

Incinerating Your Garbage

An incinerator is used by only a few villages. It is a specialized unit that includes air quality control features. True "incineration" is a high-tech method to efficiently burn wastes at high temperatures.



Advantages

- ❖ If operated correctly, emissions are quite clean and safe
- ❖ Emissions are much cleaner than a burnbox, and you have more control over the process
- ❖ You can purchase an incinerator that comes with a computer device to allow the manufacturer to troubleshoot most problems
- ❖ You can arrange for yearly maintenance visits by the manufacturer
- ❖ An incinerator operator job requires special technical skills (training is available), increasing the diversity in village job opportunities and work experience
- ❖ No animal attraction
- ❖ Reduces volume of burnable waste by about 90%, and weight of wastestream by about 80%
- ❖ Because ash and non-burnable trash is relatively non-toxic, it can be easily landfilled, shipped out, or used in construction.
- ❖ If you choose to ship ash out, it will be much cheaper than unburned trash, and you'll have less liability concerns
- ❖ If correct unit is purchased, can burn raw sewage – making it harmless

Disadvantages

- ❖ If not operated and maintained right, you can still get toxic smoke
- ❖ Although location is not as critical as burnbox placement, location should still be outside of town, preferably downwind or at least 1 mile away
- ❖ Although not as critical as with burnbox operation, should still separate out pressurized containers and hazardous wastes
- ❖ Needs regular maintenance
- ❖ Still need to deal with ash, scrap metal, appliances, and household hazardous

Who sells incinerators?

The following manufacturers have provided incinerators to communities in Alaska. Feel free to give them a call to see what kind of service, price, and performance they can provide, and who you like working with the best. Also contact Ed Emswiler, ADEC, 465-5353 for advice and a copy of his Incineration guide.

Enerwaste: Bellingham, Washington <http://www.enerwaste.com/index.htm> Contact: Tom Dutcher (360) 738 1254

Advanced Combustion Systems: Bellingham, Washington <http://www.acs-ac.com/> Contact: Mike 1(800) 445 0243

Eco Waste Solutions: Ontario, Canada <http://www.ecosolutions.com/> Contact: Jean Lucas 1(866) ECO-BURN

Communities Using Incinerators .

Community	Skagway	Egegik
Contact	Bob Ward, City Manager, 983 2297	Joe, Operator, 439 4390
Population	880 (with 580,000 visitors in the summer)	150-1500
Incinerator description	Skagway chose to purchase an incinerator when their landfill was running out of space and other landfill locations were hard to find. The community of 880 people generates approximately 8 tons of garbage per week during the winter and 8 tons of garbage per day in the summer (i.e. cruise ships). The City of Skagway worked with an engineering firm and ADEC to develop and permit a lined ashfill and purchase a waste oxidizer incinerator.	The Bristol Bay salmon fishery causes the population of Egegik to increase from 150 in the winter to 1500 in the summer. Egegik chose to purchase a batch oxidation incinerator in 1995 to help manage their increased waste stream. The incinerator is located about 1.5 miles from the community and it produces no black smoke, only clear emissions.
Incinerator Model	Waste Oxidizer by Eco-Waste Solutions Inc. of Burlington, Ontario. The incinerator includes: 2-primary (waste) chambers, 1-secondary (afterburner) chamber, 1-exhaust stack, 1-operator control system, and automatic operation.	Batch Oxidation System, 3 ton per day batch unit from Enerwaste, Washington. The incinerator was purchased in 1995 for \$226,100 including shipping and an \$18,700 conveyor system. The BOS includes a primary and a secondary combustion chamber.
Maintenance	\$12,000/yr. An automated, operator control system is installed for minimal labor and efficient use of fuel. Trouble-shooting and diagnostics are done via a modem and telephone line to reduce the need for on-site technicians. The operator control system is supplied with computer workstation that is located near the equipment and at the public works building in town. This workstation also automatically records operating parameters and makes them available for printing and record keeping.	\$6,000/yr. A maintenance person (recommended by the incinerator company) comes out once a year. He usually comes out in the spring (before summer burning) for about 6 days at a cost of about \$6,000 (his charge is \$85/hr). Operation of the incinerator is controlled by a programmable logic controller. Control of the incinerator is based on temperature, measured by sensors in the primary and secondary chambers. The operator is able to adjust for different waste types (e.g. fish waste or pallets) by setting a timer that determines the length of the burn cycle.
Fuel	Fuel costs are the most expensive part of Skagway's operation at \$53,000/year (FY 2002). Fuel issues are driven by Skagway's commitment to no visible emissions.	\$11,400/yr. Egegik burns 3.5 tons/day of waste in the summer which uses 55 gal/day of fuel (fuel is \$1.32/gal). In the winter the population decreases and they burn only once or twice a week.
Electricity	Electricity costs are included in the fuel costs above.	\$2,500/yr
Labor	Two full time employees operate the incinerator facility.	One full-time city employee is responsible for operating the landfill, incinerator, collection, and other waste management services and works 7 days/wk 8hrs/day in the summer and 5days/wk 4 hrs/day in the winter. 2 people would be ideal because the job is a lot of work.
Building/location	The building is located 6 miles from the community and has 3 levels, fuel and water storage tanks, and fencing/gating. Loose residential waste is visually pre-screened for recyclables, hazardous wastes and non-combustibles on the 3 rd floor of the facility. Then the waste is dropped down into the primary chamber on the 2 nd floor of the facility from a conveyor system (located on the 3 rd floor). The top hatch to the primary chamber is then lowered and closed.	The incinerator is located at the City landfill and housed in a split-level prefabricated building. The incinerator is on the lower level of the building, which enables waste to be loaded using a conveyor into the top of a tipping floor on the upper level. The building is 60x60 and cost \$325,000 which included a water/sewer/fuel storage and a fire suppression system (sprinkling system - 400 gpm water for one hour, programmable controller, infrared flame detectors, and alarms for malfunction, and discharge states).
Ash disposal	A specialized pneumatic and hydraulic rake is used to scoop ash out of the incinerator. Hinged floor grates open and ash falls through the floor into the ash storage vault below on the 1 st floor of the facility. The volume of the storage area is sized so that ash need only be moved from the building to the lined ash disposal area 2 or 3 times per year by a Bobcat loader. The "ashfill" is lined and drains to a 65,000 gallon leachate collection pond at its lower end.	The operator spends about 30 minutes cleaning ash from the primary chamber. Ash is then removed and transported to the landfill using a cart towed by a four-wheeler.
Opinions	Skagway did not choose an incinerator because it was the least expensive alternative. They decided to develop this facility to have their own control over the long-term management of their solid waste, and to have a solution that was environmentally sound. They are fortunate to have financed the project through means other than the garbage rate base, which keeps down costs to residents.	Egegik's incinerator is running well except for the odd problem with the electrical circuitry. They have the incinerator on pallets to increase airflow. Fuel usage is a little high but not really a problem for them.

Communities Using Incinerators

Community	Red Dog Mine	Akutan
Contact	Mike Shireman, Cominco, 426-9147	Joe Berskin, City of Akutan, 698 2228
Population	300-600	80
Incinerator description	Red Dog Mine uses a large incinerator for all of their waste disposal, and a small construction camp incinerator for backup when the main incinerator is down for repairs. Red Dog Mine is heavily regulated for emissions - when incinerating, there is black smoke for 90 seconds and then the emissions are clear. The incinerator burns thoroughly and at high temperatures. They find that feeding the incinerator a bit at a time (rather than jamming it full) allows for a cleaner burn. When bags of oily rags come in, the operator will tag them to keep track, and burn one per cycle. One bag enhances the burn, but more than one bag could be dangerous. Sewage sludge has been successfully burned as well.	Akutan has been using an incinerator for 5-6 years. The incinerator is run 3 times a week and produces clear emissions (little to no black smoke). The community picked the location for the incinerator to be about 1/4 mile from town (they wanted to locate it as far away as they could). The community did the shopping for the incinerator themselves and didn't hire a contractor.
Types of waste	The majority of waste generated is mostly food waste, food wrappings and office paper. 1,500 lbs of food waste is put into the incinerator first thing in the morning and burned for 4-5 hours. 500-1000 lb loads of more food waste are added throughout the day for a total of 3,500-5,000 lbs.	Typical community wastes.
Incinerator model	Red Dog Mine uses a John Zinc Incinerator from Industrial Boilers and Controls Inc (contact: Harvey Brunslowe in Anc. 562-2827). It is a 1,000 lb/hr incinerator with a primary and secondary chamber. The primary chamber runs for 5 hours each cycle at 1,400 degrees and the secondary chamber runs for 8 hours each cycle at 1,800 degrees. There is also a hydraulic feeder that automatically opens the incinerator, forces in the trash, and then closes the incinerator.	Akutan uses a Controlled Air (model 300) 250lb/day incinerator from Advanced Combustion Systems, in Seattle, and is EPA approved.
Maintenance	Red Dog Mine has been running their incinerator for 12 years. They say it's a good incinerator but it has a lot of electrical problems (there are a lot of controls etc. to go wrong). They have electricians on site who perform most maintenance. Maintenance costs could be lower if a dedicated full time operator was able to trouble-shoot incinerator problems, but the operator has many daily duties and does not have time to tend to breakdowns. They think that maintenance costs would be very high for a community using their incinerator if trained electricians weren't on site. Each day ash is emptied, and the incinerator is cleaned.	Exact maintenance costs are hard to determine because a salaried maintenance person fixes/maintains most equipment in the community when needed.
Fuel	Red Dog Mine played with the incinerator controls to achieve the most efficient burn. They used to burn 386 gal/day of diesel, then went to as low as 136 gal/day, but had to readjust to the current 230 gal/day. They burn for about 11 and 1/2 hours each day, and spend approximately \$100,000/yr on fuel.	\$4,655/yr. Fuel usage for the year 2000 was about 3,500 gallons @\$1.33/gal.
Electricity	Unable to determine electricity costs.	Exact electricity costs are hard to determine because a generator is used for the incinerator as needed.
Labor	One person collects garbage and operates the incinerator. The incinerator is feed every hour.	One person collects garbage and operates the incinerator.
Incinerator building/ location	The building to house the incinerator is 25' x 45' by 20' high. There are two roll-up doors on the side where two trash dumpsters can roll in. One roll-up door in the back leads to a dumpster that holds ash. The building has an auxiliary heater, but is not insulated and does not have a concrete floor. The building cost \$400,000 (including materials).	Incinerator is in a building ¼ mile from town.
Ash disposal	No special monofill. Ash is buried at the landfill.	Akutan has a temporary dumping permit from EPA/DEC to dump ash in the bay, and are waiting to construct an ash monofill.
Dumpsters	Covered dumpsters are used to keep the ravens and foxes out. All garbage is bagged. Open dumpsters are used for regular trash that is taken to the landfill. All dumpsters also have swing-out doors in the back, for ease of loading/unloading.	Information unavailable
Opinions	Red Dog Mine recommends the incinerator that they use but also recommend employing a dedicated full time operator who is trained to perform incinerator maintenance.	Akutan is very happy with their incinerator. They haven't had many problems. Their one complaint is that it burns a lot of fuel, which is costly.

Communities Using Incinerators

Community	Chignik Lagoon	Tuntutuliak
Contact	Laura Stepenhoff, Chignik Lagoon Council, 840 2281	Robert Enoch, 256 2529
Population	103	370
Incinerator description	Chignik Lagoon purchased their incinerator in 1993 and used it for 6 years for their waste disposal. They recently had a new landfill constructed so the incinerator is now used only when things freeze up. The incinerator ran really well until PHS accidentally put a pressurized container in it and ruptured a section. When the incinerator was in full use, it was operated one to two times a week in the winter and three to four times a week in the summer. One Bobcat would take the dumpsters of trash from town to the incinerator. <i>The annual costs below relate to when the incinerator was being used full time.</i>	Incinerator installed in 1995 to clean up the old dump. Now it is used only every so often due to fuel costs. To save fuel, it is now only used to burn the ¼ of wastes that can't be open burned at the dump-- including plastics, waste oil and clinic waste. They burn almost every day at the dump and only burn once a month, sometimes less, at the incinerator. They have a garbage collection service and encourage people to sort their trash at home (aluminum for recycling, and plastic, etc. for the incinerator). They have approvals from the Coast Guard and EPA to burn oil and clinic waste.
Incinerator Model	Chignik Lagoon uses a Controlled Air incinerator (model 200) from Adv. Combustion Systems. It was purchased in 1993 for \$36,383, shipping cost of \$2,575 (including extra features below).	Adv. Combustion System's 150 lb/load, 2 stage incinerator
Maintenance	Maintenance is performed by the operator.	Difficult to determine an annual cost for maintenance because it occurs on an as-needed basis. The sensors, which control temperature and burning, are cleaned every burn because they get sooty very easily.
Fuel	\$7,200/yr	Tuntutuliak's incinerator uses 55 gal of fuel per 8 hour burn (fuel in Tuntutuliak is about \$1.97/gal).
Electricity	\$12,000/yr (Electricity costs \$0.37/kw)	A portable generator is used to power the incinerator which uses about 2 gal per 8hr burn. The generator restricts the length of time the incinerator can be operated. Tuntutuliak is currently looking for a larger portable generator.
Labor	\$28,000/yr. When the incinerator was in full use, the operator performed multiple jobs including incinerator maintenance and hauling the garbage. His wage was \$60/hr.	One person generally operates the incinerator.
Building/ location	The incinerator is sited on a hillside in a covered building about 1/3 miles from town (the hospital advised where to locate it). The incinerator has an access road and is easily accessible (more so than the landfill). The materials and shipping for the building cost \$18,380. The City of Chignik paid an additional \$9,000 for labor. The building is a 20' x20' steel and cement structure. Fencing around the site (from All City Fence in Seattle) cost \$2,966.	The incinerator is located outside (uncovered) at the dump, about ¼ mile from the community.
Ash disposal	When in full use, ash was put into a dumpster that filled up two times per month. Ash was buried at the old dump.	Ash from the incinerator is disposed of at the community dump (no separate ash monofill).
Installation	The City actually installed the incinerator, but they paid \$6,200 (airfare and lodging included) for someone from Adv. Combustion to put in the electrical components and do a start up test.	<i>Information unavailable</i>
Extra Features	Chignik Lagoon has the following extra features with their incinerator: Waste oil burner (\$4,703) that hooks onto the side of the incinerator (however it's much too small – in order to use it, someone has to continuously feed it); Two stainless steel racks (\$2,442); One stainless steel spark door (\$540); Tools for pushing garbage in and out (\$306); Outside weathering kit (\$500). Six dumpsters (\$6,456).	<i>Information unavailable</i>
Who/how ordered	Chignik Lagoon got a HUD grant for the incinerator and Chignik paid the rest. It took some time for the grant to come through. The grant was \$90,000 and Chignik put in \$40,000 plus free admin. and installation. They had priced everything but weren't able to buy for 1.5 years so they had to add 10% to their costs.	A construction superintendent and VSW engineer worked on the pricing, ordering and setting up.
Opinions	Fuel and electricity costs were very high to run the incinerator - running the landfill now is a lot less costly.	They would use incinerator more often but fuel is too costly for them. The fuel, cleaning the sensors, and using a portable generator are their main complaints.