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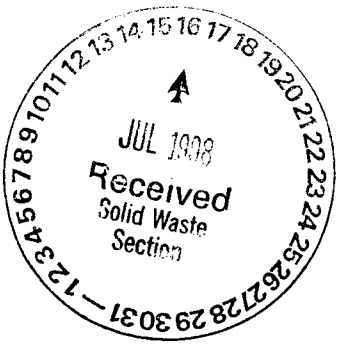
NORTH CAROLINA
DEPARTMENT OF CORRECTION
DIVISION OF PRISONS

James B. Hunt Jr.
Governor

Mack Jarvis
Secretary

Daniel L. Stieneke
Director

Compost File



MEMORANDUM

TO: Ted Lyon
Division of Waste Management

FROM: William B. Carroll, Jr.
Program Director I

DATE: July 13, 1998

RE: Compost Annual Report / July 1997 - June 30, 1998
Caledonia Correctional Institution
PO Box 137
Tillery, North Carolina 27887
Permit #: SW-41-06

Our small type three compost facility officially began on May 18, 1998. As of June 30, 1998 there was not a compost bin completed to gain any type of sample.

If there are any questions or concerns, please advise.

WBC/ldm

cc: Randy Lee
file

NORTH CAROLINA
DEPARTMENT OF CORRECTION
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James B. Hunt Jr.
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Director

Caledonia Correctional Institution
PO Box 137
Tillery, North Carolina 27887

April 29, 1998

Ted Lyon
Composting & Land Application
Branch Supervisor
Solid Waste Section

Dear Mr. Lyon:

Enclosed is our application for a small type 3 compost facility. Our facility is located on the grounds of Caledonia Correctional Institution in Tillery, North Carolina. The name on the application should be directed to Caledonia Correctional Institution.

As Caledonia's Administrator, I will be ultimately responsible for the overall operation of the compost facility. If there are any further questions or concerns, please advise.

Respectfully,

Randall E. Lee, Administrator
Caledonia Correctional Institution

cc: William Carroll
file

Request For Composting Demonstration
Permit For Caledonia Correctional Facility

1. Contact: Mr. Randall Lee, Superintendent
P. O. Box 137
Tillery, NC 27887

A. R. Rubin
NCSU-BAE

2. Material to be composted: Pre-consumer food wastes from kitchen and dining hall facilities, vegetable wastes and by-products from prison enterprises cannery, and shredded office paper.

3. Volumes to be composted: Food wastes to be composted are wet. The volume is approximately 1 ton per day. Cannery wastes may be as much as 3 or 5 tons per day, but only during the active canning season and then only when materials do not meet food quality standards. The average cannery waste generation rate should be no more than 2 tons/day. Shredded paper should constitute no more than .5 tons/week.

4. Composting methods: The windrow method shall be utilized in this demonstration. Prison labor shall blend food wastes or cannery wastes with woodchip or sawdust and place this material in windrows. Once formed, windrows shall be covered to minimize potential for vector attraction. Cover material shall be either composted material from other windrow or curing areas or woodchip/sawdust. Shredded office paper shall be blended as required, but not more than 25% of a "mix" shall be paper. This will maintain the carbon: nitrogen ratios within acceptable ranges for composite

   Windrow temperatures shall be monitored and recorded daily by DOC personnel. A sample of the composted product shall be collected following one complete compost cycle (at least three heating cycles) and analyzed to determine nutrient, metal, and indicator organism levels. These tests will be accomplished at NCSU.

5. Compost site location: This demonstration site is located at Caledonia Prison. The approximate location is as indicated on the attached map.

6. Report Preparation: Upon completion of this protect and at 3 month intervals throughout this project a report shall be submitted to the Solid Waste Management Division. This report shall list:

   1. Volumes of material composted
   2. Quality of product generated (N, P, K & regulated metals)
   3. Temperature profiles within windrows
   4. Disposition of product on farm
   5. Other information deemed important

Request For Composting Demonstration
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   P. O. Box 137
   Tillery, NC 27887

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   Windrow temperatures shall be monitored and recorded daily by DOC personnel. A sample of the composted product shall be collected following one complete compost cycle (at least three heating cycles) and analyzed to determine nutrient, metal, and indicator organism levels. These tests will be accomplished at NCSU.

   The temperature monitoring is necessary to insure pathogen reduction in the final product. Although no pathogens are anticipated in the food wastes, salmonella and coliform bacteria may enter the compost windows from birds and other wildlife. Pathogen reduction is achieved at temperatures above 131°F for consecutive days and during this time, windrows will be turned and mixed at least 5 times to insure that all materials are exposed to these temperatures. If product does not meet these time-temperature requirements then it must be applied to portions of the fields at Caledonia permitted to receive this materials. Only

product which meets the process to reduce pathogen requirements of 131°F for 15 days can be utilized in an unrestricted manner.

5. Compost site location: This demonstration site is located at Caledonia Prison. The approximate location is as indicated on the attached map.

6. Report Preparation: Upon completion of this protect and at 3 month intervals throughout this project a report shall be submitted to the Solid Waste Management Division. This report shall list:

    1. Volumes of material composted
    2. Quality of product generated (N, P, K & regulated metals)
    3. Temperature profiles within windrows
    4. Disposition of product on farm
    5. Other information deemed important

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WASTE MANAGEMENT

JAMES B. HUNT JR.
GOVERNOR

WAYNE MCDEVITT
SECRETARY

WILLIAM L. MEYER
DIRECTOR

May 20, 1998

Mr. Randall E. Lee
Administrator
Caledonia Correctional Institution
P.O. Box 137
Tillery, North Carolina 27887

RE: Compost Facility - Permit No. 42-06

Dear Mr. Lee:

Your permit to operate a Small Type 3 Compost Facility was delivered to you on May 18, 1998. Please carefully read all permit conditions. Failure to follow any of the permit conditions or the NC Solid Waste Compost Rules may subject you to compliance actions.

A preoperation inspection of the facility was conducted on May 18. The construction of the facility was found to be in compliance with the rules and in keeping with the approved application. The facility is now approved for operation.

During our inspection, Mr. Carroll indicated that the area down slope on the west of the site would be regraded and seeded to control erosion. It is my understanding that the remainder of the fans will be ordered as soon as it has been determined that the 800 CFM fans are adequate.

If I can be of assistance to you with the operation of the facility, please feel free to contact me at 919-733-0692, extension 253.

Sincerely,

Ted Lyon
Composting and Land Application Branch

cc: William B. Carroll, Jr., Caledonia Correctional Institution
Ben Barnes, Waste Management Specialist
h:cla/compost/permits/42-halif/42-06cl.98p

401 OBERLIN ROAD, SUITE 150, RALEIGH, NC 27605
PHONE 919-733-4996 FAX 919-715-3605

James B. Hunt Jr.
Governor

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Daniel L. Stieneke
Director

NORTH CAROLINA
DEPARTMENT OF CORRECTION
DIVISION OF PRISONS

Caledonia Correctional Institution
PO Box 137
Tillery, North Carolina 27887

April 29, 1998

Ted Lyon
Composting & Land Application
Branch Supervisor
Solid Waste Section

Dear Mr. Lyon:

Enclosed is our application for a small type 3 compost facility. Our facility is located on the grounds of Caledonia Correctional Institution in Tillery, North Carolina. The name on the application should be directed to Caledonia Correctional Institution.

As Caledonia's Administrator, I will be ultimately responsible for the overall operation of the compost facility. If there are any further questions or concerns, please advise.

Respectfully,

Randall E. Lee, Administrator
Caledonia Correctional Institution

cc: William Carroll
file

Certified

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WASTE MANAGEMENT
P.O. BOX 29603 RALEIGH, N.C. 27611

Caledonia Correctional Institution

is hereby issued a permit to operate a

Small Type III Compost Facility

on Caledonia Correctional Institution Property(NCDOC)

PERMIT NUMBER SW-42-06

in accordance with Article 9, Chapter 130A, of the General Statutes of North Carolina and all rules promulgated thereunder and subject to the conditions set forth in this permit.

Dexter R. Matthews, Chief
Solid Waste Section

5-15-98
Date

Permit Conditions

2. Facility operation shall not begin prior to an inspection by the Division. All parts of the facility shall be in place and in proper working order.
3. All measures in the approved permit application to control erosion and runoff from the facility shall be maintained in working order.
4. This facility shall be operated in accordance with Rule .1406 of the Solid Waste Compost Rules and the permit application.
5. All compost produced at the facility shall meet the requirements of Rule .1407 of the Solid Waste Compost Rules and the permit application.
6. Testing and reporting shall be conducted in accordance with the requirements of Rule .1408 and the permit application. An annual report of facility activities for the fiscal year July 1 to June 30 shall be submitted to the Division by August 1 of each year.
7. Operation and maintenance of this facility shall be in accordance with the Municipal Solid Waste Compost rules and the Operation and Maintenance Manual submitted with the permit application.
8. **Compost shall not be distributed prior to approval by the Division of Waste Management in accordance with .1407(6)(b) of the Municipal Solid Waste Compost Facility Rules.**
9. Groundwater monitoring wells may be required if there is indication of the potential for groundwater contamination.
10. Leachate from the facility may not be land applied prior to testing for nutrients to determine the appropriate applicaton rate and receiving approval from the Division.
11. This permit will expire on May 15, 2003. Changes in ownership, increase in facility capacity, or composting materials not addressed in the application shall require a permit modification.

⚖ SOLID WASTE SECTION PERMIT APPLICANT COMPLIANCE REVIEW ⚖

Instructions: Complete upper portion and submit this form to the Field Operations Branch Compliance Officer.

Review Requested by: Ted Lyon Date Requested: 4/29/98

Type of Permit: Compost - Small Type III Check One: New Permit ____ Renewal ____

Applicant Contact and Business Name: B-11 Carroll or Randy Lee

Parent Company/Known Subsidiaries/Other known names business has operated under:
Caledonia Correctional Institution - N.C. Dept. of Correction

Known Counties of Operation: Hal. fax

Does the applicant have a past or current solid waste permit? Yes ____ No ✓(3)

If yes, write facility type: _____, and permit #: _____

To be completed by Compliance Officer and returned to Permitting or Composting & Land Application Branch staff.

1. The applicant's compliance history for the past three years was reviewed on 4/29/98.

2. The applicant has an outstanding compliance order with administrative penalty.

   Yes ____ If yes, describe unresolved issue(s): _____

   No ✓

3. The applicant has been issued two or more compliance orders in the past three years.

   Yes ____ If yes, describe nature of the violation(s): _____

   No ✓

4. Permit denial based on the applicant's compliance history is recommended.

   Yes ____ Remarks: _____

   No ✓

4/29/98 Misty Franklin
Date Compliance Officer

Application Requirements For Solid Waste Compost Facilities

.1405(A)

Caledonia Correctional Institution is requesting a permit to construct and operate a type three solid waste compost facility.

1. An aerial photograph which is one inch is equal to 400 feet. See attached.

   (a) All properties surrounding the proposed compost site are owned by the State of North Carolina, NC Department of Correction.

   (b) There are no buildings public or private, utilities, public roads, or water courses or within three hundred feet of our proposed facility. A dry run is located approximately 150 feet behind the compost bins.

   (c) No zoning requirement. (See letter attached)

2. A letter from Keith Dobbins (Zoning Officer) is attached stating that state property is not subject to any zoning laws within Halifax County. A letter from Mr. Dobbins is attached. Therefore, no zoning permit is required.

3. An explanation of how the site complies with sitting and designed standards in rule .1404 of this section.

.1404(A)

1. The location of Caledonia's compost facility is not within the one hundred year floodplain, see attached letter.

2. The nearest property line is in excess of 2500 feet from the compost facility.

3. The nearest residence is at least 500 feet from the compost facility.

4. The closest well is 4,000 feet away.

5. There are no perineal streams/rivers within at least 300 feet of the facility. The Roanoke River is 7200 foot away.

6. The Roanoke River is a Class C stream at this point and there are no restrictions on uses within its watershed.

7. Our compost facility is not located in a closed out disposal area.

8. Our facilities position exceeds the minimum distance that is required between compost areas and swales or berms that will allow for fire fighting equipment. The distance around our facility is at least 400 feet to any building.

9. A site shall meet the following surface water requirement:
Our facility is an invessel system that is under roof and which collects all leachate from the compost bins in a 1,500 gallon tank located at the west end of the compost bins. The leachate will be added to the compost as a moisture source or if necessary sprayed on the adjacent fescue fields. Areas for spray irrigation have been approved by the Division of Waste Management staff. The area around the facility, including the areas for curing and storage is gently sloping, bermed where appropriate and is in fescue to control erosion and filter any runoff from the facility. Any feedstock spills will be immediately cleaned and placed in the compost bins. As a result:

   (a) The site shall not cause a discharge of materials into waters or wetlands of the state.

   (b) The site will not cause a discharge of pollutants into waters of the state.

   (c) The site will not cause non-point source pollution of waters of the state.

10. A site shall meet the following ground water requirements:

   (a) Our facility is a invessel system which will collect and re-cycle all leachate and should not, therefore, contravene ground water standards.

   (b) Soil texture at the site was evaluated by the Division of Waste Management and found to have a texture finer than loamy sand and the depth to seasonal wetness is in excess of 24 inches.

   (c) Our facility will be a small type three facility.

   (d) Curing may take place and finished product will be stored adjacent to the facility. The soil conditions are as described in #2 above. All stored material will pass the paint filter test.

   (e) Our compost facility sets on a minimum of six inch foundation of cement. No natural soils or liners are used for active composting.

.1404(B) Alternative minimum buffers are not required by the Division of Waste Management.

.1404(C) **A SITE SHALL MEET THE FOLLOWING DESIGN REQUIREMENTS:**

1. Our compost facility is in a location where there is controlled public access due to security measures for Caledonia Correctional Institution.

2. Less than one acre will be disturbed in the construction of this facility and the area down slope will be grassed or bermed to control and filter run-off. Our facility is an invessel system which collects all leachate from compost and recycled to meet the needs of the composting.

3. Our facility being an aerated invessel system should minimize odors. Proper feed stock blending and aeration will also minimize odors. If necessary to control odors the aeration can be reversed and a biofilter installed to control odors.

4. Our compost site is in the middle of a 7500 acre farm therefore minimizing odors to any adjacent property owners.

.1405 #4 **A DETAILED REPORT INDICATING THE FOLLOWING:**

(a) Caledonia's compost facility will utilize medium size wood chips or saw dust as its primary bulking agent. The following other solid wastes may also be composted at the facility:

Dining hall food waste and associated paper waste such as napkins and milk cartons.
Kitchen waste
Food processing waste from the cannery
Shredded paper
Socks and other 100% cotton clothing
Poultry mortality
Manure
Greenhouse wastes
Cotton gin trash
Tobacco Dust

The estimated quantity of the solid waste should be less than 100 cubic yds per month. Similar wastes may be received from other nearby Correctional facilities.

(b) Caledonia's composting facility is set on a minimum of 6" thick concrete pad. Curing and any storage will be in an area of soils with textures finer than sandy loam and a depth to seasonal wetness in excess of 24 inches..

.1405 #5 Site Plan Attached

.1405 #6 **A DESCRIPTION OF THE OPERATION OF THE FACILITY WHICH MUST INCLUDE AT A MINIMUM:**

(A) William B. Carroll, Jr. Program Director I, PO Box 137, Tillery, NC 27887, area code (919)826-5621.

(B) Two to four honor grade inmates will be responsible for operation of the facility. One Enterprise Gate Officer will supervise the inmates.

(C) This facility will operate seven days per week. The honor grades would work approximately 7:30-4:30 each day.

Dining hall and kitchen waste will be transported to the facility every morning. Other wastes will be added to the bins at various times during the day. Wastes will be screened for foreign matter as added to the bins. Putrescible wastes will be added to the bins the same day they are delivered to the facility. Wastes with any free water will be added directly to the bins. Temperatures will bemonitored daily and recorded.

Wastes will be layered into the bins and covered with bulking material.

Finished product will be moved to the adjacent curing and storage area with a loader as the bins are needed for the next batch of waste. The product will be used at the correctional institution.

More detail is provided in the operation and maintenance portion of the application.

Compost will be tested at least every 6 months for pathogens, regulated metals, and foreign matter.

.1405- 6 (D) Heavy Winds - Heavy winds would not hinder our operation due to our solid waste being in bins and not on open ground.
Heavy Rain - Heavy rains would not hinder our composting ability due to (1) our facility being bins built on a pad, (2) all weather access to the area of the bins and (3) the bins are covered by a roof which will prevent excess water from entering the bins. Snow and freezing weather should not be a factor. Food waste will be stored near the kitchens during periods of heavy snow until they can be transported to the bins. No cured compost would be moved during snowy conditions.

(E) Odors will be controlled through maintaining proper C:N ratios in the bins and odors and vectors will also be controlled by covering layers of putrescible wastes with layers of bulking material. A moisture source is available at the facility to control moisture which will control dust. Our composting facility sets in the middle of a 7500 acre farm therefore minimizing noise and air borne particles and odors to any surrounding neighbors. Noise will not significantly increase over that normally encountered with the operation of a 7500 acre farm.

.1405-6 (F) There are several choices from which Caledonia can utilize its cured composting material. They are as follows:

Using in conjunction with potting soil for day lilies.

Used as a fertilizer and potting media in conjunction with Caledonia's greenhouses.

A supplement fertilizer for all crops or a soil amendment for eroded crop land.

In case our finished product could not be utilized by Caledonia other state agencies could utilize it as a type of potting soil or fertilizer.

.1405 #7 (A) Design capacity of the facility; less than 1,000 cubic yards a quarter.

(B) See attached

(C) Wastes will be placed in the bins in layers. Wastes will be added

to the bins by pouring from plastic barrels or from a loader bucket. Layers will be 4 to 12 inches thick depending on the waste. Rakes and shovels will be used to level the layers of waste as they are added. Shreading will not be necessary of the feedstocks to be used. Bulking material will be ground prior to receipt at the faciliity.

(D) Process duration will be 45 to 120 days depending on the curing requirements of the particular user at the institution.

(E) The temperature shall be monitored and taken at least once a day. Temperature readings will be taken at various depths and locations(sides and middle) in each bin with a 3 or 4 foot compost thermometer. Moisture readings will be taken as dictated by low temperature readings. A shovel will be used to dig into the bins and moisture sampled using the hand method.

A grab sample of the product will be taken at least every 6 months and sampled for fecal coliform.

A sample will be taken from each bin as it is removed and composited, kept refrigerated and sent to a NCDA lab at least every 6 months.

(F) Temperature readings will assure that the temperatures are maintained at least 131 degrees for 3 consecutive days to meet PFRP requirements and at least 113 degrees for 14 days to meet vector attraction reduction requirements. Finished product will be sampled at least every 6 months to be sure pathogens are reduced.

(G) Each compost bin is equipped with a air control system consisting of a fan, 4 inch PVC air lines, and bioplates in the bottom of the bins to distribute air evenly. Timers will be used to control when the fans will run. Run times will vary depending on the stage of the composting material. Fans will becapable of delivering at least 815 cubic feet of air per minute.

(H) Our facility sits on top of a hill and as a result water run-on will not be a problem. Runoff will be controlled and filtered with grass buffers or berms down slope of the facility. A 1,500 gallon leachate tank is present and will collect all leachate drainage from our facility. The pad the bins sit on is sloped toward the middle of the bins and from one end to the other (east to west) to facilitate leachate collection and prevent any leachate from

draining out of the bins onto the ground surface. Leachate will be managed by using it as a moisture source for the compost or if necessary it can be sprayed on adjacent fescue hay field.

.1405 (8) See attached operation and maintenance manual

(9) Drawings attached

(10) See attached operation and maintenance manual

(11) Drawings attached

Operation and Maintenance Manual for the Caledonia Corrrectional Facility Compost Operation

Food waste from the Caledonia Prison unit is transported daily to the compost facility from the dining hall. Any food waste from other nearby prison units is delivered at a scheduled time so that the appropriate inmates will be available to unload the waste. Food waste is delivered in barrels. Other wastes are delivered at various times of the day and are put in the waste storage area on the east side of the compost bins. Food wastes are added to the bins upon delivery.

A 6" inch layer of bulking material will be placed in the bottom of each bin prior to adding any wastes. This layer may be increased if necessary to help manage leachate. Inmates will layer these materials into the bins as the food waste is added. Rakes and shovels will be used to level the material that is added to the bins. Moisture, in the form of water or leachate, will be added to the bins with the wastes as necessary to attain a moisture level of 55 to 60 percent. This will be determined by compost temperature, visual inspection and hand method. Separate hoses will be available to spray the water or leachate into the bins. Putrescible wastes will be added to the bins the same day as delivered to the facility.

Wastes will be placed in layers in the bins 3 to 6 inches thick. The thickness of the layers will be determined based on the moisture content, nitrogen content, and particle size of the wastes. Bulking material will be added on top of each layer of waste. The thickness of the bulking material layers will depend on the feedstock characteristics. As wastes and bulking materials are added boards are placed in the opening of the bin to prevent wastes from falling out of the bins.

Incoming waste is checked for non compostable materials as the wastes are added to the bins. Non compostable wastes are placed in a trash can at the bins and later disposed of with other solid waste at the prison unit. Any wastes found at the facility that are not approved for composting will be removed and disposed of properly and the occurrence reported to the Prison Administrator.

Fans are set initially to operate approximately 10 minutes per hour as the bins are filled. Fan speeds are increased as necessary to assure the oxygen content in the bins does not get to low, if the temperatures in the bins rise above 160 degrees, or if the compost becomes to wet(wet is determined using the hand method- if water can be squeezed out of the compost it is too wet).
Fan speeds are reduced when excessive heat loss is evident. An average temperature of 140 - 150 degrees is desirable..

Temperature readings are taken daily from at least two different locations in each bin at least two different depths. Temperatures must remain above 131 degrees for at least 3 days to meet pathogen reduction requirements. Temperatures must remain above 113 degrees for 14 days to meet vector attraction reduction requirements. Bin temperatures are recorded as they are taken in a log book. The book should indicate the date and bin number of each reading. If only one number is recorded for each bin it will be the lowest temperature recorded for that bin. Pathogen reduction requirements will be met after any leachate is added to the compost.

The temperature log and thermometer will be kept at the bins. A copy of the permit and permit application will be maintained at the Administration Office of the Prison Unit.

If temperatures are not maintained in a bin the contents of the bin must be examined to determine why the wastes are not composting. Moisture can be determined using the hand method. If water can be squeezed out of the compost it is too wet and aeration must be increased or bulking material added. If the compost does not leave moisture on the hand and will not hold together it is too dry and water or leachate must be added to increase moisture levels. If the compost holds together in a ball and leaves moisture on your hand it is about the right moisture level. The material in the bin may be too dense to get adequate air flow in which case the bins would need to be remixed and possibly course bulking material added. Temperatures may also fail to rise if the air flow is to great. If the bin appears to contain too much carbon and not enough nitrogen then additional feedstock or a high nitrogen fertilizer will need to be mixed with the contents of the bin. If material needs to added to a bin to regulate C:N ration or porosity the material may be removed from the bin with a loader and mixed in the receiving and bulking material storage area. Contents of bins that do not meet temperature requirements will be blended with fresh feedstocks and reblended.

In addition to temperature monitoring the following duties must be performed daily:

1. All fans checked to be sure they are operating properly.
2. The depth of leachate in the storage tank checked.

In the event fans break down there will be extra fans available. In the event of a power failure waste can be held near the dining halls until power is restored or if necessary the waste can be windrowed in the waste receiving area and later placed in a bin. Several front end loaders or backhoes are available at the prison in the event the one assigned to the facility breaks down. Feedstocks spilled around the bins will be cleaned up with a rake and shovel and placed in a bin. In the event of a fire there is a water hose and fire extinguishers at the bins. If the fire cannot be controlled it will be reported immediately to the Prison Administrators Office. In the event of leachate pump failure the leachate can be pumped out and taken to the prison wastewater treatment plant or removed manually through the tank access and added to the compost bins until the pump can be repaired or replaced.

Odors and vectors at the site will normally be controlled through proper composting methods. This includes maintaining adequate aeration, proper moisture levels, and maintaining a C:N ratio approximately 30:1. If odors persist at the site the aeration system will be reversed and a biofilter constructed at the facility. Vectors should be controlled by covering the bins with bulking material and maintaining reasonable cleanliness around the bins. If flys cannot be controlled, chemical sprays will be used or parasites will be introduced in the area.

A sample for testing for metals and foreign matter will be collected from the compost in each bin as it is being removed. These samples will be composited and maintained in a cooler. At least every six months the compost will be tested for foreign matter by passing a weighed sample through a 1/4 inch screen. Foreign matter that can be clearly identified shall be separated and weighed to determine the percent foreign matter.

A portion of the composite sample shall also be sent to a Waste Analysis Lab every 6 months and analyzed for all the information that the lab will provide. Specifically, cadmium, copper, lead, nickel, and Zinc must be included.

A grab sample will be taken at least every six months and tested for fecal coliform. The sample should be taken from inside a bin during the removal of the contents of the bin. A clean shovel or glove should be used to take the sample to avoid the possibility of contamination. The sample should be placed in a plastic bag and transported to an approved lab a soon as possible.

A berm is maintained between the bins and the adjacent road to keep run-off from leaving the site and entering the road. The berm is maintained in fescue to prevent erosion. The areas down hill from the bins on the north and west sides are maintained in fescue to prevent erosion and to filter and particulates that might move from the area around the bins. A designated portion of this area may also be used to spray leachate from the leachate storage tank if production should become to great to reuse the leachate as a moisture source. The areas around the facility will be checked monthly or after heavy rains for evidence of erosion or runoff. If any areas of erosion or runoff are noted they will be stabilized immediately with hay bales and graded and reseeded as soon as moisture conditions permit.

Facility records will be kept to indicate the following:

.1408 (B) Record Keeping:

(1) Daily operational records must be maintained, which include, at a minimum, temperature data (length of the composting period) and quantity of material processed:
(2) Analytical results on compost testing;
(3) The quantity, type and source of waste received;
(4) The quantity and type of waste processed into compost;
(5) The quantity and type of compost produced by product classification; and;
(6) The quantity and type of compost removed for use or disposal, by product classification, and the market or permitted disposal facility.

.1408 (C) Annual Reporting:

(1) The facility name, address, and permit number.
(2) The total quantity in tons, with sludge values expressed in dry weight, and type of waste received at the facility during the

year covered by the report, including tons of waste received from local governments of origin;

(3) The total quantity in tons, with sludge values expressed in dry weight, and type of waste processed into compost during the year covered by the report;

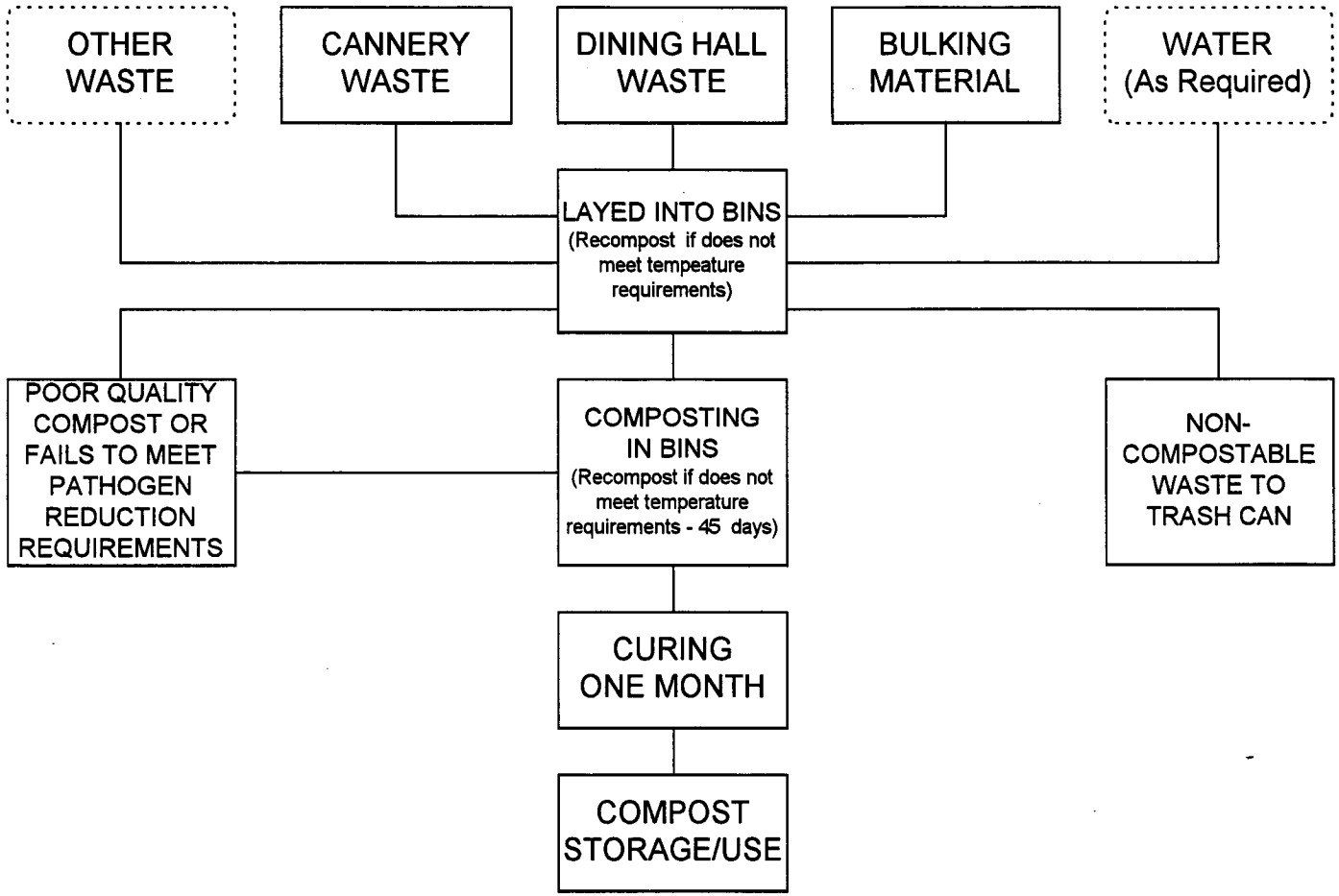
(4) The total quantity in tons and type of compost produced at the facility; by product classification, during the year covered by the report;

(5) The total quantity in tons and type of compost removed for use or disposal from the facility, by product classification, along with a general description of the market if for use during the year covered by the report;

(6) Monthly temperature monitoring to support Rule .1406 of this Section; and

(7) Results of tests required in Table 3 of this Rule.

CALEDONIA CORR. INST.
SOLID WASTE COMPOSTING FACILITY
PROCESS FLOW DIAGRAM
April 28, 1998



HALIFAX COUNTY
ZONING ADMINISTRATION
PO BOX 69 HALIFAX, NC 27839
PH 919 583-1082
FAX 919 583-2735

PLANNING BOARD BOARD OF ADJUSTMENT

To: Whom It May Concern

From: Keith Dobbins, Zoning Administrator

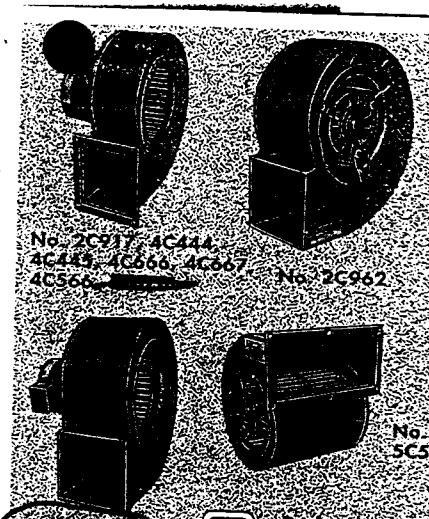
Date: February 25, 1998

RE: Caledonia Compost Facility

The compost facility that the North Carolina State Caledonia Prison is installing is exempt from county zoning regulations as per North Carolina General Statute 153A-347.

The location of the compost facility is located on FEMA map number 370327 0120B, Zone B, map effective date: May 5, 1981. This places the facility within the 500 year floodplain but not within the 100 year floodplain.

The facilty is located in Halifax County North Carolina, Tax Map 79, Parcel 1.



Dayton

LR6319 E47479 E37403

- Provide economical air delivery for larger applications in heating, ventilating, exhausting, and cooling
- Forward curved wheels driven by Dayton motors rated for continuous duty with all-position mount sleeve bearings
- Baked on gray enamel finish

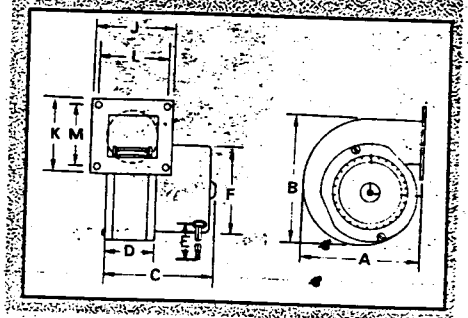
Maximum ambient temperature 104°F. Capacitors included on all energy efficient PSC blowers. Two-speed blowers (see No. 2X605 two-speed switch (not for use with speed controllers). Dayton brand. (see Index under Motor Parts & Accessories, Relays.)

Open dripproof motors recognized by Underwriters Laboratories under Motor Component Recognition Program; for construction, File E47479, for thermal protection, File E37403. Blowers without outlet flange can use No. 2C335 housing support for mounting, (see below.) NOTE: Not for use with speed controllers. Dayton brand.

PRE-PUNCHED METAL HOUSING SUPPORT: For base mounting No. 2C962, 2C946, 4C054, 4C668, 4C830, and 4C831 blowers for both horizontal, top horizontal, and upblast discharges. 12¾" long. Gray finish. Sold individually.

No. 2C335. Shpg. wt. 1.3 lbs. List ..... Each .....

Replacement Parts Available™ 1-800-323-0620



SHADED POLE AND PSC BLOWER DIMENSIONAL DATA

Stock No.	Wheel Dia.	Wheel Width	Outlet H	Outlet W	Inlet Dia.	A	B	C	D	E	F	J	K
						Dimensions in Inches							
4C444	6 5/16	2 7/8	4 15/16	3 13/16	5 3/8	10 5/16	11 1/8	8	3 7/8	12	4 7/16	5 1/16	5 3/8
2C917	6 5/16	2 7/8	4 15/16	3 13/16	5 3/8	10 5/16	11 1/8	8	3 7/8	12	4 7/16	5 1/16	5 3/8
4C448*	5 1/4	6 7/8	3 11/16	8 1/16	4 7/16	8 13/16	9 7/8	9 1/4	8 9/32	12	3 9/16	9 11/16	5
5C507*	5 1/4	6 7/8	3 11/16	8 1/16	4 7/16	8 13/16	9 7/8	9 7/16	8 9/32	12	3 9/16	9 11/16	5
2C962*	8 1/16	4	5 9/16	6 9/16	7	13 1/8	14 7/8	6 1/2	6 1/4	12	5	†	†
4C445	6 5/16	4 1/4	4 1/4	5 3/16	5 3/8	10 5/16	11 1/8	9 1/2	5 1/4	12	4 7/16	6 1/8	5 3/8
4C870	6 5/16	4 1/4	4 1/4	5 3/16	5 3/8	10 5/16	11 1/8	9 1/2	5 1/4	12	4 7/16	6 1/8	5 3/8
2C946	8 1/16	4	5 9/16	6 9/16	7	13 1/8	14 7/8	11	6 1/4	6	5	†	†
4C054	8 1/2	5 1/16	5 9/16	7 9/16	7	13 1/8	14 7/8	12 3/4	7 1/4	6	5	†	†
4C565*	5 1/4	6 7/8	3 11/16	8 1/16	4 7/16	8 13/16	9 7/8	9 1/4	8 9/32	12	3 9/16	9 11/16	5
4C566	6 5/16	4 1/4	4 1/4	5 3/16	5 3/8	10 5/16	11 1/8	9 1/2	5 1/4	12	4 7/16	6 1/8	5 3/8
5C508*	6 1/4	6 1/2	4 1/8	8 1/16	5 3/8	10 5/16	11 1/8	10 3/4	8 1/4	12	3 9/16	9 9/16	5 3/8
4C666	6 5/16	2 7/8	4 5/16	3 13/16	5 3/8	10 5/16	11 1/8	8 3/8	3 7/8	12	3 5/16	5 1/16	5 3/8
4C667	6 5/16	4 1/4	4 1/4	5 3/16	5 3/8	10 5/16	11 1/8	10	5 1/4	12	3 5/16	6 1/8	5 3/8
4C668	8 1/16	4	5 9/16	6 9/16	7	13 1/8	14 7/8	10 1/4	6 1/4	6	5	†	†
4C830	8 1/2	5 1/16	5 9/16	7 9/16	7	13 1/8	14 7/8	11 3/4	7 1/4	6	5	†	†
4C831	8 1/16	5 3/16	5 9/16	7 9/16	7	13 1/8	14 7/8	11 9/16	7 1/4	6	5	†	†

(†) Blower does not have a flange. (*) Conduit box not provided. All other models include conduit box.

SHADED POLE BLOWERS

0.0" SP	0.1" SP	0.2" SP	0.3" SP	0.4" SP	0.5" SP	0.6" SP	0.7" SP	0.8" SP	Cut-Off SP	Volts	Hz	Therm. Protect.	RPM	Free Air Watts	Amps	Stock No.	List	Each	Log
CFM, AT RPM SHOWN AT 60 Hz																			
350	340	328	312	296	274	240	202	158	1.00	115	60/50	Auto.	1585	185	2.90	4C444	$158.75	$95.10	$90.3
350	340	328	312	296	274	240	202	158	1.00	230	60/50	Auto.	1585	185	1.45	2C917	163.85	98.15	93.2
465	428	396	352	305	227	125	—	—	0.76	115	60/50	Auto.	1530	115	2.90	4C448	123.18	73.80	70.0
465	428	396	352	305	227	125	—	—	0.76	230	60/50	Auto.	1530	115	1.30	5C507	126.28	75.70	71.8
490	460	425	390	350	305	235	—	—	0.80	115	60/50	Auto.	1045	215	3.30	2C962	196.14	117.50	111.5
495	476	458	437	416	387	360	312	265	1.26	115	50/60	Auto.	1570	225	3.25	4C445	167.51	100.35	95.2
495	476	458	437	416	387	360	312	265	1.26	230	50/60	Auto.	1570	225	1.70	4C870	168.60	101.00	95.9
815	767	716	663	604	537	460	280	—	0.91	115	60	Auto.	1030	370	5.60	2C946	221.66	132.80	126.1
980	940	890	843	788	730	655	565	210	1.05	115	60	Auto.	1030	455	6.80	4C054	244.27	146.30	138.9

TWO-SPEED BLOWERS

435	410	380	345	295	205	100	—	—	0.78	115	60/50	Auto.	1350	175	2.17	4C565	131.51	78.75	74.8
296	290	279	265	220	153	90	—	—	0.75				900	110	1.41				
480	465	445	425	400	370	340	300	245	1.16	115	60/50	Auto.	1525	250	3.55	4C566	169.49	101.55	96.4
375	365	355	340	320	295	265	230	160	1.12				1165	158	2.21				
760	750	735	710	675	640	610	565	520	1.70	115	60/50	Auto.	1450	335	3.20	5C508	233.16	139.65	132.6
545	530	525	505	495	480	460	420	380	1.60				1100	215	2.07				

PSC BLOWERS

382	349	335	319	300	279	248	204	145	1.10	115	60/50	Auto.	1550	125	1.21	4C666	158.10	94.70	89.9
488	470	450	430	406	377	336	282	217	1.18	115	60/50	Auto.	1580	157	1.43	4C667	168.23	100.75	95.7
745	715	683	647	605	560	506	—	—	0.92	115/230	60/50	Auto.	1060	249	2.69	4C668	254.85	152.75	145.1
960	930	890	845	800	745	688	470	253	1.16	115/230	60/50	Auto.	1030	380	4.00	4C830	267.53	160.50	152.4
1210	1200	1190	1180	1175	1160	1135	1110	1092	2.20	115/230	60/50	Auto.	1400	910	8.60	4C831	299.99	179.75	170.7

Note: Do not operate PSC blowers above 0.4" SP on 50 Hz.
(†) Nos. 4C666, 4C667 have CSA listing No. 6319; Nos. 5C507, 4C448 has CSA listing No. 36496; all other models have CSA listing No. 34751.

TRANSFLOW BLOWE

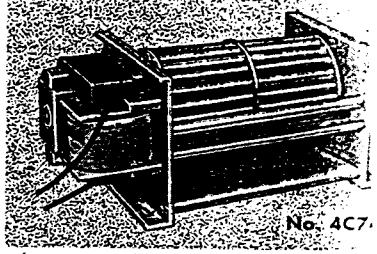
Transflow blowers disperse a wide, air pattern to ventilate, cool, or cabinets, office machines; elec- equipment, and wood burning and fireplaces.

mount in any position for quiet, effi- operation. Have 115V, 60 Hz; C- motors with extra large sleeve bear- (No. 4C848 has permanently lubricat- bearings.)

18 gauge insulated (125°C) leads. um ambient temperature 104°F. UL onent Recognized. CSA Certified. brand.

with Aluminum Housing. Extruded um construction. 4½" model has A insulation, all others have Class B ion; automatic thermal protection, ooling fan.

Dayton E19455 364



TRANSFLOW BLOW

Stock No.	A	B
		Overall Dimen
4C743	4 3/16	3 1/2
4C744	4 3/16	3 1/2
4C745	4 3/16	3 1/2
4C841	4 3/16	3 1/2
4C848	4 1/8	3 1/2

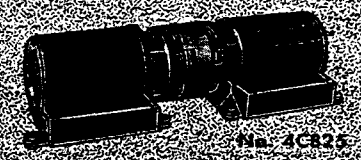
Replacement Parts Available™ 1-800-323-0620

TRANSFLOW BLOWERS WITH ALUMINUM HOUSING SPECIFICAT

0.0" SP	0.1" SP	CFM at RPM Shown 0.15" SP	0.2" SP	Cut-Off SP	Therm. Prot.	115V, 60 Hz Motor RPM	Free Air Watts
80	68	62	54	.25"	Imp.	3000	33
120	114	103	88	.33	Auto.	2450	56
160	140	124	103	.30	Auto.	3000	71
220	194	170*	142	.27	Auto.	2500	88
336	320	308	288	.56	Auto.	3000	150

Recognized Component (E47479, E37403, E61921) CSA certified (20432).

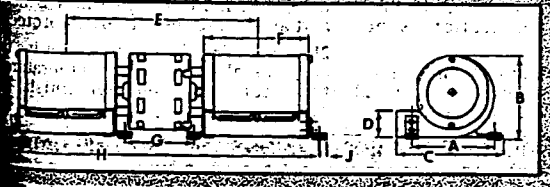
LOW PROFILE BLOWE



Dayton

36496

E47479 E37403 E61921



LOW PROFILE BLOWERS DIMENSIONS (in inches)

Wheel Dia.	Wheel W	Outlet H	Outlet W	Inlet Dia.	A	B	C	D	E	F	G	H	J	Mounting Hole Dia.
					Dimensions									
2½	3¾	1 1/16	4 5/8	2 1/8	3 5/8	3 11/16	4 5/8	1 3/16	8 13/16	4 5/8	3 3/8	14 1/2	5/16	1/4
4	1 5/8	4 5/8	2 9/16	3 5/8	4 5/8	4 5/8	1 3/4	8 15/16	4 3/4	3 3/8	14 3/4	5/16	1/4	

DAYTON LOW PROFILE BLOWERS SPECIFICATIONS AND

Blower Performance–CFM @ SP Shown 0.2" SP	0.3" SP	0.4" SP	0.5" SP	Cut-Off SP	Motor Data Volts	Hz	Therm. Prot.	RPM
97	75	—	—	0.38	115	60	Auto	3200
172	140	112	68	0.61	115	60	Auto	2700

Little Giant
PUMP COMPANY
SUBSIDIARY
TECUMSEH PRODUCTS COMPANY

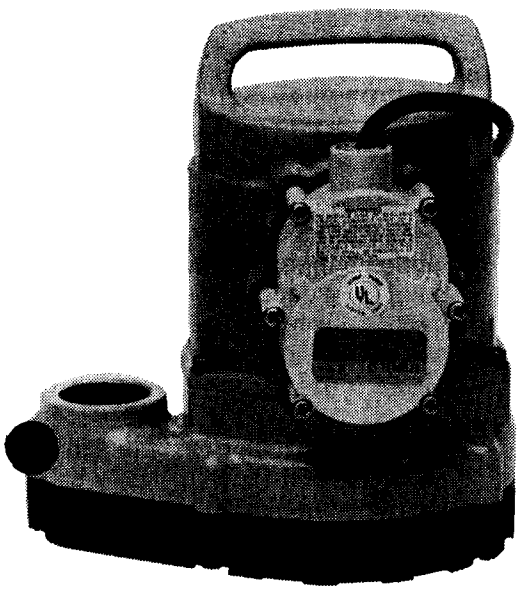
LITTLE GIANT® SUBMERSIBLE SEWAGE EJECTOR PUMPS AND EFFLUENT PUMPS

OWNERS MANUAL

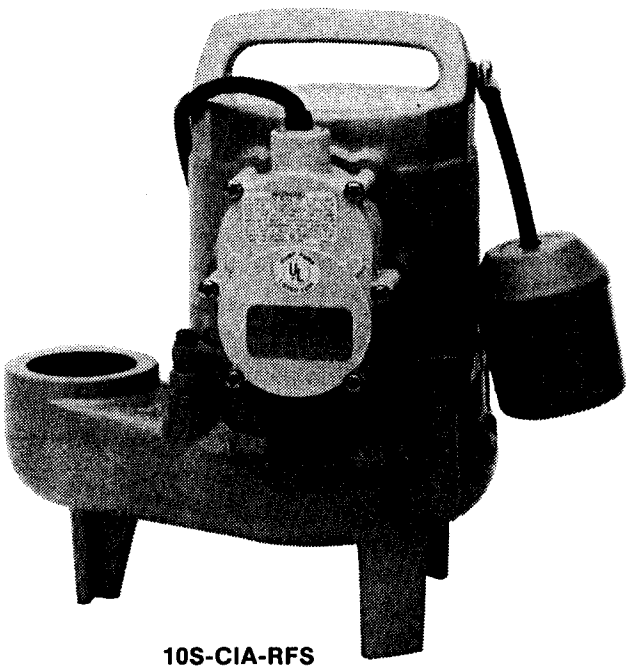
FOR

10E-CIM 10E-CIA-RFS
10S-CIM 10S-CIA-RFS

— CAUTION —
READ SAFETY GUIDELINES AND INSTRUCTIONS CAREFULLY



10E-CIM



10S-CIA-RFS

- SPECIFICATIONS
- SAFETY
- INSTALLATION
- OPERATION
- REPAIR

World's Largest Manufacturer of Centrifugal Pumps

SPECIFICATIONS

DESCRIPTION

Little Giant Submersible 10S Series Sewage Ejector Pumps and 10E Series Effluent Pumps are recommended for use in basins or lift stations and suitable for pumping sewage, effluent, wastewater and other non-explosive, non-corrosive liquids. The 10S Series Sewage Ejector Pumps have 2" spherical solids handling capability. The 10E Series Effluent Pumps have 3/4" spherical solids handling capability.

Automatic operation can be achieved with the use of the RFS Remote Float Switch. Other accessories such as basins, check valves and covers are also available.

UNPACKING

Little Giant pumps are carefully packaged, inspected and tested to insure safe operation and delivery. When you receive your pump, examine it carefully to determine that there are no broken or damaged parts that may have occurred during shipment. If damage has occurred, make notation and notify the firm from which you purchased the pump and they will assist you in replacement or repair, if required.

DISCHARGE: 10E Series —1½" NPT Vertical
10S Series —2" NPT Vertical

INTAKE: 10E Series —¾" Screened Opening
10S Series —2" Diameter Opening

HOUSING: Cast Iron

VOLUTE: Cast Iron

SCREEN: 10E Series —ABS

IMPELLER: Vortex design nylon, with pressure relief vanes

MOTOR: Split phase induction, 1750 RPM, with automatic reset thermal overload protection

HARDWARE: 300 series stainless steel

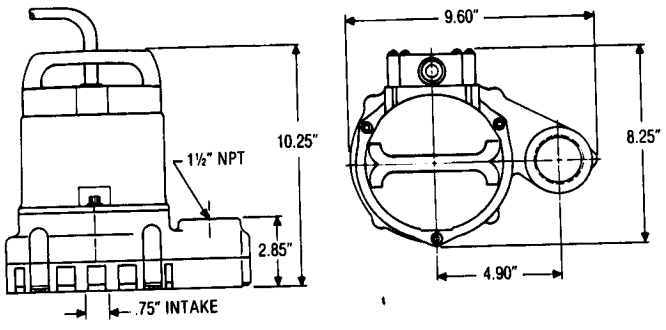
BEARING: Double shielded ball

SHAFT SEAL: Mechanical, spring loaded, stationary carbon with Nitrile boot and rotating ceramic seat

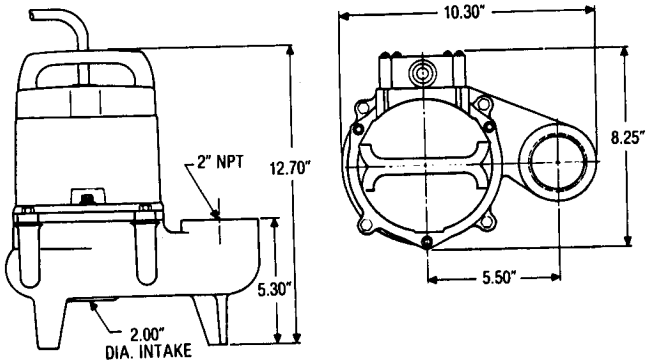
POWER CORD: 16 awg 3-conductor copper stranded

COOLING: The motor housing contains a cooling oil to provide cooling for the motor and to lubricate bearings and seals. These pumps are capable of operating with the motor housing partially exposed for extended periods of time, providing sufficient motor cooling and bearing lubrication. However, for the best cooling and longest motor life, the liquid level being pumped should normally be above the top of the cast iron motor housing.

10E SERIES



10S SERIES



MODEL NO.	LISTING	HP	VOLTS	SOLIDS SIZE (Dia. In.)	AMPS/ WATTS	GPM @ HEAD				SHUT OFF	P.S.I.	PWR CRD (Ft.)	WT (Lbs.)	DIMENSIONS (HxLxW in In.)
						5'	10'	15'	20'					
10E-CIM	UL/CSA	1/2	115	3/4	10/900	80	67	52	33	26'	11.2	15	36	10.4x9.6x8.25
10E-CIM	UL/CSA	1/2	208-240	3/4	6.5/900	80	67	52	33	26'	11.2	15	36	10.4x9.6x8.25
10E-CIA-RFS	UL/CSA	1/2	115	3/4	10/900	80	67	52	33	26'	11.2	15	37	10.4x9.6x8.25
10S-CIM	UL/CSA	1/2	115	2	12/1000	110	85	45	—	20'	8.7	15	43	12.75x10.3x8.25
10S-CIM	UL/CSA	1/2	208-240	2	6.6/1100	110	85	45	—	20'	8.7	15	43	12.75x10.3x8.25
10S-CIA-RFS	UL/CSA	1/2	115	2	12/1000	110	85	45	—	20'	8.7	15	44	12.75x10.3x8.25

115V Models are 60 Hz 208-240 Models are 50/60 Hz.

SAFETY

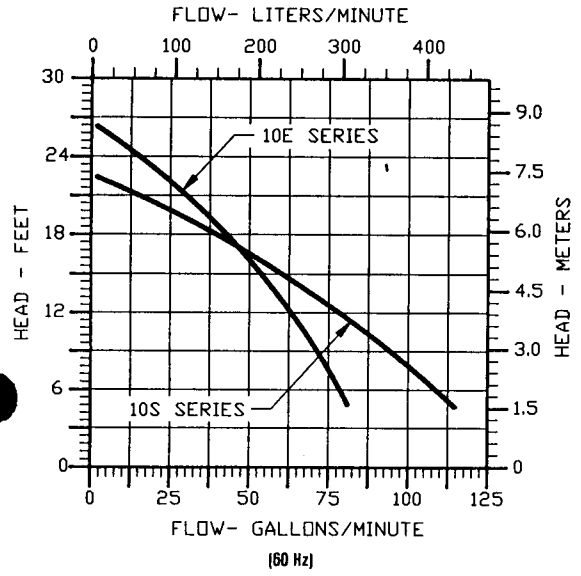
WARNING — Risk of electric shock. This pump is supplied with a grounding conductor and/or grounding type attachment plug. To reduce the risk of electric shock, be certain that it is connected to a properly grounded grounding type receptacle.

Your pump is equipped with a 3-prong electrical plug. The third prong is to ground the pump to prevent possible electrical shock hazard. Do not remove the third prong from the plug. A separate branch circuit is recommended. Do not use an extension cord.

When a pump is in a basin, etc. do not touch motor, pipes or water until unit is unplugged or shut off. If your installation has water or moisture present, do not touch wet area until all power has been turned off. If shut-off box is not accessible, call the electric company to shut off service to the house, or call your local fire department for instructions. Failure to follow this warning can result in fatal electrical shock.

The flexible PVC jacketed cord assembly mounted to the pump must not be modified in any way, with the exception of shortening the cord to fit into a control panel. Any splice between the pump and the control panel must be made within a junction box and mounted outside of the basin, and comply with the National Electrical Code. Do not use the power cord for lifting the pump.

The pump motor is equipped with an automatic resetting thermal protector and may restart unexpectedly. Protector tripping is an indication of motor overloading as a result of operating the pump at low heads (low discharge restriction), excessively high or low voltage, inadequate wiring, incorrect motor connections, or a defective motor or pump.



SAFETY GUIDELINES

1. Read all instructions and safety guidelines thoroughly. Failure to follow the guidelines and the instructions could result in serious bodily injury and/or property damage.
2. DO NOT USE TO PUMP FLAMMABLE OR EXPLOSIVE FLUIDS SUCH AS GASOLINE, FUEL OIL, KEROSENE, ETC. DO NOT USE IN EXPLOSIVE ATMOSPHERES OR HAZARDOUS LOCATIONS AS CLASSIFIED BY NEC, ANSI/NFPA70. FAILURE TO FOLLOW THIS WARNING CAN RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE.
3. During normal operation the pump is immersed in water. Also, during rain storms, water may be present in the surrounding area of the pump. Caution must be used to prevent bodily injury when working near the pump:
   a. The plug must be removed from the receptacle prior to touching, servicing or repairing the pump.
   b. To minimize possible fatal electrical shock hazard, extreme care should be used when changing fuses. Do not stand in water while changing fuses or insert your finger into the fuse socket.
4. Do not run the pump in a dry basin. If the pump is run in a dry basin, the surface temperature of the pump will rise to a high level. This high level could cause skin burns if the pump is touched and will cause serious damage to your pump.
5. Do not oil the motor. The pump housing is sealed. A high grade dielectric oil devoid of water has been put into the motor housing at the factory. Use of other oil could cause serious electric shock and/or permanent damage to the pump.
6. This pump's motor housing is filled with a dielectric lubricant at the factory for optimum motor heat transfer and lifetime lubrication of the bearings. Use of any other lubricant could cause damage and void the warranty. This lubricant is non-toxic; however, if it escapes the motor housing, it should be removed from the surface quickly by placing newspapers or other absorbent material on the water surface to soak it up, so aquatic life is undisturbed.
7. In any installation where property damage and/or personal injury might result from an inoperative or leaking pump due to power outages, discharge line blockage, or any other reason, a backup system(s) and/or alarm should be used.

INSTALLATION

Pump must be installed in a suitable gas tight basin which is at least 18" in diameter and 30" deep, and vented in accordance with local plumbing codes.

[redacted]Series Sewage Pumps feature a 2" female NPT discharge.

10E Series Effluent Pumps feature a 1½" female NPT discharge.

Pump can be installed with ABS, PVC, polyethylene or galvanized steel pipe. Proper adapters are required to connect plastic pipe to pump.

Pump must be placed on a hard level surface. Never place pump directly on clay, earth or gravel surfaces.

A check valve must be used in the discharge line to prevent back flow of liquid into the basin. The check valve should be a free flow valve that will easily pass solids.

CAUTION: For best performance of check valves, when handling solids install in a horizontal position or at an angle of no more than 45° . Do not install check valve in a vertical position as solids may settle in valve and prevent opening on start-up.

When a check valve is used drill a 3/16" hole in the d[redacted]arge pipe approximately 1" to 2" above the pump discharge connection and below check valve to prevent air locking of the pump.

WIRING

Check local electrical and building codes before installation. The installation must be in accordance with their regulations as well as the most recent National Electrical Code (NEC).

To conform to the National Electrical Code all pumps must be wired with 14 AWG or larger wire. For runs to 250 feet 14 AWG wire is sufficient. For longer runs consult a qualified electrician or the factory.

Pump should be connected or wired to its own circuit with no other outlets or equipment in the circuit line. Fuses and circuit breaker should be of ample capacity in the electrical circuit. See chart below.

H.P.	VOLTAGE	FUSE OR CIRCUIT BREAKER AMPS
[redacted] 1/2	115	20
1/2	230	15

REMOTE FLOAT SWITCH LEVEL CONTROL

The RFS series pumps are equipped with a remote float switch level control. This level control is sealed in a polypropylene float cylinder. For automatic operation, the pump must be plugged or wired into a remote float switch. Pump will run continuously if plugged directly into an electrical outlet.

When the level rises in the basin, the cylinder floats up with the level. When the cylinder position is at an angle of about 45 degrees the switch activates and starts the pump motor.

As the level draws down, the cylinder floats down and when it is again at an angle of about 45 degrees, the switch deactivates, and the pump motor stops.

NOTE: BE CERTAIN PUMP IS SECURE IN BASIN AND CYLINDER FLOATS UNOBSTRUCTED WITHOUT TOUCHING THE BASIN WALLS OR PLUMBING.

REMOTE FLOAT SWITCH INSTALLATION

1. The float switch consists of three parts:
   a) switch;
   b) cord clamp;
   c) clamp screw.

   NOTE: If screw is lost, use a #10-16 X 1/2" long tapping screw.

2. Attach cord clamp to pump cover as shown in FIGURE 1. The clamp must be positioned as shown to allow free operation of float. Be sure to locate pump and switch power cords away from switch float.

3. A 3" tether length is recommended. When a tether length of 3" is used, a minimum basin diameter of 18" is recommended. The tether length is measured as shown in illustration at right.

4. After desired tether length is established hand tighten clamp screw.

5. TESTING: Without water in basin plug pump power cord into switch in-line-plug. Plug switch into outlet. Lift float and watch for pump to operate. Do not run pump for more than 5 seconds.

TYPICAL INSTALLATION

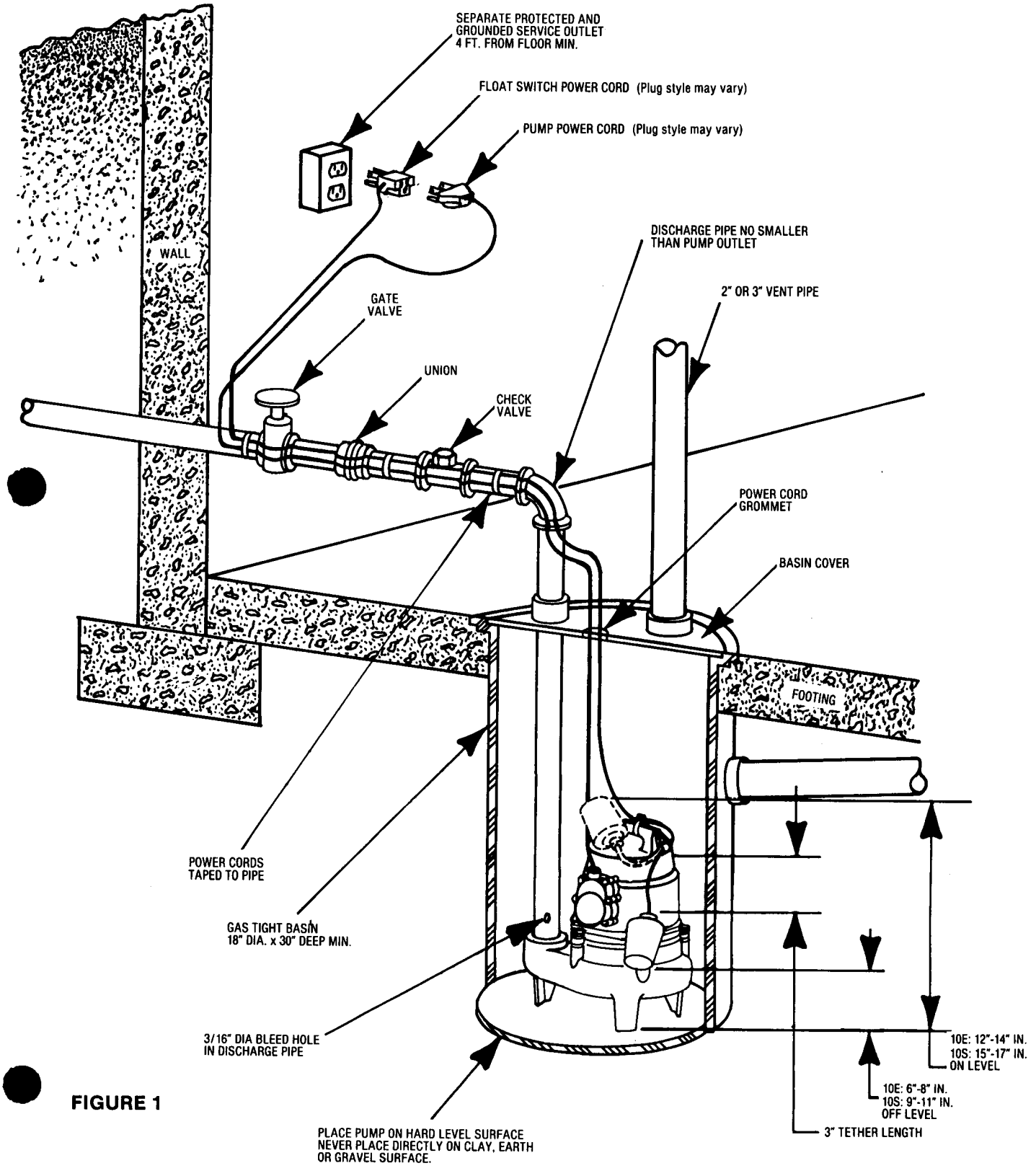


FIGURE 1

OPERATION

TESTING PUMP OPERATION

RFS SERIES SEWAGE EJECTOR PUMPS

1. These pumps are equipped with a remote float switch.
2. These pumps are installed in a basin with a sealed cover, so switch operation cannot be observed. The sump cover usually will have a spare hole that is plugged with a rubber plug. This plug can be removed and switch operation can be observed.
3. Plug power cord and remote float switch power cord into a grounded receptacle with voltage consistent with pump voltage as indicated on pump nameplate.
4. Run water into basin until pump starts.
5. Be sure gate valve in discharge line is open.
6. Allow pump to operate through several on-off cycles.

MANUAL SEWAGE EJECTOR PUMPS

The pump cord for these pumps can be plugged directly into a properly grounded receptacle with voltage consistent with pump nameplate for continuous pump operation.

CAUTION: This type of operation should be used only for emergency use or when a large volume of water is to be pumped. Pump must not be allowed to run dry. If pump is run dry, it may damage pump and void the warranty.

MAINTENANCE AND SERVICE

If pump does not operate properly, consult the Trouble Shooting Chart. If trouble can not be located with these steps shown, consult your pump dealer or take pump to a Little Giant authorized service center.

CAUTION: When working on pump or switch, always unplug pump power cord in addition to removing fuse or shutting off circuit breaker before working on pump.

CLEANING IMPELLER AND VOLUTE

1. Remove screws that hold volute to motor housing.
2. Remove volute and clean impeller and volute passage. Do not use strong solvents on impeller.
3. Be sure impeller turns freely after cleaning.
4. WARNING: DO NOT REMOVE IMPELLER. REMOVAL OF IMPELLER REQUIRES SPECIAL TOOLS AND IS TO BE DONE ONLY BY AN AUTHORIZED SERVICE CENTER.

   DO NOT REMOVE MOTOR HOUSING COVER. WARRANTY IS VOID IF MOTOR HOUSING COVER, IMPELLER OR SEALS HAVE BEEN REMOVED.

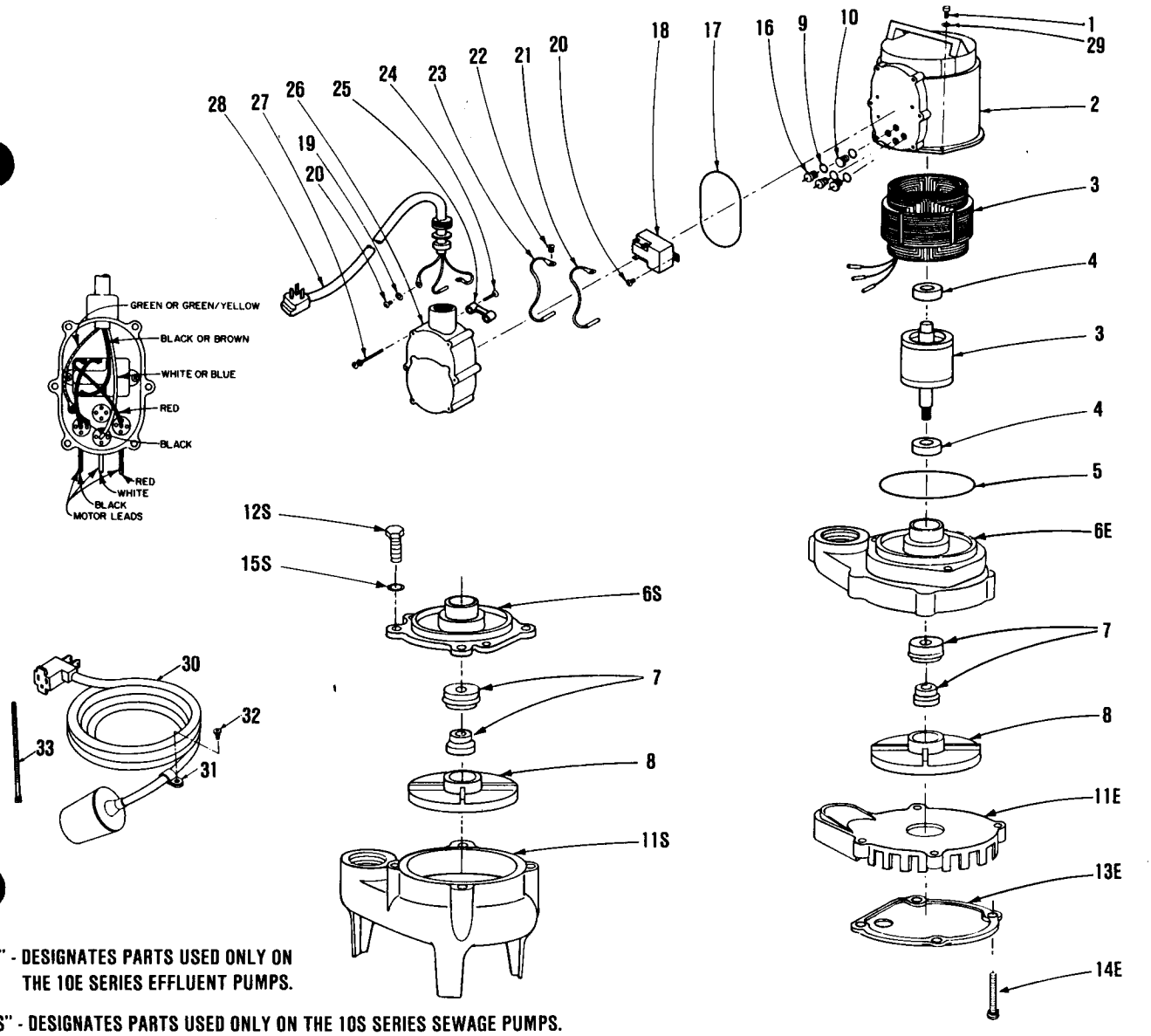
   ANY REPAIR ON MOTOR MUST BE DONE BY AN AUTHORIZED LITTLE GIANT SERVICE CENTER.

TROUBLE SHOOTING INFORMATION

PROBLEM	PROBABLE CAUSES	CORRECTIVE ACTION
Pump does not turn on Note Before trouble shooting automatic control check to see that pump operates on manual control To do this, unplug from in-line float switch plug Plug pump power cord into wall outlet If pump works, proceed to check switch, if not, fault is in pump or power supply	Pump not plugged in	Plug in pump
	Circuit breaker shutoff or fuse removed	Turn on circuit breaker or replace fuse
	Accumulation of trash on mercury float switch	Clean float.
	Remote float switch obstruction	Check float path and provide clearance
	Defective switch	Disconnect switch, check w/ohmmeter. Open-infinitive resistance, closed-zero
	Defective motor	Have pump serviced
Pump will not shut off	Remote float switch obstruction	Check float path and provide clearance
	Pump is air locked	Shut power off for approximately 1 minute, then restart. Repeat several times to clear air from pump If system includes a check valve, a 3/16" hole should be drilled in discharge pipe approximately 2" above discharge connections.
	Liquid inflow matches pump capacity	Larger pump required.
	Defective switch	Disconnect switch, check w/ohmmeter, Open-infinitive resistance, closed-zero
	Loose connection in level control wiring	Check control wiring.
Pump runs but does not discharge liquid	Check valve installed backwards	Check flow indicating arrow on check w/ohmmeter, Open-infinitive resistance, closed-zero.
	Check valve stuck or plugged.	Remove check valve and inspect for proper operation.
	Lift too high for pump.	Check rating table.
	Inlet to impeller plugged.	Pull pump and clean.
	Pump is air locked.	(See corrective action above.)
Pump does not deliver rated capacity.	Lift too high for pump.	Check rated pump performance.
	Low voltage, speed too slow.	Check for proper supply voltage to make certain it corresponds to nameplate voltage.
	Impeller or discharge pipe is clogged.	Pull pump and clean. Check pipe for scale or corrosion.
	Impeller wear due to abrasives.	Replace worn impeller.
Pump cycles continually	No check valve in long discharge pipe allowing liquid to drain back into basin.	Install a check valve in discharge line.
	Check valve leaking.	Inspect check valve for correct operation.
	Basin too small for inflow	Install larger basin.

ITEM NO.	PART NO.	DESCRIPTION	QTY.	MODEL NO./CAT. NO.						
				10E-CIM 511200	10E-CIM 511275	10E-CIA-RFS 511300	10S-CIM 511400	10S-CIM 511475	10S-CIA-RFS 511500	10S-CIA-RFS 511510
1	903710	SCREW, CAP, 1/4-20 X 5/8	3	•	•	•	•	•	•	•
2	910014	HOUSING, MOTOR	1	•	•	•	•	•	•	•
3	979404 979401	STATOR ASSY/ ROTOR ASSY	1	•		•	•		•	•
3	979414 979401	STATOR ASSY/ ROTOR ASSY	1		•			•		
4	948004	BEARING, BALL	2	•	•	•	•	•	•	•
5	928001	SEAL RING, NITRILE	1	•	•	•	•	•	•	•
6E	111223	VOLUTE/PLATE	1	•	•	•				
6S	111423	PLATE	1				•	•	•	•
7	926034	SEAL, SHAFT	1	•	•	•	•	•	•	•
8	111252	IMPELLER	1	•	•	•	•	•	•	•
9	924006	O-RING, NITRILE	4	•	•	•	•	•	•	•
10	947003	PLUG, OIL	1	•	•	•	•	•	•	•
11E	109150	BASE, SCREEN	1	•	•	•				
11S	111415	VOLUTE	1				•	•	•	•
12S	915907	BOLT, HEX, 1/4-20 x 1	4				•	•	•	•
13E	109151	PLATE, BASE	1	•	•	•				
14E	909024	SCREW/WASHER, #10-24 x 1.46	5	•	•	•				
15S	921103	WASHER, LOCK, 1/4", SPLIT RING	4				•	•	•	•
16	950431	TERMINAL, FEED THROUGH	3	•	•	•	•	•	•	•
17	928019	SEAL RING, NITRILE	1	•	•	•	•	•	•	•

ITEM NO.	PART NO.	DESCRIPTION	QTY.	MODEL NO./CAT. NO.						
				10E-CIM 511200	10E-CIM 511275	10E-CIA-RFS 511300	10S-CIM 511400	10S-CIM 511475	10S-CIA-RFS 511500	10S-CIA-RFS 511510
18	950930	RELAY, 115V	1	•		•	•		•	•
18	950934	RELAY	1		•			•		
19	921028	WASHER, LOCK, #6	1	•	•	•	•	•	•	•
20	902307	SCREW, TAP, #6-32 x 1/4	3	•	•	•	•	•	•	•
21	951963	LEAD WIRE, BLK, 4 1/2"	1	•	•	•	•	•	•	•
22	901306	SCREW, #6-32 x 3/16"	3	•	•	•	•	•	•	•
23	951964	LEAD WIRE, RED, 4 1/2"	1	•	•	•	•	•	•	•
24	902409	SCREW, TAP, #8-18 X 3/4	2	•	•	•	•	•	•	•
25	112120	CLAMP, STRAIN RELIEF	1	•	•	•	•	•	•	•
26	110054	HOUSING, RELAY	1	•	•	•	•	•	•	•
27	909025	SCREW/WASHER, #10-24 x 1 3/4"	6	•	•	•	•	•	•	•
28	951541	POWER CORD, 115V	1	•		•	•		•	•
28	951536	POWER CORD	1		•			•		
29	921024	WASHER, LOCK, 1/4, INT. TOOTH	3	•	•	•	•	•	•	•
30	950315	REMOTE FLOAT SWITCH	1			•			•	•
31	927027	LOOP CLAMP	1			•			•	•
32	902514	SCREW, TAP, #10-16 X 1/2"	1			•			•	•
33	950904	TYRAP	1			•			•	•



"E" - DESIGNATES PARTS USED ONLY ON THE 10E SERIES EFFLUENT PUMPS.

"S" - DESIGNATES PARTS USED ONLY ON THE 10S SERIES SEWAGE PUMPS.

LITTLE GIANT PUMP COMPANY
LIMITED WARRANTY
SUMP, EFFLUENT & RESIDENTIAL SEWAGE

INTRODUCTION

Little Giant #8E, #9E, #10E, #14EH, and #16EH Series Submersible Effluent Pumps are recommended for use in sumps, basins or lift stations and suitable for pumping basement drainage water, effluent, wastewater and other non-explosive, non-corrosive, non-abrasive liquids not above 140° F with up to ¾ inch spherical solids handling ability. (NOT TO BE USED FOR SEWAGE WATER EXCEPT TO PUMP SEPTIC TANK EFFLUENT)

Little Giant #9S, #10S, #14S and #16S Series Submersible Sewage Ejector Pumps are recommended for use in sumps, basins or lift stations and suitable for pumping sewage, effluent, wastewater and other non-explosive, non-corrosive, non-abrasive liquids not above 140° F with up to 2"spherical solids handling ability.

Each of the above noted Little Giant products is guaranteed to be in perfect condition when it leaves our factory. During the time periods and subject to the conditions hereinafter set forth, LITTLE GIANT PUMP COMPANY, Subsidiary of TECUMSEH PRODUCTS COMPANY will repair or replace to the original user or consumer any portion of your new LITTLE GIANT product which proves defective due to materials or workmanship of LITTLE GIANT. Contact your nearest Authorized Little Giant Dealer for warranty service. At all times LITTLE GIANT shall have and possess the sole right and option to determine whether to repair or replace defective equipment, parts, or components. Damage due to lightning or conditions beyond the control of LITTLE GIANT is NOT COVERED BY THIS WARRANTY.

WARRANTY PERIOD

PUMPS: 12 months from date of installation or 18 months from date of manufacture, whichever occurs first.

LABOR, ETC. COSTS: LITTLE GIANT shall IN NO EVENT be responsible or liable for the cost of field labor or other charges incurred by any customer in removing and/or affixing any LITTLE GIANT product, part or component thereof.

THIS WARRANTY WILL NOT APPLY:

1) to defects or malfunctions resulting from failure to properly install, operate, or maintain the unit in accordance with printed instructions provided
2) to failures resulting from abuse, accident or negligence
3) to normal maintenance services and the parts used in connection with such service
4) to units which are not installed in accordance with applicable local codes, ordinances and good trade practices
5) unit is used for purposes other than for what it was designed and manufactured
6) if pump exposed to but not limited to the following: sand, gravel, cement, grease, plaster, mud, tar, hydrocarbons, or hydrocarbon derivatives (oil, gasoline, solvents, etc.) or other abrasive or corrosive substances.
7) if pump has been used for continuous pumping of suitable liquids above 140° F.
8) if power cord has been cut or spliced
9) if pump has been dismantled by customer. (Dealer only can dismantle pump for field service.)

RETURN OR REPLACED COMPONENTS: Any item to be replaced under the Warranty must be returned to LITTLE GIANT at Oklahoma City, OK or such other place as LITTLE GIANT may designate, freight prepaid.

PRODUCT IMPROVEMENTS: LITTLE GIANT reserves the right to change or improve its products or any portions thereof without being obligated to provide such a change or improvement for units sold and/or shipped prior to such change or improvement.

DISCLAIMER: Any oral statements about the product made by the seller, the manufacturer, the representatives or any other parties, do not constitute warranties, shall not be relied upon by the user, and are not part of the contract for sale. Seller's and manufacturer's only obligation, and buyer's only remedy, shall be the replacement and/or repair by the manufacturer of the product as described above. Neither seller nor the manufacturer shall be liable for any injury, loss or damage, direct, incidental or consequential (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss), arising out of the use or the inability to use the product, and the user agrees that no other remedy shall be available to it. Before using, the user shall determine the suitability of the product for his intended use, and user assumes all risk and liability whatsoever in connection therewith. **The warranty and remedy described** in this limited warranty **is an EXCLUSIVE warranty** and remedy and is **IN LIEU OF** any other warranty or remedy, expressed or implied, which other warranties and remedies are hereby expressly **EXCLUDED**, including but not limited to any implied warranty of **MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE**. Some states do not allow the exclusive or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

In the absence of other suitable proof of the installation date, the effective date of this warranty will be based upon the date of manufacture plus one year. Direct All Notices, etc. To: Service Department, LITTLE GIANT PUMP COMPANY, 3810 N. Tulsa, Oklahoma City, OK 73112.

DETERMINATION OF UNIT DATE OF MANUFACTURE: (9-87) month and year stamped on pump and/or serial number on pump nameplate coded to indicate year of manufacture.

KEEP THIS FOLDER

File this for safe keeping. It may be valuable to you for service under the terms of the warranty.

Date of Purchase _____ Name of Dealer _____

Serial # _____ Product # _____ Model # _____

LITTLE GIANT PUMP COMPANY
3810 North Tulsa Street
Oklahoma City, OK 73112
(405) 947-2511

Form #993630–9/95

COMPOST TEMPERATURE CHART

Start Date: ____________ **Completion Date:** ____________ **Compost Bin #** ________

Date:________ Time:________ Temp:________ Date:________ Time:________ Temp:________

Date:________ Time:________ Temp:________ Date:________ Time:________ Temp:________

Date:________ Time:________ Temp:________ Date:________ Time:________ Temp:________

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Date:________ Time:________ Temp:________ Date:________ Time:________ Temp:________

Date:________ Time:________ Temp:________ Date:________ Time:________ Temp:________

SIGNATURE:______________________

April 9, 1998

DATE: ________ **TIME:** ________

HALIFAX COUNTY
ZONING ADMINISTRATION
PO BOX 69 HALIFAX, NC 27839
PH 919 583-1082
PLANNING BOARD FAX 919 583-2735 BOARD OF ADJUSTMENT

To: Whom It May Concern

From: Keith Dobbins, Zoning Administrator

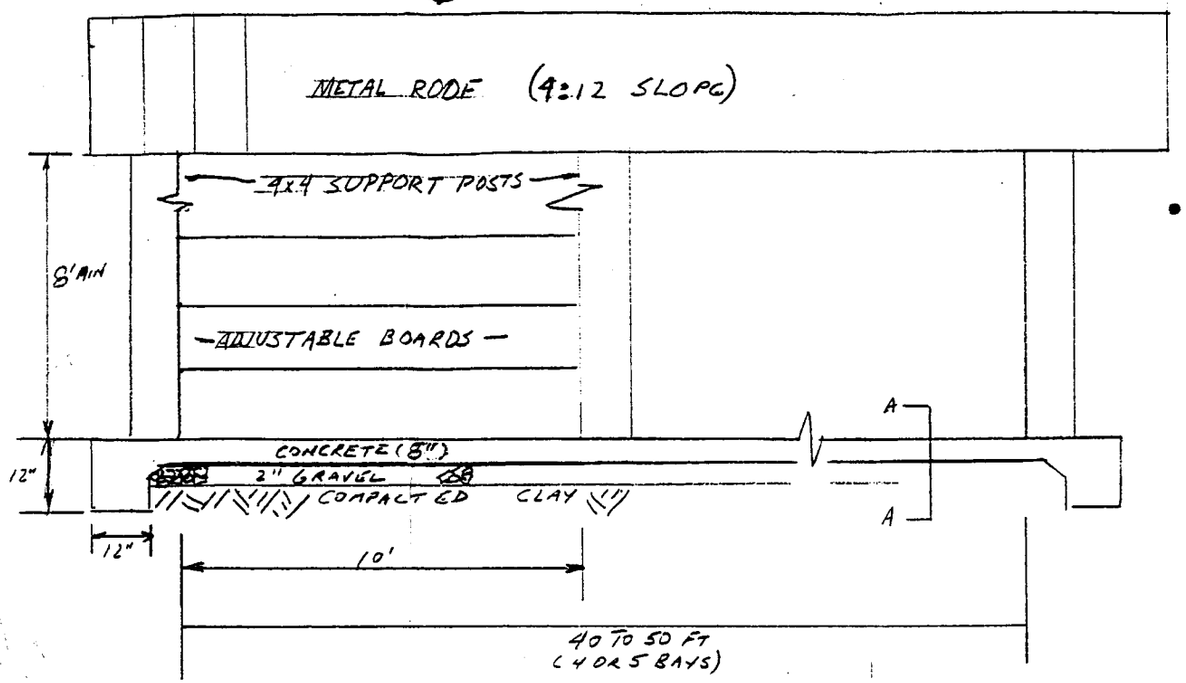
Date: February 25, 1998

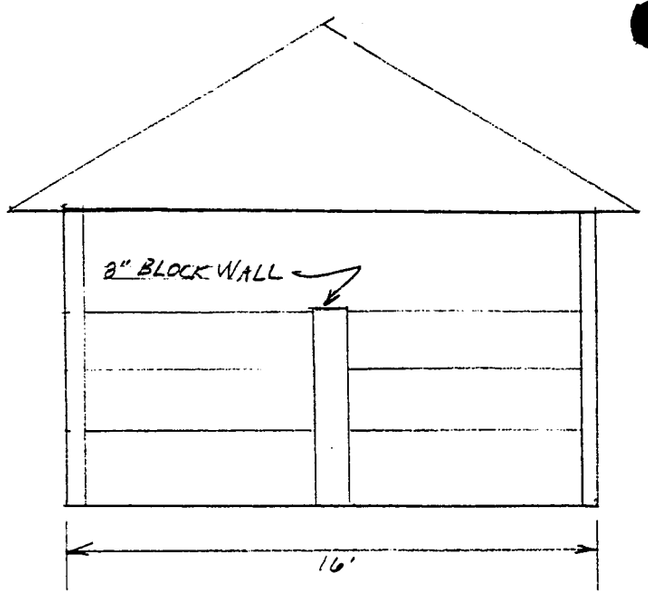
RE: Caledonia Compost Facility

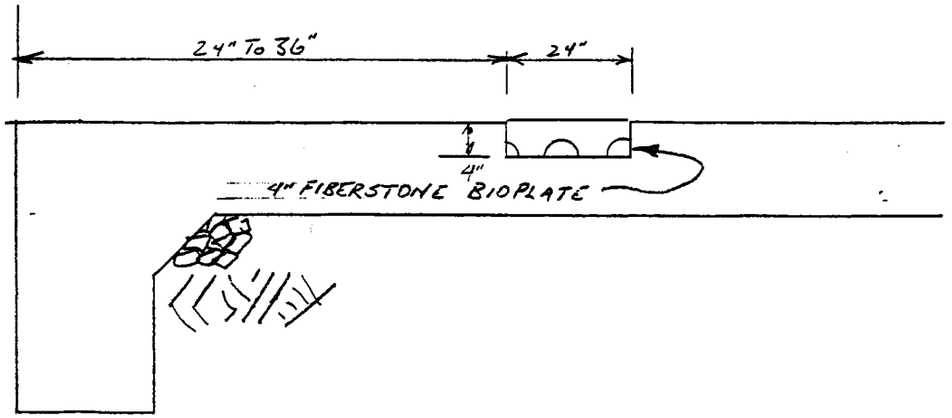
The compost facility that the North Carolina State Caledonia Prison is installing is exempt from county zoning regulations as per North Carolina General Statute 153A-347.

The location of the compost facility is located on FEMA map number 370327 0120B, Zone B, map effective date: May 5, 1981. This places the facility within the 500 year floodplain but not within the 100 year floodplain.

The facilty is located in Halifax County North Carolina, Tax Map 79, Parcel 1.







COMPOST "BIN" - D.O.C.

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WASTE MANAGEMENT
P.O. BOX 29603 RALEIGH, N.C. 27611

Caledonia Correctional Institution

is hereby issued a permit to operate a

Small Type III Compost Facility

on Caledonia Correctional Institution Property(NCDOC)

PERMIT NUMBER SW-42-06

in accordance with Article 9, Chapter 130A, of the General Statutes of North Carolina and all rules promulgated thereunder and subject to the conditions set forth in this permit.

Dexter R. Matthews, Chief
Solid Waste Section

5-15-98
Date

Permit Conditions

2. Facility operation shall not begin prior to an inspection by the Division. All parts of the facility shall be in place and in proper working order.
3. All measures in the approved permit application to control erosion and runoff from the facility shall be maintained in working order.
4. This facility shall be operated in accordance with Rule .1406 of the Solid Waste Compost Rules and the permit application.
5. All compost produced at the facility shall meet the requirements of Rule .1407 of the Solid Waste Compost Rules and the permit application.
6. Testing and reporting shall be conducted in accordance with the requirements of Rule .1408 and the permit application. An annual report of facility activities for the fiscal year July 1 to June 30 shall be submitted to the Division by August 1 of each year.
7. Operation and maintenance of this facility shall be in accordance with the Municipal Solid Waste Compost rules and the Operation and Maintenance Manual submitted with the permit application.
8. **Compost shall not be distributed prior to approval by the Division of Waste Management in accordance with .1407(6)(b) of the Municipal Solid Waste Compost Facility Rules.**
9. Groundwater monitoring wells may be required if there is indication of the potential for groundwater contamination.
10. Leachate from the facility may not be land applied prior to testing for nutrients to determine the appropriate applicaton rate and receiving approval from the Division.
11. This permit will expire on May 15, 2003. Changes in ownership, increase in facility capacity, or composting materials not addressed in the application shall require a permit modification.

Application Requirements For Solid Waste Compost Facilities

.1405(A)

Caledonia Correctional Institution is requesting a permit to construct and operate a type three solid waste compost facility.

1. An aerial photograph which is one inch is equal to 400 feet. See attached.

   (a) All properties surrounding the proposed compost site are owned by the State of North Carolina, NC Department of Correction.

   (b) There are no buildings public or private, utilities, public roads, or water courses or within three hundred feet of our proposed facility. A dry run is located approximately 150 feet behind the compost bins.

   (c) No zoning requirement. (See letter attached)

2. A letter from Keith Dobbins (Zoning Officer) is attached stating that state property is not subject to any zoning laws within Halifax County. A letter from Mr. Dobbins is attached. Therefore, no zoning permit is required.

3. An explanation of how the site complies with sitting and designed standards in rule .1404 of this section.

.1404(A)

1. The location of Caledonia's compost facility is not within the one hundred year floodplain, see attached letter.

2. The nearest property line is in excess of 2500 feet from the compost facility.

3. The nearest residence is at least 500 feet from the compost facility.

4. The closest well is 4,000 feet away.

5. There are no perineal streams/rivers within at least 300 feet of the facility. The Roanoke River is 7200 foot away.

6. The Roanoke River is a Class C stream at this point and there are no restrictions on uses within its watershed.

7. Our compost facility is not located in a closed out disposal area.

8. Our facilities position exceeds the minimum distance that is required between compost areas and swales or berms that will allow for fire fighting equipment. The distance around our facility is at least 400 feet to any building.

9. A site shall meet the following surface water requirement:
Our facility is an invessel system that is under roof and which collects all leachate from the compost bins in a _____ gallon tank located at the west end of the compost bins. The leachate will be added to the compost as a moisture source or if necessary sprayed on the adjacent fescue fields. Areas for spray irrigation have been approved by the Division of Waste Management staff. The area around the facility, including the areas for curing and storage is gently sloping, bermed where appropriate and is in fescue to control erosion and filter any runoff from the facility. Any feedstock spills will be immediately cleaned and placed in the compost bins. As a result:

   (a) The site shall not cause a discharge of materials into waters or wetlands of the state.

   (b) The site will not cause a discharge of pollutants into waters of the state.

   (c) The site will not cause non-point source pollution of waters of the state.

10. A site shall meet the following ground water requirements:

   (a) Our facility is a invessel system which will collect and re-cycle all leachate and should not, therefore, not contravening ground water standards.

   (b) Soil texture at the site was evaluated by the Division of Waste Management and found to have a texture finer than loamy sand and the depth to seasonal wetness is in excess of 24 inches.

   (c) Our facility will be a small type three facility.

   (d) Curing may take place and finished product will be stored adjacent to the facility. The soil conditions are as described in #2 above. All stored material will pass the paint filter test.

   (e) Our compost facility sets on a minimum of six inch foundation of cement. No natural soils or liners are used for active composting.

.1404(B) Alternative minimum buffers are not required by the Division of Waste Management.

.1404(C) **A SITE SHALL MEET THE FOLLOWING DESIGN REQUIREMENTS:**

1. Our compost facility is in a location where there is controlled public access due to security measures for Caledonia Correctional Institution.

2. Less than one acre will be disturbed in the construction of this facility and the area down slope will be grassed or bermed to control and filter run-off. Our facility is an invessel system which collects all leachate from compost and recycled to meet the needs of the composting.

3. Our facility being an aerated invessel system should minimize odors. Proper feed stock blending and aeration will also minimize odors. If necessary to control odors the aeration can be reversed and a biofilter installed to control odors.

4. Our compost site is in the middle of a 7500 acre farm therefore minimizing odors to any adjacent property owners.

.1405 #4 **A DETAILED REPORT INDICATING THE FOLLOWING:**

(a) Caledonia's compost facility will utilize medium size wood chips or saw dust as its primary bulking agent. The following other solid wastes may also be composted at the facility:

Dining hall food waste and associated paper waste such as napkins and milk cartons.
Kitchen waste
Food processing waste from the cannery
Shredded paper
Socks and other 100% cotton clothing
Poultry mortality
Manure
Greenhouse wastes
Cotton gin trash

The estimated quantity of the solid waste should be less than 100 cubic yds per month. Similar wastes may be received from other nearby Correctional facilities.

(b) Caledonia's composting facility is set on a minimum of 6" thick concrete pad. Curing and any storage will be in an area of

soils wwith textures finer than sandy loam and a depth to seasonal wetness in excess of 24 inches..

.1405 #5 Site Plan Attached

.1405 #6 **A DESCRIPTION OF THE OPERATION OF THE FACILITY WHICH MUST INCLUDE AT A MINIMUM:**

(A) William B. Carroll, Jr. Program Director I, PO Box 137, Tillery, NC 27887, area code (919)826-5621.

(B) Two to four honor grade inmates will be responsible for operation of the facility. One Enterprise Gate Officer will supervise the inmates.

(C) This facility will operate seven days per week. The honor grades would work approximately 7:30-4:30 each day.

Dining hall and kitchen waste will be transported to the facility every morning. Other wastes will be added to the bins at various times during the day. Wastes will be screened for foreign matter as added to the bins. Putrescible wastes will be added to the bins the same day they are delivered to the facility. Wastes with any free water will be added directly to the bins. Temperatures will bemonitored daily and recorded.

Wastes will be layered into the bins and covered with bulking material.

Finished product will be moved to the adjacent curing and storage area with a loader as the bins are needed for the next batch of waste. The product will be used at the correctional institution.

More detail is provided in the operation and maintenance portion of the application.

Compost will be tested at least every 6 months for pathogens, regulated metals, and foreign matter.

.1405- 6 (D) Heavy Winds - Heavy winds would not hinder our operation due to our solid waste being in bins and not on open ground.
Heavy Rain - Heavy rains would not hinder our composting ability

due to (1) our facility being bins built on a pad, (2) all weather access to the area of the bins and (3) the bins are covered by a roof which will prevent excess water from entering the bins. Snow and freezing weather should not be a factor. Food waste will be stored near the kitchens during periods of heavy snow until they can be transported to the bins. No cured compost would be moved during snowy conditions.

(E) Odors will be controlled through maintaining proper C:N ratios in the bins and odors and vectors will also be controlled by covering layers of putrescible wastes with layers of bulking material. A moisture source is available at the facility to control moisture which will control dust. Our composting facility sets in the middle of a 7500 acre farm therefore minimizing noise and air borne particles and odors to any surrounding neighbors. Noise will not significantly increase over that normally encountered with the operation of a 7500 acre farm.

.1405-6 (F) There are several choices from which Caledonia can utilize its cured composting material. They are as follows:

Using in conjunction with potting soil for day lilies.

Used as a fertilizer and potting media in conjunction with Caledonia's greenhouses.

A supplement fertilizer for all crops or a soil amendment for eroded crop land.

In case our finished product could not be utilized by Caledonia other state agencies could utilize it as a type of potting soil or fertilizer.

.1405 #7 (A) Design capacity of the facility; less than 1,000 cubic yards a quarter.

(B) See attached

(C) Wastes will be placed in the bins in layers. Wastes will be added to the bins by pouring from plastic barrels or from a loader bucket. Layers will be 4 to 12 inches thick depending on the waste. Rakes and shovels will be used to level the layers of waste as they are

added. Shreading will not be necessary of the feedstocks to be used. Bulking material will be ground prior to receipt at the faciliity.

(D) 45 to 120 days depending on the curing requirements of the particular user at the institution.

(E) The temperature shall be monitored and taken at least once a day. Temperature readings will be taken at various depths and locations(sides and middle) in each bin with a 3 or 4 foot compost thermometer. Moisture readings will be taken as dictated by low temperature readings. A shovel will be used to dig into the bins and moisture sampled using the hand method.

A grab sample of the product will be taken at least every 6 months and sampled for fecal coliform.

A sample will be taken from each bin as it is removed and composited, kept refrigerated and sent to the NCDA lab at least every 6 months.

(F) Temperature readings will assure that the temperatures are maintained at least 131 degrees for 3 consecutive days to meet PFRP requirements and at least 113 degrees for 14 days to meet vector attraction reduction requirements. Finished product will be sampled at least every 6 months to be sure pathogens are reduced.

(G) Each compost bin is equipped with a air control system consisting of a fan, 4 inch PVC air lines, and bioplates in the bottom of the bins to distribute air evenly. Timers will be used to control when the fans will run. Run times will vary depending on the stage of the composting material. Fans will becapable of delivering at least _____ cubic feet of air per second.

(H) Our facility sits on top of a hill and as a result water run-on will not be a problem. Runoff will be controlled and filtered with grass buffers or berms down slope of the facility. A _____ gallon leachate tank is present and will collect all leachate drainage from our facility. The pad the bins sit on is sloped toward the middle of the bins and from one end to the other (east to west) to facilitate leachate collection and prevent any leachate from draining out of the bins onto the ground surface. Leachate will be managed by using it as a moisture source for the compost or if necessary it can be sprayed on adjacent fescue hay field.

#8 If packaged our product will be labeled with all necessary information on it or an 8 x 11 handout will be given if sold in bulk. Labels or handouts will indicate classification grade, recommended uses, application rates, and any restrictions on usage. NCDA test results will be made available to other parts of the prison facility that may use the compost.

#9 A copy of the manufactures performance data for the fans is attached.

A copy of the plans for the bins are attached.

A _____ gallon pump chamber will be used for leachate collection. The tank will be a design approved by the NC Division of Environmental Health.

.1405(10) See attached operation and maintenance manual

.1405(11) Drawings attached

Operation and Maintenance Manual for the Caledonia Corrrectional Facility Compost Operation

Food waste from the Caledonia Prison unit is transported daily to the compost facility from the dining hall. Any food waste from other nearby prison units is delivered at a scheduled time so that the appropriate inmates will be available to unload the waste. Food waste is delivered in barrels. Other wastes are delivered at various times of the day and are put in the waste storage area on the north side of the compost bins.

A ____ inch layer of bulking material will be placed in the bottom of each bin prior to adding any wastes. Inmates will layer these materials into the bins as the food waste is added. Rakes and shovels will be used to level the material that is added to the bins. Moisture, in the form of water or leachate, will be added to the bins with the wastes as necessary to attain a moisture level of 55 to 60 percent. This will be determined by _____. Separate hoses will be available to spray the water or leachate into the bins. Putrescible wastes must be added to the bins the same day as delivered to the facility.

Wastes will be placed in layers in the bins 4 to 12 inches thick. The thickness of the layers will be determined based on the moisture content, nitrogen content, and particle size of the wastes. Bulking material will be added on top of each layer of waste. The thickness of the bulking material layers will depend on the feedstock characteristics. As wastes and bulking materials are added boards are placed in the opening of the bin to prevent wastes from falling out of the bins.

Incoming waste is checked for non compostable materials as the wastes are added to the bins. Non compostable wastes are placed in a trash can at the bins and later disposed of with other solid waste at the prison unit. Any wastes found at the facility that are not approved for composting will be removed and disposed of properly and the occurrence reported to the Prison Administrator.

Fans are set initially to operate _____ minutes per hour(or something) as the bins are filled. Fan speeds are increased as necessary to assure the oxygen content in the bins does not get to low, if the temperatures in the bins rise above ____degrees, or if the compost becomes to wet(wet is determined using the hand method- if water can be squeezed out of the compost it is too wet).
Fan speeds are reduced when_____.

Temperature readings are taken daily from at least three different locations in each bin at least two different depths. Temperatures must remain above 131 degrees for at least 3 days to meet pathogen reduction requirements. Temperatures must remain above 113 degrees for 14 days to meet vector attraction reduction requirements. Bin temperatures are recorded as they are taken in a log book. The book should indicate the date and bin number of each reading. If only one number is recorded for each bin it will be the lowest temperature recorded for that bin.

The temperature log and thermometer will be kept at the bins. A copy of the permit and permit application will be maintained at the Administration Office of the Prison Unit.

If temperatures are not maintained in a bin the contents of the bin must be examined to determine why the wastes are not composting. Moisture can be determined using the hand method. If water can be squeezed out of the compost it is too wet and aeration must be increased or bulking mateerial added. If the compost does not leave moisture on the hand and will not hold together it is too dry and water or leachate must be added to increase moisture levels. If the compost holds together in a ball and leaves moisture on your hand it is about the right moisture level. The material in the bin may be too dense to get adequate air flow in which case the bins would need to be remixed and possibly course bulking material added. Temperatures may also fail to rise if the air flow is to great. If the bin appears to contain too much carbon and not enough nitrogen then additional feedstock or a high nitrogen fertilizer will need to be mixed with the contents of the bin. If material needs to added to a bin to regulate C:N ration or porosity the material may be removed from the bin with a loader and mixed in the receiving and bulking material storage area. Contents of bins that do not meet temperature requirements will be blended with fresh feedstocks and reblended.

In addition to temperature monitoring the following duties must be performed daily:

1. All fans checked to be sure they are operating properly.
2. The depth of leachate in the storage tank checked.

In the event fans break down there will be extra fans available. In the event of a power failure wast can be held near the dining halls until power is restored or if necessary the waste can be windrowed in the waste receiving area and later placed in a bin. Several front end loaders or backhoes are available at the prison in the event the one assigned to the facility breaks down. Feedstocks spilled around the bins will be cleaned up with a rake and shovel and placed in a bin. In the event of a fire there is a water hose and fire extinguishers at the bins. If the fire cannot be controlled it will be reported immediately to the Prison Administrators Office.

Odors and vectors at the site will normally be controlled through proper composting methods. This includes maintaining adequate aeration, proper moisture levels, and maintaining a C:N ration approximately 30:1. If odors persist at the site the aeration system will be reversed and a biofilter constructed at the facility. Vectors should be controlled by covering the bins with bulking material and maintaining reasonable cleanliness around the bins. If flys cannot be controlled chemical sprays will be used or parasites will be introduced in the area.

A sample for testing for metals and foreign matter will be collected taken from the compost in each bin as it is being removed. These samples will be composited and maintained in a cooler. At least every six months the compost will be tested for foreign matter by passing a weighed sample through a 1/4 inch screen. Foreign matter that can be clearly identified shall be separated and weighed to determine the percent foreign matter.

A portion of the composite sample shall also be sent to the NCDA Waste Analysis Lab every 6 months and analyzed for all the information that the lab will provide. Specifically, cadmium, copper, lead, nickel, and Zinc must be included.

A grab sample will be taken at least every six months and tested for fecal coliform. The sample should be taken from inside a bin during the removal of the contents of the bin. A clean shovel or glove should be used to take the sample to

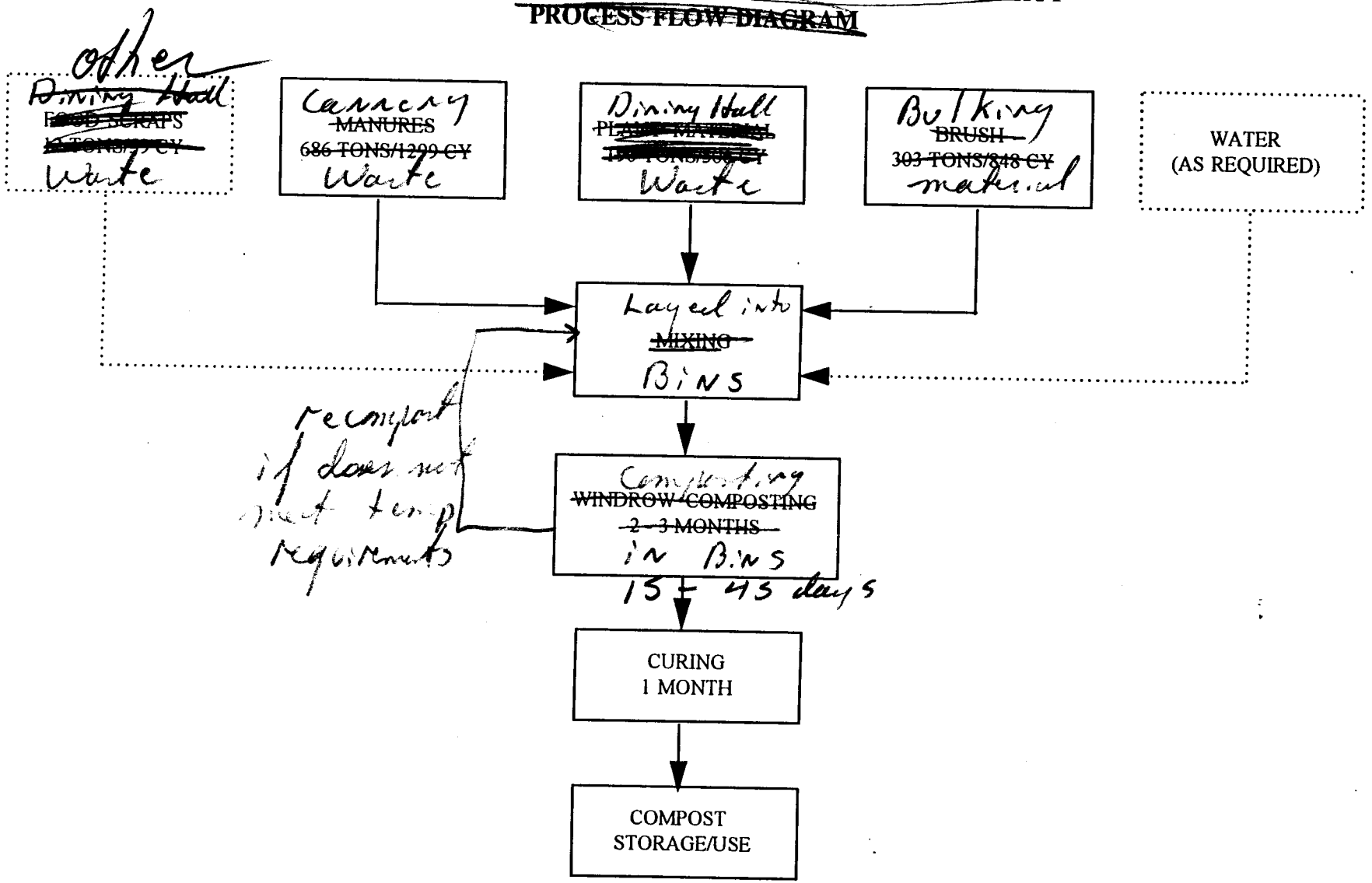
avoid the possibility of contamination. The sample should be placed in a plastic bag and transported to an approved lab a soon as possible.

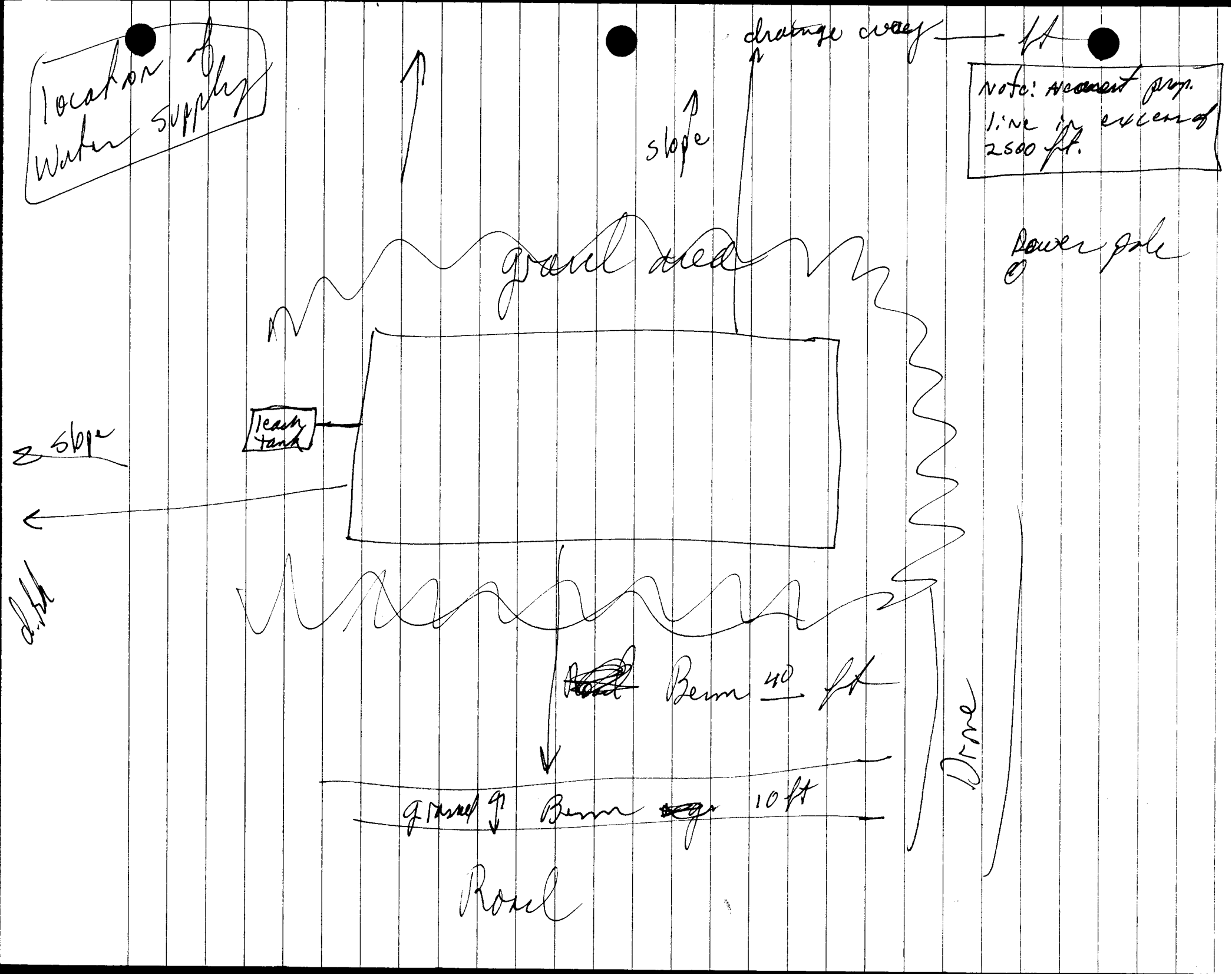
A berm is maintained between the bins and the adjacent road to keep run-off from leaving the site and entering the road. The berm is maintained in fescue to prevent erosion. The areas down hill from the bins on the north and west sides are maintained in fescue to prevent erosion and to filter and particulates that might move from the area around the bins. A designated portion of this area may also be used to spray leachate from the leachate storage tank if production should become to great to reuse the leachate as a moisture source.

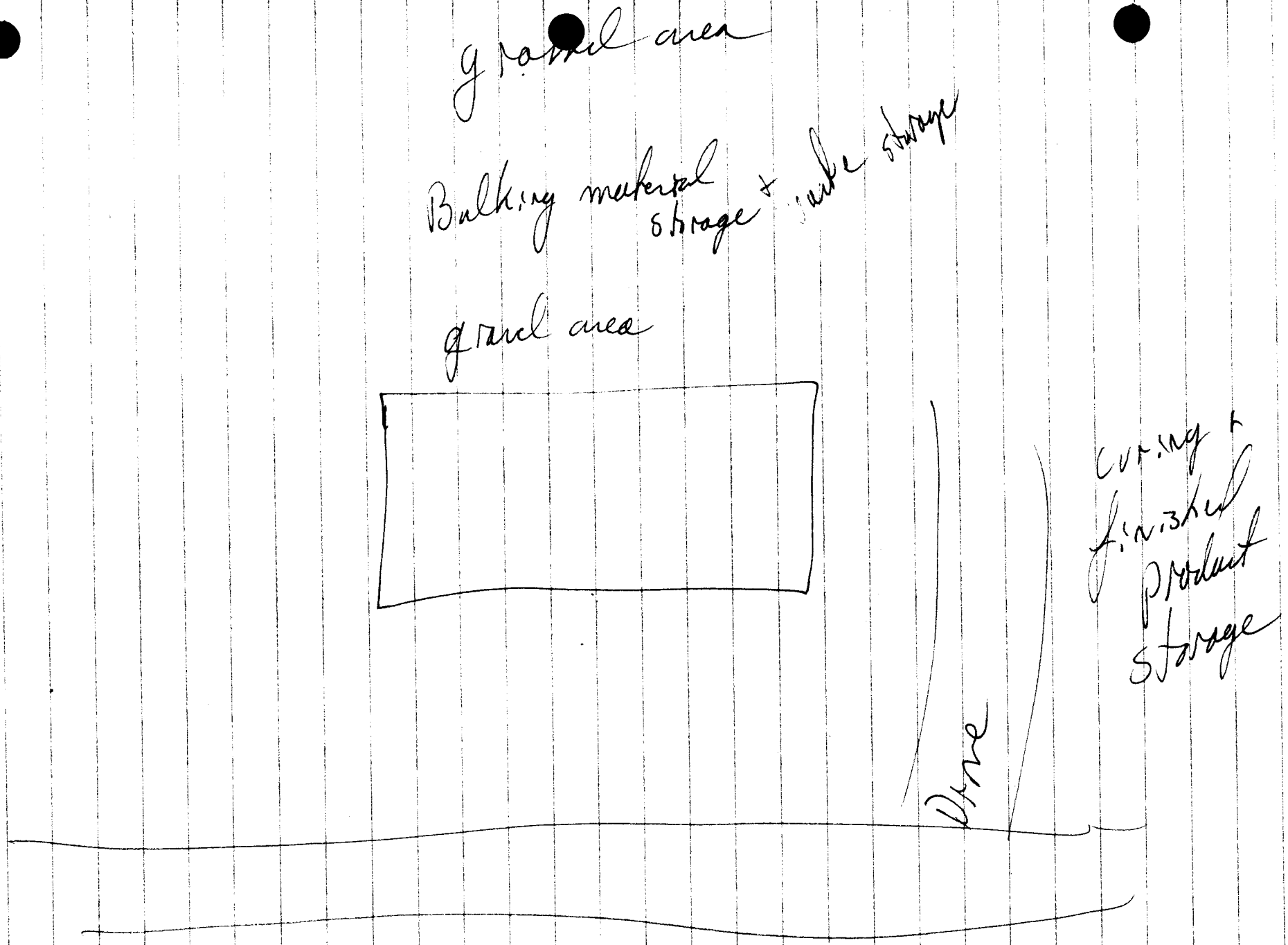
Facility records will be kept to indicate the following:

An annual report is to be submitted to the Division of Waste Management, Solid Waste Section. That report must be submitted by August 1 of each year based on the activities of the previous July 1 through June 30. That report will include:

~~FIGURE 2-2 NC ZOO SOLID WASTE COMPOSTING FACILITY PROCESS FLOW DIAGRAM~~




location of Water supply
slope
drainage away — ft
Note: Measurement perp. line in excess of 2500 ft.
ground level
Power pole
leach tank
slope
slope
Berm 40 ft
Berm 10 ft
Drive
Road


gravel area
Bulking material storage + cake storage
gravel area
curing + finished product storage
Drum

Application Requirements For Solid Waste Compost Facilities

.1405(A)

Caledonia Correctional Institution is requesting a permit to construct and operate a type three solid waste compost facility.

1. An aerial photograph which is one inch is equal to 400 feet. See attached.

   (a) All properties surrounding the proposed compost site are owned by the State of North Carolina, NC Department of Correction.

   (b) There are no buildings public or private, utilities, public roads, or water courses or within three hundred feet of our proposed facility. A dry run is located approximately 150 feet behind the compost bins.

   (c) No zoning requirement. (See letter attached)

2. A letter from Keith Dobbins (Zoning Officer) is attached stating that state property is not subject to any zoning laws within Halifax County. A letter from Mr. Dobbins is attached. Therefore, no zoning permit is required.

3. An explanation of how the site complies with sitting and designed standards in rule .1404 of this section.

.1404(A)

1. The location of Caledonia's compost facility is not within the one hundred year floodplain, see attached letter.

2. The nearest property line is in excess of 2500 feet from the compost facility.

3. The nearest residence is at least 500 feet from the compost facility.

4. The closest well is 4,000 feet away.

5. There are no perineal streams/rivers within at least 300 feet of the facility. The Roanoke River is 7200 foot away.

6. The Roanoke River is a Class C stream at this point and there are no restrictions on uses within its watershed.

7. Our compost facility is not located in a closed out disposal area.

8. Our facilities position exceeds the minimum distance that is required between compost areas and swales or berms that will allow for fire fighting equipment. The distance around our facility is at least 400 feet to any building.

9. A site shall meet the following surface water requirement:
Our facility is an invessel system that is under roof and which collects all leachate from the compost bins in a 1,500 gallon tank located at the west end of the compost bins. The leachate will be added to the compost as a moisture source or if necessary sprayed on the adjacent fescue fields. Areas for spray irrigation have been approved by the Division of Waste Management staff. The area around the facility, including the areas for curing and storage is gently sloping, bermed where appropriate and is in fescue to control erosion and filter any runoff from the facility. Any feedstock spills will be immediately cleaned and placed in the compost bins. As a result:

   (a) The site shall not cause a discharge of materials into waters or wetlands of the state.

   (b) The site will not cause a discharge of pollutants into waters of the state.

   (c) The site will not cause non-point source pollution of waters of the state.

10. A site shall meet the following ground water requirements:

   (a) Our facility is a invessel system which will collect and re-cycle all leachate and should not, therefore, contravene ground water standards.

   (b) Soil texture at the site was evaluated by the Division of Waste Management and found to have a texture finer than loamy sand and the depth to seasonal wetness is in excess of 24 inches.

   (c) Our facility will be a small type three facility.

   (d) Curing may take place and finished product will be stored adjacent to the facility. The soil conditions are as described in #2 above. All stored material will pass the paint filter test.

   (e) Our compost facility sets on a minimum of six inch foundation of cement. No natural soils or liners are used for active composting.

.1404(B) Alternative minimum buffers are not required by the Division of Waste Management.

.1404(C) **A SITE SHALL MEET THE FOLLOWING DESIGN REQUIREMENTS:**

1. Our compost facility is in a location where there is controlled public access due to security measures for Caledonia Correctional Institution.

2. Less than one acre will be disturbed in the construction of this facility and the area down slope will be grassed or bermed to control and filter run-off. Our facility is an invessel system which collects all leachate from compost and recycled to meet the needs of the composting.

3. Our facility being an aerated invessel system should minimize odors. Proper feed stock blending and aeration will also minimize odors. If necessary to control odors the aeration can be reversed and a biofilter installed to control odors.

4. Our compost site is in the middle of a 7500 acre farm therefore minimizing odors to any adjacent property owners.

.1405 #4 **A DETAILED REPORT INDICATING THE FOLLOWING:**

(a) Caledonia's compost facility will utilize medium size wood chips or saw dust as its primary bulking agent. The following other solid wastes may also be composted at the facility:

Dining hall food waste and associated paper waste such as napkins and milk cartons.
Kitchen waste
Food processing waste from the cannery
Shredded paper
Socks and other 100% cotton clothing
Poultry mortality
Manure
Greenhouse wastes
Cotton gin trash
Tobacco Dust

The estimated quantity of the solid waste should be less than 100 cubic yds per month. Similar wastes may be received from other nearby Correctional facilities.

(b) Caledonia's composting facility is set on a minimum of 6" thick concrete pad. Curing and any storage will be in an area of soils with textures finer than sandy loam and a depth to seasonal wetness in excess of 24 inches..

.1405 #5 Site Plan Attached

.1405 #6 **A DESCRIPTION OF THE OPERATION OF THE FACILITY WHICH MUST INCLUDE AT A MINIMUM:**

(A) William B. Carroll, Jr. Program Director I, PO Box 137, Tillery, NC 27887, area code (919)826-5621.

(B) Two to four honor grade inmates will be responsible for operation of the facility. One Enterprise Gate Officer will supervise the inmates.

(C) This facility will operate seven days per week. The honor grades would work approximately 7:30-4:30 each day.

Dining hall and kitchen waste will be transported to the facility every morning. Other wastes will be added to the bins at various times during the day. Wastes will be screened for foreign matter as added to the bins. Putrescible wastes will be added to the bins the same day they are delivered to the facility. Wastes with any free water will be added directly to the bins. Temperatures will bemonitored daily and recorded.

Wastes will be layered into the bins and covered with bulking material.

Finished product will be moved to the adjacent curing and storage area with a loader as the bins are needed for the next batch of waste. The product will be used at the correctional institution.

More detail is provided in the operation and maintenance portion of the application.

Compost will be tested at least every 6 months for pathogens, regulated metals, and foreign matter.

.1405- 6 (D) Heavy Winds - Heavy winds would not hinder our operation due to our solid waste being in bins and not on open ground.
Heavy Rain - Heavy rains would not hinder our composting ability due to (1) our facility being bins built on a pad, (2) all weather access to the area of the bins and (3) the bins are covered by a roof which will prevent excess water from entering the bins. Snow and freezing weather should not be a factor. Food waste will be stored near the kitchens during periods of heavy snow until they can be transported to the bins. No cured compost would be moved during snowy conditions.

(E) Odors will be controlled through maintaining proper C:N ratios in the bins and odors and vectors will also be controlled by covering layers of putrescible wastes with layers of bulking material. A moisture source is available at the facility to control moisture which will control dust. Our composting facility sets in the middle of a 7500 acre farm therefore minimizing noise and air borne particles and odors to any surrounding neighbors. Noise will not significantly increase over that normally encountered with the operation of a 7500 acre farm.

.1405-6 (F) There are several choices from which Caledonia can utilize its cured composting material. They are as follows:

Using in conjunction with potting soil for day lilies.

Used as a fertilizer and potting media in conjunction with Caledonia's greenhouses.

A supplement fertilizer for all crops or a soil amendment for eroded crop land.

In case our finished product could not be utilized by Caledonia other state agencies could utilize it as a type of potting soil or fertilizer.

.1405 #7 (A) Design capacity of the facility; less than 1,000 cubic yards a quarter.

(B) See attached

(C) Wastes will be placed in the bins in layers. Wastes will be added

to the bins by pouring from plastic barrels or from a loader bucket. Layers will be 4 to 12 inches thick depending on the waste. Rakes and shovels will be used to level the layers of waste as they are added. Shreading will not be necessary of the feedstocks to be used. Bulking material will be ground prior to receipt at the faciliity.

(D) Process duration will be 45 to 120 days depending on the curing requirements of the particular user at the institution.

(E) The temperature shall be monitored and taken at least once a day. Temperature readings will be taken at various depths and locations(sides and middle) in each bin with a 3 or 4 foot compost thermometer. Moisture readings will be taken as dictated by low temperature readings. A shovel will be used to dig into the bins and moisture sampled using the hand method.

A grab sample of the product will be taken at least every 6 months and sampled for fecal coliform.

A sample will be taken from each bin as it is removed and composited, kept refrigerated and sent to a NCDA lab at least every 6 months.

(F) Temperature readings will assure that the temperatures are maintained at least 131 degrees for 3 consecutive days to meet PFRP requirements and at least 113 degrees for 14 days to meet vector attraction reduction requirements. Finished product will be sampled at least every 6 months to be sure pathogens are reduced.

(G) Each compost bin is equipped with a air control system consisting of a fan, 4 inch PVC air lines, and bioplates in the bottom of the bins to distribute air evenly. Timers will be used to control when the fans will run. Run times will vary depending on the stage of the composting material. Fans will becapable of delivering at least 815 cubic feet of air per minute.

(H) Our facility sits on top of a hill and as a result water run-on will not be a problem. Runoff will be controlled and filtered with grass buffers or berms down slope of the facility. A 1,500 gallon leachate tank is present and will collect all leachate drainage from our facility. The pad the bins sit on is sloped toward the middle of the bins and from one end to the other (east to west) to facilitate leachate collection and prevent any leachate from

draining out of the bins onto the ground surface. Leachate will be managed by using it as a moisture source for the compost or if necessary it can be sprayed on adjacent fescue hay field.

.1405 (8) See attached operation and maintenance manual

(9) Drawings attached

(10) See attached operation and maintenance manual

(11) Drawings attached

Operation and Maintenance Manual for the Caledonia Corrrectional Facility Compost Operation

Food waste from the Caledonia Prison unit is transported daily to the compost facility from the dining hall. Any food waste from other nearby prison units is delivered at a scheduled time so that the appropriate inmates will be available to unload the waste. Food waste is delivered in barrels. Other wastes are delivered at various times of the day and are put in the waste storage area on the east side of the compost bins. Food wastes are added to the bins upon delivery.

A 6" inch layer of bulking material will be placed in the bottom of each bin prior to adding any wastes. This layer may be increased if necessary to help manage leachate. Inmates will layer these materials into the bins as the food waste is added. Rakes and shovels will be used to level the material that is added to the bins. Moisture, in the form of water or leachate, will be added to the bins with the wastes as necessary to attain a moisture level of 55 to 60 percent. This will be determined by compost temperature, visual inspection and hand method. Separate hoses will be available to spray the water or leachate into the bins. Putrescible wastes will be added to the bins the same day as delivered to the facility.

Wastes will be placed in layers in the bins 3 to 6 inches thick. The thickness of the layers will be determined based on the moisture content, nitrogen content, and particle size of the wastes. Bulking material will be added on top of each layer of waste. The thickness of the bulking material layers will depend on the feedstock characteristics. As wastes and bulking materials are added boards are placed in the opening of the bin to prevent wastes from falling out of the bins.

Incoming waste is checked for non compostable materials as the wastes are added to the bins. Non compostable wastes are placed in a trash can at the bins and later disposed of with other solid waste at the prison unit. Any wastes found at the facility that are not approved for composting will be removed and disposed of properly and the occurrence reported to the Prison Administrator.

Fans are set initially to operate approximately 10 minutes per hour as the bins are filled. Fan speeds are increased as necessary to assure the oxygen content in the bins does not get to low, if the temperatures in the bins rise above 160 degrees, or if the compost becomes to wet(wet is determined using the hand method- if water can be squeezed out of the compost it is too wet).
Fan speeds are reduced when excessive heat loss is evident. An average temperature of 140 - 150 degrees is desirable..

Temperature readings are taken daily from at least two different locations in each bin at least two different depths. Temperatures must remain above 131 degrees for at least 3 days to meet pathogen reduction requirements. Temperatures must remain above 113 degrees for 14 days to meet vector attraction reduction requirements. Bin temperatures are recorded as they are taken in a log book. The book should indicate the date and bin number of each reading. If only one number is recorded for each bin it will be the lowest temperature recorded for that bin. Pathogen reduction requirements will be met after any leachate is added to the compost.

The temperature log and thermometer will be kept at the bins. A copy of the permit and permit application will be maintained at the Administration Office of the Prison Unit.

If temperatures are not maintained in a bin the contents of the bin must be examined to determine why the wastes are not composting. Moisture can be determined using the hand method. If water can be squeezed out of the compost it is too wet and aeration must be increased or bulking material added. If the compost does not leave moisture on the hand and will not hold together it is too dry and water or leachate must be added to increase moisture levels. If the compost holds together in a ball and leaves moisture on your hand it is about the right moisture level. The material in the bin may be too dense to get adequate air flow in which case the bins would need to be remixed and possibly course bulking material added. Temperatures may also fail to rise if the air flow is to great. If the bin appears to contain too much carbon and not enough nitrogen then additional feedstock or a high nitrogen fertilizer will need to be mixed with the contents of the bin. If material needs to added to a bin to regulate C:N ration or porosity the material may be removed from the bin with a loader and mixed in the receiving and bulking material storage area. Contents of bins that do not meet temperature requirements will be blended with fresh feedstocks and reblended.

In addition to temperature monitoring the following duties must be performed daily:

1. All fans checked to be sure they are operating properly.
2. The depth of leachate in the storage tank checked.

In the event fans break down there will be extra fans available. In the event of a power failure waste can be held near the dining halls until power is restored or if necessary the waste can be windrowed in the waste receiving area and later placed in a bin. Several front end loaders or backhoes are available at the prison in the event the one assigned to the facility breaks down. Feedstocks spilled around the bins will be cleaned up with a rake and shovel and placed in a bin. In the event of a fire there is a water hose and fire extinguishers at the bins. If the fire cannot be controlled it will be reported immediately to the Prison Administrators Office. In the event of leachate pump failure the leachate can be pumped out and taken to the prison wastewater treatment plant or removed manually through the tank access and added to the compost bins until the pump can be repaired or replaced.

Odors and vectors at the site will normally be controlled through proper composting methods. This includes maintaining adequate aeration, proper moisture levels, and maintaining a C:N ratio approximately 30:1. If odors persist at the site the aeration system will be reversed and a biofilter constructed at the facility. Vectors should be controlled by covering the bins with bulking material and maintaining reasonable cleanliness around the bins. If flys cannot be controlled, chemical sprays will be used or parasites will be introduced in the area.

A sample for testing for metals and foreign matter will be collected from the compost in each bin as it is being removed. These samples will be composited and maintained in a cooler. At least every six months the compost will be tested for foreign matter by passing a weighed sample through a 1/4 inch screen. Foreign matter that can be clearly identified shall be separated and weighed to determine the percent foreign matter.

A portion of the composite sample shall also be sent to a Waste Analysis Lab every 6 months and analyzed for all the information that the lab will provide. Specifically, cadmium, copper, lead, nickel, and Zinc must be included.

A grab sample will be taken at least every six months and tested for fecal coliform. The sample should be taken from inside a bin during the removal of the contents of the bin. A clean shovel or glove should be used to take the sample to avoid the possibility of contamination. The sample should be placed in a plastic bag and transported to an approved lab a soon as possible.

A berm is maintained between the bins and the adjacent road to keep run-off from leaving the site and entering the road. The berm is maintained in fescue to prevent erosion. The areas down hill from the bins on the north and west sides are maintained in fescue to prevent erosion and to filter and particulates that might move from the area around the bins. A designated portion of this area may also be used to spray leachate from the leachate storage tank if production should become to great to reuse the leachate as a moisture source. The areas around the facility will be checked monthly or after heavy rains for evidence of erosion or runoff. If any areas of erosion or runoff are noted they will be stabilized immediately with hay bales and graded and reseeded as soon as moisture conditions permit.

Facility records will be kept to indicate the following:

.1408 (B) Record Keeping:

(1) Daily operational records must be maintained, which include, at a minimum, temperature data (length of the composting period) and quantity of material processed:
(2) Analytical results on compost testing;
(3) The quantity, type and source of waste received;
(4) The quantity and type of waste processed into compost;
(5) The quantity and type of compost produced by product classification; and;
(6) The quantity and type of compost removed for use or disposal, by product classification, and the market or permitted disposal facility.

.1408 (C) Annual Reporting:

(1) The facility name, address, and permit number.
(2) The total quantity in tons, with sludge values expressed in dry weight, and type of waste received at the facility during the

year covered by the report, including tons of waste received from local governments of origin;

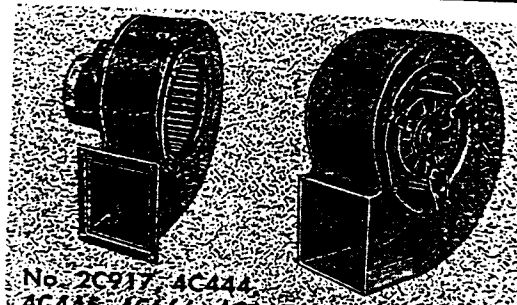
(3) The total quantity in tons, with sludge values expressed in dry weight, and type of waste processed into compost during the year covered by the report;

(4) The total quantity in tons and type of compost produced at the facility; by product classification, during the year covered by the report;

(5) The total quantity in tons and type of compost removed for use or disposal from the facility, by product classification, along with a general description of the market if for use during the year covered by the report;

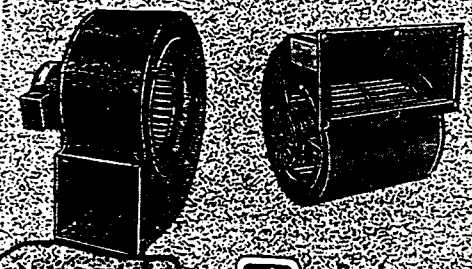
(6) Monthly temperature monitoring to support Rule .1406 of this Section; and

(7) Results of tests required in Table 3 of this Rule.



No. 2C917, 4C444, 4C445, 4C666, 4C667, 4C566, 4C870

No. 2C962



No. 4C448, 4C565, 5C507, 5C508

No. 2C335 Housing Support

No. 2C946, 4C054, 4C668, 4C830, 4C831

Dayton

E47479
LR6319 E37403

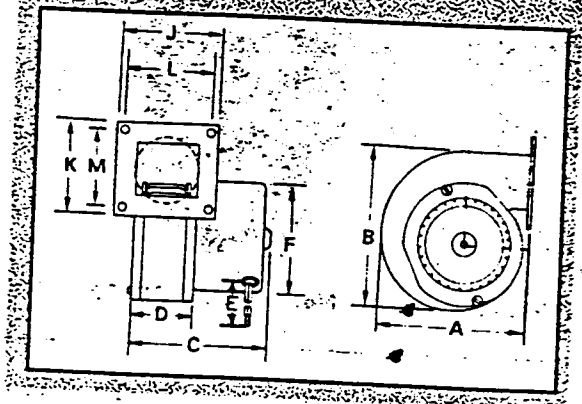
- Provide economical air delivery for larger applications in heating, ventilating, exhausting, and cooling
- Forward curved wheels driven by Dayton motors rated for continuous duty with all-position mount sleeve bearings
- Baked on gray enamel finish

Replacement Parts Available 1-800-323-0620

Maximum ambient temperature 104°F (... Capacitors included on all energy ... PSC blowers. Two-speed blowers ... No. 2X605 two-speed switch (not ... see Index under Motor Parts, Accessories, Relays.)

Open dripproof motors recognized by ... under Motor Component Recog... Program; for construction, File E47479; thermal protection, File E37403. Blo... without outlet flange can use No. 2... housing support for mounting, (see ... below.) NOTE: Not for use with speed ... trollers. Dayton brand.

PRE-PUNCHED METAL HOUSING SUPPORT. ... base mounting No. 2C962, 2C946, 4C054, 4C668, 4C830, and 4C831 blowers for bot... horizontal, top horizontal, and upblast dis... charges. 12¾" long. Gray finish. Sold in p... No. 2C335. Shpg. wt. 1.3 lbs. List ... Each .....



SHADED POLE AND PSC BLOWER DIMENSIONAL DATA

Stock No.	Wheel Dia.	Wheel Width	Outlet H	Outlet W	Inlet Dia.	Dimensions in Inches A	B	C	D	E	F	J	K	L
4C444	6 5/16	2 7/8	4 15/16	3 13/16	5 3/8	10 5/16	11 1/8	8	3 7/8	12	4 7/16	5 1/16	5 3/8	4 1/2
2C917	6 5/16	2 7/8	4 15/16	3 13/16	5 3/8	10 5/16	11 1/8	8	3 7/8	12	4 7/16	5 1/16	5 3/8	4 1/2
4C448*	5 1/4	6 7/8	3 11/16	8 1/16	4 7/16	8 13/16*	9 7/8	9 1/4	8 3/32	12	3 5/16	9 11/16	5	8 3/8
5C507*	5 1/4	6 7/8	3 11/16	8 1/16	4 7/16	8 13/16	9 7/8	9 7/16	8 3/32	12	3 5/16	9 11/16	5	8 3/8
2C962*	8 1/16	4	5 5/16	6 1/16	7	13 1/8	14 7/8	6 1/2	6 1/4	12	5	†	†	†
4C445	6 5/16	4 1/4	4 1/4	5 1/16	5 3/8	10 5/16	11 1/8	9 1/2	5 1/4	12	4 7/16	6 3/8	5 3/8	6
4C870	6 5/16	4 1/4	4 1/4	5 1/16	5 3/8	10 5/16	11 1/8	9 1/2	5 1/4	12	4 7/16	6 3/8	5 3/8	6
2C946	8 1/16	4	5 9/16	6 1/16	7	13 1/8	14 7/8	11	6 1/4	6	5	†	†	†
4C054	8 1/2	5 1/16	5 9/16	7 3/16	7	13 1/8	14 7/8	12 3/4	7 1/4	6	5	†	†	†
4C565*	5 1/4	6 7/8	3 11/16	8 1/16	4 7/16	8 13/16	9 7/8	9 1/4	8 3/32	12	3 5/16	9 11/16	5	8 3/8
4C566	6 5/16	4 1/4	4 1/4	5 1/16	5 3/8	10 5/16	11 1/8	9 1/2	5 1/4	12	4 7/16	6 3/8	5 3/8	6
5C508*	6 1/4	6 1/2	4 1/8	8 1/16	5 3/8	10 5/16	11 1/8	10 3/4	8 1/4	12	3 5/16	9 5/16	5 3/8	8 1/2
4C666	6 5/16	2 7/8	4 5/16	3 13/16	5 3/8	10 5/16	11 1/8	8 3/8	3 7/8	12	3 5/16	5 1/16	5 3/8	4 1/2
4C667	6 5/16	4 1/4	4 1/4	5 1/16	5 3/8	10 5/16	11 1/8	10	5 1/4	12	3 5/16	6 3/8	5 3/8	6
4C668	8 1/16	4	5 9/16	6 3/16	7	13 1/8	14 7/8	10 3/4	6 1/4	6	5	†	†	†
4C830	8 1/2	5 1/16	5 9/16	7 3/16	7	13 1/8	14 7/8	11 3/4	7 1/4	6	5	†	†	†
4C831	8 1/16	5 1/16	5 9/16	7 3/16	7	13 1/8	14 7/8	11 9/16	7 1/4	6	5	†	†	†

(†) Blower does not have a flange. (*) Conduit box not provided. All other models include conduit box.

SHADED POLE BLOWERS

CFM, AT RPM SHOWN AT 60 Hz 0.0" SP	0.1" SP	0.2" SP	0.3" SP	0.4" SP	0.5" SP	0.6" SP	0.7" SP	0.8" SP	Cut-Off SP	Volts	Hz	Therm. Protect.	RPM	Free Air Watts	Amps	Stock No.	List	Each	Lots of 4†
350	340	328	312	296	274	240	202	158	1.00	115	60/50	Auto.	1585	185	2.90	4C444	$158.75	$95.10	$90.35
350	340	328	312	296	274	240	202	158	1.00	230	60/50	Auto.	1585	185	1.45	2C917	163.85	98.15	93.21
465	428	396	352	305	227	125	—	—	0.76	115	60/50	Auto.	1530	115	2.90	4C448	123.18	73.80	70.08
465	428	396	352	305	227	125	—	—	0.76	230	60/50	Auto.	1530	115	1.30	5C507	126.28	75.70	71.84
490	460	425	390	350	305	235	—	—	0.80	115	60/50	Auto.	1045	215	3.30	2C962	196.14	117.50	111.57
495	476	458	437	416	387	360	312	265	1.26	115	50/60	Auto.	1570	225	3.25	4C445	167.51	100.35	95.28
495	476	458	437	416	387	360	312	265	1.26	230	50/60	Auto.	1570	225	1.70	4C870	168.60	101.00	95.95
815	767	716	663	604	537	460	280	—	0.91	115	60	Auto.	1030	370	5.60	2C946	221.66	132.80	126.16
980	940	890	843	788	730	655	565	210	1.05	115	60	Auto.	1030	457	6.00				

...ransflow blowers di... air pattern to ven... cabinets, office n... equipment, and ... and fireplaces.

...mount in any position ...operation. Have 11... motors with extra lar... (No. 4C848 has perman... bearings.)

...g, 18 gauge insulated ...um ambient temperat... ponent Recognized. C... brand.

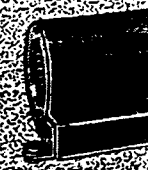
...-with Aluminum Hous... ...um construction. 4... A insulation, all others ...tion, automatic therm... ...ooling fan.

Replacement Part... 1-800-323-0620

TRANSFL...

CFM a...	0.0" SP	0.1" SP
	80	68
	120	114
	160	140
	220	194
	336	320

...ecognized Component (E47479, E3...



Little Giant PUMP COMPANY
SUBSIDIARY
TECUMSEH PRODUCTS COMPANY

LITTLE GIANT® SUBMERSIBLE SEWAGE EJECTOR PUMPS AND EFFLUENT PUMPS

OWNERS MANUAL

FOR

10E-CIM 10E-CIA-RFS
10S-CIM 10S-CIA-RFS

— CAUTION —
READ SAFETY GUIDELINES AND INSTRUCTIONS CAREFULLY

10E-CIM

10S-CIA-RFS

- SPECIFICATIONS
- SAFETY
- INSTALLATION
- OPERATION
- REPAIR

World's Largest Manufacturer of Centrifugal Pumps

SPECIFICATIONS

DESCRIPTION

Little Giant Submersible 10S Series Sewage Ejector Pumps and 10E Series Effluent Pumps are recommended for use in basins or lift stations and suitable for pumping sewage, effluent, wastewater and other non-explosive, non-corrosive liquids. The 10S Series Sewage Ejector Pumps have 2" spherical solids handling capability. The 10E Series Effluent Pumps have 3/4" spherical solids handling capability.

Automatic operation can be achieved with the use of the RFS Remote Float Switch. Other accessories such as basins, check valves and covers are also available.

UNPACKING

Little Giant pumps are carefully packaged, inspected and tested to insure safe operation and delivery. When you receive your pump, examine it carefully to determine that there are no broken or damaged parts that may have occurred during shipment. If damage has occurred, make notation and notify the firm from which you purchased the pump and they will assist you in replacement or repair, if required.

DISCHARGE: 10E Series —1½" NPT Vertical
10S Series —2" NPT Vertical

INTAKE: 10E Series —¾" Screened Opening
10S Series —2" Diameter Opening

HOUSING: Cast Iron

VOLUTE: Cast Iron

SCREEN: 10E Series —ABS

IMPELLER: Vortex design nylon, with pressure relief vanes

MOTOR: Split phase induction, 1750 RPM, with automatic reset thermal overload protection

HARDWARE: 300 series stainless steel

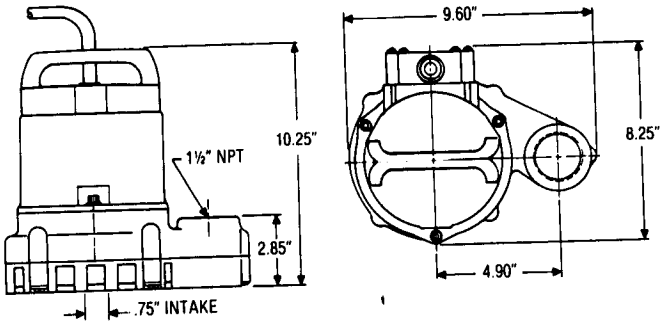
BEARING: Double shielded ball

SHAFT SEAL: Mechanical, spring loaded, stationary carbon with Nitrile boot and rotating ceramic seat

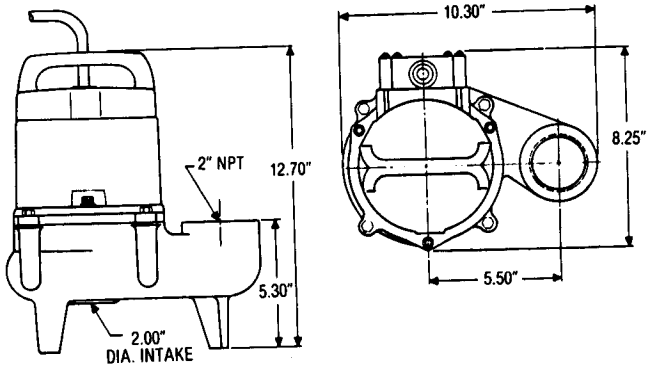
POWER CORD: 16 awg 3-conductor copper stranded

COOLING: The motor housing contains a cooling oil to provide cooling for the motor and to lubricate bearings and seals. These pumps are capable of operating with the motor housing partially exposed for extended periods of time, providing sufficient motor cooling and bearing lubrication. However, for the best cooling and longest motor life, the liquid level being pumped should normally be above the top of the cast iron motor housing.

10E SERIES



10S SERIES



MODEL NO.	LISTING	HP	VOLTS	SOLIDS SIZE (Dia. In.)	AMPS/ WATTS	GPM @ HEAD				SHUT OFF	P.S.I.	PWR CRD (Ft.)	WT (Lbs.)	DIMENSIONS (HxLxW in In.)
						5'	10'	15'	20'					
10E-CIM	UL/CSA	1/2	115	3/4	10/900	80	67	52	33	26'	11.2	15	36	10.4x9.6x8.25
10E-CIM	UL/CSA	1/2	208-240	3/4	6.5/900	80	67	52	33	26'	11.2	15	36	10.4x9.6x8.25
10E-CIA-RFS	UL/CSA	1/2	115	3/4	10/900	80	67	52	33	26'	11.2	15	37	10.4x9.6x8.25
10S-CIM	UL/CSA	1/2	115	2	12/1000	110	85	45	—	20'	8.7	15	43	12.75x10.3x8.25
10S-CIM	UL/CSA	1/2	208-240	2	6.6/1100	110	85	45	—	20'	8.7	15	43	12.75x10.3x8.25
10S-CIA-RFS	UL/CSA	1/2	115	2	12/1000	110	85	45	—	20'	8.7	15	44	12.75x10.3x8.25

115V Models are 60 Hz 208-240 Models are 50/60 Hz.

SAFETY

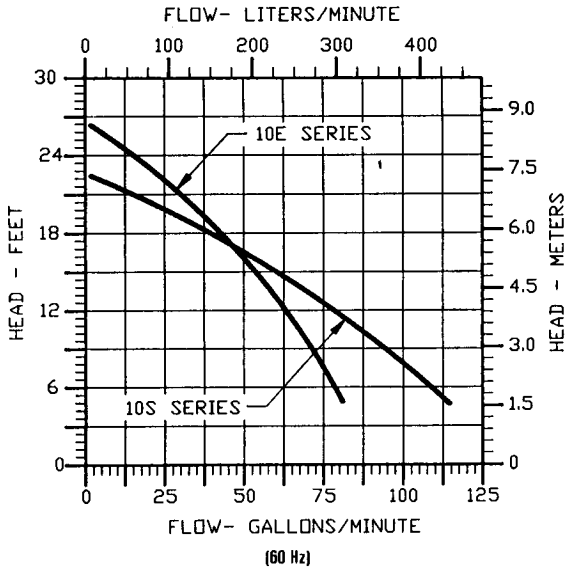
WARNING — Risk of electric shock. This pump is supplied with a grounding conductor and/or grounding type attachment plug. To reduce the risk of electric shock, be certain that it is connected to a properly grounded grounding type receptacle.

Your pump is equipped with a 3-prong electrical plug. The third prong is to ground the pump to prevent possible electrical shock hazard. Do not remove the third prong from the plug. A separate branch circuit is recommended. Do not use an extension cord.

When a pump is in a basin, etc. do not touch motor, pipes or water until unit is unplugged or shut off. If your installation has water or moisture present, do not touch wet area until all power has been turned off. If shut-off box is not accessible, call the electric company to shut off service to the house, or call your local fire department for instructions. Failure to follow this warning can result in fatal electrical shock.

The flexible PVC jacketed cord assembly mounted to the pump must not be modified in any way, with the exception of shortening the cord to fit into a control panel. Any splice between the pump and the control panel must be made within a junction box and mounted outside of the basin, and comply with the National Electrical Code. Do not use the power cord for lifting the pump.

The pump motor is equipped with an automatic resetting thermal protector and may restart unexpectedly. Protector tripping is an indication of motor overloading as a result of operating the pump at low heads (low discharge restriction), excessively high or low voltage, inadequate wiring, incorrect motor connections, or a defective motor or pump.



SAFETY GUIDELINES

1. Read all instructions and safety guidelines thoroughly. Failure to follow the guidelines and the instructions could result in serious bodily injury and/or property damage.
2. DO NOT USE TO PUMP FLAMMABLE OR EXPLOSIVE FLUIDS SUCH AS GASOLINE, FUEL OIL, KEROSENE, ETC. DO NOT USE IN EXPLOSIVE ATMOSPHERES OR HAZARDOUS LOCATIONS AS CLASSIFIED BY NEC, ANSI/NFPA70. FAILURE TO FOLLOW THIS WARNING CAN RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE.
3. During normal operation the pump is immersed in water. Also, during rain storms, water may be present in the surrounding area of the pump. Caution must be used to prevent bodily injury when working near the pump:
   a. The plug must be removed from the receptacle prior to touching, servicing or repairing the pump.
   b. To minimize possible fatal electrical shock hazard, extreme care should be used when changing fuses. Do not stand in water while changing fuses or insert your finger into the fuse socket.
4. Do not run the pump in a dry basin. If the pump is run in a dry basin, the surface temperature of the pump will rise to a high level. This high level could cause skin burns if the pump is touched and will cause serious damage to your pump.
5. Do not oil the motor. The pump housing is sealed. A high grade dielectric oil devoid of water has been put into the motor housing at the factory. Use of other oil could cause serious electric shock and/or permanent damage to the pump.
6. This pump's motor housing is filled with a dielectric lubricant at the factory for optimum motor heat transfer and lifetime lubrication of the bearings. Use of any other lubricant could cause damage and void the warranty. This lubricant is non-toxic; however, if it escapes the motor housing, it should be removed from the surface quickly by placing newspapers or other absorbent material on the water surface to soak it up, so aquatic life is undisturbed.
7. In any installation where property damage and/or personal injury might result from an inoperative or leaking pump due to power outages, discharge line blockage, or any other reason, a backup system(s) and/or alarm should be used.

INSTALLATION

Pump must be installed in a suitable gas tight basin which at least 18" in diameter and 30" deep, and vented in accordance with local plumbing codes.

10S Series Sewage Pumps feature a 2" female NPT discharge.

10E Series Effluent Pumps feature a 1½" female NPT discharge.

Pump can be installed with ABS, PVC, polyethylene or galvanized steel pipe. Proper adapters are required to connect plastic pipe to pump.

Pump must be placed on a hard level surface. Never place pump directly on clay, earth or gravel surfaces.

A check valve must be used in the discharge line to prevent back flow of liquid into the basin. The check valve should be a free flow valve that will easily pass solids.

CAUTION: For best performance of check valves, when handling solids install in a horizontal position or at an angle of no more than 45° . Do not install check valve in a vertical position as solids may settle in valve and prevent opening on start-up.

When a check valve is used drill a 3/16" hole in the discharge pipe approximately 1" to 2" above the pump discharge connection and below check valve to prevent air locking of the pump.

WIRING

Check local electrical and building codes before installation. The installation must be in accordance with their regulations as well as the most recent National Electrical Code (NEC).

To conform to the National Electrical Code all pumps must be wired with 14 AWG or larger wire. For runs to 250 feet 14 AWG wire is sufficient. For longer runs consult a qualified electrician or the factory.

Pump should be connected or wired to its own circuit with no other outlets or equipment in the circuit line. Fuses and circuit breaker should be of ample capacity in the electrical circuit. See chart below.

H.P.	VOLTAGE	FUSE OR CIRCUIT BREAKER AMPS
1/2	115	20
1/2	230	15

REMOTE FLOAT SWITCH LEVEL CONTROL

The RFS series pumps are equipped with a remote float switch level control. This level control is sealed in a polypropylene float cylinder. For automatic operation, the pump must be plugged or wired into a remote float switch. Pump will run continuously if plugged directly into an electrical outlet.

When the level rises in the basin, the cylinder floats up with the level. When the cylinder position is at an angle of about 45 degrees the switch activates and starts the pump motor.

As the level draws down, the cylinder floats down and when it is again at an angle of about 45 degrees, the switch deactivates, and the pump motor stops.

NOTE: BE CERTAIN PUMP IS SECURE IN BASIN AND CYLINDER FLOATS UNOBSTRUCTED WITHOUT TOUCHING THE BASIN WALLS OR PLUMBING.

REMOTE FLOAT SWITCH INSTALLATION

1. The float switch consists of three parts:
   a) switch;
   b) cord clamp;
   c) clamp screw.

   NOTE: If screw is lost, use a #10-16 X 1/2" long tapping screw.

2. Attach cord clamp to pump cover as shown in FIGURE 1. The clamp must be positioned as shown to allow free operation of float. Be sure to locate pump and switch power cords away from switch float.

3. A 3" tether length is recommended. When a tether length of 3" is used, a minimum basin diameter of 18" is recommended. The tether length is measured as shown in illustration at right.

4. After desired tether length is established hand tighten clamp screw.

5. TESTING: Without water in basin plug pump power cord into switch in-line-plug. Plug switch into outlet. Lift float and watch for pump to operate. Do not run pump for more than 5 seconds.

TYPICAL INSTALLATION

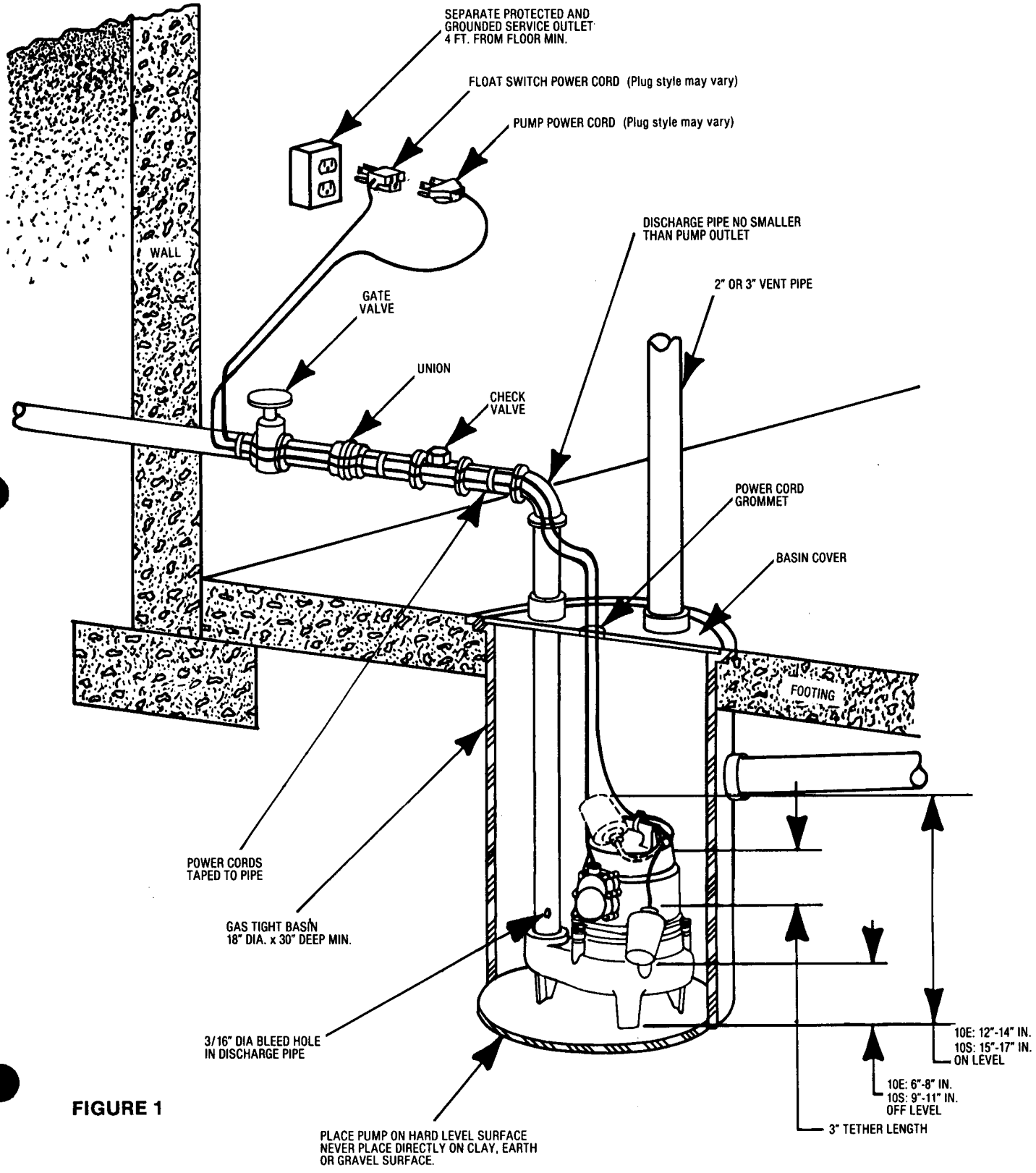


FIGURE 1

OPERATION

TESTING PUMP OPERATION

S SERIES SEWAGE EJECTOR PUMPS

1. These pumps are equipped with a remote float switch.
2. These pumps are installed in a basin with a sealed cover, so switch operation cannot be observed. The sump cover usually will have a spare hole that is plugged with a rubber plug. This plug can be removed and switch operation can be observed.
3. Plug power cord and remote float switch power cord into a grounded receptacle with voltage consistent with pump voltage as indicated on pump nameplate.
4. Run water into basin until pump starts.
5. Be sure gate valve in discharge line is open.
6. Allow pump to operate through several on-off cycles.

MANUAL SEWAGE EJECTOR PUMPS

The pump cord for these pumps can be plugged directly into a properly grounded receptacle with voltage consistent with pump nameplate for continuous pump operation.

CAUTION: This type of operation should be used only for emergency use or when a large volume of water is to be pumped. Pump must not be allowed to run dry. If pump is run dry, it may damage pump and void the warranty.

MAINTENANCE AND SERVICE

If pump does not operate properly, consult the Trouble Shooting Chart. If trouble can not be located with these steps shown, consult your pump dealer or take pump to a Little Giant authorized service center.

CAUTION: When working on pump or switch, always unplug pump power cord in addition to removing fuse or shutting off circuit breaker before working on pump.

CLEANING IMPELLER AND VOLUTE

1. Remove screws that hold volute to motor housing.
2. Remove volute and clean impeller and volute passage. Do not use strong solvents on impeller.
3. Be sure impeller turns freely after cleaning.
4. WARNING: DO NOT REMOVE IMPELLER. REMOVAL OF IMPELLER REQUIRES SPECIAL TOOLS AND IS TO BE DONE ONLY BY AN AUTHORIZED SERVICE CENTER.

   DO NOT REMOVE MOTOR HOUSING COVER. WARRANTY IS VOID IF MOTOR HOUSING COVER, IMPELLER OR SEALS HAVE BEEN REMOVED.

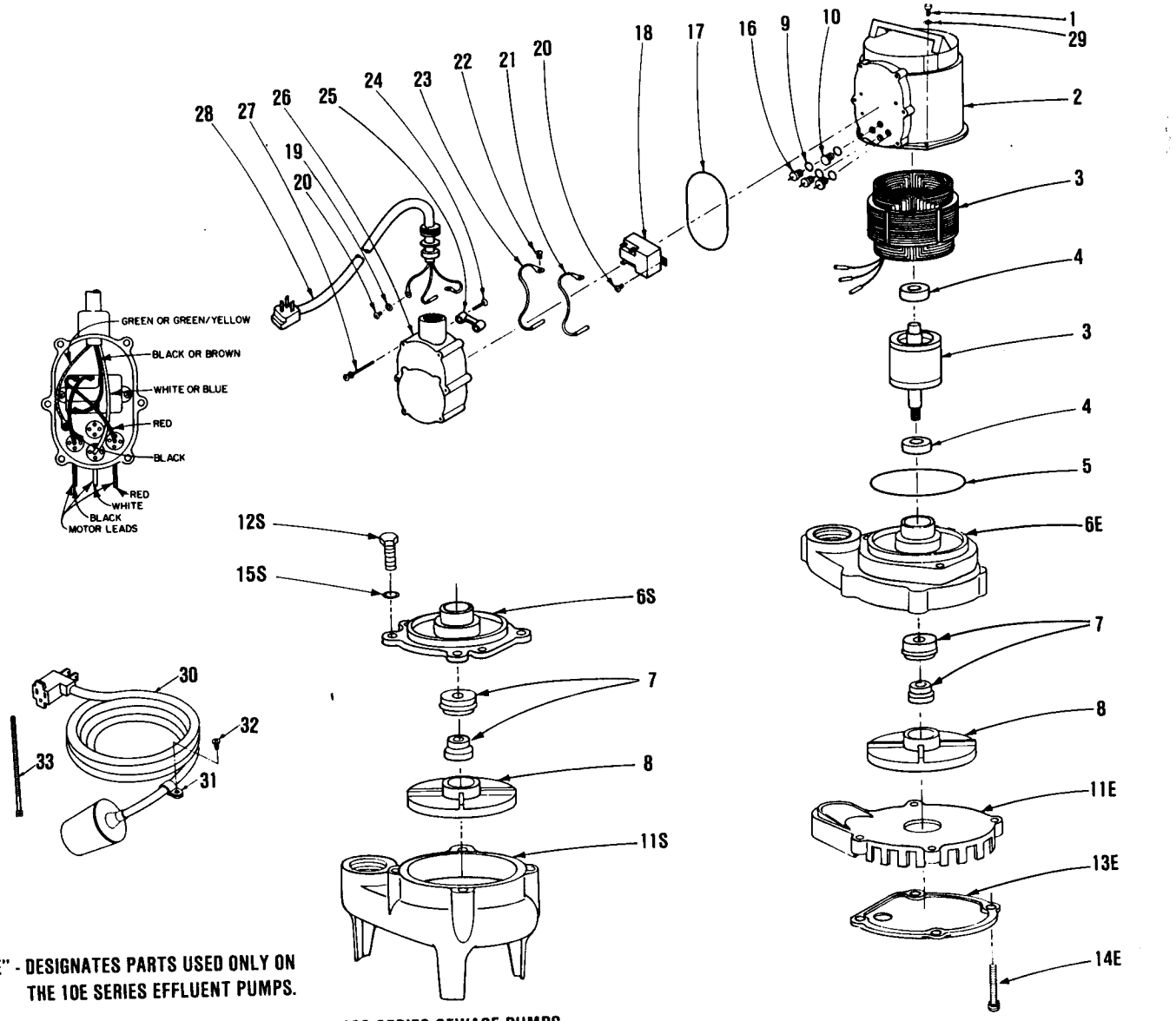
   ANY REPAIR ON MOTOR MUST BE DONE BY AN AUTHORIZED LITTLE GIANT SERVICE CENTER.

TROUBLE SHOOTING INFORMATION

PROBLEM	PROBABLE CAUSES	CORRECTIVE ACTION
Pump does not turn on Note Before trouble shooting automatic control check to see that pump operates on manual control To do this unplug from in-line float switch plug Plug pump power cord into wall outlet If pump works, proceed to check switch. If not, fault is in pump or power supply	Pump not plugged in	Plug in pump
	Circuit breaker shutoff or fuse removed	Turn on circuit breaker or replace fuse
	Accumulation of trash on mercury float switch	Clean float
	Remote float switch obstruction	Check float path and provide clearance
	Defective switch	Disconnect switch, check w/ohmmeter Open-infinitive resistance, closed-zero.
	Defective motor	Have pump serviced
Pump will not shut off	Remote float switch obstruction	Check float path and provide clearance
	Pump is air locked	Shut power off for approximately 1 minute, then restart. Repeat several times to clear air from pump If system includes a check valve, a 3/16" hole should be drilled in discharge pipe approximately 2" above discharge connections.
	Liquid inflow matches pump capacity	Larger pump required.
	Defective switch	Disconnect switch, check w/ohmmeter. Open-infinitive resistance, closed-zero
	Loose connection in level control wiring	Check control wiring.
Pump runs but does not discharge liquid	Check valve installed backwards.	Check flow indicating arrow on check w/ohmmeter, Open-infinitive resistance, closed-zero.
	Check valve stuck or plugged.	Remove check valve and inspect for proper operation.
	Lift too high for pump.	Check rating table.
	Inlet to impeller plugged.	Pull pump and clean.
	Pump is air locked.	(See corrective action above.)
Pump does not deliver rated capacity.	Lift too high for pump.	Check rated pump performance.
	Low voltage, speed too slow.	Check for proper supply voltage to make certain it corresponds to nameplate voltage.
	Impeller or discharge pipe is clogged.	Pull pump and clean. Check pipe for scale or corrosion.
	Impeller wear due to abrasives.	Replace worn impeller.
Pump cycles continually	No check valve in long discharge pipe allowing liquid to drain back into basin.	Install a check valve in discharge line.
	Check valve leaking.	Inspect check valve for correct operation.
	Basin too small for inflow.	Install larger basin.

ITEM NO.	PART NO.	DESCRIPTION	QTY.	MODEL NO./CAT. NO.							
				10E-CIM 511200	10E-CIM 511275	10E-CIA-RFS 511300	10S-CIM 511400	10S-CIM 511475	10S-CIA-RFS 511500	10S-CIA-RFS 511510	
1	903710	SCREW, CAP, 1/4-20 X 5/8	3	•	•	•	•	•	•	•	
2	110014	HOUSING, MOTOR	1	•	•	•	•	•	•	•	
3	979404 979401	STATOR ASSY/ ROTOR ASSY	1	•		•	•		•	•	
3	979414 979401	STATOR ASSY/ ROTOR ASSY	1		•			•			
4	948004	BEARING, BALL	2	•	•	•	•	•	•	•	
5	928001	SEAL RING, NITRILE	1	•	•	•	•	•	•	•	
6E	111223	VOLUTE/PLATE	1	•	•	•					
6S	111423	PLATE	1				•	•	•	•	
7	926034	SEAL, SHAFT	1	•	•	•	•	•	•	•	
8	111252	IMPELLER	1	•	•	•	•	•	•	•	
9	924006	O-RING, NITRILE	4	•	•	•	•	•	•	•	
10	947003	PLUG, OIL	1	•	•	•	•	•	•	•	
11E	109150	BASE, SCREEN	1	•	•	•					
11S	111415	VOLUTE	1				•	•	•	•	
12S	915907	BOLT, HEX, 1/4-20 x 1	4				•	•	•	•	
13E	109151	PLATE, BASE	1	•	•	•					
14E	909024	SCREW/WASHER, #10-24 x 1.46	5	•	•	•					
15S	921103	WASHER, LOCK, 1/4", SPLIT RING	4				•	•	•	•	
16	950431	TERMINAL, FEED THROUGH	3	•	•	•	•	•	•	•	
17	928019	SEAL RING, NITRILE	1	•	•	•	•	•	•	•	

ITEM NO.	PART NO.	DESCRIPTION	QTY.	MODEL NO./CAT. NO.							
				10E-CIM 511200	10E-CIM 511275	10E-CIA-RFS 511300	10S-CIM 511400	10S-CIM 511475	10S-CIA-RFS 511500	10S-CIA-RFS 511510	
18	950930	RELAY, 115V	1	•		•	•	•	•	•	
18	950934	RELAY	1		•						
19	921028	WASHER, LOCK, #6	1	•	•	•	•	•	•	•	
20	902307	SCREW, TAP, #6-32 x 1/4	3	•	•	•	•	•	•	•	
21	951963	LEAD WIRE, BLK, 4 1/2"	1	•	•	•	•	•	•	•	
22	901306	SCREW, #6-32 x 3/16"	3	•	•	•	•	•	•	•	
23	951964	LEAD WIRE, RED, 4 1/2"	1	•	•	•	•	•	•	•	
24	902409	SCREW, TAP, #8-18 X 3/4	2	•	•	•	•	•	•	•	
25	112120	CLAMP, STRAIN RELIEF	1	•	•	•	•	•	•	•	
26	110054	HOUSING, RELAY	1	•	•	•	•	•	•	•	
27	909025	SCREW/WASHER, #10-24 x 1 3/4"	6	•	•	•	•	•	•	•	
28	951541	POWER CORD, 115V	1	•		•	•		•	•	
28	951536	POWER CORD	1		•			•			
29	921024	WASHER, LOCK, 1/4, INT. TOOTH	3	•	•	•	•	•	•	•	
30	950315	REMOTE FLOAT SWITCH	1			•			•	•	
31	927027	LOOP CLAMP	1			•			•	•	
32	902514	SCREW, TAP, #10-16 X 1/2"	1			•			•	•	
33	950904	TYRAP	1			•			•	•	



"E" - DESIGNATES PARTS USED ONLY ON THE 10E SERIES EFFLUENT PUMPS.

"S" - DESIGNATES PARTS USED ONLY ON THE 10S SERIES SEWAGE PUMPS.

LITTLE GIANT PUMP COMPANY
LIMITED WARRANTY
SUMP, EFFLUENT & RESIDENTIAL SEWAGE

INTRODUCTION

Little Giant #8E, #9E, #10E, #14EH, and #16EH Series Submersible Effluent Pumps are recommended for use in sumps, basins or lift stations and suitable for pumping basement drainage water, effluent, wastewater and other non-explosive, non-corrosive, non-abrasive liquids not above 140° F with up to ¾ inch spherical solids handling ability. (NOT TO BE USED FOR SEWAGE WATER EXCEPT TO PUMP SEPTIC TANK EFFLUENT)

Little Giant #9S, #10S, #14S and #16S Series Submersible Sewage Ejector Pumps are recommended for use in sumps, basins or lift stations and suitable for pumping sewage, effluent, wastewater and other non-explosive, non-corrosive, non-abrasive liquids not above 140°F with up to 2"spherical solids handling ability.

Each of the above noted Little Giant products is guaranteed to be in perfect condition when it leaves our factory. During the time periods and subject to the conditions hereinafter set forth, LITTLE GIANT PUMP COMPANY, Subsidiary of TECUMSEH PRODUCTS COMPANY will repair or replace to the original user or consumer any portion of your new LITTLE GIANT product which proves defective due to materials or workmanship of LITTLE GIANT. Contact your nearest Authorized Little Giant Dealer for warranty service. At all times LITTLE GIANT shall have and possess the sole right and option to determine whether to repair or replace defective equipment, parts, or components. Damage due to lightning or conditions beyond the control of LITTLE GIANT is NOT COVERED BY THIS WARRANTY.

WARRANTY PERIOD

PUMPS: 12 months from date of installation or 18 months from date of manufacture, whichever occurs first.

LABOR, ETC. COSTS: LITTLE GIANT shall IN NO EVENT be responsible or liable for the cost of field labor or other charges incurred by any customer in removing and/or affixing any LITTLE GIANT product, part or component thereof.

THIS WARRANTY WILL NOT APPLY:

1) to defects or malfunctions resulting from failure to properly install, operate, or maintain the unit in accordance with printed instructions provided
2) to failures resulting from abuse, accident or negligence
3) to normal maintenance services and the parts used in connection with such service
4) to units which are not installed in accordance with applicable local codes, ordinances and good trade practices
5) unit is used for purposes other than for what it was designed and manufactured
6) if pump exposed to but not limited to the following: sand, gravel, cement, grease, plaster, mud, tar, hydrocarbons, or hydrocarbon derivatives (oil, gasoline, solvents, etc.) or other abrasive or corrosive substances.
7) if pump has been used for continuous pumping of suitable liquids above 140° F.
8) if power cord has been cut or spliced
9) if pump has been dismantled by customer. (Dealer only can dismantle pump for field service.)

RETURN OR REPLACED COMPONENTS: Any item to be replaced under the Warranty must be returned to LITTLE GIANT at Oklahoma City, OK or such other place as LITTLE GIANT may designate, freight prepaid.

PRODUCT IMPROVEMENTS: LITTLE GIANT reserves the right to change or improve its products or any portions thereof without being obligated to provide such a change or improvement for units sold and/or shipped prior to such change or improvement.

DISCLAIMER: Any oral statements about the product made by the seller, the manufacturer, the representatives or any other parties, do not constitute warranties, shall not be relied upon by the user, and are not part of the contract for sale. Seller's and manufacturer's only obligation, and buyer's only remedy, shall be the replacement and/or repair by the manufacturer of the product as described above. Neither seller nor the manufacturer shall be liable for any injury, loss or damage, direct, incidental or consequential (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss), arising out of the use or the inability to use the product, and the user agrees that no other remedy shall be available to it. Before using, the user shall determine the suitability of the product for his intended use, and user assumes all risk and liability whatsoever in connection therewith. **The warranty and remedy described** in this limited warranty **is an EXCLUSIVE warranty** and remedy and is **IN LIEU OF** any other warranty or remedy, expressed or implied, which other warranties and remedies are hereby expressly **EXCLUDED**, including but not limited to any implied warranty of **MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE**. Some states do not allow the exclusive or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

In the absence of other suitable proof of the installation date, the effective date of this warranty will be based upon the date of manufacture plus one year. Direct All Notices, etc. To: Service Department, LITTLE GIANT PUMP COMPANY, 3810 N. Tulsa, Oklahoma City, OK 73112.

DETERMINATION OF UNIT DATE OF MANUFACTURE: (9-87) month and year stamped on pump and/or serial number on pump nameplate coded to indicate year of manufacture.

KEEP THIS FOLDER

File this for safe keeping. It may be valuable to you for service under the terms of the warranty.

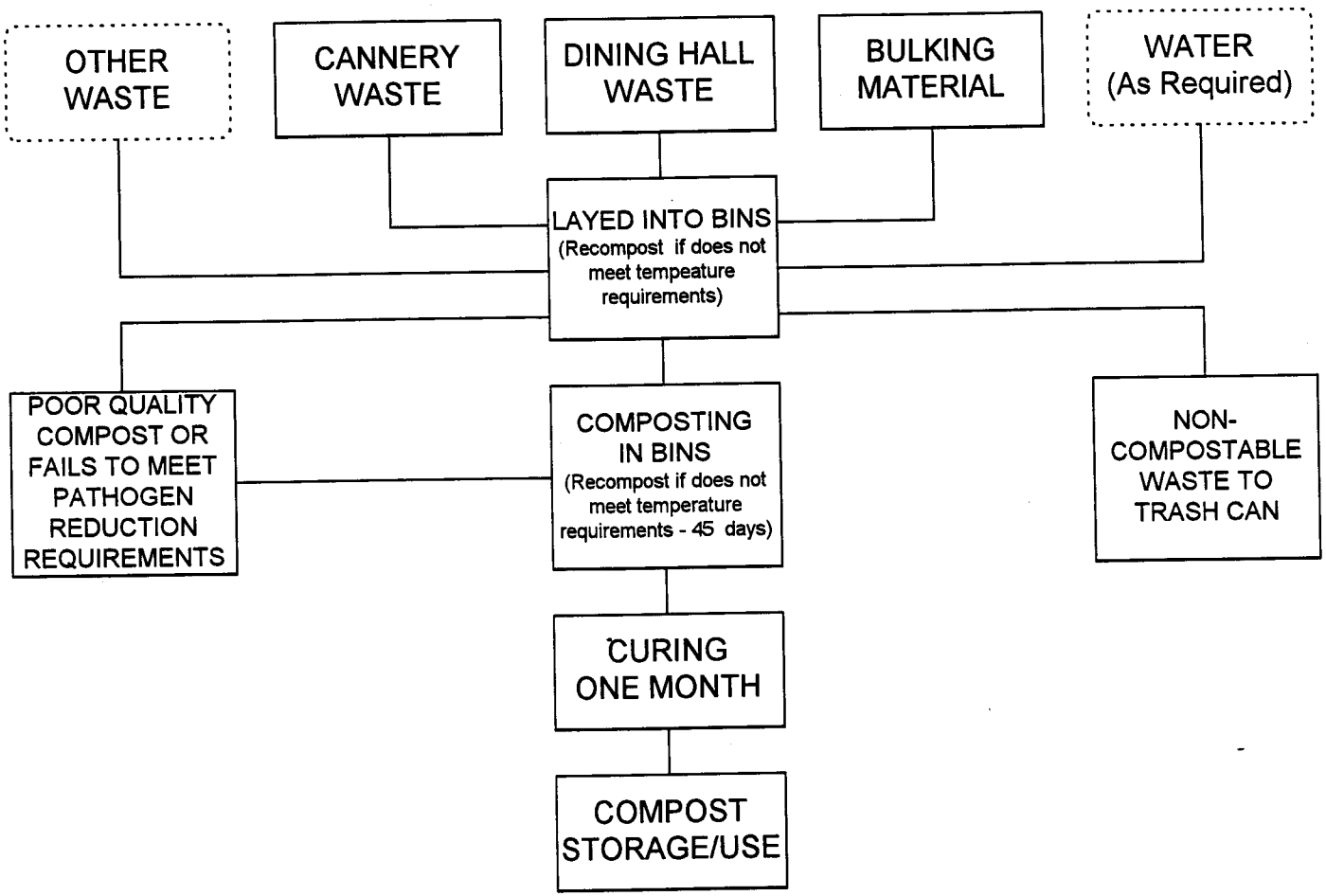
Date of Purchase _____ Name of Dealer _____

Serial # _____ Product # _____ Model # _____

LITTLE GIANT PUMP COMPANY
3810 North Tulsa Street
Oklahoma City, OK 73112
(405) 947-2511

Form #993630–9/95

CALEDONIA CORR. INST.
SOLID WASTE COMPOSTING FACILITY
PROCESS FLOW DIAGRAM
April 28, 1998



Page _____ of _____

COMPOST TEMPERATURE CHART

Start Date: ____________ **Completion Date:**____________ **Compost Bin #**________

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SIGNATURE:______________________

April 9, 1998

DATE: ________ **TIME:** ________