

Burnbox

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Photo from: Tok Welding and Fabrication
website www.alaskanstoves.com

What is a burnbox?

A burnbox is used by many Villages. Either a self-constructed or purchased large metal container with good draft is used for burning trash.

Advantages and Disadvantages

Advantages

- ❖ Burnboxes are inexpensive
- ❖ No animal attraction if done right
- ❖ Reduces volume of burnable waste by about 70%
- ❖ Reduces weight of wastestream by about 60%
- ❖ Because ash and non-burnable trash is relatively non-toxic, you have a lot of flexibility in landfilling or reusing it.
- ❖ If you choose to ship ash out, it will be much cheaper than unburned trash.

Disadvantages

- ❖ If not run right and at a high temperature, you'll get toxic smoke
- ❖ Need to have fairly predictable wind directions, and burnbox placed at least a mile downwind of homes, or 2-3 miles upwind
- ❖ Must separate out wastes causing explosions, black and/or toxic smoke, like aerosol or paint cans, batteries, lamps, rubber and tar products, tires, waste oil, liquid fuels, pressurized containers, large animals, and plastic.
- ❖ Needs regular (dirty) maintenance
- ❖ Still need to deal with ash, scrap metal, appliances, and separated wastes.

Where to start?

For tips on making or buying, installing, and operating a good burnbox Call the ADEC or EPA rural sanitation coordinator (**Joe Sarcone at 271-1316 or Bill Stokes at 269-7580**). If you want your burnbox to run well and not cause health problems, get advice first. Burnboxes are too easy to mess up otherwise.

Also, ADEC recently put out a helpful publication dealing with incinerators and burnboxes, *Burning Garbage in Rural Alaska*. Contact: **Ed Emswiler, 465-5353**, ADEC Solid Waste to request a copy.

Where can I purchase one?

Chris Marshall, who runs **Tok Welding and Fabrication**, has been working with Villages for almost 30 years on wood stoves, and about 10 years on burnboxes. He is familiar with rural Native Villages and he has been designing burnboxes so they are pretty inexpensive, really simple to use, and hard to break. His phone number is **883-5055**, and his website is www.alaskanstoves.com.

How much do they cost?

Chris at Tok Welding sells two different burnbox models (below is from his website www.alaskanstoves.com)

Portable Model Solid Waste Burn Unit

- Will serve community populations up to 60 persons.
- Cost: **\$15,500** (delivered to Anchorage or Fairbanks)
- Modifications to basic unit will incur additional costs.

Skid Mounted Model on Temporary Transportation Trailer

The skid mounted model is larger than the trailer mounted unit and is designed for a population of approximately 100 to 130. It is designed to stay at the landfill site. When pit maintenance is needed the Unit is pulled forward, then returned to the trench for continued use. The users drive up to the loading platform and throw their household trash into the front loading door. Each evening the facility operator ignites the contents, by morning the Unit is ready for loading again. Request the 4 page handout, 'Solid Waste Burn Unit', for more operational details. The price of the model '2001Burn Unit' is **\$17,500** FOB to Anchorage or Fairbanks.

Note: The exhaust stack is stowed inside the Unit for shipment.

More about burnboxes

A burnbox is used by many communities in Alaska. **The Village of Ekwok recently started using a burnbox that was built in-town for a small amount of money. The burnbox works well and residents are happy with it. Fred "Tom" Harley Jr., a resident of Ekwok, built the burnbox. He is willing to answer questions by phone (464-3359).**

He is also willing to travel to other Villages to design and build a burnbox. Paying him to build the burnbox would be less expensive than ordering a pre-made burnbox, or one that is designed by a engineering firm. Fred Harley might be more familiar with how YK Delta Villages operate and what is needed for residents to use it properly. On the other hand, if a pre-fabricated burnbox is ordered, the quality and durability could be more reliable. Also, the manufacturer might be in a better position to refund or replace the burnbox if it did not function properly.

The best thing you can do is ask other Villages what their burnbox lessons are. Below are some of the other Villages that have had successful operations.

Some Alaska Villages with successful burnbox operations.

Village	Contact Information
Ekwok	Fred "Tom" Harley, Jr. (He built the Ekwok burnbox and can help design, build it, and/or answer operation questions.) (907) 464-3359
Manley	Chuck Parker (907) 672-3869
Beaver	Arlene Pitka (907) 628-6126
Dot Lake	Bill Miller (907) 883-4227 or 882-2695
Tanacross	Roy Denny or Jerry Isaac (907) 883-5024
Elim	Luther Nagaruk (907) 890-3737
Minto	Ronnie Silas (907) 798-7399

What you need for a successful burnbox operation?

The thoughts of people who have run good burnbox programs are:

- (1) Start with a good design
 - (2) Operate it correctly
 - (3) Maintain it regularly
-

Burnbox Design



Burnboxes are usually constructed from whatever is available on site — like used fuel storage tanks, old septic tanks, old truck beds, etc. They generally consist of a body and a chimney pipe that vents the smoke. Although there are some design drawings being shared around the Villages, most burnboxes are **improvised based upon the availability of materials**. One of the **best designs now being used is in Manley**. They have a pre-fabricated burnbox.

Some designs work better, and burn more efficiently, than others. A critical factor is to have **good draft properties**. Burnboxes are generally designed so that air can be pulled in underneath the wastes through body vents (or puncture holes). The chimney and burnbox body should be **well sealed/welded** except where air should vent. Another consideration is that it should be **easy to empty out ash**. Many burnboxes are designed so that they can be tipped over, and the ash can spill out into the landfill.



A vent screen should prevent large ash particles from escaping and starting fires. Also placing a small **fireproof** mesh bag at the end of the pipe, so that fine particles are trapped, improves air quality. A last consideration that is often overlooked is *that the burnbox should be sized so that it can store enough garbage on days when the wind or weather is unfavorable to burn*. But it shouldn't be too big, or it can be difficult for the burnbox to heat up.

If the money is available to do so, the best advice to ensure a good design is to **order a pre-made burnbox or get someone experienced in making and installing burnboxes to come to your Village to do the work**. Again, Fred Harley, Jr. in Ekwok has experience in building a burnbox on-site, and Chris Marshall at Tok Welding & Fabrication makes excellent units with good durability. His models are being used throughout the state.

Burnbox Operation

We have asked people with good operations what they do. The primary considerations for good operation are to:

- ❖ Make certain that either the operator or the households **separate out plastics**, rubber (including tires) combustibles, and other **hazardous wastes** so that these materials do not get into the burnbox. While plastics will not hurt the burnbox, they produce toxic smoke. Some hazardous wastes will not hurt the burnbox, but can be hazardous to the operator when handling them, and/or will also produce toxic smoke.
- ❖ Keep up a **regular schedule of burning**. Allowing the burnbox to get too full will produce an inefficient burn, and wastes can get piled up outside and create a unattractive nuisance and health hazard. If the burnbox is used daily, it will stay warm inside, and the next day's burn will be more efficient and faster.
- ❖ **Burn any animal carcass immediately**. Any **clinic wastes** should also be **burned immediately**.
- ❖ If your burnbox is located so that smoke is smelled in the Village on certain **windy days**, **don't burn on these days** and wait until the wind direction or speed is more favorable.
- ❖ **Wet down the ash** once it is deposited in the monofill, so that it doesn't scatter and create poor air quality.

For further information about burnbox operation and maintenance, see Tok Welding's operation guide at the end of this document.

Burnbox Maintenance

The main considerations in conducting good maintenance are to:

- ❖ **Rust-proof the burnbox**. Still, always check for signs of rusting, and repair as necessary before holes become apparent and affect the burn performance.
- ❖ Periodically **clean out the burnbox** well to check for signs of structural damage.
- ❖ **Clean out the chimney pipe/vent** regularly so that it does not get clogged. If you have a fine mesh bag connected to your vent outlet, make sure that it does not get full.
- ❖ Keep any movable parts, such as hinged doors, **well-lubed** so that they do not get stuck.

How Far Is Far Enough To Site Your Burnbox?

A Year 2000 Health Study looked briefly at how far a solid waste facility should be sited from houses, so that people weren't bothered by its odors. The Table below lists how many people were bothered, and at what distance their houses were from their dump.

Taking into account the usual wind direction, and other factors, it turned out that the more frequently wastes were burned, the longer the minimum distance was that people had to live to not be bothered by dump odors/smoke. Looking at the last row, even if you locate your facility 8,000 ft away, if you plan on burning wastes frequently, you could still expect about 20 percent of residents to be bothered a lot. **You also need to think about how bad the smoke is.**

The thing is, the second Village (shown in the second row) only burned their wastes every few weeks. But when they burned, there was a lot of waste buildup, and the burn would last for a couple of days with heavy black smoke. So even though it didn't happen often, 70 percent of residents were bothered at least a little by the dump. **When you burn regularly, there is less smoke, the fire can be more controlled, and you can be more careful about what you're burning** because you can pick out big plastics and batteries.

These results are for uncontrolled, unseparated waste burning. While the results probably would be similar for burnboxes, it is likely they would be different for an EPA Regulation-compliant incinerator. If run properly, EPA-compliant incinerators produce odors that are much less noticeable (more importantly, the emissions are generally not harmful). Of course...incinerators are very, very expensive and are hard to run in a small community!

Percent of residents who were living at a given distance from their Village dump, or further, and who were bothered by dump odors/smoke.

Wastes are burned ^a :	At a distance of:	Bothered somewhat	Bothered a lot
Never	2,500 ft	9%	4%
Every 2-3 weeks	3,000 ft	70%	19%
5-6 days per week	8,000 ft	16%	21%

^a Generally, uncontained, unseparated wastes were burned in an uncontrolled manner.

Is the New Location Right?

Worksheet to determine the appropriateness of a potential facility location:

Consideration	New Location		
	No	Unclear	Yes
Is the site far enough from town so that odors or smoke are not a problem?			
Is the site far enough from any future development that might take place?			
Is the site far enough from an airport (must be at least 5,000 ft. and 10,000 ft for a jet runway)			
Is the site far enough from the water intake and traditional drinking water sources?			
Does the land need to be used for anything else (if so, could both projects work there)?			
Does the location make sense in terms of convenience, traffic for the most people possible?			
Would the location affect migration patterns of wildlife (e.g. caribou)?			
Would the community feel they needed to change subsistence practices?			
Is the location downstream of important fishing, berry gathering/hunting grounds as much as possible?			
Does the community support the new location?			
Will construction at the site or along the access road affect wildlife or important land?			
Has the old location been considered? The land is already impacted (and probably contaminated), and an access way already exists.			
For burnboxes, is the site convenient to dump ash and does it work for the type of burnbox you have? (e.g., some burnboxes need to be sited at the top of an ash pit to tip the ash out)			

Burnbox Operational Guidelines By Tok Welding and Fabrication

SOLID WASTE BURN UNIT

Model 2000, 2001, and 2001B

Tok Welding and Fabrication
Martin C. Marshall
P.O. Box 855
Tok, Alaska 99780

ph. (907)883-5055
fx. (775)307-1620
e-mail christokmarshall@yahoo.com
voice mail (800)699-2466 enter 9078835055

Location of Units in Alaska:

One Model 2000 in the Village of Manley in operation since early '00. One Model 2000 located in the Village of Beaver delivered in the fall of '00.

Goals:

Updated and New products which meet and exceed environmental standards are what we continually strive for. We have a commitment to our ENVIRONMENT and to YOU the Community Coordinator and the facility USER to provide the very best service applicable for your needs.

Description:

The Unit has two chambers; an upper waste receiving chamber approx. 5 cubic yards and a lower ash chamber approx. 4 cubic yards. There is one large loading door 34" dia. and a lower door accessing the ash chamber to facilitate clean-out. The rear dump door is hinged at the top and spans the diameter of the Unit and is held in the closed position by gravity. There are screened intakes on both sides of the Unit body. The combustion air inlets are located just under the grating which separates the interior chambers. The exhaust stack is bolted on the top of the Unit. There is a skid platform extending under the Unit and out the front which both acts as the Unit support and loading deck. The loading deck is incorporated with skid resistant grating for the facility user loading trash into the upper chamber and a diamond plateing drive over pad where vehicles are positioned for unloading. The Model 2001 is self contained requiring no logistical transfer stations, cement pads or other permanent structures. The Model 2001B has a small built in structure (on front of skid platform) where the generator (if power is not readily available) and blower motor are located.

Weight and Dimensions:

The actual weight of the Unit delivered to Beaver was 5638 pds. The approximate weight of the newer Model 2001 series will be 6350 pds.

The skid platform measures 66" wide 8" high and 25' long.

The burn box structure is 69" in Dia. and 12' long.

Overall assembled Unit;

- 13 foot high (with the 6 1/2 foot tall exhaust stack bolted on)
- 28 foot long (with the burn box mounted on skid platform)
- 75 inch wide (accounting for air intakes mounted on sides)

Transportation and Setup:

Entire Unit will arrive assembled and ready for operation except for the bolt on exhaust stack which is stored inside Unit for shipment. The stack is easily bolted on top to the respective collar using common tools and the supplied bolts. A temporary hitch tongue is bolted onto the skid platform along with a set of dolly axles underneath the entire Unit. A 3/4 ton pickup with a 2 5/8 inch ball can transport entire Unit along the road system without permits (a temporary trip license tag may be required as the Unit itself will become in effect, a trailer). The dollies will be supplied free of charge for a one week period for each Unit shipped. A deposit, and rental agreement (if in use over 7 days) with the manufacturer will be required for use of the tongue and dolly set. Removal of the dolly set is accomplished by unbolting the dolly carriage and by using a bucket loader or equivalent lifting the rear portion of Unit clear of the ground. Manufacturer can deliver the Unit anywhere in Alaska on the contiguous road system for a price of \$1.43 per mile measured from Tok to delivered site.

Site Preparation and Positioning:

Normal landfill sites are compatible with the use and operation of the 2001 Burn Unit. Level and cleared ground at the site extending away from the landfill pit approximately 75 foot is required. The Unit is pushed on it's skids into position at the pit edge using a small track vehicle or bucket loader. Approximately 8" of the rear skid platform will extend over the pit rim. The integrity of the earth under the Unit must be sufficient to bear the weight without caving in (very sandy soils would be an unsuitable site location).

Pit Trench

I I

I U I

I N I

I I I

I T I Drive up to or over skid platform to unload

I I waste into Unit.

Operation:Resident facility user:

Users of the landfill facility position vehicle upon or beside drive over ramp on diamond plated skid platform. Household waste is then manually put into the upper chamber through the large upper diameter loading door. Attempts should be made to deposit waste towards the rear of the chamber to accommodate more material. When the upper chamber is approximately 60% to 80% filled the Unit is ready for 'firing'.

Maintenance operator:

The facility maintenance operator will then visually inspect the load to ensure that it is properly prepared for firing, i.e., no concentrated volatile fumes, waste load properly positioned to the rear of the chamber, vehicles and flammable items positioned 50' away from Unit, that the blower motor ducting is in place (Model 2001B only), and that the propane stack 'after burner' assembly is positioned and ready for ignition. (The 'after burner' assembly is not field tested yet. It is envisioned that only certain waste stream demands would need this modification to the Model 2001 series in order to meet strict opacity requirements). When ready (as per applicable ancillary supplemental directions for modified Units) the facility operator will light the household waste using a match or propane wand (such as a weed burner) through the loading chamber door. The burn cycle will need no further supervision (i.e. normal loads not requiring blower motor/after burner operation). The actual burn will be three to four hours with a three to four hour cool down. Thus, if ignited at the end of the hours of operation for that day, the Unit will be ready for loading the following morning.

Clean out:

The maintenance operator would determine when to clean out the Unit. Normally when 30% ash accumulation in lower chamber is evidenced. The time periods between clean-outs will vary depending on usage and maintenance operator discretion. Clean-out may be necessary in as little as two weeks of operation or as long as every two months for infrequent usage. The clean-out procedure is outlined in the four page handout 'Directions and precautions for use'. Briefly, the clean-out procedure is a one man operation. The Burn Box portion of the Unit is manually jacked up and pinned into position. The rear clean-out door is now automatically in the opened position. The front lower door is unpinned and removed by the maintenance operator. Using the 'Ash Removal Rod' supplied with the Unit, the ash load is pushed out the rear door into the pit. The Burn Box is then lowered down into the normal position, the lower ash chamber door replaced, and the Unit is now in the ready condition to start a new operating sequence.

Periodic Maintenance and Item Replacement Schedule:

Visual inspection of the Unit by the maintenance operator before each firing is required. Areas to inspect are welded seams and brackets for cracks or distortion. Latching mechanisms and pins for excessive wear or distortion. Proper lubrication of Unit hinge pin and freedom of movement. Replace the bolt in 'rack' separating the two chambers should burn through or excessive distortion necessitate (common pipe stock is used). Ensure proper lubrication and movement and operation of lifting jack mechanism (A simple 'Handy-Man' jack is supplied by the manufacturer as the lifting mechanism). Repair or replace broken or distorted parts, before firing or lifting for clean-out.

Waste Residue:

Is not attractive to scavengers and the Unit is Bear resistant. Tin cans are friable and glass will often melt into a glob. It is anticipated that most medical waste will be made harmless if added after Unit comes up to temperature (specific study for specific items are warranted, no wholesale claim as to the safe disposal of medical waste herein is made).

Limitations:

Designed to reduce the volume of household trash; Not intended for paints solvents, petroleum waste, liquid septage, old tires, or batteries. These and other materials classified as hazardous should be disposed of in an authorized manner.

Costs:

Model 2001.....\$17,500

Model 2001B....\$20,000 (with generator to supply power to blower).

Stack 'After Burner' modification is anticipated to increase cost by \$500.

Transportation...\$1.43 /mile if delivered by Manufacturer

An operating instruction manual is supplied with each Unit. It is not anticipated that additional operating instructions/training will be required. Telephone instructions and clarifications will be available on an as contacted basis free of charge. Field instruction will be offered for a 4 hour period by the Manufacturer on the day of delivery free of charge if delivered by the manufacturer.

It is anticipated that most repair and replacement will be done locally. There are no special tools or obscure parts necessitating the Manufacturer to supply. Ancillary additions of blowers, stack 'after-burner' assemblies, or generators will all be common shelf items purchased in hardware stores or by catalogue.

Appropriate Technology:

Current production modifications to the basic Model 2000 warrant a new designation. Thus our new Basic Model 2001 comes with design improvements including; increased intake vent size, adding our unique 'Stack Blast' of heated air directionally aimed within the first portion of the exhaust stack to facilitate decreased opacity, a stack 'swirler' insert designed to help burn off carbon particles in the exhaust emissions and finally a more rigid skid platform. (The above improvements are all passive systems requiring no external power/fuel source). The 2001B has the added option of a Blower motor designed to help maintain stack opacity within acceptable limits for 'troublesome loads' such as high garbage (high moisture) content loads, especially where stricter emission standards are required.

The '2001' series is designed for community populations of up to around 100 persons. Communities exceeding this population will require multiple Units. There are several practical advantages to the approach of adding multiple Units; small but growing communities can add Units as the need dictates, adaptability to multiple landfill sites, easy relocation of Units within each facility, and compatibility with the 'use cycle' operation, i.e., as one Unit is fired another Unit will be available for loading use.

SOLID WASTE BURN UNIT
Model 2000, 2001, and 2001B
Directions and precautions for use

General Overview:

The primary purpose of this Unit is to contain and reduce the volume of trash loaded. There are possible secondary benefits such as reduced spreading of disease by scavengers, converting some components of trash into safer materials, reduced fire danger and keeping items out of physical danger to people or wildlife. However, no claim is made beyond the primary purpose of this Unit, i.e., to reduce the volume of trash loaded in a safer and more environmentally friendly manner.

Goals:

Updated and New products which meet and exceed environmental standards are what we continually strive for. We have a commitment to our ENVIRONMENT and to YOU the Community Coordinator and the facility User to provide the very best service and the very best product applicable for your needs.

Model Description:

Current production modifications to the basic model 2000 warrant a new designation. Thus our Basic Model 2001 comes with design improvements including; Increasing intake vent size, adding our unique 'Stack Blast' of heated air directionally aimed within the first portion of the exhaust stack to facilitate decreased opacity, a stack 'swirler' insert designed to burn off carbon particles and help scrub stack emissions. And finally a more rigid skid platform is incorporated into the 2001 line. (The above improvements are passive systems requiring no external power/fuel source). The 2001B has the added option of a blower motor designed to help maintain stack opacity within acceptable limits for 'troublesome loads' such as high garbage (high moisture content) loads, especially during initial firing and where stricter emission standards are required.

The '2001' series is designed for community populations of up to around 100 persons. The expectation and design intention is that communities exceeding this population will need multiple Units. There are several practical advantages to the approach of adding Units as the need dictates; affordability for smaller but growing communities, adaptability to multiple landfill sites, and compatibility with the 'use cycle' operation, i.e., as one Unit is being operated another Unit can be available for loading.

Limitations:

Not intended for paints, solvents, old tires, batteries or petroleum waste. These and other materials classified as hazardous should be disposed of in an authorized manner.

Use by Facility User:

Waste, 'household trash' is loaded, (Never load or open door of a 'Hot' or 'Burning' Unit), by the user of the Sanitary Landfill facility into the upper portion of the Unit through the top hinged door. Attempts should be made to deposit the waste towards the rear of the Unit upon the interior grating to accommodate more material.

CAUTION; To prevent personal injury the Unit should not be used or 'loaded' while burning. The Unit will be HOT and could cause a burn injury, plus there is a danger of EXPLOSION from an aerosol can bursting and/or gas-air mixture igniting causing a FLASH FIRE FRONT of super heated gas or flame to be released into the face of the user attempting to load Unit.

CAUTION; The Unit load should be ignited by the maintenance operator only.

-It is the responsibility of the Landfill Operator to ensure that the Unit is 'Safe' for use (loading) by the facility user. Loading instructions should be posted handed out or otherwise made available to potential users.

Maintenance:

The maintenance operator's duties include insuring proper loading, inspecting and igniting the waste load, cleaning out the ashes, ensuring structural integrity of the Unit assembly and performing preventative maintenance procedures. The above duties are necessary to provide safe operation and to lengthen the useful life of the Unit. Protective face shield and clothing should be worn when appropriate.

1. Igniting the load-(Wear protective gear) The maintenance operator should inspect the waste/trash load first before ignition to ensure that volatile fumes are not concentrated. The trash fuel load should not exceed 60% of the upper portion of Unit when ignited, this will help ensure a more complete burn. On models 2001B The blower assembly is attached for the initial firing of Unit and for waste loads requiring a hotter burn cycle to help maintain required emission tolerances. Close latch and secure both front doors after ignition and move combustible items, vehicles, and personnel a distance of at least 50 foot away from the Unit. On models 2001B start blower motor as per applicable supplement.

2. Clean out the ashes and debris when 20% accumulation is built up in the bottom of the lower compartment.

Procedure for Cleanout:

-Unlock the Unit, remove lower clean out door, install lift jack in receptacles and safety latch the jack with pins and safety chain. Carefully jack Unit up keeping left hand on top of jack stand while keeping the operators body in front of but clear of Unit and at a 45 degree angle away from the front of the jack. When the Unit is jacked up half way install safety bracket supplied just below jack mechanism through the jack stand holes, (This will act as a safety catch should the jack mechanism release for an inadvertent reason). Continue jacking Unit up to nearly the top of the jack stand.

-Locate and raise the safety bar and insert pin through the bracket attached to the center lower portion of the Unit when the hole in the safety bar lines up with the respective hole on the bracket. Maintain the jack in the 'raise up' position in place, now raise the jack safety bracket and pin it directly below the jack mechanism, (The Unit is only considered 'Safe' to clean out when both the jack and safety bar are both in place in the raised position with safety pins and bracket installed).

-Clean ashes out of lower compartment by pushing ash out of the rear with the ASH PUSH ROD supplied with Unit. (Gravity door is automatically opened as Unit raises).

-Reverse procedure to lower Unit. (Adhere to safety precautions above).

CAUTION: High lift jacks such as what is provided with the Unit must be maintained and inspected by the operator to ensure safe operation. Keep it clean, oiled, and parts replaced from the jack manufacturer as needed.

DANGER: To prevent the jack mechanism from sliding down it's stand when the 'down' lever is placed in the 'down' position (located on left hand side of jack mechanism) weight must be maintained on the jack. Thus if ash load or other waste item is hung up at the rear of the Unit there is a possibility of a neutral weight or an aft overcenter weight condition existing. Never place the jack 'down' lever in the down position unless YOU as the maintenance operator are ensured of three things; (1). The safety bracket is positioned and secured approximately 6 inches below the jack mechanism on the jack stand. (2). No item or ash load is aft (to the rear) of the pivot point axle of the Unit. (3). That there is not an overcenter aft moment (rear of unit heavier then the front) which could lead to reduced weight on jack mechanism causing jack to release and slam down with the consequence of having the Unit unsupported at the front end resulting in a dangerous unstable situation. If a questionable condition exists, an item of sufficient girth and strength (safety beam) can be placed forward of the axle spanning the skid rails to act as a safety stop between the Unit proper and the skid assembly, this safety beam will protect the Unit and operator from harm should something in the jacking down procedure fail. Unless the maintenance operator is sure of the proper operation of all components no attempt should be made to jack the Unit down without a safety beam in place. Lock the Unit in the down position after lowering it completely. Remove the jack and store in a dry clean secure environment.

3. Structural integrity inspection of the Burn Unit components will ensure proper and safe operation. As a consequence of the extreme operating parameters (high temperatures, exposure to the elements, and nature of the diverse materials burned) daily attention and inspection (and repair if warranted) must be focused on the following items:

- All welded seams for separation and welded brackets for distortion or stress failure.
- All safety pins for wear or distortion. Replace at 5% of surface wear of diameter of safety pins or at the first indications of distortion. (Replace with grade 8 hardness or better).

- Hinges on pivot assembly, rear door, and loading door for proper attachment, freedom of movement and proper lubrication.
- Counter Balance in place (if applicable). Replace if missing with equivalent counterbalance before tipping Unit (contact manufacturer).
- Skid platform for distortion or for loose grating which may present a tripping hazard.
- Proper and free operation of jack at each use.

4. Preventative Maintenance procedures; Grease pivot assembly zerk fittings monthly. Grease loading door hinges monthly, (Model 2000 only). Keep jack assembly clean, dry, oil jack mechanism with WD-40 spray lubricant or equivalent before each use. Paint entire Burn Unit box with barbecue stove black paint once each year (3 quarts paint and one quart paint thinner). Take extra caution before attempting to reposition unit. Rough handling, applying side load, or dragging skids over rocks may damage or distort undercarriage. Replace interior rack grating when excessive distortion or burn through occurs. Clean ashes and debris often to prevent compaction and or an inordinate amount of work to do at one time. In other words it is much easier to clean it out often then to let it fill completely up. To prevent a catastrophic spill of entire Unit and Skid platform into the pit, ensure that the rear tips of the skid platform do not extend more the 8 inches past the pit rim and that the integrity of the supporting earth under the Unit is sufficient to bear the weight, (Model 2001 weighs approx. 6000pds).

Allocating Use Times:

The Unit should be ignited at least 12 hours before it is ready for loading by the users of the Landfill facility. Thus the maintenance operator should ignite the trash load at the end of the hours of operation of the landfill for that day to ensure that users coming in the following day are not loading a Unit while it is still burning or hot.

Guarantee:

Materials and workmanship guaranteed for 6 months after delivery date. If repairs or replacement of parts are needed for safe and proper operation, Manufacturer at his option will repair or replace item with no charge within the 6 month period.

Manufacturer:

‘Tok Welding and Fabrication’

Ph(907)883-5055

Fx(775)307-1620

Martin C. Marshall

Voice Mail (800)699-2466 enter 9078835055

P.O. Box 855

e-mail christokmarshall@yahoo.com

Tok, Alaska 99780