rezplast
Manufacturing Ltd.

PORTABLE MINING TOILET

(MINI SEWAGE TREATMENT PLANT)

rezplast Manufacturing Ltd.

Portable Mining Toilets
For Permanent or Portable Installation

The light weight **"Mining Toilet"** consists basically of latrine facilities mounted on top of a miniature biological treatment plant allowing waste matter to be deposited directly into the biological treatment process. **No chemicals** of any description are required. With the "Mining Toilet" there is minimal effluent odor with minimal cleaning required every 12-18 months. By manufacturing the "Mining Toilet" as a mini sewage plant, we eliminate the need of transferring night soil from latrines to a central disposal point normally associated with conventional sanitation systems and result in significant reduction in lost time and man power. The light weight design allows for single man installation and allows for easy transfer of the unit from one location to the next with minimal machinery and man power.

- *All units can be **custom designed** to suit a specific location or drift size. The "Mining Toilet" meets all industry standards.*
- *Each unit has an impressive weight of only 150lbs, measuring only 52"long by 35" high by 36" wide.*
- *These units can hold a capacity of 40 men per day.*
- *Sold throughout North America by recognized mining supply centers.*

All units are manufactured in Sudbury, ON, Canada by Rezplast.

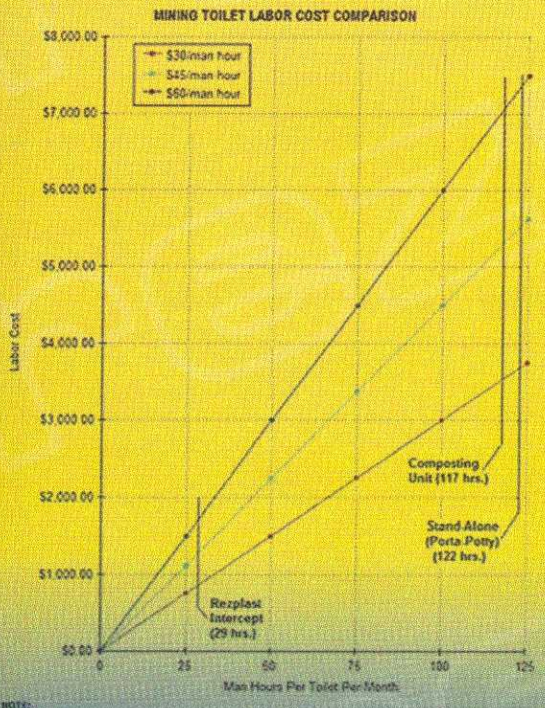
MINING TOILET OPERATING COST COMPARISON

The attached graphs demonstrate the results of a market study commissioned by Rezplast Mfg. To an independent marketing agency in the Sudbury, Ontario area.

The results are based on discussions with area mines and waste disposal management companies to determine the relative operating costs for latrine technologies currently in use in underground mines.

The study compared the following systems:
Portable Composting Latrines:

These systems utilize a holding tank to store and process the deposited waste material. Composting systems are labor intensive, requiring daily maintenance. The composting material must be "flipped" by a manually operated drum on a daily basis to maintain efficient bacterial breakdown of the enclosed fecal waste and must be checked daily to ensure that they do not overflow. Peat moss should be added regularly to enhance the biological breakdown. The system utilizes liquid human waste [urine] as part of the biological process so should not be diluted with water. Water in the tank dilutes the biological breakdown and adds weight to the waste carried to surface for disposal thus reducing the effectiveness of the biological breakdown as well as adding to the cost of disposal. Further, these systems are contructed with plastic material. Plastics develop micro-cracks on the surface which become repositories for waste matter. The toilets cannot be cleaned with disinfectants [destroys the biological process]. Due to the sensitivity of the system to water the toilets must be cleaned by manual scrubbing with appropriate cleaners in order to prevent bacterial infection of the users. This, again, is labor intensive.



NOTE:
Rezplast data based on average of 9 units in use at INCO Creighton Mine

Stand Alone Units:

Includes, for example, "Porta Potty" or "Johnny On the Spot" which are no more than portable outhouses. These systems hold about 30 – 40 gallons of waste and must be emptied frequently. Odor is a serious problem, particularly in the confines of the underground mine. Disposal costs are highest with this system due to the relative mass of waste which must be hauled to surface.

These systems are also constructed with plastic so the same problem exists regarding cleaning. The units cannot be hosed down. Water in the holding tank increases both the frequency and cost for the disposal process.

It's most common that both systems above are rented from a waste handling organization which is also contracted to deal with disposal of the waste and cleaning of the units, but at significant cost.

Rezplast Mining Toilet:

The Rezplast Toilet should be checked daily to ensure that the airflow is on [8cfm] and no foreign material has entered the bowl [e.g. rags] which will impede the action of the airpump. During that inspection the water level is also checked. "Grey water" produced in this system evaporates at low odor level rather than to leak out into a field as with the conventional in-ground septic tank. But, this water must be replaced; a small maintenance requirement. It is important to emphasize though, that no waste water is released into the mine.

Since the Rezplast Toilet uses water in the biological breakdown of the fecal waste and is not constructed of plastic [uses high quality Fiberglass construction] it may be hosed off, as opposed to the scrubbing required by the other systems, for proper cleaning.

Combine this with the fact that the Rezplast unit effectively processes human waste from 40 persons per day and requires removal of the resulting sludge only once during a 12-18 month period. It becomes very obvious why the comparitive study yielded average manpower requirements of 122 hrs/month, 117 hrs/month and 29 hours/month respectively for the Composting, Stand Alone and Rezplast systems featured in the study.

rezplast Manufacturing Ltd.
1150 Kelly Lake Road, Sudbury, ON P3E 5P4
Tel: 705-673-3824 Fax: 705-673-2844
Website: www.rezplastmfg.com

rezplast
Manufacturing Ltd.

Commissioning:
1. Make sure that the unit stands level.
2. Close all valves underneath unit.
3. Close compressed air supply valve on unit.
4. Connect compressed air supply to unit. Pressure supply to be between 65 - 100 lbs/sq. in.
5. Open manhole cover on top.
6. Remove starting floc from inside the tank.
7. Fill unit with clean water through manhole or through seat pot until water is 1 1/2" below the overflow level.
8. Open compressed air supply and ensure that air bubbles inside unit and that airlift pump discharges.
9. Pour 2.0 kgs starting floc through manhole into main tank.
10. Pour in bottle of antifoam - 500 ml.
11. Replace manhole cover.

N.B. THE UNIT IS NOW READY FOR USE AND SHOULD BE USED WITHIN 24 HOURS.

General Operation:
1. The pot lids should always be closed when not in use.
2. Proper toilet paper should be provided in order to prevent blockage of airlift pump.
3. The airlift pump should always discharge.
4. The water level in the unit should be regularly topped up to make up for the loss due to evaporation.
5. No disinfectants to be added.
6. Part of the contents can be removed once per year, or as required. It is not necessary to remove any of the contents regularly.

Maintenance:
(All items requiring attention are above water-line and no direct contact need be made with organic mass).

Smell:
This can be due to one of four items:
1. Air turned off.
2. No air entering unit (pressure reducing valve).
3. Airlift pump not operating (at manhole).
4. Overloading of unit.

1. AIR TURNED OFF:
(a) Check air supply valve at air main and small gate valve and air strainer under platform at pot end.
(b) Remove all air valve handles or handwheels (to prevent unauthorized personnel making adjustments).

2. NO AIR ENTERING UNIT:
(a) The unit will be found to be very quiet and when removing the manhole cover no agitation or movement of liquid mass will be noticed. (Assuming that both air supply valves to the unit were checked for being open and that air is present in the air main).
(b) Remove hose between pressure reducing valve and hose manifold. If air is not flowing replace pressure reducing valve. Adjust the new valve so that air is bubbling in each tank and causing a mushroom shape effect in tanks 1 and 3. Check that airlift pump is discharging.

3. AIRLIFT PUMP NOT OPERATING
After ensuring that air valves are open and air being admitted to the inside of the unit - that is agitation and movement of mass is noticed but no discharge from airlift pump when looking in at manhole. The airlift pump delivery is at manhole when the manhole is removed. The discharge or delivery from this pump must be choked or blocked, allowing the air that is admitted to the pump to blow back via the suction end of pump thus clearing the pump section. (This airlift pump has no moving parts and is a pipe with air being admitted at the bottom end).

Should the pump not be discharging, after repeated chokes, unscrew the discharge pipe by hand and insert water hose into pump pipe and flush with full water pressure.

NOTE: It must be stressed when discussing the Mining Toilet with the installer, that the air pump must be choked for a short while when they are cleaning the unit. This will ensure trouble free operation. With the airlift pump NOT in operation it would mean that only half the plant is in operation with one half overloaded and the other half with no organic matter.

4. OVERLOADING OF MINING TOILET:
The unit can be partly or grossly overloaded by serving too many users. (The units are designed to serve a working force in the vicinity of NOT more that - small single seater 10 per day; single seater 40 per day; double seater 80 per day - based on the assumption that one out of three will use the unit per day.) With smell persistent, in spite of all items working, such as:
(i) Air on.
(ii) Air to inside of unit.
(iii) Air pump working.
(iv) Ensure that no chemicals were used.
By opening manhole cover the appearance of the mass being agitated will be very thick and heavy - so thick that airlift pump will barely manage to transfer the heavy organic mass - the plant is overloaded. Half the contents must be drained and the unit refilled with clean water. The number of men in that area must be checked and divided or additional units installed.

Do NOT use disinfectants:
This will kill all the micro-organisms in the unit. If any disinfectants have been added to the unit, the entire contents should be removed, and the unit recommissioned after flushing with clean water.

Your Local Representative: