

Solid Waste Solutions in Rural Alaska



Substantial and Lasting Impacts on Health and Environmental Risk Reduction

Village Examples of:

- Providing Frequent Landfill Access Maintenance
- Minimizing the Affects of Erosion and Flooding
- Using Best Management Practices for Burning
- Reducing Purchase and Generation of Toxic Materials
- Staging Materials for Reuse in the Community or Backhaul
- Participating in Community Education and Outreach Efforts
- Additional Success Stories from Rural Alaska



Prepared by the Institute for Tribal Environmental Professionals, Zender Environmental Health and Research Group, and Alaska Villages with support provided by the US Environmental Protection Agency.



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This document seeks to provide examples from rural Alaska that will allow villages to take the relevant issues and make local decisions of how best to allot their public health and solid waste management resources and which waste type components are best addressed short-term and which waste type components are best addressed long-term. Community residents can be educated by well-informed staff that their participation in backhaul is highly desirable (and often leads to participation in other useful activities), but carrying out individual sound practices daily with their waste disposal, such as care in access maintenance, minimizing the affects of erosion and flooding, ceasing in-town barrel burning, keeping away from the dump site during burn hours if burning occurs, and reducing purchase and generation of toxic materials, produces a much more substantial and lasting impact on health and environmental risk reduction.

Detailed information for the topics addressed in this booklet can be found throughout web site resources such as <http://www.zender-engr.net> and <http://www.ccthita-swan.org>. The intent of this booklet is to compile brief explanations to high risk situations that may be common in rural Alaska villages and offer examples of how some villages have addressed these issues. We have only touched a handful of villages in preparing this document and hope that by reading through these success stories, you may be encouraged to send your pictures and stories to stories@zendergroup.org. Zender Environmental Health Group, a non-profit, will collect your stories to share with other Villages, what you have learned by posting to solid waste websites, and developing future informational booklets specific to rural Alaska issues. Your information will not be incorporated without contacting you first to make sure that what is written is okay and that you are credited.

Upgrading and Providing Frequent Maintenance to Your Landfill Access

Human and environmental health concerns are greatly reduced and the size of your dump can be controlled by upgrading and providing frequent maintenance to your landfill access, which will be addressed here. If you are looking for a more comprehensive list of practical and cheap tips for making your dump safer, please reference Making Your Dump Safer For You and Your Community: An Operator's Workbook at http://www.zender-engr.net/docs/making_your_dump_safer.pdf

WHY?

Without good access to your landfill, people are at higher risk of injury and more likely to track contaminants from the landfill to the community and into their homes. This concern is greater when considering the dumping of honeybuckets. Visualize what contaminants from your dump may be tracked back to the village roads and boardwalks on people's shoes or tires. Contaminants such as chromium, lead, and diesel from batteries and used oil may have possible health consequences that can result from ingestion, inhalation, or contact with these chemicals. One possibility of ingestion or inhalation is from the chemicals adhering to dust particles that are breathed in after being stirred up by four-wheelers.

A more detailed summary of health and environmental considerations of open dumps can be found in Chapter 3 of A Guide to Closing Solid Waste Disposal Sites in Alaska Villages at http://www.zender-engr.net/docs/site_closure_guide.pdf

As stated in Left Out In the Cold, "Poor dump conditions can often lead residents to use alternative means of waste disposal that can actually increase their health and environmental risks. Besides increased waste burning, resulting disposal practices can include long-term storage of wastes outside of homes, increasing household vector risks. Residents may make use of an out-of-sight river dump or other dump site that is easier to access; thus increasing water contamination risks, and extending the problem of uncontrolled dumping to other areas outside of town. But away from town is where subsistence fish camps and hunting grounds are often located."



Community poster developed by air quality training participants to illustrate the possible contaminants transported from the dump in road dust.

WHAT?

Upgrading the Access to Your Dump: Make it easy to get in and out of your landfill so that residents will use the landfill and dump wastes (and recyclables) in the appropriate areas. What makes access easy? Do residents use 4-wheelers, snow machines, trucks to haul their trash to the dump? Is there enough room to get into the appropriate dumping areas and easily turn around without having to back up?

Frequent Maintenance: Maintaining your dump access is also an important part of encouraging proper disposal at your dump and keeping residents from tracking contamination back to the village. Access will also help prevent your dump from “growing” toward the village. Without access to the designated dump area, residents will dump where it is most convenient. Have you noticed that if one bag of trash is dumped in a place where it doesn’t belong, it acts like a magnet for others? A bag of trash near the entrance to the dump makes it easier for the next person to believe it is okay for them to drop their trash their too. If the dump access is not frequently maintained, trash may build up and block the way to the proper disposal area. Keeping your dump maintained of these misplaced bags/items can greatly improve the overall life of your dump.



Difficult access and no turnaround is posing additional health risks and increasing the amount of space needed for this dump.

Additional information on health risks caused by dumps and best management practices can be found in:

[Left Out In the Cold](http://www.zender-engr.net/docs/swm_health_risk_stats.pdf)- Solid Waste Management and the Risks to Resident Health in Native Village Alaska at http://www.zender-engr.net/docs/swm_health_risk_stats.pdf

[Solid Waste Procedures Manual for Municipal Class III Solid Waste Landfills](http://www.dec.state.ak.us/eh/sw/Factsheets/Class3Manual.pdf) at <http://www.dec.state.ak.us/eh/sw/Factsheets/Class3Manual.pdf>

WHO’S DOING IT?

Koyakuk

Koyakuk has a circular drive that residents use to access the open cell at their dump. They use movable plastic fencing to close off portions of the dump and to create access for where people should dump. Here is how they were able to upgrade their dump with improved access that is easier to maintain and encourages good dumping procedures by the community.

A construction company was planning to perform work in Koyakuk and would significantly increase the population from 89 to 119 with the construction company employees that would be staying in town. The Koyakuk environmental department asked the construction company to upgrade their dump site. Leona first called Tanana Chiefs Conference (TCC) to ask advice and TCC gave the construction company, Nippo Construction, a call to see what their plans were. TCC said that since they were significantly adding to the population, they should donate assistance to the community for the waste generated and Nippo agreed. Here’s what Nippo construction did:

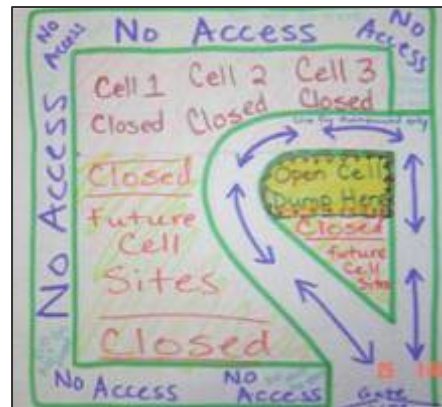


Diagram of Koyakuk dump.

- gave them fish totes for batteries and eight empty 55-gallon barrels, and lined wooden boxes for shipping the barrels
- hauled some batteries and scrap metals to the barge landing
- backhauled the materials
- upgraded the dump - they closed a cell and opened a new cell and stockpiled six loads
- gave them moveable plastic fencing to close off portions of the dump and to create an access for where people should dump
- gave them 40 supersacks to put steel and old insulation in them
- extended the salvage area



Signs and blocking access to roads will also help to ensure community members dump properly as seen here with the Koyukuk dump.

Leona also shipped out eleven 55-gal barrels to Galena (folks from Galena came down and transported them by boats in three trips).

Contact: Leona Leonak_koyenviron@yahoo.com

Minimizing the Affects of Erosion and Flooding

Human and environmental health concerns are greatly reduced by minimizing the affects of erosion and flooding, which will be addressed in this section.

WHY?

Water in contact with solid waste presents a real problem. Water changes the physical and chemical make-up of the solid waste and the resulting leachate can contain chemical and biological contaminants. For many villages the two biggest challenges of water coming into contact with solid waste are due to flooding and erosion. Changes in weather due to climate change have resulted in more frequent and severe storms which erode shorelines, and river and slough banks. The erosion can cut into old and existing dump sites and deposit dump site contaminants into subsistence rivers and sloughs. Many villages are also experiencing more frequent and more severe flooding. The flood waters can pass through dumpsites collecting solid waste and contaminants and deposit them over tundra and into rivers and sloughs.



WHAT?

In so many of the cases moving an old or existing dumpsite to avoid flooding and erosion is just not immediately possible. Also, erosion control projects for banks and shorelines are costly and are mostly put in place where houses and roads are in danger. In addition, it may not be possible to get to a dumpsite with a piece of heavy equipment or heavy equipment may not be available to move the solid waste away from shorelines and banks. More and more villages have to depend on their own solutions and local resources to protect the tundra and subsistence waters from dumpsite erosion and flooding contamination.

Often people pick the easiest way to dispose of their solid waste. Sometimes this means throwing out the solid waste at the edge of rivers or sloughs. Educating the people about contamination from solid waste and encouraging them to dispose of their solid waste in a dumpsite away from the bank of the river or slough is one step that can be taken to minimize the solid waste contaminants that erode into rivers and sloughs. As for the solid waste that is already on the banks of the rivers and sloughs, some villages have organized people to work to move the solid waste from the banks of the rivers and sloughs by hand. This is hard work, but it can be done and has been done (an example is the village of Nightmute – see below). It is important that the workers have proper gloves and boots to do this work. In places where there is not the right type of soil or material to build a berm around the dump site to keep out flood waters, fencing can be one way to contain the solid waste in the dump site when it floods (an example is the village of Kwigillingok – see below). Moving or closing a dump site located in an eroding or flooding site takes planning and funding. This can be a long range goal as these other local solutions are put in place.

WHO'S DOING IT?

Native Village of Nightmute 2003

In April 2003 the people of Nightmute recognized an environmental disaster was ready to hit their village. Due to erosion, one edge of the solid waste dump for the village was on the bank of the Toksook River. Usually heavy equipment is used each winter to push the solid waste inland and away from the river bank so that breakup and the natural erosion of the river doesn't result in all of the trash falling into the river. This year the ice was not thick enough for the heavy equipment to go across the river to the dump, and weeks before breakup more than 3 TONS of trash was at the edge of the river ready to fall in.



Jimmy George, Christopher George, David Tulik, Roseanne Joe, and Ferdinand Matthias of Nightmute

With the assistance of the former EPA Tribal Coordinator, Jimmy George and his assistant, Ferdinand Matthias, the people, the city, tribal governments, the school, businesses, and other organizations of the village came together to tackle the problem. The dump site was moved 100 feet from the river, a salvage area was set up for metal waste, and fencing and signs were put up to help direct people to the best place to dump their trash. Below are a few of the before and after pictures of the incredible efforts and work accomplished.



Summer dumpsite along the eroding river.



Uncontrolled trash at the summer dumpsite.

Volunteers arrive at the dump site, put on their personal protective equipment and begin the laborious task of moving the dump by hand! A boardwalk was made to transfer the filled supersacks away from the riverbank. It took at least four people to drag the supersacks up onto the cart on the boardwalk.



Clean-up crews hauling trash from the river front.



Clean-up crews hauling trash from the river front.



Dragging supersack over the trash.

The improved dump location with fencing and boardwalk access from the river to the appropriate dump area.



To improve the future use of the dump, Nightmute has added good signage and a salvage area.



Native Village of Nightmute 2007

Nightmute received a Denali Commission Solid Waste Grant to purchase a burnbox and carry out a demonstration cleanup, making use of super sacks as a berm to contain their wastes. The following write-up was developed by John George, IGAP Project Director and David Tulik, IGAP Technician Assistant to describe Nightmute's project activities to date. The project will be completed late summer 2007.

Narrative by John George, IGAP Project Director and David Tulik, IGAP Technician Assistant:

On April 23, 2007 in the morning John and David assembled the trailer mount. In the afternoon we hooked up the Burn Box to the IGAP Honda and took it through the lagoon road to the river where it is the best avenue to get it across the riverside. We went on to the river and just below the CVRF Fishery Support Center building the trailer right wheels got stuck in the snow, we tried to pull it using one Honda, but unfortunately one Honda was not strong enough to get it unstuck. After trying to get it unstuck several times, we decided to go to the Tribal Office and ask the tribal janitor if it would be ok to use the Clinic Honda, because one Honda was not strong enough to pull the six (6) thousand pound burn box, after we got the approval we went up and link up the two Honda with a strong rope like a train, since the ice and snow was too slippery, the trailer did not move.

While we were trying to move the burn box Mr Jay Dull Sr. LKSD janitor stopped by and decided to voluntarily attach the LKSF snowmachine to the front of the first Honda, which we end up with three vehicle in a chain like. We kept pulling and pulling and out of the blue the trailer got unstuck, and it move all the way down, close to the dump site, but hundred (100) yards to the dump we got stuck again, this time the left wheels got stuck into the snow about six (6) to seven (7) inches deep, this took about one and half hour to get it unstuck. While we were trying to get it unstuck from this area, Elder Moses Tulik who is also an ATS agent came by and started helping out, when it finally got unstuck, I decided to go get the burn barrel mats from the clinic connex where they we're stored for the winter to place on the snow to prevent the burn barrel from getting stuck again, while I was at the connex Isadore Tulik stopped by and asked what the mats we're for, I told him that they would be used to prevent the burn barrel from sinking into the tundra, so I asked if he would be able to help us bring up the burn barrel by the dump site he agreed.



When I came back Mr. Jay Dull Sr. had left to work at school, but Elder Moses Tulik stayed with us until we got to where the burn barrel will be stable from sinking into the tundra. When we got close to the river bank the two Hondas couldn't pull the burn barrel any longer, so we attached Isadore Tulik's snowmachine in the front of the first Honda, since river slope close to the river bank was some what at an angle and the three vehicles couldn't move the burn barrel, so I decided to make an announcement over the VHF radio that Moses was carrying, for more help, few minutes later Mr. Foster Wallace and Aaron Sunny came to aide us, and we we're able to bring it up by the dump site. When we got to a good location we placed all five (5) mats under the barrel burn barrel. Before we moved the burn barrel across the riverside, David and I had to access the river and what area would be the best place to put the burn barrel.

This statement is only for one day of work on the burn box.

May 21, 2007

Tundra Bag Demonstration Clean-up Project of the Dump Site, Beginning 5-21-07 to 5-30-07

In this morning John and David gave safety briefing, hand out protective clothing, masks, boots, gloves, to each workers, assigned job duties, addressed what should be burned and what not to burn. We watched the video on "Burn Unit Demo", at the resident of Joseph Tony's house, so we or they will know the operational of the burn barrel unit. The hired residents were, James Joe, Edward Joe, Kenneth Sunny, Joseph Tony, John and David took the equipment and supplies to the work site and brought two bundles of super sacks to project area.



We had made an announcement of the VHS radio to see if any of the residents would want to rent their boat and motor for the whole project period. John made a rental agreement and presented it to President, Joseph Post to review it and sign. Took the IGAP four wheeler Honda and Trailer across the riverside to the project area, for the use of hauling super sacks once they are filled up with solid waste trash. I have contacted and talked to my technical partner to ask for permission to buy refreshments to energize the labor workers. So we have filled out a purchase requisition form to buy from Nightmute Enterprise, and Chinuruk Inc. stores.



The first protective breathable coveralls had minor problems, they end up being torn when they reach out or step too far, and protective gloves sweat too much on the inside, so we talk to our labor workers, what's best or a good way to protect themselves from contaminations. The best option was buying duct tape to patch the holes and tears. Since the first patch of safety gear, were no longer usable we ended up



ordering the yellow safety gear to replace the white ones. The work begins at 8:00am in the morning and ends at 5:00 pm.

Before the project began, John and Annmarie Matthias our Accountant drew \$5,300 from VRS to cover for the salaries and boat rental, and drew more funds ranging from \$193.02 for freight difference of the IRA Totes for batteries which cost at \$1,530 that were ordered from Arctic Wire plus \$360.31 for safety gear from Alaska Safety and to pay for the consultant services that have been helping us with grant administration forms and reports and planning and shipping for the bags and burnbox at \$3,600. We purchased the Tok Welding Burnbox for \$20,300 (not including shipping). The supersacks cost \$2,160 (not including shipping).

On the first day of the project we bagged 13 super sacks and we began cleaning from the east end of the dup site and work our way east, on the second day we bagged 19 super sacks and the total bags we filled on the first day was 40 bags. The bags were filled half full and towed to the berm creation which is location about 100 to 150 feet away from the river bank, once the bags are put in place we use a four trailer to top off each bag to square them off. So far the total bags we have filled is 70 bags in just 1 week and one day. The burnables, salvageables, electronics, and recyclables we separated. So this way they would end on bagables. We have picked 3 TRA Toes with acid batteries and they weigh at 3,886.5 pounds, which Coastal Village Region Fund (CVRF) is willing to back haul them out of Nightmute for free and for one time only which we are fortunate to get this service. We have one more TRA tote to fill in once the



power plant operator brings it to the makeshift storage site, which may bring the total to 4 or 5 thousand pounds of acid batteries. Before the project began, John George IGAP project director has been soliciting to Larson Hunter, one of the CVRF workers to see if they would find a way to back haul acid batteries out of Nightmute. At first CVRF would be able to back haul them but John kept on persisting, and several weeks later he got the okay from the CVRF barge manager. CVRF will pick up the totes sometime in June on the first barge.

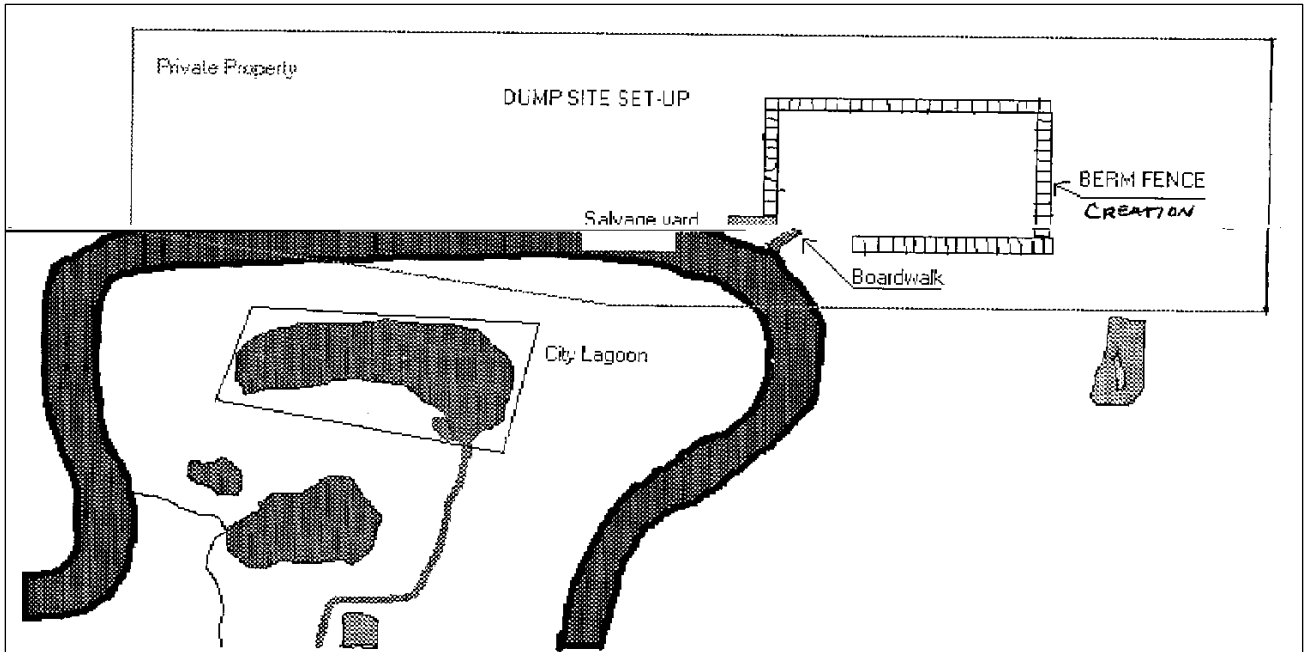
Some of the workers were also sent to the clinic to follow up their scheduled appointments which were made before the start of the project. Edward Joe has been laid off because he has to attend to his surgery in anchorage and was immediately replaced by the standby applicant Morgan Joe. The picture of the volunteers that helped us haul the burn barrel to the dump site will be taken once they return to Nightmute from the summer relocation. On the May 30th laborers have bagged at least 19 bags from the river bank site. We have moved our cleaning site from the west end of the dump site because the river bank from started eroding due to permafrost melt down. At the dump area we have made a make shift tent out of water proof trap as a bread area, the only time the laborers are brought to the village is noon and the end of work day. David Tulik IGAP Technician Assistant has made a diagram of the dump site set-up (see next page).

Sincerely,

John George, IGAP Project Director

David Tulik, IGAP Technician Assistant





Contact: John George, IGAP Project Director and David Tulik, IGAP Technician Assistant, 907-647-6216

Native Village of Kwigillingok

The Native Village of Kwigillingok carried out a community survey in 2006 and 2007 to document the history of the dumpsite and to identify community solid waste issues. The top concerns of the residents were river erosion at the dumpsite, proper access into the dumpsite, burnable trash, and food waste. The Native Village of Kwigillingok has fenced their dump to help contain wastes during seasonal flood events. However, after the high tide and seasonal flooding occurs, the hazardous pollutants from wastes may leach into the river, contaminating the surrounding lakes and rivers.



As seasonal flood events are combined with high tides, Kwigillingok's fencing prevented waste from washing into the river, becoming navigational hazards, being deposited downstream, and being consumed by fish, birds, and game nearby.



Eroding riverbank next to Kwigillingok's dump.

Kwigillingok currently collects and recycles materials such as lead acid batteries, household and button cell batteries, electronics, fluorescent lamps, and ballasts to help keep hazardous pollutants from contaminating the river. Residents suggest that it is time to close the current dumpsite due to the encroaching river. The land selection for the new dump location has been made and the closure of the existing site and opening of a new dump are now current village projects.

Kwigillingok's has had and will continue to deal with many obstacles during the process of closing an old landfill and opening a new landfill. Their proposed landfill location was restricted by the scarcity of sites that are not prone to flooding and proximity to the runway. Kwigillingok has determined the best option for them would be a mound-type landfill construction to minimize the disturbance to permafrost areas. Excavation in the Kwigillingok area tends to thaw adjacent permafrost areas and these thawed areas often lose several feet in elevation due to melting of ice-rich permafrost, which then makes an area prone to periodic flooding.

If Kwigillingok can receive funding for a bermed landfill design to withstand the undercutting that may occur, their proposed landfill will consist of approximately 2 acres of land surrounded by earthen berms approximately five feet high. Trash will be deposited on the ground surface within the bermed and fenced area. Their proposed 0.75-mile landfill access road will connect the existing lagoon road to the proposed landfill. If there is not any locally available material to construct a bermed dump site, material would need to be barged in. With engineering and environmental assessment work, a new landfill could cost roughly \$2,000,000 and possibly much more. Additional costs will be incurred for constructing the landfill access road.

Examples of Kwigillingok's staged recyclable materials are shown here. Details on staging and backhaul are presented below in the section titled "Staging Materials for Reuse in the Community or Backhaul."



Collected lead acid batteries to be backhauled.



Aluminum cans to be sent out to recycling center.



Household batteries collected in a plastic container.

Contact: Emma Kiunya, IGAP
Coordinator, Kwigillingok Environmental
Services Department,
emmakiunya@yahoo.com, 907-588-8912



Collected electronic waste to be backhauled.

Using Best Management Practices for Burning

Human and environmental health concerns are greatly reduced by using best management practices for burning. For a complete document, please see [Burning Garbage and Land Disposal in Rural Alaska, a Publication for Small Alaskan Communities Considering Incineration and Energy Recovery](#), which provides detailed descriptions of how waste is burned, burning methods and components, regulations – guidelines to success, other resources, and case studies in Alaska. This publication was prepared and produced by the Alaska Energy Authority and the Alaska Department of Environmental Conservation and can be accessed on-line at the following addresses: Alaska Energy Authority <http://www.aidea.org/aea.htm> and Alaska Department of Environmental Conservation <http://www.state.ak.us/dec/eh/sw/index.htm>.

WHY?

The low temperature burning of household waste, that is a result of burn barrels and burn boxes, emits dangerous toxins that are inhaled by residents. Immediate effects may include burning eyes, headaches, nausea, fatigue, dizziness and allergic hypersensitivity. Exposure to smoke from burn barrels and burn boxes may also cause damage to your lungs, nervous system, kidneys, and liver.

A detailed emissions characterization study by USEPA was undertaken to examine, characterize, and quantify emissions from the simulated burning of household waste materials in barrels: [Evaluation of Emissions from the Open Burning of Household Waste in Barrels](http://www.ccthita-swan.org/pdf/burn1.pdf) at <http://www.ccthita-swan.org/pdf/burn1.pdf>

WHAT?

Location, burning methods, duration of burn, and segregation can decrease your community's risk to inhaling toxins:

Location: Ceasing in-town barrel burning and keeping away from the dump site during burn hours can reduce residents exposure to toxins.

Burning Methods: Methods for increasing temperature (such as reducing moisture content) and decreasing the duration of the burn will reduce the toxic emissions.

Duration of Burn: A fast burn will decrease exposure. Less waste and more frequent burns will make a shorter fire and can be more effective with clean, dry materials such as wood and paper. Frequent burning will also help prevent additional moisture from collecting in the waste.

Segregation: Separate all hazardous wastes such as batteries, household chemicals, and oil. You can also lower the toxins by taking out the plastics.

The following information is from [Health Effects of Burning Trash](#), which provides more detailed recommendations for reducing chemical exposure from open burning. The full 4-page document, available at http://www.zender-engr.net/docs/health_effects_burning_trash.pdf also provides a 1-page overview of health effects and a 2-page table describing chemicals from solid waste burning and associated health effects. Resources like these are useful for developing education and outreach materials for your school and community and providing directly to students so that they can create their own posters and flyers.



What to do about dioxin and other chemicals released during burning:

Dioxin is one of the most hazardous chemical compounds to breathe and it causes cancer. It is almost always formed when burning garbage. The only requirements for it to form are: Heat over 400 °, Chlorine, and Organic material. Temperatures of 600° to 1200 ° will form the most dioxin, and at over 1800° very little is formed.

- ◆ **Increase the source-people distance:** Toxicological studies on dioxin showed the potential for health risks within 26 feet of the source of open burning from just 15 minutes of burning. As the burning continues, the impact area widens. If people in your community insist on home burning, move the barrels (or pass an ordinance) so that they are 50 ft (or more) from houses. Locate burnboxes far away, and keep people from the dump during a burn.



- ◆ **Make it short:** A hotter fire will burn quicker, reducing the ultimate size of the smoke impact zone. See www.ccthita-swan.org/pdf/burnbarrelsDEC.pdf and www.ccthita-swan.org/Tutorials/burnbox.cfm for hotter fire designs and tips. Less waste and more frequent burns make a shorter fire, and thus a smaller zone as well. Cooling ash more quickly also reduces dioxins — because ash will be in the range of optimal dioxin-formation temperatures for a shorter time.

- ◆ **Take out the plastic:** You can lower the amount of dioxin formed and its toxicity by taking out sources of chlorine. One of the highest sources of chlorine is PVC. It is 56% chlorine. Some studies show that the amount of PVC in waste is the most important predictor of dioxin emissions (although others state that reducing PVC is futile as there will always be enough chlorine in other wastes to form dioxin). PVC is in plastic containers that are labeled #3, in PVC pipes, many children's toys, vinyl flooring and siding, and vinyl furniture covering. PVC also forms hydrochloric acid – which besides damaging the burnbox, is a major irritant to eyes and lungs, and potentially lethal. These types of wastes are easy enough to take out before burning.



- ◆ **Make it brown:** Another source of chlorine is white paper products, including plates, napkins, cardboard, and office paper. These products are almost always bleached with chlorine. These products are more difficult to separate before burning, unless the households separate them beforehand. Promote non-chlorine bleached products in your stores and schools and offices. White paper without chlorine is available.

- ◆ **Junk the mail:** Go door-to-door if you have to and offer to remove people from junk mail lists. Ask them for the catalogs they don't use, find the phone number to remove their names, and ask them to call (or ask them if you can call). Junk mail contains chlorine bleached paper and lots of heavy-metal based ink, and no one needs it. Send a postcard with your full name and address to the Mail Preference Service, Direct Marketing Association, P.O. Box 9008, Farmingdale, NY 11735-9008. Call Equifax 1 (800) 873 7655 or Opt Out 1 (888) 567 8688 to remove name from mailing lists. Go to www.stopjunk.com, www.the-dma.org/cgi/offmailinglistdave, www.afandpa.org



- ◆ **Write manufacturers** of commonly bought products in your Village and tell them to switch to non-chlorine bleached, soy-based ink, and #1 and # 2 plastics. Write your lawmakers too. Address letters from the Tribe and City – it will pull more weight.

Additional information to assist villages in selecting a burnbox can be found in:

What Type of Burnbox Does Our Village Need? at <http://www.zender-engr.net/docs/Burnbox.pdf>

Additional information on best management practices can be found in:

Solid Waste Procedures Manual for Municipal Class III Solid Waste Landfills at <http://www.dec.state.ak.us/eh/sw/Factsheets/Class3Manual.pdf>

WHO'S DOING IT?

Kiana Environmental Department

Upon learning that barrel burning in town was dangerous to residents' health, the Kiana Environmental Department convinced all of the residents to stop burning in town and to use barrels that were relocated to the dump. Beginning in 2004, Kiana environmental staff started educating the community through newsletters. In May of 2005, they visited homes, stores, and offices to explain why "OPEN BURNING MUST STOP!" and gave them handouts on health hazards of open burning, which was also included in the community newsletters. By June of 2005, Kiana stopped the open burning in their community and relocated the burn barrels to the gravel pit area away from the village.

"The main store had four burn barrels which were being used on a regular basis to burn card board, plastic and Styrofoam. We had to convince the store owner to get rid of their barrels in which the environmental program started making cardboard logs out of their boxes which are available for residents to help heat their homes during the long winter months. We also provided trash hauling service for the offices and clinic. The clinic now hauls their own trash to the burn barrels and burns their own garbage, where before the clinic had three burn barrels outside the clinic facility to burn their burnable trash."

Kiana is a leader in waste reduction technologies, as they also heat their Environmental building with cardboard logs. The environmental program has collected waste oil since 2004 and recently purchased a waste oil to energy converter (WOTEC) to reduce/eliminate used oil disposal. "Thanks to EPA IGAP funds we will be able to make our waste oil usable and save money to heat our local fire hall where the WOTEC system will be installed." They received a Denali Commission grant for a Summit burnbox, which is being installed. The idea of moving waste burning from town to the dump is an important health risk reduction behavior, as in-town barrel burning appears to be much worse for residents' health than keeping the smoke source further away. Kiana's

"By stopping the open burning we are protecting the health of the residents and also it is a better place to live. We do not need to smell the plastic, etc. where in the past it was awful to pass by open burning in our village."



Kiana relocated the residential burn barrels to the gravel pit area away from the village after educating the community on the health hazards of open burning.



Kiana uses cardboard logs and scrap wood to help heat the environmental program's building throughout the long winter months.



Kiana's environmental program has collected waste oil since 2004.



Kiana's Summit burnbox purchased with Denali Commission grant funds.



Kiana's temporary recycling center and appliance staging area.

case, their dump is located a reasonable distance from town and in a usually favorable wind direction.

Kiana has also implemented an extensive recycling program to keep hazardous materials from being burned. The Kiana Environmental Program requested a building from the City of Kiana to be used as a temporary recycling center in which residents drop off appliances of all kinds and lead acid batteries. They also had the school drop off old computers, keyboards, and other equipment that would have otherwise gone to the dump. Although, there is not room inside the building, appliances are also stored here and used for parts and eventual backhaul. By having the temporary recycling center people do not have to go and dig around the open dump anymore for needed parts.

Kiana also has a battery recycling program in which they collect batteries of all kinds. Containers for household disposable batteries were made to hand out to every household and boxes were built for backhauling the lead acid batteries. In the past, batteries were brought to the dumpsite.

Kiana also keeps ink cartridges out of their dump and sends to companies that pay for them. The incoming funds from the cartridges go towards their recycling rewards program.

Kiana environmental program was also successful in recruiting Kemberly Henry for one year of service through Rural Alaska Community Action Program's (RurAL CAP's) Rural Village Environmental Network (RAVEN) program. Kemberly's actions to obtain green cleaning product kits (among many other valuable resources), additional funding for an environmental awareness picnic, and more recycling containers has reduced the amount of household hazardous materials from being purchased and keeps more household hazardous materials and containers from being burned.



Kiana's household disposable battery containers made to hand out to every household.



Kiana's household disposable battery containers made to hand out

Contact: Gloria Shellabarger, 907-475-2252, gshellabarger@zender-engr.net

"We are eliminating a lot of contamination to our land, water, subsistence by not letting the appliances, etc. into our open dump."

City of Sand Point

Sand Point is located on Popof Island, 570 air miles southwest of Anchorage. It is the largest fishing port on the Aleutian chain. The community's unique location allows it to serve as a service and repair center for marine vessels that are headed south to Seattle or north to the Bering Sea. Sand Point is a first class city and is a member of the Aleutians East Borough. Services provided in the community include health, police, fire, water/sewer, recreation, docks, harbor and boat haul out and storage. Sand Point has a population of approximately 952 during the winter months and about 1,200 during the peak summer fishing season. It was founded over 100 years ago as a cod station and has served as a service center for various fisheries since that time.

Solid Waste History

For many years, the community hauled trash to an unpermitted dump located on the main thoroughfare between the airport and city center. In 1999, the City began construction of a new landfill. The project was completed and permitted by the ADEC in June 2000. The landfill has since been re-certified through 2010. The new landfill is a Class III landfill per ADEC standards.

Treatment of Solid Waste

The City of Sand Point collects all trash from dumpsters located throughout the community. Depending on the area served, we will empty these dumpsters 1-3 times per week.

Open burning is allowed in Class III landfills under certain conditions established by ADEC. The old, unpermitted dump had a small burn area that usually smoldered for long periods of time emitting both smoke and odor. At the new landfill, we wanted to continue to burn as much of our waste stream as possible but try and reduce or eliminate the negative effects associated with the old dump.

Our first attempt was to purchase and erect an open Burn Box manufactured by Summit Engineering. While still in use today, this box has both positive and negative elements associated with its use. The pros included ease of operation and cost. We simply drove our refuse collection truck into the box, dumped the contents, drove out and started a fire. The negative effects of the box were, depending on the weather (wind and rain is a constant in the Aleutian Islands) and the contents of the refuse being burned, it would take most of the day to burn and smoke from the smoldering pile was troublesome. Being more than 4 miles from the nearest resident did mitigate the smoke/odor problem to some degree. The Summit Burn Box also warped from the extreme heat and is becoming less and less usable as time goes on.

In 2005, the City decided to try something more 'state-of-the-art' for incineration and investigated several types of incinerators that infused air into the fire to help mitigate the smoke, odor and smoldering that we were facing. After much deliberation, and with the help from a \$75,000 grant from the Denali Commission, we purchased a Burn Box manufactured by Crochet Industries out of Baton Rouge LA. The Crochet unit was erected in 2005 and is in operation today.

Specifics Concerning the Crochet Burn Box

As with any unit, the Crochet Burn Box has both advantages and disadvantages to its operation.



Advantages:

- The unit is self-contained and no power supply is need to the site
- The unit was designed with an air blowing system which infuses air directly into the base of the fire which keeps smoldering to a minimum and a complete burn can be done regardless of weather.
- The unit has replaceable parts that can (and must) be repaired or replaced periodically.
- Waste is loaded into the unit via a hopper. Ash is deposited into the landfill. The ash takes 80 to 85 percent less space that direct burying of refuse.

Disadvantages:

- The unit is much more costly to operate than the Summit model. The City has hired a second Solid Waste operator to work at the landfill. This position cleans the box from the previous day's fire and prepares it for the next cycle. He is also the operator in charge of the actual burn process and keeping the landfill orderly. The other operator collects and hauls refuse to the landfill on a daily basis.
- The unit requires more capital investment up-front (nearly \$200,000 to manufacture, ship and erect) as well as additional monthly costs for fuel and maintenance.

Other Issues:

- All refuse collected must be segregated and appliances, waste metal, batteries, tires and other 'non-desirable materials are removed prior to burning. However, most household waste that is thrown into the dumpsters is burned.
- The foundation of the Sand Point unit could have been better planned. The unit was built on a gravel pad and during the winter months and given the heat generated near the unit, the area around the Burn Box becomes a muddy bog at times. A cement pad and working area would have been more preferable – but also much more expensive.
- The municipal waste generated by city residents will not always provide enough suitable material to produce enough heat to burn thoroughly. Sand Point is fortunate to have plenty of wood pallets from the cannery to use as a base fire before adding municipal waste. This could be an issue with other small communities that has no such 'resource'
- If / when a part needs to be repaired, Sand Point will try to repair it locally. If something needs to be replaced, they will contact Crochet for cost/availability/freight/etc. of the needed part. This unit was a proto-type and not something that is massed produced, therefore, parts are limited at this time.

Cost

As mention above, the initial investment for the Crochet unit was approximately \$200,000, which included the unit with a hopper and shipping to Sand Point from Louisiana. Partial funding came from a Denali Commission Solid Waste Grant.

The City also purchased a small skid-steer loader at a cost of approximately \$50,000 to be used to load the unit/hopper and unload the ash after each daily burn. Cleaning the unit by hand/shovel wheelbarrow is possible but would be much more time consuming and potentially dangerous.

The unit on diesel generated power to operate the hopper as well as drive the blower fans. The generator uses approximately 75 gallons of diesel every week.

Community Contact

You can contact City Administrator Paul Day in Sand Point about the specifics of this unit by calling (907) 274-7561 or emailing Paul at daypar72@gci.net. More information on Crochet Burners can be found at <http://www.ccthita-swan.org/Tutorials/burnbox.cfm>.

ADDITIONAL BURNING CASE STUDIES IN ALASKA

Burning Garbage and Land Disposal in Rural Alaska, a Publication for Small Alaskan Communities Considering Incineration and Energy Recovery provides a summary for the following case studies: burn box in Manley Hot Springs, thermal oxidation unit in Egegik, and thermal oxidation unit in Skagway. These summaries include community contacts, pictures, manufacturers, system descriptions and operation, cost, maintenance, issues and problems, cost of operation, and other models. It also includes a database of incinerator vendors available for small-scale waste treatment. As stated above, this publication was prepared and produced by the Alaska Energy Authority and the Alaska Department of Environmental Conservation can be accessed on-line at the following addresses: Alaska Energy Authority <http://www.aidea.org/aea.htm> and Alaska Department of Environmental Conservation <http://www.state.ak.us/dec/eh/sw/index.htm>.

Reducing Purchase and Generation of Toxic Materials

Human and environmental health concerns are greatly reduced by reducing the purchase and generation (source reduction) of toxic materials, which will be addressed here. If you are looking for a detailed guide for Hazardous Waste, please reference Solutions for Hazardous Waste in Alaska Native Villages at <http://www.zender-engr.net/haz.htm>. This guide was funded by the Native of Selawik through the EPA Tribal Hazardous Waste Program Management Grant and includes, but is not limited to basics of hazardous waste, examples of hazardous waste programs throughout rural Alaska, safety gear and spill response clean-up information, training, starting a program, funding, storing, shipping, writing ordinances, educating the community, testing and sampling, and how to properly recycle all kinds of hazardous waste. Additionally, you may find the 15-page summary, Household Hazardous Wastes (HHW) available at http://www.ccthita-swan.org/pdf/household_haz%20_feb05.pdf, as useful background information for educating your community.

WHY?

What lands in a village often stays in a village or will cost money to ship back out of the village. Therefore, the most efficient way to reduce waste is not to create it in the first place! When you avoid making garbage, you don't have to worry about disposing of it later. This is more important when you consider the potential human and environmental health impacts caused by using and disposing of toxic materials. Many of the dumps in rural Alaska are unlined, leaking, flooding or sitting in or next to lands and waters that people subsist from. When hazardous waste, such as paint thinner, is discarded into these dumps the container will eventually rust out, break down, or get crushed by an ATV, snowmachine, or heavy equipment and the hazardous material will be in direct contact with the soil. Snow melt, rain, and flooding will carry the toxins from the waste through the ground and may affect drinking water sources and local rivers.

WHAT?

Community Education Many people do not know that some of the things they use or buy are toxic or considered household hazardous wastes. The documents above are great resources for developing education and outreach materials for your community. This information can also be used to write up facts in your community newsletters or make regular announcements on the local radio.

Community Involvement Ask households to purchase less hazardous products and use less toxic alternatives. The Household Hazardous Wastes (HHW) document cited above includes alternatives to toxic household cleaners. Find out from your community what non-toxic products work best for them and share this information.

Set up a Reuse/Exchange Facility A reuse center will allow people to bring in leftover household hazardous waste and reduce the purchase of additional products. Products can include items such as paint, paint thinners, partially used household cleaners, and art and hobby supplies. For more information about selecting a good storage / collection center and to see examples, go to http://www.ccthita-swan.org/Tutorials/storing_hazwaste.cfm.

WHO'S DOING IT?

Selawik

Hazardous Materials Exchange Connex: As part of Selawik's Hazardous Management Plan, Selawik environmental staff has set up a Hazardous Materials Exchange Connex. The Connex is for residents to share their household hazardous waste products. Residents bring their products that they do not wish to keep in their house anymore. This will keep their children safe from accidents and the household air safer to breathe. Or these products may be something that is leftover that they do not use anymore. Other people will be able to now use these products. Fewer chemicals will be needed in our community. The stores will need to order less hazardous products because people will share. Household hazardous products should not be discarded at the dump because they can drain into the creek and then to the River.

This Connex is also used for other exchangeable items that are valuable and must be kept indoors.

Open Hours for Materials Exchange Connex: Tuesday 3-5 pm, Friday 12 -3 pm. If the Connex is not open, look for the staff at the workshop or Environmental Department.

Selawik's Hazardous Management Plan clearly describes miscellaneous household hazardous waste products and outlines their program for managing these wastes as well as provide guidance for community, store, clinic, school, staff, and elder responsibilities. The following section is taken directly from Selawik's Hazardous Waste Management Plan:

11. Miscellaneous Household Hazardous Products

There are many additional household hazardous waste products. These include:

- Household cleaners
- Paints
- Degreasers
- Insect sprays, mosquito coils
- Auto and boat care products
- Dyes
- Mold removers
- Air fresheners
- Fingernail polish, Hairspray
- Vehicle Transmission and Brake fluids



All of the above listed products are hazardous because they contain harmful chemicals. These chemicals can leak into the soil or vaporize into the air or dissolve into the water. They contaminate our land and water and can be harmful to subsistence, even if they are not burned. Only if the containers are completely emptied and drained, are they acceptable to end up at the dump. If product is leftover that can be used, discarding it at the dump or in the trash is wasteful. Also, if a product has not been used for a long time, it is safer for children if the product is given to someone else to use. Children can accidentally poison themselves. Discarding leftover household hazardous products is against Inupiaq values.

11.1 Program Summary Any leftover household hazardous materials are brought to the Materials Exchange Shed in their original containers. Other community members may then pick up the containers and bring them home.

11.2 Community Drop-off The community should drop-off their leftovers during the Shed Open Hours (see Chapter 2). If they wish to drop-off their products at any other time, they must arrange with the Environmental Department. It is critical to drop off materials only in their

original container. Without the original container and label, the liability risk is too high. Residents will not know how to use the product, or exactly what it is. At the discretion of the Environmental Department, and with the advice of an elder, any residents who drop off products that are not in their original container face being summoned to a public meeting or other traditional form of reprimand. If the product dropped off is particularly hazardous and the container intentionally mislabeled, the Council will exercise its sovereign power in a way the Elders decide meets traditional justice. If the product causes harm to a community member as a result of the product not being dropped off in its original container, and the community member not knowing what the product was, the person or entity dropping it off can face criminal charges.

11.3 Community Open Hours to Pick Up Shared Materials

The community may use the Materials Exchange (“Share Shed” or “Thrift Store”) during open hours. They may either keep the product, or if there is material leftover they may bring it back to the shed, or lend it to neighbors. With proper use, the Shed should not be any more dangerous than a store.

Community Duty #1: Protect your community and children. Only bring leftover products in their original containers. Be certain that they are not leaking. Before you buy a hazardous product at the store, check the “Share Shed” to see if someone has brought the product there. The less hazardous materials generated in the community, the better for everyone’s health.

Business, School, Office, Utility, and Clinic Duty: Use the Share Shed for any products that do not fall under Subtitle C, or that are otherwise unsuitable for household use. Do not use the Share Shed to discard hazardous wastes. It is against Inupiaq values, and as a business, it is also against federal law. Do not bring material in a volume that is more than what a household would generate, without approval by the Environmental Department.

Staff Duty #1: Educate the public and businesses about the Exchange shed and its open hours. Announce on the scanner and flyers about how subsistence is protected by people using the shed, what types of materials are appropriate, and that original containers must be used. During open hours, this Share Shed can become an additional community socializing place. It will be the beginning of a full-use Thrift Store, and its frequent use will provide a very good justification or additional monies to build or renovate a larger building for this purpose.

Staff Duty #2: Staff the Exchange Shed During Open Hours. Make sure that it is kept organized, like a hardware store would be so that it is safe and pleasant to use. Turn back any containers that are cracked or where the product looks like it is not what it is supposed to be. Be sure to turn away any containers that do not have the original cap, or where the cap/lid does not work anymore. Use a sign-in sheet for any containers that are from businesses.

Staff Duty #3: Evaluate the use of the Share Shed each month. If most people are not using it, find out why by asking community members. Increase education and incentives to increase the use. Everyone in the community should be aware of the shed, as it will save them money and protect their children.

Staff Duty #4: Just before use of the shed has reached a high level of participation and there is not enough room for the products and people, **start looking for funding** to expand the operation. Use the numbers in your monthly evaluations to justify funding.

Staff Duty #5: Safety No smoking. Ensure that a spill kit is always stocked in the Shed or just outside in case a container leaks. Keep safety gear available. Ensure that caps are secure on each container before open hours (and just after closing). If someone has looked at a container but decided to not take it, check to make sure the cap is secure again. The cap/lid helps to

keep this program safe. No smells should be noticeable if the cap is secured. If a smell is noticeable, bring the container outside. Ensure that spill response procedures are posted. If a spill occurs, regardless of its volume or potential harm, clear the shed of any non-HAZWOPER trained personnel immediately. Only small quantities of everyday household hazardous products should be in the shed, so that remediation of the spill should be straightforward. If the spill occurs and the product does not appear to be what the container says, regardless of volume, clear the shed, and evaluate the situation outside the building. Only re-enter with appropriate level of safety gear.

Elder Role Use the Share Shed and bring others when you do. Give the Environmental Department suggestions about how they could make it usable and nice to visit. The Shed should be as clean and organized as a store.

Community Education: Selawik's Hazardous Management Plan clearly outlines educational opportunities for reducing purchase and generation of toxic materials. For example, in a section titled Burning of Plastics in Burnbarrels is Not Allowed, there are the following suggestions for community, store, clinic, school, staff, and elder responsibilities:

Community Duty #1: Try as hard as possible to not buy plastics – this includes containers, bottles, and wrapping. When there is no alternative to plastic, purchase Type #1 or Type#2. These Types some day may be able to be recycled in Selawik ONLY IF THEY ARE SAVED OUT FROM THE WASTESTREAM.

Store Duty: Do not purchase plastic bottles when aluminum cans or glass bottles are available instead. Do not purchase Styrofoam cups, plates, or bowls, and order paper instead. Even if the price is slightly higher, the community health risks that will be reduced are worth it. If the public complains, ask the Environmental Department for Handouts on Plastic and Styrofoam dangers, or ask Elders to announce on the scanner how this step protects subsistence and community values. There is a significant chance that the batteries will contain mercury, even alkaline batteries.



Clinic Duty: Act as a role model for the rest of the community in separating out plastics, and not using plastic or Styrofoam containers. Remind community members when you see them with plastic bottles or burning plastics how it can impact their health and subsistence. Pop beverages in plastic bottles also usually contain a larger volume than aluminum cans or glass bottles. Encouraging the public to stop using plastic beverage containers will likely reduce consumption of sugary beverages. You can remind them how sugary beverages impact Alaska Native health.

School Duty: Have school classes work with the Environmental Department and Stores to make posters or handouts that teach Youth and Adults about why they should reduce or stop buying plastic bottles and Styrofoam. Order only paper disposable products or if affordable, biodegradable disposables made natural materials. These disposables are becoming less expensive, and you can work with the Environmental Department to order these.

Staff Duty #1: Education on the hazards of plastic bottles and Styrofoam. See http://www.ccthit-swano.org/pdf/open_burning.pdf for example of hazards. Staff will work with the School and Elders to educate the public about the importance of reducing greatly their

purchase and use of plastics, and never burning them, especially in town. Let youth know (who are the biggest consumers of plastic beverage bottles) that the reason plastic bottles are made is because they don't get burned in the lower-48, but recycled or buried. If they were open burned, plastic bottles would not be allowed to be made in the United States. They are that dangerous to breathe when burned. Work with them to find a way to recycle the bottles in the future. Show them products (like clothes) that have been made from recycled plastic bottles.

Staff Duty #4: Ensure that the Tribal and City Offices switch to their own plates and cups, or use paper, by reminding people and acting as a role model.

Elder Role Show the community that you don't use plastic bottles or Styrofoam. Remind people over the scanner and in town that burning plastics harms subsistence racks and it is very unhealthy to breathe. Let people know that reducing plastic buying follows Inupiaq values of not wasting materials. Educate youth about Inupiaq life without plastic and chemicals.



Contact: Raven Sheldon, Director, raven.sheldon@akuligaq.org and Lorraine Ticket, Environmental Technician, 907-484-2005, lorraine.ticket@akuligaq.org

Staging Materials for Reuse in the Community or Backhaul

Backhaul is highly desirable and often leads to participation in other useful activities. However, coordinating backhaul efforts can be very time consuming and expensive. There may be other efforts that require less time and money that could take priority. Several of these efforts have greater benefits to environment and health than backhaul. Therefore, if you have limited time and money, it is very important to prioritize your program's efforts based on the goals of your community.

WHY?

Human and environmental health concerns can be greatly reduced by staging some of the materials that you may eventually backhaul. For example, diverting lead acid batteries, electronics, and fluorescent bulbs (to name a few) from the landfill to staging areas will prevent hazardous materials from leaching into the environment, or from being burned which exposes residents to toxic smoke.

Sno-gos, four-wheelers, and vehicles may not need to be backhauled for a long time once the fluids and batteries are removed. White goods (refrigerators and freezers) may also be okay to store for a long time after refrigerant (Freon) is removed and the fluids drained. With fluids and batteries removed, all of these items do not typically pose a serious or immediate threat to the environment or health. This is because it takes a very long time for these items to degrade in the environment. You can see that by looking at your vehicles abandoned many years ago. They are still there. When these vehicles do eventually rust out and disintegrate, the metals are not very harmful, and they do not migrate into the water or through the soil very easily. The plastic and rubber is not harmful unless it is burned, which can release chemicals into the air.

At many landfills, vehicles and white goods do not make up a high portion of the wastes. It is always a good idea to look carefully at your own landfill to see how much these wastes contribute to its area. They do take up at least some space in all landfills and when they are abandoned elsewhere, they can become an "eyesore" or present an injury hazard to children.

"Staging" is a term for making wastes safe and ready to backhaul, to re-use and salvage, or to store long-term. Staging mechanical wastes (items with engines or hydraulics) means draining the harmful fluids and removing the batteries. Staging electronic goods means storing them in a sheltered area where they won't deteriorate. Staging fluorescent bulbs means storing them back in the insulated box they came from, or packing them safely so they do not break. Staging batteries usually



Freon removal in the YK Delta.



Selawik shrinkwraps and palletizes their batteries to stage them for shipping.

means storing them in covered totes. Staging aluminum can mean just tying them up in garbage bags until a plane is ready to take them.

Staging for Backhaul: Staging for backhaul could help in developing a regional approach to a larger backhaul effort when there is funding, equipment, and time available. Your land and environment will be safe in the meantime. Working with more Villages will mean that the costs can go down and the efforts of developing a sustainable backhaul program can be shared.

While vehicles do not present a very high environmental and health risk for most communities, staging can reduce any risks from these wastes *immediately*. Finding a practical way to backhaul may take several years to accomplish. Therefore, training for *staging* may be a priority over *backhaul* efforts for many communities in the short-term.

Staging for Reuse: The community will benefit from staging hazardous materials that may not be destined for backhaul. Recycling companies can make money from steel vehicles, lead batteries, copper pipes, and aluminum cans and boats if they can obtain it from you for no charge. But backhauling hazardous wastes is a different story. Due to strict regulations and logistics, it costs companies more money to recycle these wastes than they are worth. Some wastes like fluorescent bulbs and electronic goods can be posted out, or arranged for free shipping with the regional cargo company. Several villages have accomplished this on their own to send to places like Total Reclaim in Anchorage (561-0544), which has not yet charged villages for recycling these wastes. But hazardous *fluids* have very costly transport, disposal, and handling regulations. A drum can cost more than \$500 to ship out to someone who will accept it. Details and contact information to determine rates of shipping out hazardous wastes from your villages may be found on the SWAN website at www.ccthita-swan.org/Tutorials/shipping_hazwaste.cfm.

The good news is that antifreeze and used oil may be staged and recycled within the community instead of backhauling. Paints, solvents, and cleaners may also be staged and then reused within the community. Again, because it produces *immediate* results in reducing community risks, education may take priority over backhaul efforts.

Used oil program – how to protect more of your water:

Petroleum hydrocarbons, such as used oil, have been detected in several river samples downstream of dumps and in the water in and around communities. A primary potential source for this is thought to be used oil from boat, atv, snowmachine, car, and heavy equipment engines. Although careful maintenance helps,



Double-bagging batteries that are cracked or show damage is one step in safe staging.



Here, palletized batteries, totes with packaged fluorescent bulbs, and shelves of paint and reusable household products are staged in a connex until the barge comes for the batteries and funds are saved for posting the bulbs.



Akiachak is converting an old Quonset Hut into a hazardous waste staging and solid waste Reuse Center. They plan build up their Center to use for future regional staging and backhaul along the Kuskokwim with other villages.

some used oil leaks from older vehicles and is lost no matter what. You can see this when you drain old vehicles for staging. Draining used oil is required for backhauling, and it reduces the risk of used oil contamination. However, by the time a vehicle is abandoned, often not much is left of the oil. The largest portion of recoverable used oil that can contaminate the land and water is through people changing their oil and dumping it.

Think about it. During a vehicles' lifetime, the oil will be changed from 3 to 20 times in Villages, depending on the vehicle and other factors. In newer vehicles, very little leaks so that several quarts of oil during each change can be discarded at the dump, in town on the ground, or by the river (for boats).

Used oil is quite harmful to aquatic life and human health. One gallon of used oil contaminates one million gallons of water to above the standard for human drinking water. Think of a pond that is 6 feet deep, and 150 feet wide and 150 feet long. If a gallon of used oil were poured in and mixed, the entire pond would become contaminated for drinking until the oil and its toxic chemicals degraded.

If a car is drained for staging – you will be draining from nearly 0 to 4 quarts of oil. By draining the vehicle, you will be protecting about a half million gallons of drinking water (if all the oil reached the water and was not diluted by river flow).

But if a used oil collection program is started, you will be protecting that many gallons of water *each time* someone changes their oil and places it in the collector. For that same car, *you can protect 10 to 20 times more water* – 5 to 10 **million** gallons - and help to heat a building at the same time!

So, in communities with limited resources, education and funding efforts for people to not dump their used oil each time they change their oil may need to be the first priority over efforts spent on backhauling once at the end of a vehicles life.

To have an affordable and safe way to store your used oil from staging your vehicles, you will want to operate a used oil program anyway. Storing oil outside for too long can be dangerous due to rusting drums, and it can be expensive to transport.

To set up a used oil program, you just need used oil collection points (either transfer stations or a central workshop with open hours) and, preferably, a used oil burner, boiler, or blender. The total cost for a burner and several used oil stations can be about \$12,000 to \$15,000.



Selawik installs their used oil burner in their workshop.

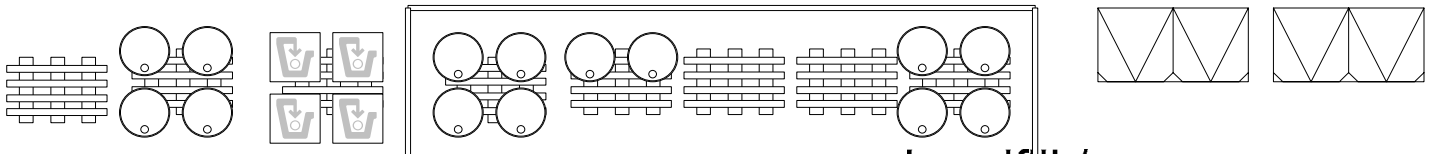


Chenega Bay's electronics backhaul and Freon removal.



WHAT?

The following diagram is an example (provided by Total Reclaim, Inc.) of how a community could stage materials that they want to divert from an unlined dump.



Landfill /
Recycling
Center

Residential Used Oil Collection Stations: Many villages now operate used oil burners to heat a building, and an increasing number are purchasing used oil boilers or blenders. See SWAN for their contact information and the type of used oil burner they use http://www.ccthita-swan.org/Tutorials/oil_burner/oil_burner12.cfm. These villages have success stories in diverting used oil from their environment and saving resources to heat buildings. A common problem however is that not many households participate, so that the bulk of residential used oil is still being discarded on the ground or in the river. That amount is enough to make millions of gallons of water unsafe to drink.

Akiachak is one village that is successfully addressing this issue. They recently purchased used oil stations for residents with their IGAP monies over a two year period. They have placed these stations throughout town and one at the harbor. The bright yellow stations are noticeable and easily accessible at all times, so residents began using them almost immediately. The staff picks up nearly a drum-full of used oil every few weeks, depending on the season. Based on the estimated amount of used oil generated by residents, this amount of oil tells the staff that they are getting really good participation from their community. This is all oil that used to be discarded in the water and on the ground. In other words, **fifty million gallons** of safe drinking water is potentially being protected for every drum collected.



E-Waste

Copper

Aluminum
and Plastics

A used oil collection station purchased by Akiachak. One of two good condition 55-gallon drum(s) are placed inside and changed out when close to full. The grey top is down to cover the barrels or completely close the station.



Akiachak solid waste management community meeting.

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WHO'S DOING IT?

Villages in Northwest Alaska

Staging to Prioritize Health and Environment: Many Villages around the State have begun to work together and with different entities to prioritize how to spend their limited resources to best protect the environment in regards to handling wastes not destined for the landfill. They are planning for staging these wastes now, and carrying out locally-managed and locally-feasible scrap metal backhauling efforts after they have addressed their high priority risks as much as possible. One of these groups is the Northwest Arctic Solid Waste Working Group, comprised of the villages of Noatak, Noorvik, Kiana, Buckland, Shungnak, Selawik, Deering, Kivalina, and Kotzebue. They met to prioritize the regional and village actions needed to reduce their solid waste risks as much as possible, and as soon as possible. The meeting included a training about solid waste health risks, demonstrated staging and problem issues and wastes, and funding.



Northwest Arctic Villages meet to discuss strategies after a training.

They asked the question: What should we focus on? What is the priority to backhaul out of our villages?



They then determined that their priority would be set based on: *Health issues, Traditional values, Available funding, and Convenience/ease (resource use)*. Here are their results:

Priority Ranking of Backhaul 1-10 (10 being highest priority).	
10	Sno-go/4-wheelers/vehicles, removing fluids and batteries is a higher priority than backhauling the vehicles, need training.
9	Plastic, don't burn (education higher priority), stage and consolidate at a hub.
7	Lead acid batteries, training needed.
6	Construction debris, compliance, education, contracts, agreements.
6	White Goods, remove refrigerant is higher priority than backhauling the appliances and need training.
6	Antifreeze, backhaul not a priority, education and recycle in village.
5	Wires, don't burn (education higher priority), store and stage copper, aluminum, and steel separately.
5	Solvent/paint/cleaners, backhaul not a priority, reuse and education is the priority.
5	Styrofoam, education, reuse, consumer choice.
1	Computers/electronics/cell phones, consolidate at a hub.
1	55-gallon drums/scrap metal, designated storage.
0	Tires, don't burn (education higher priority), other uses
0	Fluorescent lights.
0	Waste oil, backhaul not a priority, education and funding for used oil burner.

0	Propane tanks, education is higher priority, stage and recycle when able.
0	Household batteries, education, storing, consolidate at a hub. Propose Alaska Airlines collection centers.
0	Dead animals, No backhaul, education and segregation.
0	Glass, education, reuse (jelly, fish, seal oil).
0	Household furniture, reuse, separate scrap metal, education – don't burn.

They wanted to plan out the steps involved in staging and backhauling used batteries as an example:

What are the steps in staging batteries for transport?

Community and school education:	
1	Most important for getting participation!!
Supplies:	
1	1st aid, PPE (safety gloves, goggles, rubber boots, apron) eye wash, absorbent, placards, manifests, MSDS
2	Buy supplies in bulk (consolidate resources) Can Kotz buy totes?
Hauling/Transporting to airport or barge:	
1	Modified sled for transporting?
2	Equipment: fish totes, fork lift / pallet jack
3	Designated Space (next to transportation choice)
4	Labor / training: proper storage and handling
5	Recruit Volunteers: education (volunteers can flag unknown hazards so untrained volunteers do not handle hazards)
6	Grants / Funding
7	Track Outcomes!
8	Get Recognition! Newsletters
Storage/Staging:	
1	Fuel tanks – cut and cover.
2	Old connexes
Shipping:	
1	What can be outside and what needs to be inside?
2	Know the requirements, determine amount for planning purposes, plan to collect from fish camps.
3	Batteries in Fish Totes: absorbent, layer of batteries, layer of cardboard, layer of batteries, layer of cardboard, etc.
4	Can make tote out of plywood (line with plastic and put in absorbent), seal plastic.
5	5-gallon buckets (paint buckets) with lids and label.

6	Properly label batteries – placards.
Destination:	
1	End destination? Where will we transport materials to? Need regional plan for some materials.
How and when?:	
1	Determine Logistics for each community – Barge? Plane? How often? Some communities do not have barges anymore or never did. Selawik cannot get to their airport very well because the Bobcat forklift would destroy their boardwalks.

Each member of the group volunteered for a task to move their staging and prioritized waste backhauling forward. All of the tasks were completed by the next scheduled teleconference!

Contact: Any IGAP staff at the villages listed above.

The Northwest Arctic group incorporated Elders' wisdom in deciding their staging priorities.



Native Village of Venetie Tribal Government Backhaul Project

The Native Village of Venetie Tribal Government has been orchestrating a major backhaul of items from Venetie. Summary by Lance Whitwell: I was approached by Garry Webber of CATG on plans to begin backhauling white goods, hazardous material, etc. out of our villages. Of course this sounded good to me, as the environmental programs coordinator for the tribe. In early June, I attended a Freon removal tech training in Ft Yukon. As a part of the class we did some hands on training, and I discovered that the procedure is not as difficult as I had imagined it to be. Later on in June, Garry Webber, CATG, came to Venetie for a SWM workshop and to assist with the removal, and packaging of 2 PCB positive electrical transformers that were discovered in town. We discussed pushing the envelope on our newly formed partnerships with our resource agencies. As we have been TALKING for years about backhauling stuff from this area. But we have to fly everything into our villages, because there are no roads into our remote communities. The Air Cargo carrier had made a partnership with the YRITWC to receive backhaul items and transport back to Fairbanks. Since we were tired of talking about it, we decided to test the system:



Lance Whitwell has prepared Venetie's white goods for backhaul by removing Freon and banding them for transport.

So I began a freezer pick up service in Venetie and ended up with 12 on the first day and 3 on the next day. I called Garry in Ft. Yukon and told him to send up the Freon removal equipment on the next mail plane. Kind of in a rush, because we had no idea when the cargo plane would come in and we had to be ready. Rather than sending the equipment, Garry came up too. It worked out really good, because I took all of the freezers to the airport garage, and Garry had brought a banding tool. So we feverishly started removing Freon, then placing freezers onto pallets, and banding them all together. We repacked and banded the battery tote and prepared the PCB transformers in overpack drums. We were set to go and the system worked without any snags.

The EVERTS AIR CARGO plane came in, the VENETIE VILLAGE HOUSING ORGANIZATION used their loader and operator to load our items on the plane and took it all to Fairbanks, the YUKON RIVER INTERTRIBAL WATERSHED COUNCIL picked the stuff up in Fairbanks and took it all to Nenana and loaded it all on YUTANA BARGE LINES' slow boat to Seattle where it will all be recycled.

Contact: Lance Whitwell, NVVTG/ANA Tribal Energy Programs, 907-849-8165

Council of Athabascan Governments

CATG is working with the villages in the Yukon Flats region to assess solid waste issues. Garry Webber, CATG Solid Waste Coordinator, has developed a solid waste tracking system and is working with villages to develop a regional backhaul program. Checklists have been developed for backhauling specific materials such as batteries, refrigerators, and electronics.

2006' CATG/SWC : Village Solid Waste Tracking System

{NAME of Village}

<i>TYPE of SW</i>	<i>Amount/Count</i>	<i>Location in Village</i>	<i>Backhaul Status</i>
<i>Batteries</i>			
<i>E-Goods</i>			
<i>APPLIANCES</i>			
<i>ALUMINUM</i>			
<i>Vehicles</i>			
<i>Equipment</i>			
<i>Used Oil</i>			
<i>Asbestos</i>			
<i>Hazardous Mat.</i>			
<i>Old 55gal. Drums</i>			
<i>FREON/APPLIANCES</i>			
<i>COMMENTS/notes :</i>			
<i>Contact Person & Contact number: Enter here</i>			

CATG has also provided solid waste training in the region by collaborating with Total Reclaim, Inc., Alaska Forum, Inc, Solid Waste Association of North America, Alaska Chapter, Yukon River Intertribal Watershed Council, and Institute for Tribal Environmental Professionals.

Contact: Garry Webber, 800-478-2667, gwebber@catg.org

Newtok

Newtok is, according to Bethel Recycling, the first (and possibly still the only) village to ship out electronic wastes. Despite every sort of environmental and logistical challenge, including the lack of heavy equipment and a dumpsite that is only accessible by boat twice per day due to tides. They have an active hazardous waste program. They have their staff HAZWOPER certified and a Freon Removal certified person and the equipment. They have an antifreeze recycler machine which is getting set up. Much of this was helped by them receiving a hazardous waste grant from EPA. But they took the initiative to draft up this very competitive national grant, with every chance at not getting it, and they got it. Newtok separates out their lead-acid batteries, fluorescent lights, and electronic wastes now. Because they burn, they are also starting to separate out plastic bottles from their waste stream for backhauling eventually to Bethel. Additionally, they are beginning a collection program for newspaper and aluminum cans and household batteries. They developed a hazardous waste and construction waste ordinance and contract for outside projects.



Used Paint

Fluorescent Lights

Electronics

Aerosol Cans



Contact: Margaret Nickerson,
dinning69@yahoo.com, 907-237-2314

Used Oil Containers

Participating in Community Education and Outreach Efforts

Participating in community education and outreach efforts will allow you to reduce the human and environmental health concerns from solid waste by providing enough information to engage community members and students in developing local solutions. Education will help generate an understanding and support for waste management issues in your community. There are many resources for getting started such as those located on the SWAN website at www.ccthita-swan.org/Educating/educating.cfm. This section has been included to reinforce the importance of education and outreach efforts in your efforts toward making local decisions of how best to allot your public health and solid waste management resources.

Appendix 2 of Alaska Native Health Board's Rural Alaska Integrated Waste Management Reference Manual & Planning Resource Guide provides guidelines for public education and community outreach. This resource is available at www.ccthita-swan.org/pdf/anhb_education.pdf.

WHY?

You can not solve the village's problems with solid waste on your own. It is a long-term process that will need many interested community members to find solutions. However, people need to be aware of the problems and perceive the risks before they will take action. How many people stand by and practice the same habits if they are completely aware of the negative impacts to their health?

Education can generate understanding and support for waste management issues, leading to community ownership. People will often take ownership if given a chance to help develop alternatives to existing practices. Many changes will require community cooperation to be economical and sustaining.

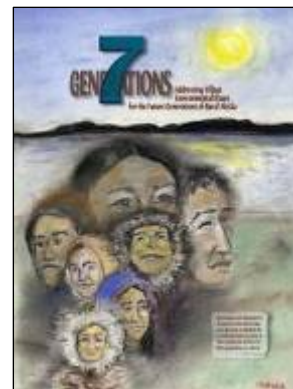
WHAT?

Community education and outreach is a method of providing information to people in your community on issues of particular concern and will depend on the goals of your solid waste management program and unique qualities of your village. Efforts should be consistent and ongoing.

Methods may include, but are not limited to workshops and trainings, door-to-door visits, school activities, special events, meetings, radio announcements, newspaper articles, presentations at community and council meetings, and creating newsletters, posters, and flyers.

The *7 Generations* course, offered by Aleutian Pribilof Islands Association, is designed to assist rural Alaskans who want to accomplish environmental planning and management using a community-based approach. The course manual contains valuable tools that enable a community to prioritize and identify its environmental issues. You can download this manual at www.7generations.us/page3.html.

Alaska Youth Reach Out and Recycle is a guide of educational activities and resources to help youth start recycling programs in their schools and communities. It was compiled by Alaska Youth for Environmental Action and available at www.ccthita-swan.org/pdf/AYEA.pdf.



Changing Waste in Changing Times: Solid Waste and Natural Resource Issues in Rural Alaska – A Teacher’s Guide is a guide that was developed to present activities which inform the teacher and students of solid waste management problems that are becoming commonplace in villages. The lessons included present alternatives for taking care of the environment and contains methods to make not only school children more sensitive to environmental problems, but hopefully to inspire a grassroots program that will address local concerns. For more information or to order a copy of the curriculum, contact Northwest Renewable Resources Center at 1-206-269-2357.

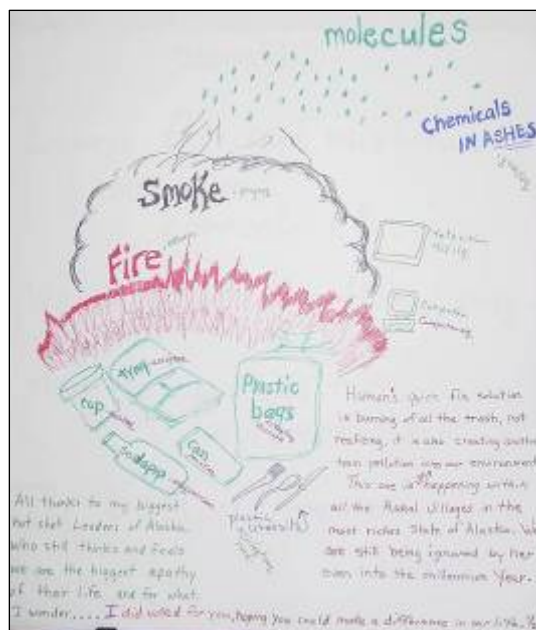
Culturally Responsive Science Curriculum is a useful handbook for those interested in developing curriculum specific to their region. Since 1996, the Alaska Science Consortium has been working with the Alaska Rural Systemic Initiative (AKRSI) and the Alaska Department of Education to help develop standards-based, culturally relevant curriculum that effectively integrates indigenous and Western knowledge around science topics. This work has involved teachers, Elders, Native community leaders, agency personnel, and educational consultants and has taken many forms. This handbook represents some of the thinking and products that have resulted from this slowly evolving and highly collaborative process. It is available online at www.ankn.uaf.edu/Publications/Handbook/.

WHO’S DOING IT?

Many villages in Alaska have established environmental education and outreach programs. The materials that individual Tribes develop may be one of the most important resources to share throughout the State since the issues in rural Alaska are unique and relevant educational materials are hard to find.

Newtok

Margaret Nickerson has been creating educational materials for her village and those in the Nelson Island region as she learns about the hazards of materials that are brought into her community. Below are some examples of how Ms. Nickerson shares information with her community and schools. You can access more education and outreach materials developed by Ms. Nickerson at www.zender-engr.net/margaret.pdf and contact her at 907-237-2314.



Fort Yukon

In December of 2003 students in grades K-9 designed posters in an effort to help educate the community of Fort Yukon on the importance of environmental stewardship and the cultural significance of keeping the land clean. The Council of Athabascan Tribal Governments (CATG) Natural Resources Department in conjunction with the Fort Yukon School bi-lingual teacher introduced a challenging poster contest to the students. A full write-up of the poster project can be viewed at www.ccthit-swain.org/pdf/FtYukon.pdf.



HOUSEHOLD HAZARDOUS WASTE

WHAT DOES HAZARDOUS WASTE MEAN?

Hazardous wastes are solid or liquid materials having certain properties that endanger human health and the environment.

WHAT IS HOUSEHOLD HAZARDOUS WASTE?

Potentially hazardous products that we use on a daily basis. Such as:

- Brake fluid
- Engine cleaners
- Paints and thinners
- Solvents
- Antifreeze
- Degreasers
- Used motor oil
- Drain cleaners
- Flammable patch remover

HOW DO I KNOW IF IT IS HAZARDOUS WASTE?

Three types of labels are used on potentially hazardous products in the home:

1. **CAUTION**—means that one person would make you sick and might kill you.
2. **WARNING**—means that a specialist would get you sick and might kill you.
3. **DAANGER**—means that as little as a taste could cause death.
4. **CARCINOGEN**—means that breathing, touching, or eating the substance increases the risk of cancer for the rest of your life.

PROPER DISPOSAL OF HOUSEHOLD HAZARDOUS WASTE

TWO IMPORTANT PRINCIPLES OF DISPOSAL:

1. What will happen to the waste one, ten, fifteen and fifty years from now? Will it get into your water? Will it travel downstream and contaminate drinking water, or fish that you may one day catch and eat?
2. A small amount is not insignificant.

SOME THINGS TO CONSIDER FOR HAZARDOUS MATERIALS AND DISPOSAL:

- Buy and use only enough for the job
- Use non-hazardous alternatives whenever possible
- Read labels carefully—follow directions for use and disposal
- Never bury or dump waste on the ground. Never pour waste down a drain or into the water.

FACT: 1 QUART OF USED MOTOR OIL CAN CONTAMINATE 250,000 GALLONS OF WATER!

FOR MORE INFORMATION CONTACT: BRYAN HUBBERT AT CATG, 863-2887 OR VICKIE THOMAS AT GOTO, 862-2881

Additional Success Stories from Rural Alaska

Kotlik – Using best management practices for burning waste and minimizing purchase and generation of toxic materials.

Contact: Victor Tunuchuk, victor_aknative05@yahoo.com

The population of Kotlik is 616. They made their own burnbox from several tanks, dismantled, brought across river, reassembled. They successfully banned Styrofoam in their store and plastic bags.

Building a burnbox with existing materials:

Kotlik used a 1500 gallon stove oil tank. They started the homemade burnbox on Sept 5 2006 and finished it in approximately one week. Then they spent another week to bring it across the river and put together.

The tank was in the middle of town and a certified welder (local) and a helper cut the tank into 6 pieces and they brought the pieces down to the river and brought it across the river in an aluminum skiff. The welder then put the pieces together on the other side with the welding equipment.



If there was a road and equipment it would've been easier. They are in wet and swampy land and they had to do it all by hand. If they had heavy equipment it would've been easier too.

On the burnbox in the middle, at the top, there is a chimney. At the front of the burnbox, there is a door. People throw their trash in and after burning someone will remove the ashes from the tank. It's open on one side only. Victor Tunuchuk Sr. and Pius Akaran came up with the design. They saw a video on a seven generation's course (that showed a tank and stack and door). They went back to their community and described the video and came up with the design.

This project was funded by the Bill Moore Slough's Elder council, the City, and IGAP. (the City of Kotlik donated funds to IGAP for the project). The costs included labor for two workers, and the gas for the boat was paid by Bill Moore Slough's Elder council.

The City donated the tank as well. Initially there was some stove oil that needed to be pumped out. They pumped it into a tank and they took the stove oil home to use.

They are now building another one.

Yupit of Andreafski Tribal Government

Contact: Serena Alstrom, 907-438-2329, alstrom_epadirector@hotmail.com

The City of St. Mary's developed an ordinance for solid waste collection. A fee of \$66.00 per month is billed to each household for trash, water, and sewer services. The portion for the trash collection fee is \$10.00. This does not include businesses in St. Mary's; such as, the St. Mary's School District, local stores, etc. The businesses are charged a different rate. The City of St. Mary's also owns their own heavy equipment, which is used to cover the landfill once a week/month or when needed. The landfill land is leased from Pitka's



Point Native Corporation to the City of St. Mary's and is located six miles from both St. Mary's and Pitka's Point.

Yupit of Andreafski Tribal Government has coordinated the spring clean-up, which was developed from the AmeriCorp program in 1992. Since then they have applied for funding through the Alaskans for Litter Prevention and Recycling (ALPAR). The community redefined the way spring cleanup was operated by making it a forward thinking project that the youth could make money from. The difference here that is worthy of sustainable recognition is that they noticed that the kids would not pick up litter the rest of the year, thinking of the money that they could make by picking up the bags in Spring (i.e. a pay per bag system). The IGAP department started talking with the kids and changed the way they did the cleanup. Presentations were made at school and during the clean-ups on solid waste and littering. "The fewer litter they create in the community, the fewer days we pick trash, the same cool prizes awarded." The youth were told they can either pick 40 bags to get a bike or they can pick 10 bags to get a bike; which would they rather do? We have noticed the changes. The 2006 Spring Clean-up the top picker netted 15 bags and received a new bike compared to 2002 Spring Clean-up there the top picker netted 42 bags. There is a difference and we are getting through to the youth!

Skagway Traditional Council

**Contact: Amber Matthews, 907-983-4068,
amatthews@skagwaytraditional.org**

Skagway Traditional Council has been working with the City of Skagway to develop their recycling efforts. Their first step was acquiring funds from BIA to build a storage shed for batteries. Collaboration with the City was needed to determine available space. Other efforts include working with Haines Sanitation to assess large scale composting options and writing a proposal to EPA for cold climate composting bins.



Nelson Island Consortium

Contact: Johnathon Lewis, Chefornak, 907-867-8306

This group has made ground breaking work in community cooperation. These seven communities (one being a summer subsistence camp) formed from a meeting held almost three years ago that was attended by 50 people from all the villages, including a number of elders. Their cooperation is traditional-based, as they have shared the same subsistence areas for thousands of years. They saw these areas being impacted by pollution and felt together, working traditionally and led by their Elders insights, they could reclaim their lands and clean up their communities. They have brought three separate trainings into their villages (HAZWOPER, Freon Certification, and Solid Waste Management Planning), rather than pay separately to go out to Anchorage. The money saved has been devoted to ordering bilingual signs for their subsistence areas asking visitors to bring their trash home, to additional community members traveling to the meetings, to cleanup projects, to monitoring fish nets, to bring Elders to conferences, to recycling efforts, and to teleconferencing. Besides the use of traditional respect in keeping costs low, one of the unique features of the Consortium is that they meet every week by teleconference. The meetings are attended not just by environmental or Nelson Island staff, but also by Tribal Council and Elders.

The Nelson Island Consortium is a sustainable entity that has built enough history and redundancy in the organization such that if one or more villages is dealing with a crisis, or staff turnover occurs or subsistence trips are needed, there are always staff from other villages that will step in to help out. For example, in calling a contact, in hosting a training, in turning in a grant, in researching needed information. Each village has HAZWOPER trained staff and they are ready to assist each other in emergencies. They have developed a planning style with an entrenched foundation in tradition. When two of the villages could not fill a part-time position, rather than keep the money for their own village, they both donated the money to a Consortium-wide subsistence area litter monitoring project. They cooperate in submitting grants, deciding which are important, and each submitting a support letter for the village that is submitting it. In this way, they were able to be funded for three different solid waste related projects.



Over the past two years, each village has begun recycling programs and cleanup projects: one is taking part in a demonstration of tundra bag technology, one is taking part in a demonstration for compost toilets, one is demonstrating how a hazardous waste program can be carried out in the YK Delta. Two villages were able to make significant improvements in the honeybucket disposal situation. The Consortium also received a Brownfield grant they will start next year, which again will be shared equally to fund part-time positions in community education on reducing contaminants, and will fund an in-village GIS training taught in Yup'ik. When one of the staff learns about how to carry out a solid waste component, such as packing and backhauling batteries, they share the information and steps with the other villages. They have shared duties of resolution-making for banning Styrofoam and plastic bags as well as researching contaminant effects on human health, and how to educate their communities in Yup'ik with the information that they gather in English.

Their rotating community meetings are open to all residents and they provide an opportunity for the host community to learn from and meet experts on solid waste and related environmental matters, to voice specific individual concerns, to listen to Elders from other villages, and to understand the Consortium process and participate actively in its projects. There are no other community entities in the state which represent their full communities and who meet on such a regular basis. Most inter-tribal/inter-community organizations are seated in hub villages, and in this past year, the Consortium has demonstrated that an organization alternative for small off-road villages that fits traditional, non-hierarchical community partnering patterns can be as effective as the common urban-centralized inter-village entity model. This demonstration can have a profound effect on increasing community partnerships and sub-regional solutions because it empowers and builds capacity in the village.

Native Village of Tununak

Contact: David Hooper, 907-652-6529, tnkigap@yahoo.com

Like other villages, with no heavy equipment and wetland tundra, Tununak had a dump that had poor access for residents and where users had to choose to walk and drive over wastes to access the center, or expand it. By saving their monies to rent heavy equipment and pay two operators, they were able to cover approximately 7 acres of open dump in just two weeks and create a trench-fill system, whereby residents can drop their wastes in, and no longer have direct contact with wastes when using their dump. While a full closure is beyond available funding, Elders are very happy with the result. Tununak recently started their recycling program and has backhauled 928lbs by taking the extra time to provide the children individual checks from the 20cents/lb they receive for the cans they pick up. Already, children are starting to pick up cans from the ground – a first reported by staff and a big step in educating their community about separating wastes and benefits of recycling. They also closed out their honeybucket bunkers that were leaking onto the boardwalk and were unable to be pumped out due to high operation and maintenance and they built locally 2 large underground bunkers. They were able to stop people from having to resort to dumping their wastes on the beach.



Chefornak

Contacts: Johnathon Lewis, 907-867-8306 agginraq@yahoo.com; Anna Abraham, ms_annaabraham83@yahoo.com; Jessica Lewis, jessi_0386@yahoo.com

Without heavy equipment, Chefornak was in a similar situation as Tununak. By negotiating with an in-town water project, they were able to use an excavator and pay an operator to cover and dig a trench for the community to use even though they lack cover material. Without heavy



equipment the dump will be difficult to maintain, but it buys the community precious time and space, and reduces drastically the direct contact exposure of visiting the dump. During the frequent flooding, it also diverts much of the leachate created to drain through soil versus overland, removing in the process a large volume of contaminants that otherwise flow directly to the creek that leads to their subsistence river.

Chefornak Compost Toilet Project

**The Chefornak community contact for this project is: Billy Chagluak 907-867-8306
billychagluak@yahoo.com**

**The Zender Environmental contact for this project is: Simone Sebalo 907-277-2111
ssebalo@zender-engr.net**

Chefornak's honeybucket lagoon is 6 years past its designed closure date, and elders and the community are very concerned about the frequent flooding to the nearby creek. Therefore, Chefornak decided to test compost toilets as a honeybucket alternative. This is a demonstration project that started in 2006 working with Zender Environmental and will continue through 2007. One toilet is being tested in the community store and four toilets are being tested in households. The project funds a local operator in Chefornak to monitor the toilets and teach the households how to operate and maintain them. The toilets are straightforward to use – they require adding a cup or so of peatmoss each day, pulling an aerator bar a couple times a week, and adding a natural microbe accelerator every 2 weeks to help speed up the composting process. Fans and a small heater help to evaporate any liquids out through a vent pipe. Every couple months, compost is produced and can be emptied out from the bottom of the toilet. The compost can then be used for gardening projects (flowers, plants, etc.) or as cover for garbage at the dump.



Zender Environmental is the technical consultant for the compost toilet project and communicates daily with the local operator to help monitor the project, troubleshoot any problems, and get feedback from the operator and households. Initial funding for the project is through a Central Council of Tlingit and Haida Indian Tribes EPA Special IGAP Grant, and Zender has been providing a large amount of additional volunteer time in project planning, analysis, installation, and in securing funding for additional toilets to continue and broaden the scope of the project, so that more residents are able to switch to them. From this effort, Envirolet and SunMar are now providing a free toilet each.



Billy Chagluak explains how the composting toilets work at a public meeting in Chefornak.

Newtok

Contact: Margaret Nickerson, 907-237-2314, dinning69@yahoo.com

Newtok's access to their old honeybucket lagoon was cut off and there was no place for the community to dump waste but in the river in town. With just \$30,000 from BIA, they invented the individual honeybucket vacuum to reduce exposure to germs from leaking and overflowing honeybuckets hauled through town, and also creating a separate honeybucket bunker apart from town.



Newtok was the initiator of the Nelson Island Consortium and is heavily involved in educating its community about contaminants that can come from wastes, and in working with the school to ban the use of Styrofoam. Its staff, consisting of IGAP and Nelson Island representatives, is very helpful to other villages and constantly seeking out ways to improve their environment with very limited resources.

Akiachak Native Community

Contact: Eric Phillip, 907-825-4615, ephillip@unicom-alaska.com

Akiachak has built their own burn boxes by cutting and welding used oil drums.



Village of Atmautluak

Contact: Billy Gilman, 907-553-5610, epanrs@yahoo.com

Atmautluak's dumpsite is actually across the river and downstream. They operate a collection program in summer whereby none of the residents need make the journey and in fact, generally don't make the journey. This keeps people out of the dump and safe from its hazards, as it is an open dump. They operate a home-made burnbox there and the operator uses a proper smoke cartridge mask. With the collection program, residents do not load their own wastes, as they are kept away from the dump. In winter time, the collection program continues, but more residents do go there as they have access by snowmachine.

Atmautluak pays for the dump operation through Bingo receipts. The idea that they offer collection to everyone, even those that wouldn't otherwise be able to afford it, and do so using their own generated revenues is something unique and extremely important from a public health perspective (i.e. keeping people away from the dump). They've been trying hard to improve their dumpsite. An aspect of their collection program is that they will be one of the first villages to use road mats for a site access road. They successfully applied for a Tribal open dump grant to fund replacing the boardwalk with something that won't require operation and maintenance monies. In terms of making do with what they have, besides building their own burnbox with old tanks donated from the school, they negotiated with Northland for an old connex to use as a shed at their site. Without any heavy equipment, or landing at their dump, they made sled

runners out of spare metal from a van, and were able to tow the connex from town across the river with snowmachines in winter. They also operate a recycling program that includes keeping used clothing at the Tribal office for people to make use of.

Newhalen Native Village

Contact: Ron Wassillie, 907-571-1720, ronwassillie@hotmail.com

The community of Newhalen has cleaned up their dump, managed to keep it organized, and has a great and extensive backhaul program that has continued for several years now. They had an open dump a few years ago and with the community and a focused environmental staff they cleaned it up, and a local resident familiar with Seattle recycling industry began working with the staff on separating out and recognizing what types of waste were recyclable. They have been recycling copper pipes, aluminum boats, other separated scrap metal for several years and are the first small Alaska village to do so.

Kivalina IRA Council

Contact: Millie Hawley, 907-645-2256, millie.hawley@kivaliniq.org

Despite a number of overwhelming environmental challenges and little infrastructure, the Kivalina Environmental Department has managed to operate a recycling program with one of the highest participation rates by residents in the State. When not carrying out subsistence activities, they collect from 7 to 11 full bags of recycled materials per week – and have shipped out an average of 100lbs per month for the first half of 2006. This same staff is successfully collecting lead-acid batteries as they go door to door for the cans, and the Department collects household batteries. Through the Alaska Materials Exchange, they found someone in Anchorage to ship their Styrofoam peanuts and they also collect plastic bags. They use their can refund monies to pay for posting out their household batteries, Styrofoam, etc. In short, they have a high participation, sustainable, and diverse recycling program. They continue to look for ways to expand the opportunities, increase participation, and persevere when their program runs into obstacles.



Selawik IRA Council

Contacts: Raven Sheldon, raven.sheldon@akuligaq.org, Lorraine Ticket, lorraine.ticket@akuligaq.org, 907-484-2005

A 24-acre open tundra dump serves as the Selawik's solid waste disposal site. All wastes generated in the town, including hazardous wastes, construction wastes, and honeybucket wastes from non-hooked homes, end up at this dump, or a much smaller river bank dump, a mile out of town. The main dump edge is encroaching on town, and dump fires occur several times each summer, causing toxic smoke to permeate the Village. Access is poor and treacherous so that residents often store their garbage in town, or worse, use home burn barrels to avoid visiting the dump.

The Selawik Environmental Program has been leading an effort for 5 years now to close the dump and to construct a new landfill located further from town. Successes include: 1) a State

approved landfill permit and SWM plan, 2) Grants that purchased a waste collection system, a dozer, an equipment shed, gravel for a turnaround at the existing dump, and a hazardous waste plan and equipment 3) Funding to train residents, prepare for the construction projects, and identify potential community impacts 4) DOT funding to build a landfill road, 5) Selection as a National Federal Environmental Justice Project, and 6) Galvanizing the community through carrying out petitions, surveys, school education, Community Organization meetings, and 7) Organizing a Community Environmental Committee and an Environmental Youth Group. Through conferences and workshops, Selawik has been active in sharing their experiences with other Native Villages throughout the state.

Selawik's current efforts include the following: They recently fenced their landfill with 900 feet of fencing funded through their open dump grant. Their landfill road will be constructed next year with DOT funding. They currently store e-wastes and batteries for shipping out of the village for recycling. They installed a used oil burner in their equipment shed and collect oil from the public. Selawik has worked cooperatively and successfully with the Tribal and City Government. Selawik completed a community comprehensive plan by meeting with the IRA, City, and planning committee and used information gathered in several public meetings. They trained 28 people in HAZWOPER in their Village. They hired 18 HAZWOPER certified people to cleanup their dump.

Selawik used part of its YR 2001 and 2003 open dump grant monies to build an equipment garage for their new (used) dozer. The shop was finished in September 2003. It houses their new dozer and new Bobcat, and provides a place to maintain them during the winter. The garage will also be used as a central location for recycling wastes. Kids from the Alternative School will run the Recycling Program. It will provide a place for them to "hang out", fix elders' snowmachines and keep out of trouble. There is no other place in town for kids to do this. The community will benefit as a result and be supportive of the Solid Waste Program.



Total Reclaim, Inc.

Contact: Larry Zirkle, Total Reclaim, Inc. 907-561-0544, larryz@totalreclaim.com

Staging, Recycling, and Backhaul. Larry Zirkle has been working with YRITWC, ITEP, Seven Generations, and Zender Environmental in rural Alaska, educating and developing tools for villages to stage and ship recyclable materials and assists in determining priorities for backhaul efforts. He is currently developing a "Rural Recycling Kit" that includes signage for drop offs, staging requirements, how to and where to ship, and safety supplies for minor spills with MSDS sheets. Additionally, Larry provides freon removal training and volunteers his time to "clean up" when visiting a village. Larry's goal is to educate the communities by spending time in rural Alaska talking with youth, elders, and councils. Larry also promotes "One Voice" throughout Alaska by emphasizing the importance of collaboration toward environmental solutions.



Native Village of Venetie Tribal Government Remediation Project

**Contact: Lance Whitwell, NVVTG/ANA Tribal Energy
Programs, 907-849-8165**

In an effort to encourage other community members to clean-up small scale fuel spills associated with leaking fuel tanks, the Native Village of Venetie Tribal Government has embarked on a project to clean up our own site. During the winter we had several incidences of fuel leaks from our monitor heater fuel tank. This spring we could really see and smell the fuel around our tank. As the environmental leaders of our land we thought it would be good to demonstrate our dedication to the environment, by providing comprehensive clean up instructions and an estimated cost for clean-up of small scale spill sites.



We used recycled sewage pipes, and old tarps as liners, the only other cost was 16 hours of labor, and hauling gravel. I have compiled a step-by-step instruction of what we did, so others who wish to do this can have a clear program to follow. While this is not a professional soil remediation, it follows the basic principals of a major remediation project that was done in Venetie in the past. Total cost for this project was only about \$200, less than the cost of 1 drum of fuel. Feel free to email Lance at lancewhitwell_nvvtg@hotmail.com for a supply list and step-by-step instructions.

Agdaagux Tribe of King Cove Environmental Department

Contact: Desirae Roehl, 907-497-2648, des_atcenvironmental@yahoo.com

The Agdaagux Tribe Environmental Department has been extremely successful over the last three years in developing their program to make a difference in protecting the health of the environment and the residents of King Cove. Desirae Roehl, Charly Bendixen, Sunshine Gould, and Joyce Gould have worked together to advance environmental public education, promote sound scientific practices in managing natural resources in King Cove, and collaborate with the many entities needed to successfully implement environmental projects in rural Alaska.

The Agdaagux Tribe Environmental Department has fostered coordination and cooperation among professional, scientific, educational, and non-profit organizations having leadership responsibilities for Alaska's environment and natural resources by facilitating the development of a comprehensive community environmental plan. This plan was developed over many meetings in collaboration with city council, community members, school representatives, and local businesses. Ms. Roehl and her staff's recycling efforts to collect aluminum, paper, plastic, and cardboard, lead-acid batteries, and household batteries required cooperation with school, businesses, and community members. Their mission to eliminate plastic shopping bags in the community of King Cove included meetings between the Agdaagux Tribe, City of King Cove, Youth Litter Patrol, and the community. The Agdaagux Tribe Environmental Department has consistently ensured that all parties are included when an environmental issue needs addressing.



Projects include: used oil storage program complete with tanks, a safe oil filter burner and educational materials, ink jet and toner cartridge recycling, household battery collection (over 8 gallons in the first 5 months), creation of watershed maps to help identify water resources with potential threats, collecting water quality data in water sites with potential threats, providing baseline data and identifying current problems, creation of a comprehensive community environmental plan, creation of a recycling plan and a recycling center to be opened when connexes arrive (anticipated December 2005), ordered household and business collection receptacles for recyclables which will be distributed free-of-charge, working to reduce the use of plastic shopping bags which results in litter and health hazards to wildlife, ordered bear-proof/wind-proof dumpsters which will arrive in December 2005, hosted a solid waste training for all Aleutian Pribilof Tribes to attend and work collaboratively on larger issues.

NEW DUMPSTERS IN KING COVE

You may have noticed that there are new dumpsters with steel lids located through-out the community. The purpose of these dumpsters is to keep trash from blowing out and littering our town. They are also constructed to keep dogs, birds and bears out, preventing messes like the one seen in the picture to the right and minimizing safety issues associated with bears during the summer.

We realize that these dumpsters are not as convenient as the open top dumpsters that we used in the past, but they will have positive impacts in the community if they are used correctly.

There are a total of 4 latches on each dumpster. You must pull the U shaped latch to open the lid. We ask that you please take the extra time to ensure that the lids are closed after you dump your trash. Don't fill dumpster so full that you can't re-close the lid. Thank you.



King Cove's used oil collection tanks.



King Cove's SmartAsh Burner, purchased through BIA funding awarded to Agdaagux Tribe.