprayed with water (or a lime solution) to quench (cool) the gases.

Carbon particles are minimized by maintaining proper combustion conditions – adequate temperature of about 1,800 degrees F, turbulence in the combustion chambers, and sufficient residence time in the incinerator. Carbon and metal particles can be captured in a fabric filter (often called a baghouse) that works like a furnace filter or vacuum cleaner bag. Alternatively, the particles can be electrically charged and then captured on magnetized metal plates in an electrostatic precipitator, similar to a household electronic air cleaner.

Typical acid gases such as hydrochloric and sulfuric acid result from burning waste that contains chlorine (e.g., vinyl plastics or food waste that contains salt) or sulfur. Contacting the acid gases with lime or a similar alkaline solution can neutralize these gases. Dry scrubbers inject dry lime powder into the gas stream, while wet scrubbers use a liquid lime solution. In the latter case, the water evaporates and the lime particles, along with sulfur or chlorine compounds, are captured by the particle-removal device (bag house or precipitator described above).

Toxic or hazardous compounds are controlled by:

- Banning them from the waste entering into the incinerator (directing them to a licensed hazardous waste facility).
- Maintaining proper combustion conditions as described above for particles.
- Capturing them along with the lime particles.
- Injecting powdered, activated carbon into the gas stream. Toxic compounds attach to the carbon powder and are captured in the precipitator or bag house.

2.4 / Ash Disposal

How would an incineration facility dispose of its ash?

An incinerator produces two kinds of ash: 1) bottom ash (metal, glass, soil, rocks, unburnable materials, plus partially burned pieces of potentially burnable materials) and 2) fly ash (particulate matter captured by the air pollution control system). In general, bottom ash is less of an environmental concern because toxic compounds are less likely to leach out of bottom ash. Fly ash may contain heavy metals and other toxic compounds and is considered more of an environmental concern.

Based on the tonnage of waste processed by the incinerator (i.e. greater than 20 tons/day), the resulting ash must be disposed in a Class I municipal solid waste landfill (MSWLF), in accordance with 18 AAC 60.300(c)(1). A Class I landfill newer than 1991 requires a liner. While the KIB landfill is a Class I landfill, it does not have a liner. The KIB has applied for approval from DEC to dispose of ash into the current active cell. Once the current cell capacity is reached, a new lined cell would have to be constructed.

Incinerator ash must pass the Federal Toxicity Characteristic Leaching Procedure (TCLP) test before it can be disposed in a landfill. Ash must be tested on a regular basis, with frequency of testing determined by state or local environmental officials. If the ash proves to be hazardous, it would be prohibited from disposal in the KIB Landfill. Disposal at a licensed hazardous waste landfill would likely be more expensive than at the KIB Landfill and involve higher transportation costs. This uncertainty about ash disposal is another implementation risk for a new incinerator in Kodiak.

If there is no locally available ash landfill, what are the implications/options?

The nearest landfills with a permitted ash cell are the Allied Waste Regional Landfill located near Roosevelt, Washington and the Columbia Ridge Regional Landfill owned by Waste Management located in Arlington, Oregon. Ash would need to be shipped by barge to this landfill in enclosed shipping containers or top-loaded boxes with a weather/bird resistant cover approved by regulatory officials, possibly including the Coast Guard.

2.5 / Incineration Operation

What operating cycle would the incinerator use?

In general, it is more efficient to operate an incinerator continuously (24 hours a day). Intermittent operation ("cycling" the incinerator) requires fossil fuel to heat up the incinerator to proper burning temperatures after it has cooled down from inactivity. Heating and cooling cycles can eventually cause damage to the refractory ("fire brick") lining of the incinerator chambers, increasing repairs, an important component of operating and maintenance (O & M) costs.

An incinerator of a given capacity and sized for 24 hour / day operation will be smaller than one sized for 8 hour / day operation. Therefore, the continuous-burn (24 hour / day) unit will have a lower capital cost. Fossil fuel use will be lower as well, since the incinerator does not need to be warmed up each morning.

Modular incinerators typically operate 5 days a week, allowing the weekend for cool-down and maintenance. A two-week shutdown for annual maintenance and overhaul is also typical. Therefore, 250 operating days per year is normally assumed when calculating the necessary incineration capacity.

2.6 / Potential Incineration Facility in the KIB

What would be the major components of an incineration facility?

An incineration facility for KIB would require the following major components:

- Scales and scale house.
- Incinerator building with waste receiving and storage areas, control room, restrooms/locker rooms, lunch room/ meeting room, office, storage, and maintenance shop.
- Modular (controlled air) incinerators and air pollution control system. Some of the equipment might be located outdoors.
- Site roadways, landscaping, parking and stormwater control.
- Utilities: sewer, water, stormwater, natural gas (or other fossil fuel), electricity, phone, Internet.
- Rolling stock: front-end loader or tool-carrier with various attachments, pickup truck.

A waste-to-energy (WTE) facility would require all of the above, plus the following:

- Steam generating equipment (boiler).
- If generating electricity: a steam turbine, electrical generator, electrical substation and power transmission lines.

Would waste-to-energy (WTE) make incineration more attractive financially?

The heat released by burning solid waste is typically captured in a boiler, producing steam and (in a few cases) hot water. Steam can be piped directly for use in space heating, industrial processes, or drying applications. In many European cities, it is common to have “district heating” systems of underground pipes that send steam to nearby buildings to provide space heating. In the U.S., steam is typically used to turn a steam turbine that in turn drives an electrical generator. Most large (over 400 TPD) U.S. incineration systems generate and sell electricity to help offset their operating costs.

The following factors contribute to the success of a WTE system:

- A long-term, reliable, politically stable supply of solid waste. This generally requires that local jurisdictions sign an agreement that commits them to send a certain amount of solid waste to the WTE plant each year. Each jurisdiction pays for incineration of a guaranteed minimum quantity of waste, regardless of whether it actually delivers the waste. The agreement must last long enough to recover the cost of the plant.
- Sufficient revenue to recover capital costs (interest and principal on borrowed funds) and operating costs (labor, utilities, ash disposal, equipment replacement, repairs, etc.). Revenues include:
    - Tipping fees ($/ton charged to dispose of waste at the WTE plant);
    - Income from the sale of electricity or steam; and
    - Funds contributed by local governments.
- Continuing citizen support for the WTE facility and its operations. Dealing with citizen protests or lawsuits regarding issues such as air or water emissions, odors, truck traffic, etc. is time-consuming and expensive.

- Stable regulatory environment. Essential changes in regulations may require frequent and/or expensive upgrades or changes in plant operation, the costs of which may be difficult to recover without increasing tipping fees.

- A basic incineration facility requires incinerators, waste storage and administration buildings, air pollution control equipment, and a control system. A WTE plant requires all that, plus a steam turbine, electric generator, electrical switching gear, and a more sophisticated control system. Funding either an incineration facility or a WTE plant will probably require the sale of bonds.

- The approximately 11,500 tons per year (TPY) of disposed municipal solid waste from the KIB represents a relatively small quantity of MSW to burn, compared with other U.S. locations where WTE has been successful. Small amounts of waste convert to small amounts of steam or electricity and result in a small revenue stream that will not justify the additional construction and operating costs of steam generation and electrical generation equipment required for a WTE facility.

- Selling steam requires a major steam customer in close proximity to the WTE plant. A piping system to deliver steam and return condensate (water from the condensed steam) must be constructed between the WTE plant and the steam customer. Unlike Europe, it is rarely the case that an American industrial steam user is located an economical distance from the WTE plant. Furthermore, the WTE plant would be required to deliver steam according to the customer's demand schedule, typically 24 hours a day, 7 days a week for most industries. The modular incinerators that would likely be used at a KIB facility may be continuous (24 hour/day) units, but most likely will be shut down on weekends and are not suitable for 24/7 operation. The incineration facility would probably operate 5 days a week before shutting down on the weekend for cleaning and routine maintenance. The resulting intermittent steam delivery would likely not be acceptable to most industrial users.

- Selling electricity requires even more infrastructure. Besides the boiler to produce steam, there is a steam turbine / generator combination to generate electricity. Although the retail price of electricity (cents per kilowatt hour) may seem high to most homeowners, a WTE plant would be selling electricity at wholesale rates that are considerably lower. Utilities are no longer required by law to purchase electricity from small facilities such as WTE plants. A KIB WTE facility would produce relatively small amounts of power. Furthermore, the power would be intermittent (say 5 days a week) and not have the high degree of reliability required by a utility. For these reasons, a KIB WTE facility would probably be paid lower rates for its electricity.

Pending a detailed cost / benefit analysis, it seems unlikely that a WTE facility would be able to cover its operating costs and pay off its loans or bonds by using the small revenue stream resulting from sale of small amounts of electricity or steam, unless tipping fees were relatively high to make up the difference.

2.7 / Costs

What order-of-magnitude / planning level capital costs should be expected?

"Hard" components of the capital cost include:

- Site improvements (roadways, parking, utilities)
- Off-site improvements (access roads, traffic signals)
- Retrofit of existing and/or construction of new buildings
- Equipment purchase and installation

"Soft" components of the capital cost include:

- Environmental and land use permitting process (cost increases in proportion to the amount of opposition to the project). An Environmental Impact Statement (EIS) may be required for permitting a facility in Kodiak.
- A health risk assessment may be required by local authorities.
- Engineering feasibility studies, designs, plans and specifications.
- Legal fees during project development.
- Administration / staff time during project development.
- Economic feasibility studies, financing arrangements, bond reports.
- If WTE, negotiation of power sales agreement.
- Testing of air emissions from completed facility to obtain a permit to operate.

Very few incineration facilities have been constructed in the U.S. in the last 10 years. In 2005, a small (about 4 TPD) incineration only (not WTE) facility was built in Bridgewater, New Hampshire for about $2 million (M. Milnes, VP of ACS). Advanced Combustion Systems (ACS), a Bellingham, Washington manufacturer, provided the incinerator, air pollution control equipment, controls and air emissions monitoring equipment. Besides the equipment and the usual site improvements, the $2 million cost included closing / capping a small existing landfill and providing propane storage (natural gas was not available as an auxiliary fuel). It is not clear whether the town already owned the land, or had to purchase it for this project. The costs for Bridgewater are indicative of the range and types of capital costs for incineration facilities, but are not strictly comparable with Kodiak, since at 45 TPD the KIB facility would be considerably larger.

Developing an accurate engineering cost estimate for an MSW incinerator in the KIB is made difficult by the following factors:

1. For the last three years or more, construction costs have escalated at rates far in excess of historical rates. The cost of basic building materials (cement, steel, etc.) has escalated between 15 and 50%. So many projects are currently under construction that contractors have difficulty finding qualified subcontractors to perform various trade work such as concrete, plumbing, etc. This labor shortage tends to drive up prices. The combination of volatile material costs and a shortage of experienced labor have made it very difficult to accurately predict what it will cost to construct a project.

2. The "premium" for work in Alaska due to overall higher construction costs, partly due to higher freight and shipping costs, adds another degree of complexity to the cost estimating.

3. Permitting costs are an uncertainty. Regulatory agencies generally wait until they see a detailed facility proposal before they develop their specific list of permit requirements. For example,

an agency may wait to gauge the public's reaction to a proposed incinerator before requiring a health risk assessment to examine potential health impacts to humans in the vicinity of an incinerator. Experience has shown that as opposition grows, agencies tend to request increasing amounts of technical documentation to demonstrate that the facility will not harm humans or the environment.

4. It is tempting to accept an unsolicited cost proposal from a developer or equipment supplier as being independent, reliable and comprehensive. The equipment costs may be reasonably accurate and up-to-date, but equipment is only one major component of the total project cost. It is unlikely that the buildings and site infrastructure have been engineered to the level of detail necessary to provide an accurate construction cost estimate. In addition, developers may assume that there will be minimal opposition and few environmental hurdles. This is often not the case, and permitting costs can easily be underestimated.

In light of the factors discussed above, a very preliminary planning-level estimate of project costs (engineering, permitting, construction, emissions testing and startup) for an incineration – only plant could range from about $5 to 6 million (2007 dollars), excluding land purchase. Upgrading to WTE could add another $2 to 3 million. To get more precise cost estimates one must develop a specific project scope and solicit bids.

What order-of-magnitude / planning level operating costs should be expected?

Operating costs depend on a variety of factors, including:

- Labor (scale attendant/bookkeeper, plant operators/equipment drivers, maintenance personnel, and plant manager, etc.). Labor rates and customary fringe benefits vary widely between geographic areas and public/private sectors
- Insurance (liability, fire, property damage, environmental pollution, etc.)
- Utilities (water, sewer, electricity, stormwater disposal, phone, Internet)
- Permits and fees (solid waste, sewer, air pollution, etc.)
- Periodic air emissions and ash testing, including laboratory analysis and reporting to regulatory agencies
- Ash disposal (assume that 1 ton of MSW produces about 0.2 tons of ash). Cost of ash disposal can vary quite significantly depending upon the mode in which it must be disposed. If ash fails the TCLP test and is classified as hazardous waste, it will have to be shipped to a permitted hazardous waste handling and disposal facility in either Oregon or Washington.
- Equipment maintenance
- Sinking fund to pay for major refurbishment of equipment (e.g. every 5 years)
- Site and building maintenance
- Emergency fund

Operating costs in the range of $70 to $120 per ton (2007) could be expected. Many costs (some labor, insurance, permits, some utilities, sinking fund, building maintenance, and emergency fund) will be relatively constant, provided a certain threshold amount of waste is burned each year. However, some costs will vary in proportion to the amount of waste burned (ash disposal, electricity).

What factors contribute to a financially successful incineration facility?

- Adequate tipping fee to cover capital and operating costs, plus a sinking fund to cover periodic major maintenance, overhaul, and upgrade.
- A reliable, long – term waste supply.

- A stable regulatory environment and citizens that support the facility rather than continually trying to shut it down.

What impact would attracting more (or other) types of waste have on incineration economics?

Modular incinerators are used to burn medical waste in the U.S., although other methods of disposing of medical waste are becoming more popular. While operating parameters (e.g. amount of combustion air, process control, etc.) may be slightly different for solid waste, medical waste and animal carcasses, it is technically feasible to burn all three types of waste in the same modular incinerator. However, there may be regulatory requirements that limit or prohibit burning of medical wastes in the same incinerator. Regulations may require the two wastes to be burned at separate times. In the 1990s this was the case in Ferndale, Washington where an incinerator burned medical waste exclusively during certain hours each week, and solid waste the remainder of the time. Burning medical wastes in the same incinerator used for solid waste could provide additional income to the facility and help dispose of a difficult waste. On the other hand, local authorities may require that MSW be burned in a totally separate incinerator from the one used for medical waste and animal carcasses.

The table on the following page details the projected cost to procure, site, and operate an incinerator in Kodiak.

Table 1
Projected Incineration Disposal Cost for Kodiak

Fixed Costs		**Note**
Land	**KIB Landfill**	
Utilities Upgrade	$ 40,000	**A**
Building Retrofit and Additions	2,000,000	**B**
Engineering, Design, and Permitting	300,000	**C**
Misc. Equipment	250,000	**D**
Incinerator/Air Pollution System Equipment & Installation	2,800,000	**E**
Total Land, Building, and Incinerator	5,390,000	**F**
Monthly build payment @ 6% for 15 years	45,484	**G**
Annual Fixed Cost	**$ 545,807**	**H**
Annual Variable Costs		**I**
Labor (assume 8 people for continuous burn incinerator)	$ 875,000	**J**
Equipment and Building Maintenance and Repairs	75,000	**K**
Diesel Fuel @ $6 per gallon (13 gallons per hour)	468,000	**L**
Utilities	50,000	**M**
Operating Supplies and Equipment	70,000	**N**
Regular Air Emissions and Ash Testing	100,000	**O**
Ash Disposal	56,000	**P**
Insurance	50,000	**Q**
Sinking Fund for Major Maintenance/Replacements	100,000	**R**
Equipment and Vehicle Costs	50,000	**S**
Landfill Operational Costs	272,000	**T**
Landfill Closure Costs	272,000	**U**
Total Estimated Annual Variable Costs	**$ 2,438,000**	**V**
Total Annual Cost (H + V)	**$ 2,983,807**	**W**
Total Waste Tons (11,538 MSW + 2,107 C&D)	13,645	**X**
Estimated Disposal Fee per Ton	**$ 219**	**Y**

Notes
A: Upgrade electricity, water, and sewer service to the facility
B: Upgrade the baler building to sort waste and house the incinerator
C: Facility siting study, public involvement program, solid waste and air pollution permits
D: Equipment needed to pull materials out of the waste stream prior to incineration and to pull metals and other inerts from the ash
E: Approximate cost of an incinerator, air pollution control (APC) equipment and control system
F: Total of items A through E
G: Monthly payment on a note for $5,390,000 over a fifteen year period @ 6% interest
H: Annual Fixed Cost (Monthly payment amount x 12 months)
I: Variable costs
J: Labor cost is assumed at $87,500 per person (fully loaded rate) for a staff of 10
K: Repair and routine maintenance for the building, site, and equipment
L: The incinerator burns 13 gallons of diesel per hour. The incinerator will burn continuous for 24 hours a day, 5 days a week for 50 weeks a year. The incinerator will be shut down for an annual two week period for routine maintenance.
M: Approximate cost of electricity, water, and sewer
N: Approximate annual supply cost

O: Approximate cost of compliance
P: Costs associated with operations at the landfill (testing, etc.)
Q: Assumed cost of insurance
R: Annual amount set aside for replacement and repair, excluding items covered in Note K
S: Cost of equipment and vehicles at the landfill
T: Cost to run the landfill @ $20 per ton x 13,600 annual tons
U: Closure costs @ $20 per ton x 13,600 annual tons
V: The sum of items J through U
W: Annual fixed cost plus the annual variable cost
V: Total MSW tons of 11,538 plus the annual 2,107 tons of construction and demolition waste
W: Total annual cost of $2,983,807divided by the annual 13,645 waste tons

2.8 / Policy Considerations

What is the compatibility of incineration with an emphasis on waste reduction/recycling (diversion)?

Recycling materials such as newspaper, cardboard, office paper, and plastics will reduce the amount of combustible material going to the incinerator. This will decrease the average heating value of the waste and make it more difficult to burn, since wet wastes such as food scraps would then comprise a larger percentage of the waste after dry recyclables such as paper and plastic were removed.

On the other hand, recycling glass and metal containers will reduce the amount of non-combustibles in the waste stream and thus increase its average heating value, making it burn more easily. Removal of glass and metal, which are abrasive and can damage the refractory lining of the incinerator, helps reduce wear and damage to the incinerator.

Some recyclables (paper, plastics) are burnable and others (metals, glass) are not. Kodiak's population and disposed trash growth rates are relatively flat. It is not expected there will be significant increases in either category of material. If an aggressive waste reduction / recycling program is instituted after the incinerator is built, it may draw tonnage away from the incinerator, thus raising the cost per ton of waste that actually passes through the incinerator. Labor and fuel costs may decrease somewhat as tonnage decreases due to recycling, but the incinerator itself will be somewhat oversized.

2.9 / Conclusion and Rationale

Considering the technical, economic, environmental, public acceptance factors and implementation risks associated with an incineration facility, would incineration be feasible in the KIB?

While incineration is technically feasible, permitting and cost are significant hurdles. The most reliable way to obtain accurate cost information regarding incineration is a staged procurement process:

- Develop a preliminary project summary (for example, waste flow, site, permit conditions, range of proposed tip fees, potential KIB construction and operating budget).
- Request letters of interest and qualifications from equipment vendors and facility operators.
- Based on the quality of responses and range of preliminary costs, determine whether a formal Request-for-Proposals (RFP) is justified.
- If the KIB determines that incineration could be economically feasible, develop a detailed RFP and draft contract, and advertise for bids.
- Evaluate bids and select a suitable proposal.

The complete details of incineration costs follow this report.

REFERENCES

Incineration report completed by Terrill Chang, P.E.

EnviroMech, Waste-to-Energy Feasibility Study for Coos County, Oregon, 2002

Communication with Mike Milnes, VP of Advanced Combustion Systems, Bellingham, WA, July 27, 2006.

Communication with Jim Baumgartner, Alaska Department of Environmental Conservation (ADEC), August 8, 2007; 907 / 465 – 5108

Communication with Karin Hendrickson, ADEC, August 9, 2007; 907 / 269 – 7626

3.0 / Waste Export / Waste-By-Barge

Barging waste to an off-island landfill is the simplest method of disposal and the most expensive. Shipping expenses, which have been historically volatile, comprise 85% of the total projected costs. Contracting for disposal with the regional landfills in the Columbia River basin can take two forms: a bundled contact for all transportation and disposal or a series of contracts with the various transportation companies (truck, barge, rail, and disposal).

3.1 / Logistical Process Description

The following description outlines the primary steps involved in a typical waste-by-barge scenario from Kodiak to one of the large privately-held, rail-served regional landfills in the Pacific Northwest.

Figure 1: The Barging Process

1. Waste is collected locally from the curb, dumpster, and drop boxes as well as “self-haul” waste is delivered to a transfer facility located at the landfill.
2. At the transfer facility, the waste is dumped (tipped) on the floor where it would be sorted for recyclables and contaminants prior to being loaded into an open top intermodal container. The payload of the garbage in the container is approximately 25 tons (non-compacted).
3. The intermodal container is then covered, sealed and trucked to the Samson Marine Terminal for loading onto a barge. The barging of the intermodal container(s) takes approximately five days from Alaska to the marine terminal in Seattle.
4. Once the intermodal container arrives in Seattle, it is removed from the barge and trucked to a local railroad yard and loaded onto a rail car for shipping to the landfill.
5. Trainloads of waste are shipped daily to the regional rail-served landfill, approximately 350 miles away. This trip takes about 12 hours.
6. At the landfill the intermodal container is lifted from the rail car and placed on awaiting trucks which deliver them to the landfill’s “working face” to be dumped.
7. Once dumped, the container is returned to the landfill’s rail yard and placed back on the rail car to complete the return trip to Seattle and then to Kodiak where the intermodal container is returned for re-use and the cycle begins again.

3.2 / Landfills and Routes

We researched the potential for utilizing the Alaska Marine Highway System (ferry system) as a means to transport municipal solid waste from Kodiak to either the Central Peninsula Landfill (CPL) outside Soldotna via Homer, Alaska and truck draying it from there to the landfill as well as "ferrying" the containerized waste from Kodiak to Homer, Alaska via the ferry system and truck draying it to the Anchorage Regional Landfill (ARL) near Eagle River, Alaska. Both landfills were considered for their regional vicinity to the KIB as disposal alternatives, ones within the region as opposed to exporting the KIB's waste to private landfills in the lower 48 States.

Several challenges presented themselves in terms of the respective landfills' interest in accepting the waste for disposal and the Alaska Marine Highway (AMH) System's interest in transporting waste in enclosed trailers or intermodal containers on their ferry vessels. The AMH officials state that while the vessels do transport general freight commodities in standard intermodal containers and trailers, the vessels are primarily designed for the transportation of passengers and passenger vehicles.

While these key components pose a challenge for the regional waste export concept, Samson Tug and Barge, a regular route barging company with year round service to the KIB, provided a transportation rate from Kodiak to Anchorage and Seward in the event either Anchorage or the Kenai Borough would accept Kodiak's waste at their regional landfill. Contained herein are the highlights of the research and responses received from the various parties.

Alaska Marine Highway System

Dana Jensen, the Port Captain for the Alaska Marine Highway System was contacted to seek the AMH's interest, shipping requirements and rate levels to transport the KIB's waste to Homer for subsequent truck drayage to either the Anchorage Regional Landfill or the Kenai Peninsula Borough's Central Peninsula Landfill located just outside of Soldotna. The purpose of contacting them was to seek an alternative transportation means to compare their service offerings and costs to that of a private barging company. Mr. Jensen agreed to investigate the opportunity internally with the AMH's Operations Manager and Safety Officer.

After much internal review, discussion and deliberation, Dana Jensen, Bill Miller, their Safety Officer, and Jim Beatle, their Operations Manager, all concluded and jointly decided to decline interest in transporting containerized waste. The following reasons are what they cited as their most significant concerns:

- Health and safety concerns for the passengers and crews with solid waste onboard the vessel
- New Alaska Fish and Wildlife regulation over relocation of rodents (rats) in areas that are currently "rat free"
- Political concerns and ramifications of accepting shipments of waste on passenger ferries
- U.S. Coast Guard oversight and adherence to regulations
- Intermodal containers and / or trailers are placed below deck with automobiles and any fire similar to the one in the SE could not be contained onboard an enclosed area causing significant risk to passengers, crew and vessels
- Container odor and leaching of non-solids (liquids)
- Recent spontaneously combusted intermodal container fire on a barge with garbage and other goods in Southeast Alaska (see photo on the following page)

Figure 2: Fire on AML Barge

Mr. Bill Miller, Safety Officer for the Alaska Marine Highway System, provided this internal recommendation to his peers regarding the inquiry to transport the KIB's solid waste on the ferry system:

"This concern is not only for the introduction of rodents to other areas in Alaska but shipboard as well. Transporting large quantities of refuse from Kodiak on a recurring basis would ultimately result in the introduction of rodents (rats and mice) on our vessels. They are destructive. Being rodents, they need to constantly chew to wear down their teeth. Any wiring, fuel lines, foam, fabric, wood, nets, and cargo are all fair game. Chewing on wires can cause fires. What they don't chew they foul with urine and feces (40 droppings a day). They contaminate food storage areas and can even spread disease by inhabiting crew quarters and introducing fleas and mites.

Considering the introduction of rodents onto our vessels and the (unintentional) transport to remote parts of the State of Alaska, I highly recommend this request be denied on the basis of both Environmental and Occupational Health and Safety."

Respectfully,

W. J. Miller

W. J. Miller
Safety Officer
Alaska Marine Highway System

Mr. Miller also cited and provided the following supporting documentation, specifically, the new regulations issued by Alaska Fish and Wildlife concerning potential relocation of rodents to non-contaminated areas in Alaska:

1. Prohibits the intentional or negligent (e.g., unsecured garbage, improperly-stored food) feeding of rats, mice, and other "deleterious exotic wildlife";
2. Make it against the law for the owner or operator of a vessel, vehicle, aircraft, structure being translocated, or other means of conveyance to knowingly or unknowingly harbor live rats or mice, or to enter Alaska (including Alaska waters) while knowingly or unknowingly harboring these animals; and
3. Requires that the owner or operator of a harbor, port, airport, or food processing facility in which live rats or mice have been found develop and implement an ongoing rodent response and eradication or control plan.

Alaska Marine Highway Equipment Restrictions

In addition to the Alaska Marine Highway's concerns and reasoning for deciding not to accept KIB waste on board their vessels, the capacity of the ferries to accommodate equipment over 40' in length (no overhang for container chassis) is prohibited due to the size and weight capacity rating of the internal elevators. The lift capacity of the onboard elevators is limited to 60,000 pounds, including both the equipment tare weight and payload.

In order to load the trailer or container onboard, two trucks are required on each end to perform what is known as a "double shuffle", where one truck rolls the trailer onto the ferry and onto the elevator platform and the other removes it on the lower deck for staging while the ferry is enroute. This is a service performed regularly, however the significance of the trailer length restriction is that most modern day trailer manufacturers do not build 40' long live floor (walking floor) trailers and the payload capacity of this short trailer is estimated to be less than 15 tons, significantly increasing the resulting cost per ton for transportation, making the ferry option not only disagreeable with the AMH, but economically challenging on a cost per ton basis.

Again, the main restriction with the Alaska Marine Highway ferry service is the denied request to transport solid waste by the Safety Officer and Port Captain, not the equipment length and payload restrictions.

Alaska Marine Highway Contact Information:

Bill Miller
Safety Officer - State of Alaska
Department of Transportation & Public Facilities
Alaska Marine Highway System
Phone: (907) 228-7277; E-mail: william.miller@alaska.gov

Samson Tug & Barge

The other transportation alternative researched within the region that provides regular route barging service between Kodiak and the Kenai Peninsula and is willing to accept waste is Samson Tug and Barge.

Samson provides indirect regular route service to Seward via Seattle and Sitka. Samson departs Seattle with service to Kodiak every other week year round or two barges per month. The transit time from Seattle to Kodiak is approximately 12 days. The transit time from Kodiak to Seattle is approximately 9 days. The Kodiak to Seward schedule at this time runs from Kodiak to either Sitka or Seattle and then returns to Seward. This is not an efficient transit time. Samson may consider a Kodiak weekly service or a Kodiak to Seward direct call with a multi-year contract with the KIB. The cost per container from Kodiak via either route is $2,559.

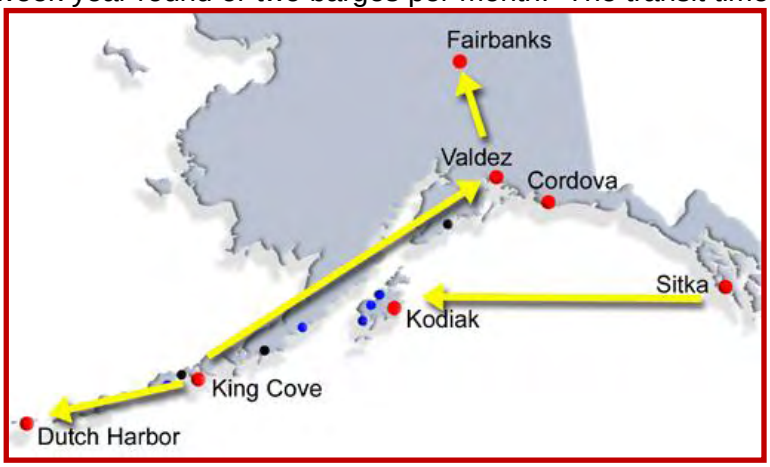

Figure 3: Samson Alaska Ports

The combined pricing for both the conceptual Alaska regional disposal scenario where the KIB ships its waste via Samson Tug and Barge to either the Anchorage Regional Landfill (ARL) or the Kenai Peninsula Borough's Central Peninsula Landfill (CPL) via Seward is detailed in the waste export cost pro forma.

Samson Tug & Barge Contact Information:
Bill Ludwig
Sales, Samson Tug & Barge
Phone: 206.812.3429; E-mail: bill@samsontug.com

Municipality of Anchorage - Anchorage Regional Landfill (ARL)
Brian Crewdson, Director of Solid Waste Services for the Municipality of Anchorage, was contacted about accepting the KIB's waste for disposal at their local landfill located near Eagle River, just outside Anchorage. Currently, the only outside jurisdiction that the ARL is accepting solid waste from is in small quantities from the City of Whittier, Alaska. The ARL charges a rate that is exactly twice their posted gate rate to the City of Whittier and Brian expects this rate would remain in effect in the event the KIB waste were be to accepted at the ARL. Their current posted gate rate is currently $45.00 per ton and is anticipated to increase in the near future to $55.00 per ton. The City of Whittier is currently paying $90.00 per ton and with the rate increase the cost per ton will be $110.00.

At present, there is not a formal or defined process for seeking approval for waste acceptance outside the Municipality of Anchorage. Brian suggested that a formal request in writing be submitted explaining the KIB's potential need to transport and dispose of their waste at the ARL. The KIB would need to provide justification as why such a strong need exists, demonstrating that local options are not available. Brian commented that the process would most likely be fairly subjective and a response to a written request from the Municipality could be developed within two weeks of receiving the request.

ARL Contact Information:
Brian Crewdson
Director of Solid Waste Services, Municipality of Anchorage Alaska
Phone: 907-343-6275; E-mail: crewdsonBI@ci.anchorage.ak.us

Kenai Peninsula Borough – Central Peninsula Landfill (CPL)
As part of the KIB project research, Bob Garlock, the Solid Waste Director for the Kenai Peninsula Borough was contacted about accepting the KIB's waste at the Borough's Central Peninsula Landfill (CPL). At present, the Kenai Peninsula Borough code of ordinances does not allow the acceptance of waste from outside the Borough. Bob suggested that if a dire need exists for accepting and disposing of solid waste from another Alaska community, one with compelling enough reasons, the Kenai Peninsula Borough's Assembly may reconsider its ordinance on waste acceptance from outside the Borough.

When asked about an approximate disposal rate for the KIB study, the Solid Waste Director stated he could not respond since quoting a rate could imply that they would consider accepting the KIB's waste, a decision that would be up to the Borough's Assembly and the Mayor. He did comment that their current internal cost of disposing of their own waste is approximately $60.00 per ton. At present, they do not charge disposal rates for the citizens of the Borough. The revenues required to maintaining the landfill is derived from local property taxes.

At the suggestion of the Solid Waste Director, the KIB drafted a letter to the Mayor of the Kenai Peninsula Borough, that could be given consideration and would have to be voted on by the Assembly since the ordinance already exists preventing the importation of waste from outside the Borough.

CPL Contact Information:

Bob Garlock
Solid Waste Director, Kenai Peninsula Borough

Phone: 907-262-2002; E-mail: bgarlock@borough.kenai.ak.us

Preliminary transportation and disposal pricing for MSW and / or incinerator ash were secured from various interested disposal companies previously detailed. The pricing was based on shipping the municipal solid waste or ash from the Kodiak Island Borough (KIB) to one of the privately held regional landfills in either Eastern Washington, Idaho or Oregon.

The price ranges are provided for planning and informational purposes only. The price quotations shall not be construed as enforceable or binding on any of the potential disposal companies that provided price ranges unless and until a written agreement has been executed and signed by all parties. Notwithstanding the generality of the foregoing, if a particular jurisdiction solicits price quotes for solid waste management services from qualified vendors through a procurement process, the disposal companies reserve the right to base their official price quotes on the specific parameters of that procurement process. The table below identifies the disposal firms and the contacts that provided price quotations that determined the planning price range.

Table 2
Contact Information for Private Disposal Companies

Disposal Company	Contact	Position	Phone Number
Allied Waste	Joe Casalini	Business Development	206-255-4070
Idaho Waste Systems	Grant Gauthier	VP of Business Development	208-447-7127
Waste Connections	Eddie Westmoreland	Division Vice President	253-414-0349
Waste Management	Mike Holzschuh	Business Development Landfill Group	425-825-2004

3.3 / Cost Assumptions

- Assumes 23 tons payload per container for MSW and 20 tons for ash.
- The cost of the containers would have to be borne by the Borough and that cost is included in the cost analysis.
- The rate range includes truck drayage from a transfer station, barge loading at origin, barge transportation to Seattle, container off-loading, drayage to a rail yard in Seattle, rail transportation to one of the regional landfills (in Eastern Washington, Oregon or Idaho) and disposal, including taxes.
- The bundled costs assume a disposal rate of $22 per ton for MSW and $29 per ton for incinerator ash, plus taxes.

Table 2
Waste Export Summary Costs

Waste Origin	KIB - Kodiak Island	KIB - Kodiak Island	KIB - Kodiak Island	KIB - Kodiak Island
Destination Landfill	Eastern OR or WA	Eastern OR or WA	Anchorage Regional	Central Landfill
Waste Type	MSW	Incinerator Ash	MSW	MSW
Landfill Owner	Privately Owned	Privately Owned	City of Anchorage	Kenai Borough
Assumptions:				
Transportation Method (Combination of Modes)	Truck/Barge/Rail	Truck/Barge/Rail	Truck/Barge	Truck/Barge
Transfer Station Location	Kodiak	Kodiak	Kodiak	Kodiak
Annual Tons	11,500	2,875	11,500	11,500
Backhaul Opportunity	no	no	no	no
Days Worked Per week	5.5	5.5	5.5	5.5
Tons Per 48' Container or 20' Ash Container	23	20	23	23
Containers Needed Daily	1.75	0.50	1.75	1.75
Total Transfer, Transport & Disposal Cost Per Ton:	$208.76	$239.07	$288.54	$243.65
Percentage of fixed cost to variable costs	12%	12%	8%	6%
Percentage of transportation cost to total cost	77%	76%	54%	61%

Recommendation
The KIB should not consider waste export as an alternative to either landfilling or incineration. The transportation costs are unpredictable due to changing fuel prices and the KIB's level of control over this option is low.

SAMSON
TUG AND BARGE

Date: 06/28/2007
By: Bill Ludwig

SHIPPING QUOTATION

Quote Number: BIL6888

Chris Bell
Solid Waste Management

PHONE: 360.326.8937
FAX:
EMAIL: solidwaste@comcast.net

Origin Port:	Kodiak	Destination Port:	Seattle
Project / Bid Name:	Quote Date (09/14/07)	Shipper / Consignee:	
Booking Number:		Est. Ship Date:	

THIS QUOTATION HAS BEEN PREPARED BASED ON INFORMATION PROVIDED ON THIS DATE. CHARGES MAY DIFFER FROM THOSE QUOTED DUE TO CHANGES IN DIMENSIONS, WEIGHT, DESCRIPTION OF GOODS, OR SHOULD THE SHIPPING CIRCUMSTANCES VARY FROM THAT DESCRIBED HEREIN. FINAL RATE APPLICATION WILL BE BASED ON TARIFFS, CLASSIFICATIONS OR CONTRACTS IN EFFECT AT THE TIME OF SHIPMENT. THIS QUOTE IS ONLY BINDING IF YOUR ACCOUNT IS CURRENT. ANY PAYMENTS RECEIVED, INCLUDING PREPAYMENTS, WILL BE APPLIED TO ANY PAST DUE BALANCES FIRST. TENDERED FREIGHT MAY BE HELD AT YOUR EXPENSE UNTIL PAST DUE BALANCES ARE PAID. QUOTE VALID FOR 60 DAYS.

Description of Terms, Rates Offered, Etc.

Description of Items	Weight/Qty	Rate	Rate Type	Totals
*Municipal Solid Waste				
Shipper Owned 48' Open Top Containers				
27 Ton Minimum/48' Open Top Container	27	$80.00	TON	$2,160.00
Current fuel surcharge	.185	$2,160.00	PCT	$399.60

*Rate does NOT apply to hazardous shipments.

TOTAL: $2,559.60

-Rate is subject to the fuel surcharge in effect at the time of shipment.
-Rate is based on Shipper Owned/Shipper Load & Count 48' Open Top Containers with Tarps.
-Shipper must line the containers to prevent leakage...subject to Carrier's approval.
-Rate includes 1-free spot per container within 10-miles of the Kodiak city limits (road legal loads only).
-Rate applies to the dock only in Seattle.
-Rate includes 3-days free time in Seattle...then daily storage charges will apply.
-Maximum 54,000 pounds product weight per container.
-Shipments are subject to road weight restrictions.
-Total charges are based on the above listed dimensions.
-Samson services Kodiak at least twice per month year round...weekly service is a real possibility in the near future.
-Shipments are subject to space availability on the barge.
Hello Chris...note that this rate includes roundtrip service, local Kodiak drayage services, terminal handling, and wharfage charges. We can address the purchasing and positioning of equipment to handle the 48' containers in Kodiak in conjunction with a multi year contract. Anyway...please contact me to discuss these shipments in further detail...thank you.
Bill Ludwig x 302 / bill@samsontug.com

SAMSON
TUG AND BARGE

Date: 06/28/2007
By: Bill Ludwig

SHIPPING QUOTATION

Quote Number: BIL6888

Chris Bell
Solid Waste Management

PHONE: 360.326.8937
FAX:
EMAIL: solidwaste@comcast.net

Origin Port:	Kodiak	Destination Port:	Anchorage
Project / Bid Name:	Quote Date (09/14/07)	Shipper / Consignee:	
Booking Number:		Est. Ship Date:	

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Hello Chris...the rate from Kodiak to Anchorage is the same as the rate from Kodiak to Seattle. The rate includes roundtrip service, local Kodiak drayage services, terminal handling, and wharfage charges. We can address the purchasing and positioning of equipment to handle the 48' containers in Kodiak in conjunction with a multi year contract. Anyway...please contact me to discuss these shipments in further detail...thank you.
Bill Ludwig x 302 / bill@samsontug.com