Integrated Solid Waste Management Plan
For the Community of Koliganek, AK

January 2011
Updated: December 2016

Integrated Solid Waste Plan
For the Community of *Koliganek*

Compiled by:

Delores Larson, IGAP Coordinator
Katrina Merlino, IGAP Technician





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Compiled using the Alaska ISWMP Template Version 6.0, Zender Environmental, 2008.
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1. Introduction and Description of Community

1.1 Mission and Values Statement:

This plan was originally developed by Zender Environmental and the Koliganek Environmental Program, using the ISWMP template version 6.0, with funding from the Bristol Bay Area Health Corporation, Environmental Health Department 2009. In fall of 2016 the NKVC TSWMP has been updated using version 8.2 of the ISWMP template. As a community we need to develop a Tribal Solid Waste Management Plan that suits our needs. This plan will help protect our subsistence way of life. Our elders say that if we respect our lands and values then we will be given the opportunity to have plenty to take and to gather. We need to implement the best solid waste practices possible so that our lands, subsistence, and community are protected. This TSWMP will provide "ordinances" or traditional rules for the community to follow and abide by; therefore, ensuring this plan is followed is critical to our community.
"All projects need input and support from the community and council for it to be worthwhile and beneficial. In starting a project we need to build awareness of the environmental issues, obtain local support, and implement good planning."- Anuska Wysocki

1.2 History of the Community:

The Native Village of Koliganek is a federally recognized sovereign tribe located on the Nushagak River approximately 75 miles northeast of Dillingham and 275 miles southwest of Anchorage. Koliganek is a tribally recognized village comprised of 300 tribal members and the population of Koliganek is about 200 residents as of the most recent survey. The majority of the residents are Yup'ik Eskimos. The first recorded location of Koliganek was on the Tikchik Lake near the headwaters of the Nuyakuk River. Koliganek relocated three times for various reasons and the existing site was established in 1964. Koliganek means "the village farthest up the river" and is accurately spelled Qaliraneq by the Yup'ik People.

Demographics and Utilities:

Koliganek consists of 220 residents. There is a clinic, a school, two Tribal Offices, a grocery store, an electrical generator plant, a water treatment plant, and a GCI phone and internet tower. Treated water can be obtained from one watering point. However, most residents obtain their drinking water from individual households. Koliganek has operated a piped system for over 25 years. Water is derived from a well and is treated. 33 homes and facilities are connected to the piped water and a community septic tank. Twelve homes have individuals wells and septic systems. Eight homes haul water and honey buckets. The sewage lagoon is on the west part of town and is for primary treatment only, after which the water drains to the surrounding wetlands, creeks, and to the Nushagak River. The sewage lagoon has had several problems, including seeping out and flooding. Koliganek owns its own electric generator plant. Electricity is provided by New Koliganek Village Council. There is one school located in the community, attended by 60 students.

The population of the community consists of 87.4% Alaska Native or part Native. Koliganek is a Yup'ik Eskimo village with Russian Orthodox practices and Christianity practices. Subsistence

activities are an important part of the lifestyle. During the 2000 U.S. Census, total housing units numbered 77, and vacant housing units numbered 24. Vacant housing units used only seasonally numbered 2. U.S. Census data for Year 2000 showed 66 residents as employed. The unemployment rate at that time was 13.16 percent, although 39.45 percent of all adults were not in the work force. The median household income was $44,583, per capita income was $13,242.
A new State-owned 3,000' long by 75' wide runway is available. Boats and ATVs are used in the summer; snow machines in the winter. Locals travel to New Stuyahok, Ekwok, and Dillingham frequently. There are no docking facilities; goods are lightered from Dillingham and Anchorage.

1.3 Location and Climate:

Koliganek is located on the right bank of the Nushagak River, and lies 65 miles northeast of Dillingham. Koliganek is located at 59.7° North Latitude and -157.3° West Longitude. There are no roads to our community. People arrive here by scheduled small plane service and snow machine in winter, or boat and plane in summer. Koliganek is located in the Bristol Bay Recording District. The area is in a climatic transition zone. The primary influence is maritime, although a continental climate affects the weather. Average summer temperatures range from 37 to 66; winter temperatures range from 4 to 3.

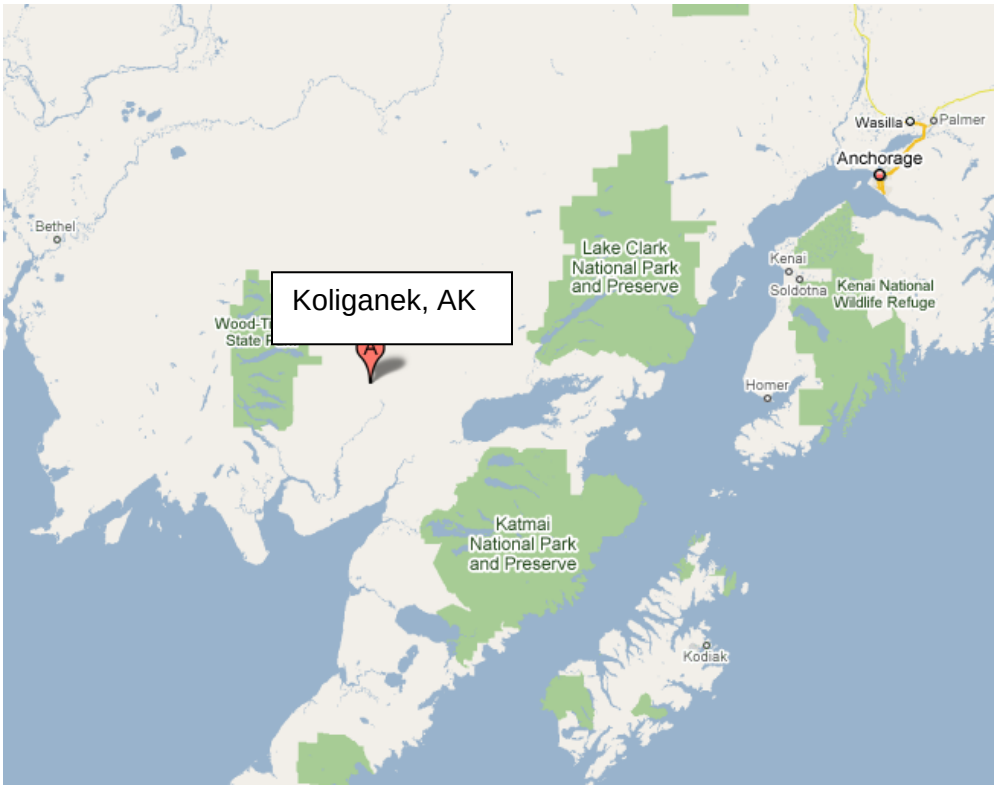
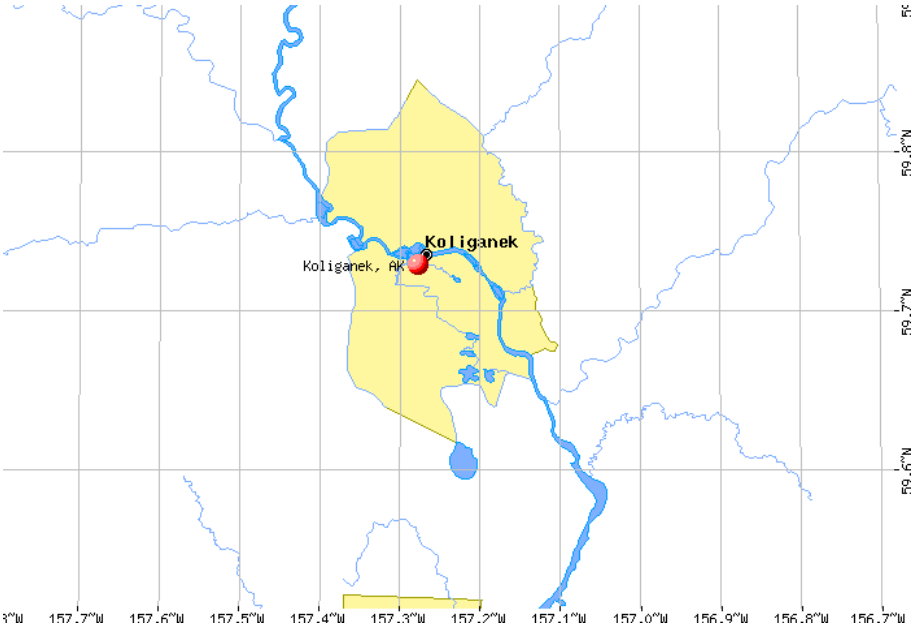


Figure 1 Location of Koliganek, Alaska



1.4 Additional Critical Community Logistics Relating to Waste Management:

Our community is isolated and close-knit. We must depend on each other in emergencies. We do not have extra people or service departments or places to go for assistance. So there are several events where the full community is involved in responding. These events include:

- Search and Rescue
- Funerals (attended by full community)
- Extreme Weather
- Flooding
- Erosion and loss of structures
- Fires (house or surrounding lands)
- Water System freeze-up
- Running out of fuel oil
- Subsistence activities which must be performed in a short time or the opportunity for the food is lost

These events take priority in our community in order to survive. Solid waste collection, backhaul opportunities, site maintenance, and community practices may be disrupted for a time period during these events. In order to write a plan that works best for our community, these practicalities are reflected in this plan and incorporated to the maximum extent possible.

2. Community Participation

Community participation for the best solid waste plan is very important to us. Community disposal practices play a big part in whether our plan protects our health and environment. In addition to listening to our Elders speak, our community participation included the following:

2.1 Community Solid Waste Committee:

A Committee was formed in 2000. This committee is comprised of 7 members. They represent different parts of our community. Their job was to make sure that our plan fits our community and will work best for our community. The committee meets quarterly. Meeting minutes are taken at the meetings, current solid waste issues are discussed, and a report is given by the IGAP staff of what was completed during the quarter regarding solid waste. The following people serve on our committee:

- Delores Larson, IGAP Coordinator
- Katrina Merlino, IGAP Technician
- Gust Johnson, Solid Waste Operator
- Charlie Nelson, Solid Waste Operator
- Margo Hiratsuka, Genevieve Kapatak, Greg Kapatak, and Lena Norbert, Four regular community members

2.2 Community Survey:

We carried out a community survey on concerns and suggestions. The full results are included in the appendix. This survey was conducted in October 2009 by the IGAP staff and 23 surveys were filled out.

Of the people that filled out the survey, 43% answered that they have some concerns about trash or the dump, 22% said they had a lot of concerns, and 35% said they didn't have many concerns. Specific concerns that people listed were**:**

- Controlled access will help landfill stay under control, meaning things that aren't supposed to be disposed up there will be eliminated. Shouldn't be open burning
- Keep it (the dump) extremely clean
- lots of trash on right side laying around
- all that oil up there is very hazardous. Lots of drums up there. Trenches are too close to the fence
- metal piling up
- please keep it (the dumpsite) clean
- there are trash build up at home on weekends and sometimes dogs get into them
- Have neighbors pile trash together than trash man pick it up
- trash behind fence on the ground
- Waste is not being separated and so our burns are not efficient
- water filling up hole

Suggestions given by people that filled out the survey about the way trash is managed or how to make the dumpsite better or more useful included:

- get a better burn box

- help keep it clean by not throwing trash in village and playground
- good job trying to keep it clean
- I think we should burn everything that's trash
- It would help if people who separate their trash, esp. recyclables in separate bags
- people should put their trash where dogs won't get them
- the solid waste operation should have a truck instead of a honda and cart haul more trash and not as cold in winter or when it's raining
- The SWO needs an assistant to help him better manage the landfill
- Trenches. Make sure they are properly dug
- would be nice to have the person picking trash to knock and ask if we have trash
- Bigger fence and more structured
- control access. A dumpster for residents to put their trash in outside of landfill, stop open burning.
- keep everything separated and burned better
- maybe find a way to do something about the big stuff- getting full.
- maybe have traps for crows so they don't mess stuff up
- more space for larger junk
- to tell people to stop littering
- to tell people to stop throwing trash on the ground
- try to keep road cleared in winter
- We need to have our own recycling building for safety reasons

Suggestions that residents had to help convince people to use correct garbage disposal included:

- education, presentations, fines for littering and incorrect disposal of garbage
- ethical reasoning, talk about how it can ruin our subsistence lifestyle
- fine for dumping improperly, locking the gate after 6pm or earlier
- have dumpsters
- have trash man ask if there is any hazardous material
- incentive programs for recycling. Gathering support from community. Educating on benefits
- inform them!
- make signs all over village
- parents teach kids. Grandparents teach grandkids. Make it a part of lifestyle
- pics of bad dumpsters and tests
- put more flyers out. Especially talk to everyone about it
- put signs everywhere
- putting up posters in a public place- school, post office and store
- tell people what's happening to the world
- they should throw their trash away in the trash can

2.3 Council Updates:

Although we don't have specific council meetings for solid waste, our solid waste IGAP staff regularly update the Council and get approval for solid waste activities on a monthly basis.

2.4 Community Meetings

Our IGAP staff give presentations to our community approximately twice a year (meetings held in the gym). They give updates about solid/hazardous waste and what the staff are doing, give reports about any trainings attended, update information on where the solid waste plan is at, etc. The meetings are usually attended by approximately 25 people and incentives are generally given to ensure a decent turnout.

2.5 School Presentations:

Our IGAP Staff give quarterly presentations and or activities in school classrooms on topics such as recycling, hazardous wastes, global warming/climate change, subsistence, natural resources (land, air, and water).

2.6 Community Education, Outreach, and Voiced Concerns:

Our IGAP/Environmental Staff visited all homes to educate and receive feedback from residents about the environmental issues. We became aware of what the major environmental concerns are in our community. Environmental Staff would like to educate community on pollution, hazardous waste, recycling, and littering, etc.

This is what people are saying in our community that is related to solid waste management (see Section 2.2 of this plan for written solid waste survey results):

- The bridge to the landfill needs repair
- Hazardous Waste needs to be stored in a designated area and in second containment
- We need a new burn box
- We need a Recycling Center

2.7 Public Outreach Printed Materials:

We develop newsletters that inform people about our solid waste programs. They include pictures and articles and they are mailed every quarter to households. When special events come up that are solid/hazardous waste related (such as collection days etc.), we also develop and distribute flyers, put up signup sheets, post on our facebook page, and make announcements on the radio.

3. Community Development

3.1 Current Community Population:

We have 220 people living here now, including 3 school staff that leave during the summer. Additionally, we have about 65-70 people who leave for commercial fishing or other summer employment. On most days in the summer, about 10 to 15 people are camping overnight at fish camps. During fall hunting, not very many people camp out for hunting overnight. During Winter, about 20 to 50 people are gone from the village on most days for subsistence or hauling wood. The average number of people gone from the village for other reasons, like visiting, shopping, and medical appointments on most days is about 5 to 20. About 40 visitors come and stay over in our village each day in the summer. In the winter we have about 50 people each month for Russian Christmas, Slavi/ tournaments, carnivals and gatherings. We usually have

about 2 to 7 people each year who live here during summer for construction, and 0 to 3 people for winter projects. For about 4 to 6 weeks during Spring Break up, and 4 to 6 weeks during Fall Freeze up, most people stay in the village because it is dangerous to travel by boat or snow machine.

3.2 Expected Community Development:

We have no development projects at this time that are expected to impact our population or our population growth rate.

Average yearly community growth expected for next 20 years and growth rate calculation process:

See the Projected future population and waste generation section for the impact of our projected future population on the waste generated that we must manage. Our expected growth rate for the next 20 years is 2.17%. This growth rate is based on averaging 10 year census data (and current State Community Database data) from 1980 till now. As described above, in the future, we do not expect any development projects that will affect our population numbers. We do not expect to see a significant difference in the number in people moving in and out that would affect our rate. So we expect our growth rate to remain about the same. We estimated our population would be about 272 people in 5 years, 302 people in ten years, 337 people in 15 years, and about 375 people in 20 years.

4. Solid Waste Disposal Site Information and Goals

The table below describes the primary features and conditions of our current dumpsite. The right-hand column describes our related upgrade goals or planning changes. There are additional Tables in later Chapters that discuss the site operation and maintenance, waste collection system, waste recycling, and waste burning.

Table 1 Solid Waste Site Features And Situation

Feature	Current Description	Changes Planned?
Land Ownership	The land where the dumpsite is located is owned by the New Koliganek Village Council.	
Dumpsite Location	The dumpsite is located two miles from the edge of town. The dump is southwest of town.	
Dumpsite Operation Responsibility	IGAP is responsible for operation and maintaining the landfill. Solid Waste Operators (SWOs) will continue daily trash pickup at residential, elderly, and business/public buildings that participate in the Solid and Hazardous Waste Collection Program. SWO's will maintain the burnbox once a week.	In the future we plan to have controlled access to the landfill.
Summer Dumpsite Access	The access to the dump is in fair condition. It is an unpaved gravel road. People travel to the dump by ATV in summer. Once people enter the dump there is a path that they follow through the dump. People do not litter along the sides of the access road. Although, windblown litter is often found along the road.	The bridge to the landfill needs to be repaired so that heavy equipment can go across.
Winter Site Access	In winter, the Solid Waste Operator travels to the landfill by snow machine. They enter the site from the West. There is only one entrance to the landfill.	

Table 1 Solid Waste Site Features And Situation

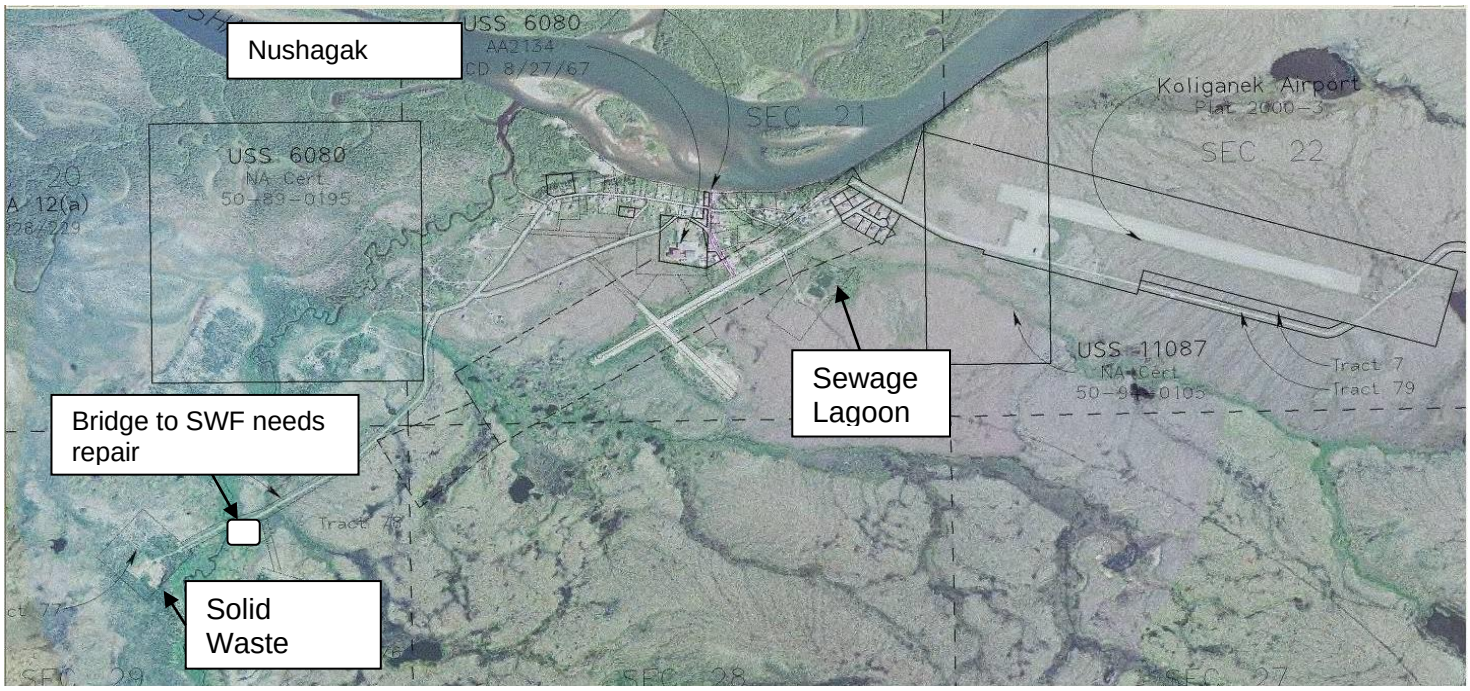
Feature	Current Description	Changes Planned?
Path/area inside the Dump for unloading wastes	Usually the residents do not enter the landfill. We have a solid waste operator who picks up the residents garbage on a daily basis. The path entrance is pretty clean. We have a new burn box that the SWO's use to burn trash.	We need to ensure a clear access path to greatly reduce disease transmission and injury risks. We will need to fund the staff more time so that they are able to keep a path clear and we need to keep everyone out of the dump at least in summer (except for the salvage yard).
Site Size	The dumpsite is about 200 ft long by 300 feet wide. This does not include the windblown litter (i.e. plastic bags, paper). The windblown litter accumulates mostly the NE corner inside of the landfill; it also goes out about 100-200 feet outside from the dump. Clean up happens once a year inside the fence, along the perimeter, access road, and open pit area. Trees are along the fence line, which captures a lot of debris. The new landfill is adjacent to the old landfill, which is now covered and vegetation has grown over it.	
Site Shape	The dumpsite is shaped rectangular. About 15% of the dump area is covered by trench in-fill, which lay 10 feet from the fence. There are currently 6 trenches filled. Each trench is about 16 feet wide, about 50-60 feet long and 8-10 feet deep. Life span of a trench is about 8 months. The rest is ground, windblown litter and a pathway for the Solid Waste Operator to maneuver on. Berms made of piled dirt are set up along the outside of fence that are a foot high; these were developed with an EPA Unmet Needs grant in 2006.	
Estimated Waste Volume (± 20%)	Waste Volume of filled trenches 16x60x10x4= 38,400 ft^3 or 1,422 cubic yards of combined trench fill	
Estimated Waste Weight (± 30%)	284.4 tons (using 400 pounds per cubic yard assuming a normal open dump with little heavy equipment compaction)	
Type of site management	Open dumping and sometimes into trenches. Occasional consolidation with backhoe. New burnbox used to burn waste.	
Heavy Equipment used at Dump	We have access to the Council's backhoe which is used to dig trenches, compact and consolidate waste twice a year. The Council provides an operator to run the backhoe and also covers the gas/fuel for it.	
How often wastes are consolidated or compacted	A new trench is dug and an old one covered, and waste consolidated/compacted every 6 months or so.	
How often	Waste in trenched are covered when full (every 6 months or	

Table 1 Solid Waste Site Features And Situation

Feature	Current Description	Changes Planned?
wastes are covered	so). Material from digging the trench is used to cover the waste.	
Operator/Technician Staff	We have 2 SWO's who work 20 hours a week, two weeks on two weeks off, opposite shifts. Duties are to collect trash, maintain the landfill, collect recyclables, and maintain the recycling center.	
Burning wastes	We have a new burnbox which has been used to burn wastes and SWO's transport the ashes to the burn box, once every other week.	
Salvage Pad/Area	There is a salvage area (open pit) south of the landfill that includes wastes such as used snowmobiles, automobiles, atv's, freezers and refrigerators, as well as shrub clippings from people's yards and old metal pipes and culvert material. Currently there is about 3 used drums of used oil in the landfill that shouldn't be there, with 5-5gal buckets of antifreeze and also glycol (unmixed), batteries (in and out of the vehicles, fuel (in and out of the vehicles). Leachate is a concern during break up, leaving a pool of contaminated snow melt about hundred ft. wide and 3 ft. deep in this area.	We need to separate out the hazardous wastes from this area and let people know the materials that can be put in the salvage area. Solid Waste Operators are currently working on transferring drums and 5gal buckets to the shop where the used oil burner is at.
Additional Waste Segregation	Recyclables (pop cans, electronics, small household appliances, household and lead-acid batteries) are separated from the waste stream and is stored in second containment until arrangements are made to ship those items out.	
Recycling Shed/Area	There is a place for people to drop off their vehicle batteries and electronic wastes at Recycling connex, which is located on the old airport road, a few miles from dumpsite. People either drop them off, or the Solid Waste Operator will pick them up if requested.	
Dumpsite Age	Constructed in 2006, adjacent to the old landfill.	
Fencing	Good fencing around the site but it's not locked. It closes off and locks but the Council is in debate about controlled access.	A decision needs to be made about controlling access to the site (locking the gate during hours of non-operation).
Types of Wastes that Are Now at the Dump		
Residential wastes:	Cardboard, paper, plastics, tin and aluminum cans, diapers, Styrofoam, old or broken household items like furniture, toys, clothes, rugs, appliances, dishes, glass, tires, ATV's, snow-machines computers, TV's, small batteries, tires	

Dump site photographs

The following pictures show the dumpsite and its key features.



Open landfill entrance gate 24/7. (picture from BBAHC SW report)

An open burning shallow landfill trench with evidence of litter scatter (Picture from BBAHC sw report)

Landfill entrance sign (picture from BBAHC sw report)

Koliganek's old burning equipment (Picture from BBAHC sw report

Koliganek's new burning equipment

5. Current Solid Waste Management Program And Practices

5.1 Waste Collection Program:

Table 2 Waste Collection Program

Item	Description	Planned changes or goals
Number of collection services, including any private services that an individual offers:	Program Income generated will be used to pay half of the cost of the SWO positions, fuel, supplies, and parts in 2013-2020 and IGAP will cover the cost of the other half. Both SWO's will continue daily pick up at homes and public buildings. SWO's will separate recyclables, hazardous waste, and burnable items.	Tapering off of IGAP and having community pay for collection fee themselves
Operated by:	IGAP	
Households that use the service each month	Majority	Households who choose not to pay may be allowed to dump their own garbage in a responsible manner.
Total number of households in village	50-60	
Estimated average number of households who self-haul some or all of their garbage to the dump at least once per month.	Just a few go on the weekends when the operator doesn't do pickup, maybe 5-10 households	
Fee charged for collection service (if more than one service, list fees for each service)	Residential households pay $13/month. Elderly households pay a discounted rate of $8/month. Businesses/Public Buildings pay $53/month.	Collection fees are projected to be increased each year until program is self sustaining.
Besides the fees collected, what other money is used to pay for the collection service?	IGAP funds pay for the SWO.	
How often garbage is collected:	The operator collects trash every day (Monday-Friday).	Pick up Monday-Friday, council would like one solid waste operator work for two weeks and then the other operator will work two weeks.

We began to implement fees for solid waste collection in January 2013. This is something we are working towards to make our program self sustainable. In a solid waste survey we carried out in 2009, we asked people in our community what they thought about a fee being implemented for solid waste. The results of the survey showed that the majority of people thought that a $10/month household collection fee would be reasonable. The majority of people thought that Elders should pay somewhere between $0 and $10 per month and that tourists

should pay more (majority at $40/month). The majority of people also thought that bigger households should not pay more than smaller households, that there should be a reduced rate for Elders, and that people should be able to volunteer community hrs instead of paying fees. There were also suggestions of how to raise money to pay for solid waste besides fees which included things like holding dances, cake walks, and doing other fundraising. The results of relevant questions from the survey are given below.

Results from 2009 solid waste survey regarding setting solid waste collection fees:

Survey Question #21. Do you think $10/mo household collection fee would be reasonable?

yes	15	65%
no	5	22%

If no, what is a reasonable per month fee?

- $0
- 20
- $5 or none for those without jobs
- people won't want to pay so they'll start dumping it themselves
- the village council could do it so they can have a clean place

We may need to start fees in the future, how do you feel about that?

- crazy
- don't like the idea (2 responses)
- fine (2 responses)
- I don't like it but I know it will keep an SWO for our community
- it sucks
- It would help the recycling program a lot
- just another bill to worry about
- not good
- Not very good because people (or some people) are having a hard time
- okay, it's done everywhere else
- that's okay
- up to the Boss

Survey Question # 22. How much do you think people will pay if people knew the more they paid the more we can protect subsistence, elders, children?

Low-income	
Rate	# of responses
$0-5	1
$5	4
$8	2
$10	5
$12	1

$20	2
$30	1
$40	1

Elders	
Rate	# of responses
0	5
$0-5	1
$5	3
$10	5
$12	1
$40	1

Others/tourists	
Rate	# of responses
$5	1
$10	1
$12	3
$20	1
$30	1
$35	2
$35-40	1
$40	5

Survey Question # 23. Should bigger households pay a little more than smaller households?

Yes	5	22%
No	13	57%

Survey Question # 24. Should there be a reduced rate for Elders?

Yes	18	78%
No	3	13%

Survey Question # 25. Should people be able to volunteer community hrs instead of paying fees?

Yes	13	57%
No	4	17%

Other comments:

- it really doesn't work that way. We would have a hard time finding volunteers to do work for free
- the younger people could help out like they do in the summer time

Survey Question # 26. Extra comments regarding waste fees

- fees are a good idea
- is there any grants for waste programs?
- most places charge fees for garbage collection anyway (at least the places I've lived)
- No (3 responses)

Survey Question # 27. do you have any ideas about how else to raise money to pay for our garbage and dump besides fees?

- bingo, dances, cake walks
- cake walks, dances
- dump their own trash
- fund raise (3 responses)
- fundraising through hazardous waste or battery collection
- have dances, cake walks
- no. If you pay for your trash to come in then you should pay to take them out
- other grants, donations, local fundraising
- reduce, reuse, recycle
- the one who get the most trash could win a prize (2 responses)

Note also that there was a survey question which asked what people like about how trash is managed and where it goes and the most common comments were that they like that trash is collected by the operator and that the location of the dump far away from the village.

5.2 Site Operations and Equipment Maintenance:

The operator and a backhoe operator provided by the Council perform semi regular cleanups at the landfill. Approximately twice a year the backhoe is used to dig new trenches, compact and consolidate waste and close full trenches.

The Table below summarizes our current site operation and maintenance features.

Table 3 Summary Table For Site Operation And Maintenance

Program Feature	Current Description	Planned Changes or Goals
Operation Type	Basic monitoring by operator, occasional consolidation, burnbox, and some volunteer clean-up	Looking to hire laborers or increase SWO hours to do a backhaul project.
Certifications or trainings?	**Waste collector/operator:** 40 HR HAZWOPER, RALO, RACEJT	When operators are new, they will apply for the RACEJT training program. After receiving 40 hr HAZWOPER, SWO will be required to take yearly 8 hr refreshers. Would also like to include Freon Removal certification.
Heavy Equipment used at	The Council provides a backhoe and operator.	Obtain funding to

Table 3 Summary Table For Site Operation And Maintenance

Program Feature	Current Description	Planned Changes or Goals
Landfill	This backhoe is used for all other projects in our town too.	purchase a backhoe to maintain landfill.
How often wastes are consolidated or compacted	Approximately every 6 months	Continue to consolidate and compact wastes to extend the life of the landfill trenches.
How often wastes are covered	Approximately every 6 months	Continue to cover wastes to reduce windblown litter and minimize odor that attracts vectors.
Available Local Cover Material for Dumpsite?	Trenches are covered with material originally excavated from the trench.	
Heavy Equipment:	• ATV (used for collecting trash and recyclables) • Trailer (used for collecting trash and recyclables) • Snow machine (used for collecting trash and recyclables) • backhoe (used to compact and consolidate waste and dig trenches - owned by council and council pays for all gas/fuel usage for it) • Burnbox – like new condition, used to burn burnables.	Obtain funding to improve solid waste management practices.
Equipment Storage:	Backhoe is stored in a shop.	Possibly build a warehouse to store all heavy equipment and vehicles to keep out of harsh weather conditions.

Waste Burning Practices

We have a locally made burnbox which has been used on occasion to burn wastes, however it is not sized correctly for our community and it doesn't work very well. It's difficult to get a good burn going in it. From time to time we try to clean it out (it's a two person job) and try to get it running properly but it doesn't take long for it not to work again. Non-burnable wastes have been placed into the burn unit and accumulate and a buildup of ash seals off the ash grate. We need to seek funding to purchase and appropriate burn unit for our community.
UPDATE: We received funding in 2015 from EPA to purchase a new burn box. SWO's separate recyclables, burnable and non burnable waste. Recyclables will be stored in the recycling connex, burnable items will be burned in the burn box and the remaining ashes will be transported to the trench and covered, non burnable items will be placed in the salvage (open pit) area. SWO's will clean out the burn box once a week.

Table 4 Waste Burning Practices

Feature	Current Description	Planned Changes or Goals
Is burning waste a normal way to manage some or all of your wastes?	Yes, non burnables are separated. Burnables are burned in the burn box then the ash is transported to the trench.	Continue waste separation to reduce the volume of waste going into the landfill and the potential to create leachate.
How many households burn waste in barrels in town?	None. A resolution was passed by the council to prohibit burning waste in barrels.	
Do businesses burn any wastes in barrels that are in town? **What wastes are burned by them?**	No	
Is waste burned on the ground at the Dump*?* Who lights the fire?	Open burning is prohibited at the landfill.	Prohibit open burning on the ground to ensure that the wastes are burned at the right temperature to minimize black smoke.
Burnbox Information		
Burnbox Type and Age and How Ash is Emptied.	Portable burn box, constructed by Tok Welding and Fabrication in 2015. Burn box is staged next to the active trench. Burn box is cleaned every other week by SWO, ash is transported to the trench.	
How often is the burnbox used?	During hours of operation. Monday-Friday, 10:00-2:00.	There is no burning when it is too windy out and also when the wind is blowing towards the village.
Does the operator wear an approved mask and long sleeves, glasses, steel-toed boots?	IGAP provides the SWO's safety glasses, dust masks, and rubber gloves to handle solid and hazardous wastes. Also provide insulated and steel toed boots, insulated coats and bibs, gloves, hat, face masks, goggles, and rain gear to protect against the harsh weather conditions.	Protect the health and safety of the SWO.
Is there a signed statement by the operator that he is expected to wear protective gear and operate the burnbox in a correct and safe manner?	No, but this is something we would like to consider.	

Table 4 Waste Burning Practices

Feature	Current Description	Planned Changes or Goals
Are there rules about which wastes are acceptable in the burnbox?	**Operator separating wastes:** *Pull out anything they see that looks dangerous and is hazardous to burn.* **Household and Businesses Separating wastes before bringing to dump:** *Take out styrofoam, batteries, any leftover household chemicals.* **Prohibited Wastes:** Tires, batteries, computers, TVs, fluorescent lights, hazardous wastes, PVC pipes, big plastics	Educate the community on the importance of waste separation.

5.3 Revenues and Costs for Current Solid Waste Practices

The following table lists the current costs of our solid waste program.

Table 5 Current Annual Operation And Maintenance (O & M) Expenditures For Solid Waste.

Item	Unit Cost	Units	Quantity	Annual Cost
Personnel				
Solid Waste Operator	$17	hour	520	$8,840
Solid Waste Operator	$17	hour	520	$8,840
Heavy Equipment Operator repair, maintenance, and replacement fund (Running Track Loader average of 60 hrs twice per year for compaction and consolidation of wastes, clearing access).	$30	hour	16	$480
Administration, (4 hr per month, $16/hr)	$25	hour	48	$1,200
Fringe, inc. FICA, workmen's comp, benefits ($12,168 x 20%, this equals $12,168 x 0.20)	32%	lump	$5,178	$1,671
Travel and Training				
Training, (e.g. Tribal Leader's Summit, RACEJT, AFE, ATCEM) (optional – depends on need and experience of operator)	$7,928	Lump sum	2	$15,856
Other				

Fuel for snowmobile, atv, equipment operation at site, 5 gallons per week	$5	gallon	240	$1,200
Heavy equipment repair, maintenance, and replacement fund (Running Track Loader average of 60 hrs twice per year for compaction and consolidation of wastes, clearing access).	$30	hour	16	$480
Other equipment repair, maintenance and replacement fund, ATV for collection, 20 hr per week for 26 weeks, set-aside funds	$30	hour	16	$480
Supplies				
Safety gear needed each year	$750	Lump sum	2	$1,500
Office Supplies	$480	Lump sum	1	$480
Total annual O & M expense				**$41,027**

5.4 Current Annual Revenues Dedicated to Solid Waste

The below Table lists the current revenue sources dedicated to our solid waste program.

Table 6 Current Annual Revenue For Solid Waste Program

Item	Annual Revenue
Household fee 25 households @ $13 per month	$3,900
Business fee for 6 businesses (1 Store, clinic, post office, old clinic, school, VPSO bldg), $53 per month	$3,816
Elderly discount fee, 9 households @ $8 per month	$864
Tribal IGAP funds	$18,635
Construction Project waste tipping fees	$5,000
Equipment rental fees to outside projects	$440
Revenues from recycling aluminum cans	$60
Total annual revenues for solid waste	**$32,715**

5.5 Health and Environmental Issues

Our primary health and environmental issues related to solid waste management are:

- Hazardous waste, not separating garbage
- Open burning affecting our air quality (need waste separation)
- Affect on subsistence lifestyles
- Hazardous wastes disposed at landfill will pollute land, water and air (hazardous Waste needs to be stored in a designated area and second containment)
- Public's exposure to waste at the landfill when self-hauling

Note that 43% of people that filled out the survey had concerns "somewhat" about the landfill affecting subsistence lifestyle, and 22% had "a lot" of concerns. Thirty-five percent of people felt that dumpsite concerns affected how often subsistence activities are preformed, 26% of people felt that dumpsite concerns affected where and how subsistence activities are performed, 22% of people felt that the amount and types of subsistence foods consumed/obtained are affected by dumpsite concerns, and 9% felt a subsistence activity couldn't be performed because of dumpsite concerns. And finally, 22% of people had concerns "somewhat:, and another 22% had "a lot" of concerns, about the dumpsite and hazardous waste, that may have changed activities that are part of Yupik values, lifestyle, or Elder teachings.

6. How Much Waste Is Generated

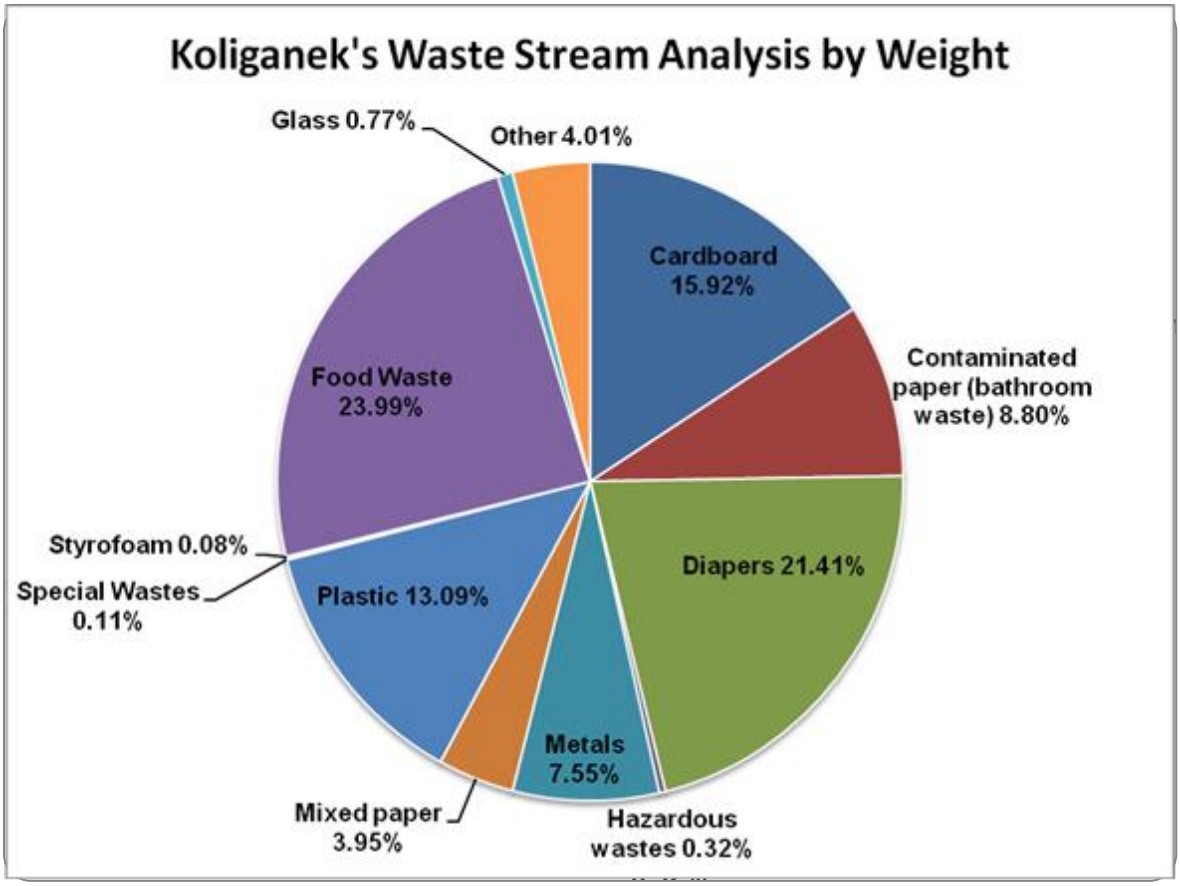
This section assesses the amount and type of our current waste generation and special waste accumulation. Knowledge of our waste stream is critical in determining the best waste management strategy for our community.

6.1 Overview of Waste Characterization Process and Results

To determine our community's residential waste generation rate, we carried out a waste characterization in our community in January 2010. Seven households participated and after 4 full days of using designated trash bags, the trash was collected from the households and separated into categories and weighed. The residential waste generation rate was found to be 0.9 pounds/person/day. A breakdown of the waste stream (by weight) is shown in the figure below. Food waste and diapers make up a fairly large portion of our waste stream by weight. About half the households that participated in the waste characterization had dogs that were fed the majority of the food wastes generated, so for those households, the food waste amounts were low (and sometimes zero), but for the other households the total food wastes were higher than the average shown in the chart. And similarly with diapers, the households with babies had total diaper amounts higher than the average shown in the chart.

Full results from the waste characterization can be found at the end of this plan.

We were unable to interview businesses to determine a business waste generation weight. So we added 20% (which also accounts for special wastes and construction wastes that are calculated below) to our residential waste numbers, for a total estimated waste generation rate of 1.08 pounds/person/day. The 20% is a rate based on several waste characterizations of rural non-hub villages. It is slightly lower than the national average due to the fact that we have virtually no commercial facilities – stores or factories. The population of our community is 244 people. Thus, the approximate amount of waste generated by our community each year is 96,185 lbs per year (or 48.1 tons per year). See the following sections for a breakdown of special and recyclable wastes, including for businesses, that are part of this total.



We have calculated the weight and amount of special wastes in the community on the following pages, that can be considered part of the total. In addition to standard “special wastes”, we include any wastes that can be managed differently, with backhaul, recycling, reuse, etc, so that a separate accurate estimate is important in our planning efforts.

6.2 Accumulated Special Wastes Currently in the Community

Table 8 Special Wastes Stockpiled In Our Community Now

Column A	Column B	Column C	Column D
Waste	**How many of these wastes are stockpiled or sitting around your community now:**	**Average Weight of Single Item in pounds (lbs)**	**Estimated Total weight of wastes in your community now**

Lead-acid batteries in **boats**	63	40	2520
Lead-acid batteries in **ATV's**	70	12	840
Lead-acid batteries in **Sno-gos**	99	12	1188
Lead-acid batteries in **cars or trucks**	24	40	960
Aluminum skiff (exc. engine):	63	1000	63000
Other boats (with engine):	2	2000	4000
Atv's:	70	800	56000
Sno-gos:	99	1000	99000
Car or Truck:	24	2000	48000
Heavy Equipment	10	10000	100000
Refrigerators and freezers	136	250	34000
Stoves, Washers, Dryers	10	200	2000
Office fluorescent lights (4 ft tube=0.7 lb)	20	0.7	14
Empty 55 gallon drums	125	50	6250
Full 55 gallon drums of used oil	4	600	2400
Full 55 gallon drums of used antifreeze	1	600	600
Full 55 gallon drums of unknown or mixed waste	2	600	1200
Total weight in pounds			421972

6.3 Special Wastes & Other Wastes of Interest in Recycling, Reuse & Reduction Programs

The values of our community are to conserve and protect everything that comes to us from the land. Our goal is to maximize the careful use of resources, including recycling. This section contains tables that identify wastes that may be reduced, banned, or diverted for immediate or future recycling through a management program.

Table 7 Special Waste Annual Generation Rates

Table 9 Special Waste Generation Rates

Column A	Column B	Column C	Column D	Column E	Column F	Column G	Column H	Column I	Column J	Column K	Column L
WASTE:	About this many households have at least one of the item:	Average number that these households own. (average number owned by households listed in Column A)	Average number of yrs before the waste item will need to be discarded	Total number generated each year	How many total of these wastes do businesses have? *(e.g. if 5 businesses have atvs, then write 5)*	Total average number each yr discarded from business, schools, offices, utilities.	Total from households and businesses	Average Weight of Single Item in pounds (lbs)	Estimated Total weight generated (lbs)	Estimated % that is **not** salvaged for parts or reused	Estimated total weight each year generated that is not salvaged for parts or reused (lbs)
	Enter:	*Enter:*		***(=BxC ÷D)***	*Enter:*	***(=F÷D)***	***(=E+G)***		***(=H x I)***	*Enter:*	***(=J x K)***
		Survey Count for vehicles and batteries:*									
Lead Acid Batteries: **BOATS**	63	1	2	0.5	15	7.5	8	40	320	100%	320
Lead Acid Batteries: **ATV's**	70	1.5	3	0.5	5	1.7	2.2	12	26	100%	26
Lead Acid Batteries: **SNO GO's**	99	3	15	0.2	3	0.2	0.4	12	5	100%	5
Lead Acid Batteries: **CAR or TRUCK**	24	12	4	3.0	4	1	4	40	160	90%	144
Total Lead-Acid Batteries											**495** *(about 67% of this weight is lead)*

Aluminum skiff (exc. engine):	63	1	8	0.1	15	1.875	2	1,000	2,000	90%	1,800
Other boats:	2	1	20	0.1	0	0	0.05	2,000	100	100%	100
ATV's:	70	1	5	0.2	5	1	1.2	800	960	60%	576
Sno-Gos:	99	3	5	0.6	3	0.6	1.2	1,000	1,200	50%	600
Car or Truck:	24	0	20	0.0	4	0.2	0.2	2,000	400	75%	300
Heavy Equipment	10		20		4	0.2	0.2	10,000	2,000	70%	1,400
Household refrigerators and freezers	125	3	25	15.0				250	3,750	100%	3,750
School/Store refrigerators and freezers	11		20		8	0.4		1,000	400	100%	400
Wood stoves	50	2	40	2.5		0	2.5	**200**	500		0
Cooking stoves	60	1	15	4.0		0	4	200	800		0
Washers, Dryers,	54	1.25	20	3.4	3	0.15	3.525	200	705	100%	705
Fluorescent light **bulbs**	54	8	1.5	288.0	10	6.66666667	294.7	0.20	59	100%	59
Fluorescent **tube** lights (4-ft tubes)	35	2	5	14.0	20	4.0	18.0	0.75	14	100%	14
Computers (without monitors)	40	1	3	13.3	*25*	8.3	21.7	*30*	650	100%	650
Monitors	40	1	3	13.3	*25*	8.3	21.7	*20*	433	100%	433
Laptops	20	1	3	6.7	*5*	1.7	8.3	*7*	58	100%	58
T.V.'s	70	2	7	20.0	*5*	0.7	20.7	*50*	1,036	100%	1,036
										Total	**12,376**

*For purple shaded rows, a survey was performed to count the number of vehicles in Koliganek. For these rows, the actual count is entered in Column C

Table 8 Important Additional Wastes With Different Estimation Methods

(Diapers, Used Oil, Antifreeze)

Column A	Column B	Column C	Column D	Column E	Column F	Column G	Column H	Column I	Column J
Disposable Diapers	Number of people in village	Number of babies in village that use disposable diapers:	Number of diapers each day for each baby (nationwide average is 5):	Number of diapers each day:	Number of diapers each year:	Total weight: (Average weight of full diaper = 0.4 lb)	Approximate volume in landfill, cubic yard.: (avg. child = .53 /yr)	Average waste generated per person each day in lbs	Approximate % of total waste stream by weight
	Enter:	*Enter:*	Enter amt or use the average of 5:	*C x D*	*E X 365*	*F X 0.4*	*C x.53*	*Enter:*	*(c x d)/(b x i)*
	200	15	8	120	43,800	17,520	7.95	1.1	**54.55%**

Table 10 Important Additional Wastes With Different Estimation Methods (Used Oil)

	Households						**Businesses**				**Totals**		
Column A	Column B	Column C	Column D	Column E	Column F	Column G	Column H	Column I	Column J	Column K	Column L	Column M	Column N
Used oil from vehicles	Number of households that have working vehicles:	Average number of vehicles for households that own one:	Total household vehicles (estimated)	Average number of quarts that are drained per vehicle:	How many times per year is oil purposely drained on average for these vehicles?	Number of quarts drained each year by houses:	**Total** number of vehicles for **all** businesses	Average number of quarts that are drained per vehicle:	How many times per year is oil purposely drained on average for these vehicles?	Number of quarts drained per year from businesses	Total quarts each year that are drained:	Total Gallons of recoverable used oil each year for recycling/ heat	Total **gallons** of drinking water protected if used oil is diverted:
	Enter:	Enter:	B x C *OR* Enter:	Enter:	Enter:	D X E X F	Enter:	Enter:	Enter:	H X I X J	G+K	L X 4	M * 1 million
ATVS	70	1	70	3	2	420	5	2.5	2	25	445	1780	1,780,000,000
Snow-machines	99	1	99	0	0	0	3	0	0	0	0	0	0
Boats	63	1	63	2.5	1	157.5	15	2.5	1	37.5	195	780	780,000,000
Cars or Trucks	24	1	24	4	2	192	4	4	2	32	224	896	896,000,000
Heavy Equipment	0	0	10	6	2	120	5	6	2	60	180	720	720,000,000
TOTAL			**266**			**890**				**154.5**	**1,044**	**4,176**	**4,176,000,000**

Table 9 Estimation Of Aluminum Cans, Plastic Bottles, Styrofoam, And Cardboard For Recycling Or Waste Reduction/Banning Purposes

Column A	Column B	Column C	Column D	Column E	Column F	Column G	Column H	Column I	Column J
Recyclable Material	**How Many pieces (cans, bottles, boxes etc.) the stores order each year:**	**About how many households bring in or order their pop cans directly:** ***(Just estimate what you think)***	**Average number of items these households bring in each year:**	**Total posted or brought in from households each year**	**Number posted or directly shipped to businesses other than stores (e.g. school):**	**Total estimated number:**	**Total pounds per year:**	**Total potential revenue per year:** ***(multiply pounds(column H) by the price that Recycling company pays (column J))***	**Price that Recycling company pays per pound**
	Enter	**Enter**	**Enter**	**(CxD)**	**Enter**	**(B+E+F)**	**(see comments for each cell)**	**(H*J)**	***(the prices listed here are just examples - you can call the recycling company to get an estimate)***
Aluminum Cans *(not cases)*	43200	20	730	14600	2000	59800	1993.3333	$398.67	$0.20
Plastic Bottles	8064	15	215	3225	500	11789	943.12	$14.15	$0.02
Styrofoam	240	10	200	2000	2900	5140	102.8	$0.00	$0.00
Cardboard *(Corrugated boxes)*	3000	30	72	2160	420	5580	11160	$290.16	$0.03
Total Estimated Revenues								$702.97	

6.4 Construction and Demolition Wastes

Based on USEPA research for nationwide averaged actual figures, the amount of construction and demolition (C & D) wastes is summarized in the Table below. Because C & D wastes from a project enter the site in a single year, versus over the building lifetime, total project wastes and average annual wastes are included.

Table 12 Estimation of Construction & Demolition Waste

Column A	Column B	Column C	Column D	Column E	Column F	Column H
Project	**Building Area (sq ft)** (estimate the approximate area of the buildings)	**Salvage Factors** (Estimate how much of the project waste is salvaged by the community.)	**Total Project Wastes (pounds)** (Find the right waste number from Table A below. Multiply it by the average sq ft of the building type, multiplied by (1- column c))	**How often built (years)** (every *x* years)	**Average waste per year (pounds)**	**Average waste per year (tons)**
	Enter	*Enter*	*B X (1-C) X (Table A factor)*	*Enter*	*D ÷ E*	*F÷ 2,000*
School *construction*	19,433	10%	68,035	50	1,361	0.7
Clinic *construction*	2,400	5%	8,869	30	296	0.1
Post office *construction*	1,440	5%	5,322	40	133	0.1
Store(s) *construction*	2,496	5%	9,224	40	231	0.1
House(s) *construction*	896	10%	3,532	1	3,532	1.8
Renovation, residential	150	40%	1,590	1	1,590	0.8
Renovation, *non-houses*	890	20%	12,581	1	12,581	6.3
Demolition, *residential*	0	0%	0	1	0	0.0
Demolition, *non-residential*	0	0%	0	1	0	0.0
Total Average Tons Per Year of C&D Waste					19,723	**9.9**

Table A: Typical Construction and Demolition Waste Generation Rates Researched, in lbs (pounds) per sq ft

	Residential (lbs/sq ft)	Non-residential (lbs/sq ft)
New Construction	4.38	3.89
Renovation	Varies	17.67
Demolition	115	155

From: Characterization of Building-Related Construction and Demolition Debris, Franklin Associates, USEPA 1998.

The numbers in the table above represent the amount of construction wastes generated in our community. The procedure we have developed for handling construction project waste is described below.

Contractual Agreement Between the Tribe and Construction Companies

Our Tribal Council has an ordinance in place stating that construction companies will need to sign a contractual agreement with the Tribe agreeing to either ship their construction waste materials out, or pay a fee to dump non-hazardous waste materials in the landfill. Should the construction company need to use the landfill, a fee will be decided upon between the Tribe and the construction company. Hazardous construction materials will not be permitted in the landfill.

6.5 Projected future population and waste generation:

Our population growth was discussed in Chapter 4. The Table below applies the estimated growth rate to the estimated annual waste generation rate of 48.1 tons per year, discussed above. This ISWMP is based on the projected figures. Future programs, such as expanded education and recycling efforts will incorporate the projected population.

Table 10 Projected Population and Waste Generation for the Next 20 Years for Koliganek

Year	Population	Waste (Tons)
2016	*227*	*40.6*
2017	*232*	41.5
2018	*237*	42.4
2019	*242*	43.3
2020	*247*	44.2
2021	*253*	45.2
2022	*258*	46.2
2023	*264*	47.2
2024	*270*	48.2
2025	*275*	49.3
2026	*281*	50.3
2027	*287*	51.4

2028	*294*	52.5
2029	*300*	53.7
2030	*307*	54.8
2031	*313*	56.0
2032	*320*	57.2
2033	*327*	58.5
2034	*334*	59.8
2035	*341*	61.0
2036	*349*	62.4

7. Recycling, Reducing, And Reusing Program

7.1 General description of program's most important accomplishments/ aims:

Our first recycling event was aluminum cans in 2003. Our first backhaul of aluminum cans started in 2007. We are also collecting lead-acid batteries, used oil, and e-waste. We have a connex van to store these recyclables. We are trying to teach our kids to reuse paper. Used paper is collected and made into notebooks and planners. We are trying to increase the types of materials that are recycled and reused with the resources that we have accessible. All of our current efforts and our procedures for recycling various materials are detailed in the Tables in the following pages.

Recycling information from our solid waste survey.

In a solid waste survey that we carried out in 2009, we asked people in our community about recycling and our recycling program. We received 23 surveys and here is a summary of what people answered.

The majority of people (70%) knew about the aluminum can recycling program and where they can bring cans. Twenty-six percent did not know, so some education is needed to inform people about the program. The majority of people knew that Koliganek could get money from the cans to help pay for cleaning up the environment and protecting subsistence, but again 26% did not, so we will also try to educate about this.

When asked what people do with aluminum cans most of the time, 48% also said they separate cans for the solid waste operator to pick up, but 48% said that they leave cans in their trash. When asked why they think people don't separate their cans, the following answers were given:

- can't afford more trash bins
- just want to throw cans in trash
- need extra trash containers for aluminum
- no trash can
- keep forgetting there is a recycling program
- laziness, lack of knowledge on what to do with them
- Lazy (7 responses)
- lazy or they don't know
- too lazy or don't care about trash build up

- probably don't want to
- so they can.
- so we don't mess stuff up
- so we don't mess up our equipment
- They don't care
- I don't know (2 responses)
- to get money from the cans

We asked what items they thought people could learn to separate from their trash and aluminum cans were highest on the list, but other items included:

Material	**% of survey responses**
Al cans	83%
Cardboard	61%
Paper	61%
Small batteries	61%
Plastics	48%
Tin cans	43%
Glass jars	39%

Suggestions that people gave for ideas about getting more people to recycle their cans included:

- advertise
- give prizes. R/T tickets or gas. Really motivates people
- Have a door prize every month
- have prizes
- maybe once a month can have gathering and bring can to drop off and have door prizes. This would show people are recycling
- notify people then suggest we can win a prize. Make recycling an activity or something
- offer door prizes once in a while, provide can crushers
- Prizes picked out of hat. IGAP provide receptacles just for cans
- prizes, prizes, prizes
- have two trash cans (2 responses)
- Having 1 person just pick up cans only
- incentive program
- put more flyers out to the community
- saving earth and money
- talk about recycling, how it will help the environment
- tell kids to put away cans
- tell them or ask them to separate their cans

Getting a recycling building to collect and store recyclables has been discussed for our community and we asked people if they thought it was a good idea and all but one person responded “yes.” We asked what they thought about a building/center and if it would increase the recycling of the materials that we already recycle. Everyone responded positively about this and the comments included:

- a very good idea
- Amazing idea, yes!

- it might be a good idea
- Yes (11 responses)
- yes, more people can get involved

Further along in the survey we asked if a recycling building would increase and benefit our Village and again we got all positive responses which included:

- there would be a place to put hazardous stuff so it doesn't get into our earth
- very much
- Yes (11 responses)
- yes because it would be a little cleaner
- yes because it would be a lot cleaner
- Yes they would have a place to put them
- Yes! Absolutely
- yes, a lot
- yes, less waste at dump
- yes, reduces waste in environment

We also asked if they thought people would use the recycling building/center and 87% responded “yes” (0% responded “no”) and a few comments given were:

- yes, because they would be there to help people recycle
- yes, if we know where to bring the stuff would be helpful
- yes, it will reduce the amount of trash going to the landfill
- I don't know, maybe

When asked how we can make it easier for people to recycle, the majority of comments were to build a recycling center and other comments included:

- have different bins for recyclables
- have marked containers
- have them build a recycling building
- Having the center just for these things
- Build a recycling center
- build the centers to have drop offs there to recycle
- have a big recycling building
- have building for recycling
- I would bring my recyclables to the recycling center
- inform them
- more locations for recycling so it's easy access
- provide trash bins
- put them in plastic bags and pile them in a conne1 to be picked up
- Put up sign, send letters
- saving plastic bottles, can crushers in every home
- the way they did it in the past was take to the dump
- to help them recycle

We asked if a recycling center was built, would most people be willing to bring their items to the center, and the results were:

Yes, people would go to the center	57%

No, they would need to be collected	22%
Maybe, it depends on: • how much money you get from community • it depends on one or the other should be an option to have • Elders and weather	

A thrift store/reuse center has also been discussed as a separate center or part of the recycling building, and we asked people which unused items they thought people might share/donate, and the results were as follows:

Material	**% of survey responses**
Household hazardous wastes	61%
vehicle parts	57%
toys, books	57%
clothes	52%
appliances, furniture	35%
other	4%

Based on the survey results, we will pursue funding for a recycling building/center (which may also double as a reuse center), continue and try to increase our education and outreach effort about recycling to our community, and look into an incentive program that offers some sort of prizes to help motivate people to recycle more.

Table 11 Wastes That Are Currently Collected Or Dropped-Off For Recycling, Backhaul, Storage, Or Reuse Programs

Waste	How collected or separated? What residents should do	What for?	Where it is stored?	Is it shipped out? How often?	Who takes it?	Where does it go to?
Aluminum cans:	Cans are picked up from households. Some residents crush their cans, or SW operator will crush them and put in trash bags and tags them with shipping address.	Recycling to reduce volume of waste going into the landfill, respect for our land and for communities where new aluminum is mined and their environment is being harmed.	In a recycling connex	Cans are shipped out with airline whenever they have room. We call them ahead of time for space available, cans are staged at the airport.	Grant Aviation and Northern Air Cargo	The ALPAR Flying Cans
Cardboard:	*Not recycling at this time. It is burned in burn box.*	NA	NA	NA	NA	NA
Paper:	IGAP just started recycling office paper	Recycled notebooks, daily planners, and calendars.	Kept in office in the storage room.	We encourage summer youth employees to make enough notebooks to distribute to all the school kids on a yearly basis.	IGAP staff	Koliganek School
Ink jet cartridges	**-**	**-**	**Not sure where operator stores them**	**-**	**-**	**-**
Plastic Bags:	NA	NA	NA	NA	NA	NA
Glass:	NA	NA	NA	NA	NA	NA
Styrofoam:	NA	NA	NA	NA	NA	NA
Food Wastes:	Several households feed their	dogs	NA	NA	NA	NA

Waste	How collected or separated? What residents should do	What for?	Where it is stored?	Is it shipped out? How often?	Who takes it?	Where does it go to?
	food waste to their dogs.					
Furniture, Clothes, toys, other useful items	Sometimes people will hold sales or give clothes away	-	NA	NA	NA	NA
Household (small) batteries	Collected with Lead Acid batteries- picked up by SW Operator	For recycling, to keep out of land fill and reduce hazardous waste	In recycling connex	Needs to be shipped out- no backhaul event at this time	NA	Will eventually go to Total Reclaim
Lead-acid (Vehicle) batteries	Picked up by SW Operator	For recycling, to keep out of land fill and reduce hazardous waste	In recycling connex	Needs to be shipped out- no backhaul event at this time	NA	Will eventually go to NAPA in Dillingham or Interstate Batteries in Anchorage
Used oil	Not currently collected- will eventually be transported from landfill to used oil burner	NA	NA	NA	NA	NA
Antifreeze	Not currently collected	NA	NA	NA	NA	NA
Vehicle fluids that are not oil	Not currently collected	NA	NA	NA	NA	NA
Computers *(all electronics contain unsafe metals when burned)*	Collected from Households	For recycling, to keep out of land fill and reduce hazardous waste	Stored in a connex and will be shipped out	Needs to be shipped out- no backhaul event at this time	NA	Will eventually go to Total Reclaim
T.V.s	Collected from Households	For recycling, to keep out of land fill and reduce hazardous waste	Stored in a connex and will be shipped out	Needs to be shipped out- no backhaul event at this time	NA	Will eventually go to Total Reclaim

Waste	How collected or separated? What residents should do	What for?	Where it is stored?	Is it shipped out? How often?	Who takes it?	Where does it go to?
Other electronics	Collected from Households	For recycling, to keep out of land fill and reduce hazardous waste	Stored in a connex and will be shipped out	Needs to be shipped out- no backhaul event at this time	NA	Will eventually go to Total Reclaim
Fluorescent lights *(These contain mercury and phosphor powder)*	Collected from Households	For recycling, to keep out of land fill and reduce hazardous waste	Stored in a connex and will be shipped out	Needs to be shipped out- no backhaul event at this time	NA	Will eventually go to Total Reclaim
55-gal drums	Not currently collected	NA	NA	NA	NA	NA
Scrap copper (e.g. pipes	Not currently collected	NA	NA	NA	NA	NA
Scrap Aluminum (boats, etc.)	Not currently collected	NA	NA	NA	NA	NA
Junk vehicles	*Store at dump salvage area*	*Backhaul in future*	NA	NA	NA	NA
Junk appliances	*Store at dump salvage area*	*Backhaul in future*	NA	NA	NA	NA
Freon from appliances	*Store at dump salvage area*	*Backhaul in future*	NA	NA	NA	NA
Unused hazardous materials like paints, cleaners, degreasers, lube oil, disinfectants, sprays, mosquito repellents, insect killers, mold removal, weed killers	Paint is collected	For reuse, to keep out of land fill and reduce hazardous waste	Paint stored in Recycling center to possibly reuse	NA	NA	NA

Table 12 Recycling Equipment Description, Status, And Plans

Item	Description	Own Now?	Will purchase in next year with existing funds	Want to have in next 5 years	Plan later than 5 years when we are ready or have the need for it.
Recycling Shed to store wastes for later backhaul?	We have one connex but it's pretty full.	Yes	Will try to find funding for an additional one.	Yes	
Storage bags for Aluminum Cans	ALPAR bags	Yes	Last bags received in 2016	Yes	N/A
Recycling Baler	Wanting to acquire for the future	No	NA	No	Yes
Reuse-Share Shed	NA	NA	NA	NA	NA
Connex or Shed to store hazardous wastes for safety	We have another connex that is filled with empty propane bottles	Yes	Yes	Yes	Yes

The following Table summarizes staff management and community member responsibilities for our Recycling Program.

Table 13 Recycling Management Program

Item	What community members should do	Who is in charge of this program?	Planned drop-off locations or other means of collection?	What is the priority for increasing recycling or starting it? (1 = highest, 2 = medium concern, 3 = lower concern)
Aluminum can recycling	Cans are picked up from households. Some residents crush their cans, or SW operator will crush them to put in trash bags and tags them with shipping address.	IGAP	SWO will continue to collect recyclables and store in the Recycling Connex.	2
Newspapers	We don't recycle these yet, but we do have a mixed	NA	NA	3

Item	What community members should do	Who is in charge of this program?	Planned drop-off locations or other means of collection?	What is the priority for increasing recycling or starting it? (1 = highest, 2 = medium concern, 3 = lower concern)
	paper program where kids turn used paper into notebooks and planners			
Cardboard	We don't recycle these yet, but we do have a mixed paper program	NA	NA	3
Plastic Bottles	We don't recycle these yet, but we would like to in the future	NA	NA	2
Plastic bags	We don't recycle these yet, but we would like to in the future	NA	NA	2
Used oil	Eventually, safely contained in second containment- burned properly in the used oil burner.	IGAP	Purchasing a new connex and 55 gallon drums for a designated used oil collection site.	1
Vehicle Batteries	Batteries are picked up at households or dropped off at recycling connex	IGAP	SWO will continue to collect recyclables and store in the Recycling Connex.	1
Computers, TV's	People drop off at connex or picked up at households	IGAP	SWO will continue to collect recyclables and store in the Recycling Connex.	1
Household Batteries	People drop off at connex or picked up at households	IGAP	SWO will continue to collect recyclables and store in the Recycling Connex.	1
Printer cartridges	Will be addressed in the future	NA	NA	2

7.2 Recycling Revenue and Payments

We made about $60 from recycling cans in 2008. This money went to the Tribal Council. We also backhauled a connex van full of lead-acid batteries to West Seattle Recycling in 2013. We received a check for the amount of $2,258.36 for recycling 8,686 lbs of lead acid batteries, funds went to the Solid and Hazardous Waste Collection Program.

7.3 Backhaul Program

Table 14 Wastes Already Backhauled

Waste item	Amount backhauled (count or weight)	Date(s) backhauled
Refrigerators and freezers	None yet	Next five years
Junk vehicles (this is sold as scrap metal)	None yet	Next five years
Other scrap metal	None yet	Next five years
Batteries (lead acid)	8,686 lbs	2013
Computers	9 pallets of electronics and small household appliances	2013
Other e-waste	9 pallets of electronics and small household appliances	2013
Other Large Appliances	None yet	Next five years

Table 15 Wastes To Be Backhauled Within Five Years

Waste item	Estimated amount to be backhauled (count or weight)	Where are the items being stored?	Estimated date for backhaul
Refrigerators	50-100	Open pit area by landfill	2019
Junk cars	2-5	Open pit area by landfill	2019
Miscellaneous scrap metal	20 (Hondas/ sno-gos)	Open pit area by landfill	2019
Batteries (lead acid)	~20	Recycling connex	2019
Computers	5-10	Recycling connex	2019
Other e-waste	~20	Recycling connex	2019
Fuel drums	125	Open pit area by landfill	2019
Tires	100-150	Open pit area by landfill	2019

8. Hazardous Wastes

We know that hazardous wastes can be harmful to us, so we are trying to reduce our use and also to keep them out of our landfill and our camps. We are now collecting lead-acid batteries, e-waste, and used oil. We set-up a connex in 2003 to store these hazardous wastes. We continue educating the community about why it is important to recycle or properly dispose of hazardous wastes. We are trying to encourage the use of less toxic alternatives such as propylene glycol instead of ethylene glycol for antifreeze and green cleaners for household cleaning. The tables on the following pages summarize further our hazardous waste program.

In a solid waste survey that we gave our community in 2009, we asked that if people knew about the hazards from waste to our land, air, and water, and that recycling makes the dump smaller and further from the creek, would they recycle hazardous materials more. All but one response to the question was “yes” and one was “no.”

We also asked people where they dispose of their used oil and 48% answered that they store it in a safe place for the operator to pickup and 13% answered that they dump it on the ground.

And then we asked how they thought we could encourage people to store their used oil in a safe place and the following comments were given:

- educate
- Educating them
- have a big container and put signs up telling where to dump
- I didn't know you can take used oil to the store
- keep telling them
- provide designated area/storage for used oil- not at landfill
- put it in a closed container
- put more flyers out
- talk about how dangerous it would be to plants and animals we eat
- tell them it will kill the fish and animals
- We recycle our own use it for other things
- Yes (2 responses)
- yes, take to the dump

We plan to continue and increase our education and outreach about used oil and hazardous wastes and also seek funding for ways to improve disposal of solid and hazardous waste.

Table 16 Table For Hazardous Wastes And Some Reasons Why They Harm Our Community

Waste	Where/how it is disposed now	Why it is harmful
Medical Wastes	Sharps are sent to BBAHC	Diseases from medical waste can be spread by contact with soiled bandages, sharps etc.
Disposable Diapers	At the landfill	Has a lot of germs from the poop that people can step on and track back to homes. If burned, there are many chemicals which are irritants if they are breathed and can cause illnesses if they are at a high level.
Plastic bottles, PVC pipes, and Styrofoam	Most of it is buried in the trench or put into the open pit	Could cause leachates and takes up volume
Household (small) batteries	Stored in recycling connex	To reduce toxins in the environment by keeping these out of landfill
Lead-acid (Vehicle) batteries	Stored in recycling connex	To reduce toxins in the environment by keeping these out of landfill
Used oil	Currently stored at the landfill	Takes up volume, could cause leachate
Antifreeze	Currently stored at the landfill	Takes up volume, could cause leachate
Vehicle fluids that are not oil	Currently stored at the landfill	Takes up volume, could cause leachate
Computers	Stored in recycling connex	To reduce toxins in the environment by keeping these out of landfill. Takes up volume, could cause leachate
T.V.s	Stored in recycling connex	To reduce toxins in the environment by keeping these out of landfill. Takes up volume, could cause leachate
Other electronics	Stored in recycling connex	To reduce toxins in the environment by

Waste	Where/how it is disposed now	Why it is harmful
		keeping these out of landfill. Takes up volume, could cause leachate
Fluorescent lights	Stored in recycling connex	To reduce toxins in the environment by keeping these out of landfill. Takes up volume, could cause leachate

Table 17 Hazardous Waste Recycling And Staging For Future Backhaul

Item/Task	Do we have this?	Who operates it? Who is in charge? Where is it?	Do we want this in the next five years? What are the details of what we want?	What is priority to get or improve? *(1 = highest, 2 = medium, 3 = lowest)*
Place for people to drop-off?	No	Eventually IGAP	Yes- second containment for hazardous wastes	1
Used Oil Burner? Who operates?	Yes	IGAP	Received funding in 2017 to purchase a new used oil burner	1
Totes for storage of lead-acid batteries?	No	IGAP	5 more totes	1
Antifreeze Recycler?	No	NA	Yes	1
Freon Removal?	Yes	IGAP	Certified operator to safely handle and dispose Freon from refrigerators and freezers	1
Fluid Pumps for Draining Cars?	No	NA	Yes	2
Connex for storage and eventually backhaul?	Yes	IGAP	Yes. Keep hazardous waste from being exposed to the harsh weather conditions	1
HAZWOPER Certified Technicians	Yes	IGAP Staff and SW Operators	Yes- continuation of annual recertification	1
Spill Response Kit	Yes	IGAP	Yes, have spill kit readily available and stocked to respond to emergencies	2
Hazardous Waste Plan, including operational steps	No	IGAP	Yes	1
Clinic Medical Waste Plan	No	BBAHC	NA	NA

9. Old/Closed Dumpsites

In addition to our current landfill, we have two dumpsites in our community that people used to bury trash in years ago. They are no longer used and are covered up.

10. Additional Related Waste Concerns For Subsistence

In October 2009, we carried out a solid waste survey in our community and asked the following questions regarding landfill/trash affects on subsistence. Results for the relevant questions are given below.

Survey Question 28. Do you have any concerns about the landfill and affecting subsistence lifestyle?

Not at all	26%
Somewhat	43%
A lot	22%

Survey Question 29. How have subsistence activities been changed due to dumpsite concerns?

Where activities are preformed	26%
How often activities are performed	35%
How they are performed	26%
Type of foods obtained	22%
Amt of foods consumed	22%
An activity can no longer be performed	9%
Don't want to specify	17%

Survey Question 30. Do you have concerns about the dumpsite, haz waste, that may have changed activities that are part of Yupik values, lifestyle, or elder teachings?

Not at all	39%
Somewhat	22%
A lot	22%

Results from these questions in the survey are significant and we need to work towards reducing the concerns that people have about the landfill and trash management in terms of the affect on subsistence.

11. Disposal Methods for Waste

This table reviews our disposal options for garbage and other leftover wastes. Each option is scored for various criteria.

Table 18 Disposal Options For Garbage And Other Leftover Wastes.

A higher value represents better addressing of issue and/or greater community consensus

		Considerations					
Option	**Summarized comments**	**Traditional Values/ Subsistence protected (1-5)**	**Reduce Direct Health Risk (1-5)**	**Shortest time till completed (including finding $$) (1-5)**	**Low O & M Cost (1-5)**	**Ease of maintaining option as designed (1-5)**	**Total**
Backhaul	Safely package and stage recyclables and backhaul items for shipment out of community.	5	5	3	5	5	23
Site Clean-up separation	Includes site cleanup, regarding, salvage, waste separation in town, collection program, burnbox, recycle/reuse and store/stage Center.	5	5	1	5	5	21
Burnbox	Koliganek obtained funding to purchase a new burnbox in 2015. Non burnables are separated and burnables are burned in the burn box and the ash is transported to the trench.	3	3	5	4	4	19
Storage for recyclables	Connex van to store recyclables is at capacity. Educate community on recycling. Build Recycling Center to expand recycling program to protect environment.	5	5	1	4	3	18
Collection program	As of January 1, 2013, New Koliganek Village Council began a Solid and Hazardous Waste Collection Fee Program to make solid waste operations self sustaining.	4	5	5	3	4	21

12. Summary Of Programs And Actions

The Table below lists the primary actions and programs we have identified. Also listed are criteria that our community and council have developed as most important in prioritizing and selecting the actions and programs to be implemented. The right-hand column lists the final score of the various community identified actions. The higher scores thus reflect the best management strategies for our community. See our survey results and Council meeting notes for specific details on the community opinions on which the scoring is based. Chapter 14 of this plan summarizes our action plan and guidance for our solid waste program which incorporates results of tables 23 and 24 and our solid waste surveys.

Table 24 Prioritization Of Identified Actions for Addressing Solid Waste Issues

		Identified Priority Criteria ***Higher values denote activity higher/better effect on criteria.***							
Column A	**Column B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Activity or Waste to target	**What to do? Any comments:**	**Traditional Values (1-5)**	**Reduce Health Risk (Direct) (1-5)**	**Reduce Environ-mental Risk (1-5)**	**Reduce Specific Subsistence Risk (1-5)**	**Reduce Dump size/ volume (1-5)**	**Low Cost (1-5)**	**"Ease of doing well" (1-5)**	**Total**
Get rid of cardboard because dump gets filled up	Baler	**1**	**4**	**5**	**5**	**3**	**2**	**3**	**23**
	Burnbox	**3**	**1**	**3**	**3**	**4**	**3**	**4**	**21**
	Cleanup project to have salvage yard and separate pet carcasses and clear access	**4**	**5**	**4**	**4**	**3**	**2**	**2**	**24**

Re-organize dumpsite to separate wastes	Educate on chemicals in our households, and what to buy that is safer	**3**	**3**	**5**	**4**	**3**	**3**	**4**	**25**
Hazardous waste and materials	Educate community to properly dispose of hazardous wastes	**1**	**5**	**5**	**5**	**4**	**2**	**2**	**24**
Ban Plastic Bags	Work with stores and school to switch from plastic to cans and glass.	**3**	**5**	**4**	**4**	**4**	**3**	**2**	**25**
Plastic bottles are hazardous to breathe and bad for subsistence	Develop a recycling plan, work with region, for a 5 year goal of implementing	**3**	**4**	**5**	**4**	**5**	**2**	**1**	**24**
Backhaul junk cars/scrap metal	Package and staged properly until shipped out of community	**2**	**5**	**5**	**3**	**5**	**1**	**1**	**22**
Keep a clear access path	Dispose waste in appropriate areas: landfill trench, recycling center, or salvage pit	**5**	**4**	**4**	**5**	**3**	**3**	**4**	**28**
Get people to stop littering at camps	Encourage people to take along their garbage from the camp ground and dispose at landfill.	**5**	**3**	**5**	**5**	**3**	**4**	**3**	**28**
Have people stop changing oil and batteries near river and dispose properly.	Educate community on hazards from pollution	**5**	**3**	**4**	**5**	**3**	**5**	**3**	**28**

Control Access to Landfill	Controlling access to the landfill will eliminate people and animals from being exposed to hazardous materials and harmful materials will not be placed in the landfill.	**3**	**5**	**5**	**4**	**5**	**5**	**2**	**29**
Maintain a Collection Program	Work with community to continue a fee structure to become self sustaining.	**2**	**3**	**2**	**2**	**4**	**2**	**1**	**16**
Shape/install berms around dump for water flow around instead of through dump	Maintain landfill to keep water from seeping into ground.	**3**	**4**	**5**	**5**	**4**	**2**	**1**	**24**
Keep dogs and scavengers out of garbage		**3**	**3**	**4**	**5**	**4**	**4**	**1**	**24**

Table 19 Items Needed To Meet Planned Goals for Solid/Hazardous Waste Improvement

Item	What it would be used for	Why it's important for the community, how it fits into our priorities identified above	Approximate Cost	Ideas for how to obtain it (grants, funding sources etc.)	Timeframe for obtaining it while to find funding)	What is the priority for this item? *(1 = critical, 2 = high, 3 = medium 4= low)*
ATV	To haul trash, used oil/hazardous wastes such as lead acid batteries	To safely collect and transport these materials	$5000	AFE	Within 12 months	1
Loader 350 w/ backhoe attachment	To make new trenches, compacting trash, and grading landfill	Will help to maintain landfill management and decrease erosion.				2
Burnbox	To burn trash to reduce waste volume	The burnbox will help improve our dumpsite and extend the life of our landfill.		Denali solid waste grant, Tribal SWM grant	Within 12 months	1
Totes	To store and ship batteries	Will help reduce the amount of lead from entering our water and land.		AK Forum demo funds? ANTHC/Rural cap grants?	Within 24 months	3
Connex	To store hazardous wastes and recyclables	Will help reduce the amount of hazardous chemicals getting into our land and water and protect subsistence.		AK Forum demo funds? ANTHC/Rural cap grants?	Within 12 months	1

Item	What it would be used for	Why it's important for the community, how it fits into our priorities identified above	Approximate Cost	Ideas for how to obtain it (grants, funding sources etc.)	Timeframe for obtaining it while to find funding)	What is the priority for this item? *(1 = critical, 2 = high, 3 = medium 4= low)*
Spill guards for barrels of used oil	To contain any potential oil leaks	To contain hazardous waste and prevent environmental pollution		AK Forum demo funds? ANTHC/Rural cap grants?	Within 5 years	2
Used oil burner	To burn used oil for heat	Reusing is a value to our community and to keep this out of landfill		AK Forum demo funds? ANTHC/Rural cap grants?	Within 12 months	1
Drum crusher	To reduce the volume of empty 55-gal drums	Reducing volume of landfill and aid in separation of materials			Within 5 years	3
Smart Ash Burner	To burn oily rags and absorbent	Will assist greatly with clean ups (e.g. potential oil spills) and kept out of landfill			Within 24 months	3
Can crushers	To put in households to reduce the volume of cans for storing and shipping for recycling	To make backhauling easier, to keep this material out of landfill			Within 5 years	4
Recycling Center	Facilitates collection of recyclables(aluminum cans, lead acid and household batteries and electronics).	Will help us to expand our current program to glass, plastic bottles, plastic bags, cardboard. Will help keep these materials out of landfill			Within 5 years- after new houses are built	2
Parts for fixing heavy equipment	To get the equipment up and running again	To keep equipment running to manage landfill			Within 5 years	3

Item	What it would be used for	Why it's important for the community, how it fits into our priorities identified above	Approximate Cost	Ideas for how to obtain it (grants, funding sources etc.)	Timeframe for obtaining it while to find funding)	What is the priority for this item? *(1 = critical, 2 = high, 3 = medium 4= low)*
Safety gear	To protect the dump operator and volunteers when working with wastes	Will help with the separation and clean up of landfill. Important to protect the health of solid waste operator or volunteers			Ongoing	1
Dumpsters	To put around the community to store trash				NA	Na
Recycling Baler	To reduce volume of recyclables for storing and shipping	Consider this long-term- add to table 27			Within 24 months	3
Fencing	To block public access at the dump and help prevent windblown litter	We currently reuse our fencing, but may need more fencing in the future to keep animals out as well as other vectors, and to contain			Within 5 years	4
WOTEC (used oil blender)	To filter used oil into new oil that can be used by our community	Reusing materials is a value in our community. This would help cut costs in purchasing new oil as well as having to backhaul/recycle this			Within 12 months	2
Freon removal equipment	To safely remove Freon from appliances and ship it out for recycling.	This will aid in the backhauling of refrigerants. Will keep this hazardous waste out of the landfill.			Within 24 months	2

Item	What it would be used for	Why it's important for the community, how it fits into our priorities identified above	Approximate Cost	Ideas for how to obtain it (grants, funding sources etc.)	Timeframe for obtaining it while to find funding)	What is the priority for this item? *(1 = critical, 2 = high, 3 = medium 4= low)*
Antifreeze recycling unit	To filter used antifreeze into new antifreeze that can be used in our community	Reusing materials is something we value in our community. This would help cut costs in purchasing new antifreeze as well as having to backhaul/dispose of this material. Will help keep antifreeze out of landfill.			Within 24 months	2
Vehicle fluid draining pumps	To drain fluids (brake, fuel, antifreeze etc.) from vehicles so the vehicles can be shipped out and recycled as scrap metal	Will aid in backhauling efforts, and keep these materials out of landfill and around the community, especially the beaches- will prevent environmental pollution and protect community members and wildlife.			Within 5 years	3
Oil filter crusher	To crush and drain oil filters for recycling	Will reduce volume and keep these items out of landfill.			Within 5 years	3
Composting bins	To start small-scale composting projects for solid wastes	Would like to do this in the future. Scrap foods will be reduced and reused as compost and will be eliminated from landfill			Within 5 years	Future effort

Item	What it would be used for	Why it's important for the community, how it fits into our priorities identified above	Approximate Cost	Ideas for how to obtain it (grants, funding sources etc.)	Timeframe for obtaining it while to find funding)	What is the priority for this item? *(1 = critical, 2 = high, 3 = medium 4= low)*
Recycling bins	To put around the community to store recyclable materials	This will greatly help in separating trash (i.e.- burnables to non-burnables) so that burnables can be burned in burnbox and non-burnables can be compacted and disposed of in landfill which will greatly reduce the waste stream.			Within 24 months	3
Glass crushers or palletizes	To pulverize glass to a material that can be used for art projects, glasphalt etc.	Long term project recycling center gets up and running.			Within 5-10 years	Future effort
ALPAR bags for community litter cleanup	Free bags (shipping not included) for community cleanups	To help facilitate clean up and contain litter safely.			Ongoing	3
Garage for heavy equipment	To protect heavy equipment and to help with the maintenance of equipment	To expand working life of equipment, protect from weather, rust and vandalism.			Within 5-10 years	3

13. Planned Annual Expenditures And Revenues

13.1 Annual Program Costs for Our Solid Waste Plan Implementation

The below Table reflects the annual program expenditures for implementing our plan.

Table 20 Planned Annual Operation And Maintenance (O&M) Costs For Solid Waste

A	B	C	D	E
Item	**Unit Cost**	**Units**	**Quantity**	**Annual Cost (=BxD)**
Personnel				
Solid Waste Site Operation and Maintenance, Labor 8 hr/week, $16/hr, including 4 hr/week at new burnbox, lighting twice per week.	$17	hour	520	$8,840
Solid Waste Collection, Labor, 1 person, 24 hr per week 47 weeks per year (when site is accessible), including all households and businesses and dropping off wastes at correct dump site location or placing in burnbox when appropriate.	$17	hour	520	$8,840
Administration, (4 hr per month, $16/hr)	$25	hour	48	$1,200
Fringe, inc. FICA, workmen's comp, benefits	32%	lump	$23,928	$7,657
Travel and Training				
Training, (e.g. HAZWOPER, RALO, SWMP, Forum on Environment)	$15,856	Lump sum	1	$15,856
Heavy equipment repair, maintenance, and replacement fund (Running Track Loader average of 4 hrs/week for 42 weeks for compaction and consolidation of wastes, clearing access)	$20	hour	168	$3,360
Other equipment repair, maintenance and replacement fund, ATV for collection, 20 hr per week for 22 weeks, Snow machine 20 hr per week for 25 weeks (no collection for 6 weeks due to break up)	$440	hour	1	$440
Supplies				
Safety gear needed each year	$600	Lump sum	2	$1,200
Office Supplies	$120	Lump sum	1	$120
Total annual O & M expense				**$47,513**

13.2 Planned Annual Revenue Sources

The below Table reflects our revenue sources for our planned program changes which include setting fees in the future for households, businesses, and tourists, and charging Construction Project waste tipping fees and Equipment rental fees to outside projects.

Table 21 Revenue Sources For Planned Solid Waste Program Improvements

Item	Annual Revenue
Household fee 55 households @ $15 per month	$9,900
Business fee for 3 businesses (1 Store, clinic, post office), $50 per month	$1,800
School, $100 per month	$1,200
Offices (2) $35 per month	$840
EPA IGAP funds	$18,635
Construction Project waste tipping fees, $100/yard at 20 yards of non-salvageable material per year average of landfill life	$5,000
Revenues from recycling aluminum cans	$250
Total annual revenues for solid waste	**$37,625**

14. New Community Solid Waste Guidance For Protecting Health And Subsistence

Maintaining new burnbox, use it to burn *separated* trash and stop open burning.

- The operators should pull out anything they see that looks dangerous to burn.
- Household and Businesses need to separate wastes such as plastics, Styrofoam, batteries, any leftover household chemicals.
- A rule should be set for the following wastes to never be burned: Tires, batteries, computers, TVs, fluorescent lights, hazardous wastes, PVC pipes, big plastics

Use appropriately sized trenches at the landfill to dump ash from the burnbox into (for specifications of trench size and design, refer to the 2008 Environmental Health Survey Solid Waste Disposal System Koliganek, Alaska By Bristol Bay Area Health Corporation)

Implement a more complete hazardous waste program which sets up a collection center (additional connex) for various hazardous wastes, and educates the public on where to take these wastes, and how to prepare them. Backhaul materials out when space on barge/airplanes is available.

Establish a fee structure for residences and businesses and with an educational component, continue collecting these fees for future sustainability of the solid waste program.

Control access to the landfill by locking the gate during hours of non-operation and consider setting hours for public access with the operator on-site or eliminating public access and only allowing access by the landfill operator.

Reduce litter in the community by educating the public through newsletters, presentations, and vhf, and inform people to put their trash where dogs can't access it.

Increase recycling by:

- Obtain funding for a recycling building/center (which may also double as a reuse center)
- Continue and increase education and outreach efforts about recycling to our community
- Start an incentive program that offers some sort of prizes to help motivate people to recycle more.

Other suggestions:

- For educational component, put up signs in the community regarding solid waste, post pictures of bad dumpsters, post flyers/posters around the community, teach kids about solid/hazardous waste, explain to public how improper solid/hazardous waste behavior can affect subsistence, continue newsletters and doing presentations to the public.
- Set fines for littering and improper disposal
- Ban plastic bags

Attachment 1
Results from 2009 Solid Waste Survey

Koliganek's Solid Waste Survey Results

This survey was conducted in October 2009 by the IGAP staff and 23 surveys were filled out. Results are displayed question by question and the numbers represent the total responses for each question and the overall percentage based on the 23 surveys.

1. What do you do with your trash most of the time?

Take it to trash trailers	10	43%
take it to the dump	7	30%
pay someone to take it to the dump	2	9%
pay someone to take it to the trash carts	0	0%
trash man picks it up	11	48%

2. Do you have concerns about trash or the dump?

Yes, a lot	5	22%
Yes, some	10	43%
No, not very much	8	35%

What concerns do you have?

- all that oil up there is very hazardous. Lots of drums up there. Trenches are too close to the fence
- Controlled access will help landfill stay under control, meaning things that aren't supposed to be disposed up there will be eliminated. Shouldn't be open burning
- global warming
- Have neighbors pile trash together than trash man pick it up
- have not lived here long enough
- Is it being recycled well
- Keep it extremely clean
- lots of trash on right side laying around
- metal piling up
- please keep it clean
- there are trash build up at home on weekends and sometimes dogs get into them
- trash behind fence on the ground
- Waste is not being separated and so our burns are not efficient
- water filling up hole

3. Do you have ideas/comments about the way trash is managed?

- get a better burn box
- good job trying to keep it clean
- help keep it clean by not throwing trash in village and playground
- I think we should burn everything that's trash
- it seems to be managed all right
- It would help if people who separate their trash, esp. recyclables in separate bags
- No! just keep up the excellent job
- people should put their trash where dogs won't get them
- the solid waste operation should have a truck instead of a honda and cart haul more trash and not as cold in winter or when it's raining
- The SWO needs an assistant to help him better manage the landfill

- Trenches. Make sure they are properly dug
- why do people litter in Koliganek?
- would be nice to have the person picking trash to knock and ask if we have trash

4. Do you have ideas/comments about making the dumpsite better or more useful?

- Bigger fence and more structured
- control access. A dumpster for residents to put their trash in outside of landfill, stop open burning.
- keep everything separated and burned better
- maybe find a way to do something about the big stuff- getting full.
- maybe have traps for crows so they don't mess stuff up
- more space for larger junk
- no, its fine
- not really, it's good.
- to tell people to stop littering
- to tell people to stop throwing trash on the ground
- try to keep road cleared in winter
- We need to have our own recycling building for safety reasons

5. What do you like about how trash is managed or where it goes?

- dumpsite
- excellent
- I like that it goes to a specific location and the SWO tries his best to keep it safe.
- I like that someone picks it up
- I like that we burn stuff
- I like that we have two SWO who pick up trash in our community
- I'm glad someone picks up trash
- it isn't managed that good. There are still people littering
- it seems to be managed all right
- like the dump- nicer and far from the village
- pick up is useful, I think because some families can't bring large items it would be useful to have deliver of large items
- thank you for picking up trash at my house. I am grateful for SWO picking up trash for me.
- that it's away from the village
- the trash can be recycled
- They're doing excellent work
- trash managed just fine
- wastes burned and everything recycled
- when it gets throwing away
- where are you putting metal garbage? Are you sending it somewhere to be recycled?

6. Do you know about the aluminum can recycling program and where you can bring your cans?

yes	16	70%
no	6	26%

7. Did you know that Koliganek can get money from the cans to help pay for cleaning up environment/protecting subsistence?

yes	9	39%
no	6	26%

8. What do you do with your aluminum cans most of the time?

Leave cans in my trash	11	48%
Separate cans for sw operator to p/u	11	48%
Use cans for something else, explain • not applicable for me; I do not drink from aluminum cans • use for spit cans		

9. Why do you think people don't separate their cans?

- can't afford more trash bins
- I don't know (2 responses)
- just want to throw cans in trash
- keep forgetting there is a recycling program
- laziness, lack of knowledge on what to do with them
- Lazy (7 responses)
- lazy or they don't know
- need extra trash containers for aluminum
- no trash can
- probably don't want to
- so they can.
- so we don't mess stuff up
- so we don't mess up our equipment
- They don't care
- to get money from the cans
- too lazy or don’t care about trash build up

10. Can you suggest ideas about getting more people to recycle their cans?

- advertise
- give prizes. R/T tickets or gas. Really motivates people
- Have a door prize every month
- have prizes
- have two trash cans (2 responses)
- Having 1 person just pick up cans only
- incentive program
- maybe once a month can have gathering and bring can to drop off and have door prizes. This would show people are recycling
- notify people then suggest we can win a prize. Make recycling an activity or something
- offer door prizes once in a while, provide can crushers
- Prizes picked out of hat. IGAP provide receptacles just for cans
- prizes, prizes, prizes
- put more flyers out to the community
- saving earth and money
- talk about recycling, how it will help the environment
- tell kids to put away cans

- tell them or ask them to separate their cans

11.a How would you feel if we built a recycling building? Do you think this would help recycle more?

- a very good idea
- Amazing idea, yes!
- it might be a good idea
- Yes (11 responses)
- yes, more people can get involved

11.b. Do you think people might use this center?

Yes, probably	20	87%
No, not much	0	0%

Other responses:

- I don't know, maybe
- yes, because they would be there to help people recycle
- yes, if we know where to bring the stuff would be helpful
- yes, it will reduce the amount of trash going to the landfill

12. How can we make it easier for people to recycle?

- Build a recycling center
- build the centers to have drop offs there to recycle
- have a big recycling building
- have building for recycling
- have different bins for recyclables
- have marked containers
- have them build a recycling building
- Having the center just for these tings
- I would bring my recyclables to the recycling center
- inform them
- more locations for recycling so it's easy access
- provide trash bins
- put them in plastic bags and pile them in a connex to be picked up
- Put up sign, send letters
- saving plastic bottles, can crushers in every home
- the way they did it in the past was take to the dump
- to help them recycle

13. Do you think building a recycling building is a good idea?

Yes	21	91%
No	1	4%

14. Do you think building a recycling building would increase and benefit our Village?

- there would be a place to put hazardous stuff so it doesn't get into our earth
- very much

- Yes (11 responses)
- yes because it would be a little cleaner
- yes because it would be a lot cleaner
- Yes they would have a place to put them
- Yes! Absolutely
- yes, a lot
- yes, less waste at dump
- yes, reduces waste in environment

15. If people knew about the hazards from waste, and that recycling makes the dump smaller and further from the creek, would they recycle more?

Yes	20	87%
No	1	4%

16. If we built a recycling center would most people be willing to bring their items to the center?

Yes, people would go to the center	13	57%
No, they would need to be collected	5	22%
Maybe, it depends on: • how much money you get from community • it depends on one or the other should be an option to have • Elders and weather		

17.a What items do you think people could learn to separate from their trash

Al cans	19	83%
Cardboard	14	61%
Tin cans	10	43%
Plastics	11	48%
Glass jars	9	39%
Paper	14	61%
Household batteries	14	61%

17 b What unused items do you think people would share/donate

hhw	14	61%
toys, books	13	57%
clothes	12	52%
vehicle parts	13	57%
appliances, furniture	8	35%
other	1	4%

18. Where do you dispose your used oil?

store in a safe place for the operator to p/u	11	48%
Dump it on the ground	3	13%

19. How do you think we can encourage people to store their used oil in a safe place?

- educate
- Educating them
- have a big container and put signs up telling where to dump
- I didn't know you can take used oil to the store
- keep telling them
- provide designated area/storage for used oil- not at landfill
- put it in a closed container
- put more flyers out
- talk about how dangerous it would be to plants and animals we eat
- tell them it will kill the fish and animals
- We recycle our own use it for other things
- Yes (2 responses)
- yes, take to the dump

20. How many used batteries does your house have that will need to be collected?

- 3
- 1-2 per year
- 2 to 3
- 2?
- I don’t know (3 responses)
- more than enough
- one
- over a million
- possibly 1 or 2
- yes (2 responses)

21. Do you think $10/mo household collection fee would be reasonable?

yes	15	65%
no	5	22%

If no, what is a reasonable per month fee?

- $0
- 20
- $5 or none for those without jobs
- people won't want to pay so they'll start dumping it themselves
- the village council could do it so they can have a clean place

We may need to start fees in the future, how do you feel about that?

- crazy
- don't like the idea (2 responses)
- fine (2 responses)
- I don't like it but I know it will keep an SWO for our community
- it sucks
- It would help the recycling program a lot
- just another bill to worry about
- not good
- Not very good because people (or some people) are having a hard time

- okay, it's done everywhere else
- that's okay
- up to the Boss

22. How much do you think people will pay if people knew the more they paid the more we can protect subsistence, elders, children?

Low-income	
Rate	# of responses
$0-5	1
$5	4
$8	2
$10	5
$12	1
$20	2
$30	1
$40	1

Elders	
Rate	# of responses
0	5
$0-5	1
$5	3
$10	5
$12	1
$40	1

Others/tourists	
Rate	# of responses
$5	1
$10	1
$12	3
$20	1
$30	1
$35	2
$35-40	1
$40	5

23. Should bigger households pay a little more than smaller households?

Yes	5	22%
No	13	57%

24. Should there be a reduced rate for Elders?

Yes	18	78%
No	3	13%

25. Should people be able to volunteer community hrs instead of paying fees?

Yes	13	57%
No	4	17%

Other comments:

- it really doesn't work that way. We would have a hard time finding volunteers to do work for free
- the younger people could help out like they do in the summer time

26. Extra comments regarding waste fees

- fees are a good idea
- is there any grants for waste programs?
- most places charge fees for garbage collection anyway (at least the places I've lived)
- No (3 responses)

27. do you have any ideas about how else to raise money to pay for our garbage and dump besides fees?

- bingo, dances, cake walks
- cake walks, dances
- dump their own trash
- fund raise (3 responses)
- fundraising through hazardous waste or battery collection
- have dances, cake walks
- no. If you pay for your trash to come in then you should pay to take them out
- other grants, donations, local fundraising
- reduce, reuse, recycle
- the one who get the most trash could win a prize (2 responses)

28. Do you have any concerns about the landfill and affecting subsistence lifestyle?

Not at all	6	26%
Somewhat	10	43%
A lot	5	22%

29. How have subsistence activities been changed due to dumpsite concerns?

Where activities are preformed	6	26%
How often activities are performed	8	35%
How they are performed	6	26%
Type of foods obtained	5	22%
Amt of foods consumed	5	22%
An activity can no longer be performed	2	9%

Don't want to specify	4	17%
Other • doesn't affect right now, but might affect subsistence in the future • Hazardous waste, not separating garbage • open burning will affect our air quality • will affect a lot of subsistence lifestyles		
Other • good for wildlife • hazardous wastes disposed at landfill will pollute land, water and air		

30. Do you have concerns about the dumpsite, haz waste, that may have changed activities that are part of Yupik values, lifestyle, or elder teachings?

Not at all	9	39%
Somewhat	5	22%
A lot	5	22%

31. Any other comments to questions 26 or 27?

- keeping healthy environmental at all times
- must fund raise, dances.

32. What do you think will help convince people to use correct garbage disposal

- education, presentations, fines for littering and incorrect disposal of garbage
- ethical reasoning, talk about how it can ruin our subsistence lifestyle
- fine for dumping improperly, locking the gate after 6pm or earlier
- have dumpsters
- have trash man ask if there is any hazardous material
- I don't know anymore
- incentive programs for recycling. Gathering support from community. Educating on benefits
- inform them!
- make signs all over village
- parents teach kids. Grandparents teach grandkids. Make it a part of lifestyle
- pics of bad dumpsters and tests
- put more flyers out. Especially talk to everyone about it
- put signs everywhere
- putting up posters in a public place- school, post office and store
- tell people what's happening to the world
- they should throw their trash away in the trash can

33. Would you like any written information or would you like to see more presentations on solid waste ?

- environmental newspapers, VHF
- go into action
- Just put papers up. Facts about recycling
- PowerPoint (2 responses)

- presentations
- use vhf, environmental newspaper
- yes written information
- Yes, anything to help out
- Yes, having more presentations and hear how things are being used and coming along after used them for a year or two

Attachment 2
Data Sheets from 2010 Waste Assessment

New Koliganek Village Council Environmental Program Photographs

Photos of the Annual Spring Clean Up and Community Picnic!

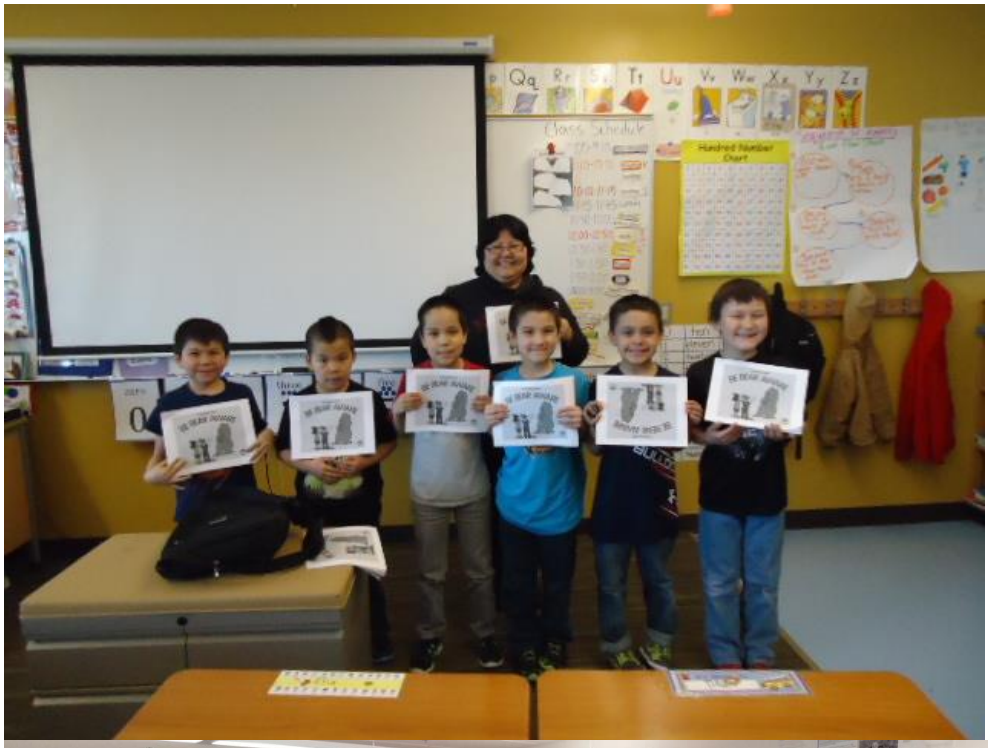
Photos of the yearly Landfill Clean Up!

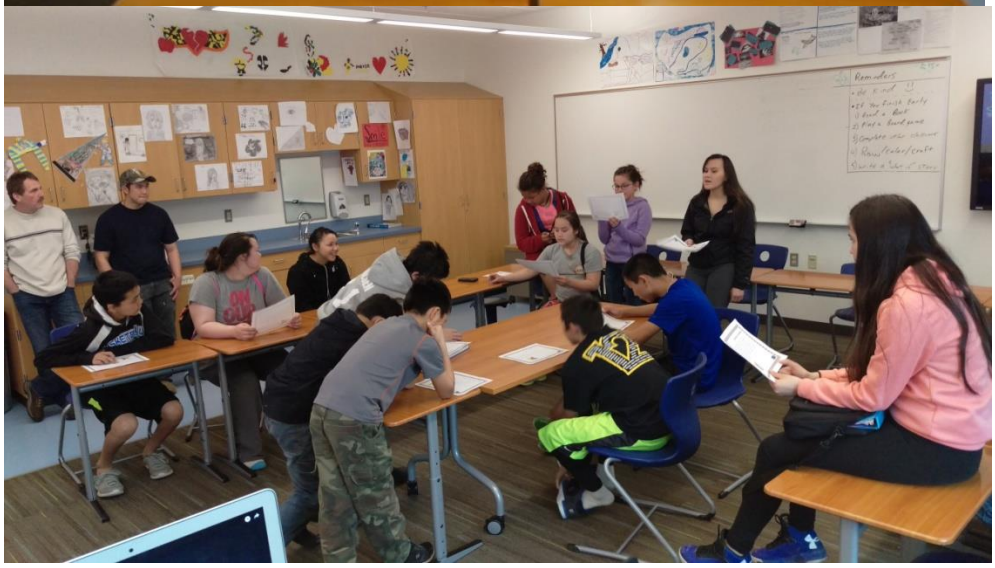
Photos of the yearly ALPAR Litter Patrol Clean Up!

Photo of the Summer Youth Employees crushing pop cans!

Photos of the Backhaul Project!

Photos of the Water Quality Training and Sampling Event!





Photos of the Outreach and Educational presentations at the school!

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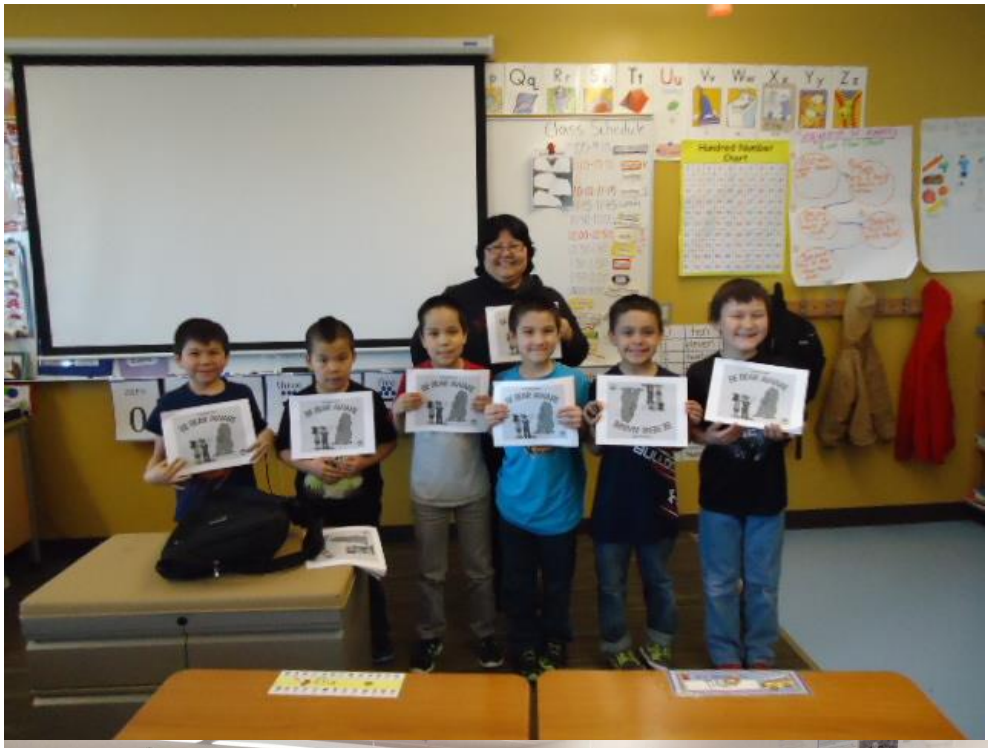

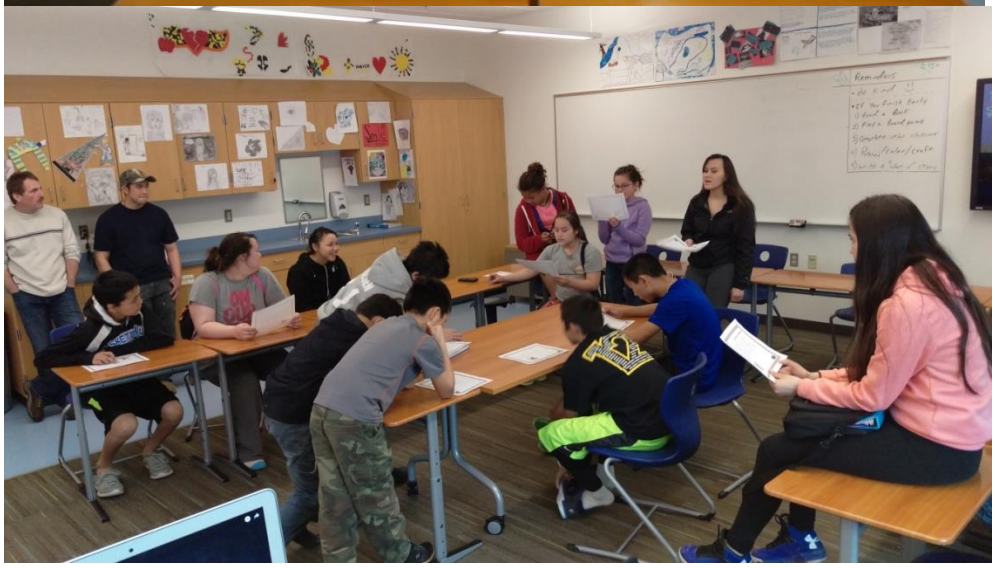

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