EXECUTIVE SUMMARY

The Nayadic, Inc. Model M-6A was tested under the provisions of ANSI/NSF Standard 40 for Individual Aerobic Wastewater Treatment Plants (1990), which was developed by the NSF Joint Committee on Wastewater Technology. The performance evaluation was conducted at the NSF Wastewater Technology Test Facility in Chelsea, Michigan, using wastewater diverted from the Chelsea municipal wastewater collection system. The evaluation consisted of six months of testing, during which a seven week stress test was conducted. The evaluation consisted of three weeks of dosing without sampling to allow for plant start-up, sixteen weeks of dosing at design flow, seven weeks of stress test and five weeks of dosing at design flow. Sampling started in the fall and continued through the winter and into spring, covering a full range of operating temperatures.

Section H. (3), in Appendix A of Standard 40, provides for exclusion of up to ten percent of effluent sample days, not to exceed one during stress testing, in completing the pass/fail determination. Other than samples collected for information only, no sample days were excluded in the pass/fail determination for this evaluation. The average effluent BOD5 was 6 mg/L during the evaluation, ranging between <5 and 14 mg/L, and the average effluent suspended solids was 7 mg/L, ranging between <5 and 22 mg/L. The Model M-6A produced an effluent that successfully met the performance requirements established by NSF Standard 40 for Class I effluent:

The maximum arithmetic mean of seven consecutive sample days was 9 mg/L for BOD5 and 12 mg/L for suspended solids, both well below the allowed maximum of 45 mg/L. The maximum arithmetic mean of 30 consecutive sample days was 8 mg/L for BOD5 and 8 mg/L for suspended solids, both well below the allowed maximum of 30 mg/L. Removal rates ranged from 95 to 97 percent for BOD5 and 96 to 98 percent for suspended solids, consistently above the requirement of 85 percent. The effluent pH during the entire evaluation ranged between 7.3 and 7.9, within the required range of 6.0 to 9.0. The plant also met the requirements for noise levels (less than 60 dbA at a distance of 20 feet) and color, threshold odor, oily film and foam.

### SUMMARY OF ANALYTICAL RESULTS

<table>
<thead>
<tr>
<th></th>
<th>Average</th>
<th>Std.Dev.</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Median</th>
<th>Interquartile Range</th>
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</thead>
<tbody>
<tr>
<td><strong>BOD5 (mg/L)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Influent</td>
<td>150</td>
<td>30</td>
<td>66</td>
<td>220</td>
<td>150</td>
<td>130-170</td>
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<tr>
<td>Effluent</td>
<td>6</td>
<td>2</td>
<td>&lt;5</td>
<td>14</td>
<td>6</td>
<td>5-7</td>
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<tr>
<td><strong>Suspended Solids (mg/L)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influent</td>
<td>194</td>
<td>66</td>
<td>52</td>
<td>480</td>
<td>180</td>
<td>150-220</td>
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<tr>
<td>Aeration Chamber</td>
<td>7,900</td>
<td>2,040</td>
<td>260</td>
<td>11,000</td>
<td>8,200</td>
<td>6,500-9,400</td>
</tr>
<tr>
<td>Effluent</td>
<td>7</td>
<td>3</td>
<td>&lt;5</td>
<td>22</td>
<td>6</td>
<td>5-8</td>
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<tr>
<td><strong>Volatile Suspended Solids (mg/L)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Influent</td>
<td>160</td>
<td>46</td>
<td>58</td>
<td>390</td>
<td>150</td>
<td>130-180</td>
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<td>Aeration Chamber</td>
<td>5,800</td>
<td>1,560</td>
<td>200</td>
<td>9,500</td>
<td>6,100</td>
<td>4,600-9,400</td>
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<tr>
<td>Effluent</td>
<td>6</td>
<td>2</td>
<td>&lt;5</td>
<td>18</td>
<td>5</td>
<td>5-6</td>
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<td><strong>pH</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influent</td>
<td>-</td>
<td>-</td>
<td>7.0</td>
<td>7.8</td>
<td>7.4</td>
<td>7.5-7.6</td>
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<td>Aeration Chamber</td>
<td>-</td>
<td>-</td>
<td>7.0</td>
<td>8.0</td>
<td>7.4</td>
<td>7.4-7.5</td>
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<tr>
<td>Effluent</td>
<td>-</td>
<td>-</td>
<td>7.3</td>
<td>7.9</td>
<td>7.6</td>
<td>7.5-7.6</td>
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<td><strong>Dissolved Oxygen (mg/L)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aeration Chamber</td>
<td>1.3</td>
<td>1.8</td>
<td>0.1</td>
<td>7.6</td>
<td>0.4</td>
<td>0.1-1.5</td>
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<tr>
<td>Effluent</td>
<td>3.9</td>
<td>1.2</td>
<td>0.8</td>
<td>6.3</td>
<td>4.2</td>
<td>3.5-4.7</td>
</tr>
</tbody>
</table>
## NAYADIC INC.
Aerobic Sewage Treatment Systems
General Specifications

### MODEL M-6A

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>Combination contact stabilization and extended aeration</td>
</tr>
<tr>
<td>Capacity</td>
<td>Holding – 600 gallons&lt;br&gt;Treated – 500 gallons</td>
</tr>
<tr>
<td>Organic Capacity</td>
<td>.5 to 1.5 # BOD/Day</td>
</tr>
<tr>
<td>Efficiency</td>
<td>95% + Reduction (BOD, TSS)</td>
</tr>
<tr>
<td>Aeration Rates</td>
<td>3000 cf./lb. BOD/Day @ 3 psig</td>
</tr>
<tr>
<td>Weir Overflow Rate</td>
<td>31.8 Gallons / foot / Day</td>
</tr>
<tr>
<td>Compressor</td>
<td>¼ HP, 1725 rpm, 60 cycle, 115V Rated</td>
</tr>
<tr>
<td>Air Line</td>
<td>½” PVC Sch. 40</td>
</tr>
<tr>
<td>Diffusion</td>
<td>Diffuser: disc plate body w/ snap-on&lt;br&gt;Check diaphragm</td>
</tr>
<tr>
<td>Warning Device</td>
<td>Visual / Audio-Visual</td>
</tr>
<tr>
<td>Treatment Tank</td>
<td>Fiberglass Construction</td>
</tr>
<tr>
<td>Height</td>
<td>73 ½” w/o Cover&lt;br&gt;93 ½” with Cover &amp; Lid</td>
</tr>
<tr>
<td>Diameter</td>
<td>72”</td>
</tr>
<tr>
<td>Weight</td>
<td>485 lbs.</td>
</tr>
<tr>
<td>Maximum Depth of Installation:</td>
<td>63 ½” Inlet invert to Tank Bottom.</td>
</tr>
<tr>
<td>Inlet and Outlet Pipe Connection:</td>
<td>4” PVC opening</td>
</tr>
<tr>
<td>Material Specifications</td>
<td>Polyester Laminated Glidden 4728 or Equal with over 33% glass content, Owens Corning fiberglass 825-DA-211, Producing cured properties as follows:&lt;br&gt;A) Flexural Strength – 36,350 PSI&lt;br&gt;B) Flexural Modulus – 1.49 x 10^6 PSI&lt;br&gt;C) Tensile Strength 16,210 PSI&lt;br&gt;D) Heat Distortion temp – 183°F</td>
</tr>
</tbody>
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# NAYADIC INC.
Aerobic Sewage Treatment Systems
General Specifications

## MODEL M-8A

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td><strong>Treatment</strong></td>
<td>Combination contact stabilization and extended aeration</td>
</tr>
<tr>
<td><strong>Capacity</strong></td>
<td>Holding – 800 gallons</td>
</tr>
<tr>
<td></td>
<td>Treated – 600 gallons</td>
</tr>
<tr>
<td><strong>Organic Capacity</strong></td>
<td>1 to 2 # BOD/Day</td>
</tr>
<tr>
<td><strong>Efficiency</strong></td>
<td>95% + Reduction (BOD, TSS)</td>
</tr>
<tr>
<td><strong>Aeration Rates</strong></td>
<td>2950 cf./lb. BOD/Day @ 3 psig</td>
</tr>
<tr>
<td><strong>Weir Overflow Rate</strong></td>
<td>32.8 Gallons / foot / Day</td>
</tr>
<tr>
<td><strong>Compressor</strong></td>
<td>1/3 HP, 1725 rpm, 60 cycle, 115V Rated</td>
</tr>
<tr>
<td><strong>Air Line</strong></td>
<td>½” PVC Sch. 40</td>
</tr>
<tr>
<td><strong>Diffusion</strong></td>
<td>Diffuser: disc plate body w/ snap-on Check diaphragm</td>
</tr>
<tr>
<td><strong>Warning Device</strong></td>
<td>Visual / Audio-Visual</td>
</tr>
<tr>
<td><strong>Treatment Tank</strong></td>
<td>Fiberglass Construction</td>
</tr>
<tr>
<td><strong>Height</strong></td>
<td>79 ½” w/o Cover 103” with Cover &amp; Lid</td>
</tr>
<tr>
<td><strong>Diameter</strong></td>
<td>81 ½”</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>625 lbs.</td>
</tr>
<tr>
<td><strong>Maximum Depth of Installation:</strong></td>
<td>70 ½” Inlet invert to Tank Bottom.</td>
</tr>
<tr>
<td><strong>Inlet and Outlet Pipe Connection:</strong></td>
<td>4” PVC opening</td>
</tr>
<tr>
<td><strong>Material Specifications:</strong></td>
<td>Polyester Laminated Glidden 4728 or Equal with over 33% glass content, Owens Corning fiberglass 825-DA-211, Producing cured properties as follows: A) Flexural Strength – 36,350 PSI B) Flexural Modulus – 1.49 x 10^6 PSI C) Tensile Strength 16,210 PSI D) Heat Distortion temp – 183°F</td>
</tr>
</tbody>
</table>
NAYADIC INC.
Aerobic Sewage Treatment Systems
General Specifications

MODEL M-1050A

Treatment
Combination contact stabilization and extended aeration

Capacity
Holding – 1050 gallons
Treated – 800 gallons

Organic Capacity
1.7 to 2.4 # BOD/Day

Efficiency
95% + Reduction (BOD, TSS)

Aeration Rates
2900 cf./lb. BOD/Day @ 3 psig

Weir Overflow Rate
41.9 Gallons / foot / Day

Compressor
1/3 HP, 1725 rpm, 60 cycle, 115V Rated

Air Line
½” PVC Sch. 40

Diffusion
Diffuser: disc plate body w/ snap-on
Check diaphragm

Warning Device
Visual / Audio-Visual

Treatment Tank
Fiberglass Construction

Height
88” w/o Cover  112 ½” with Cover & Lid

Diameter
80 ½”

Weight
760 lbs.

Maximum Depth of Installation:
78 ½” Inlet invert to Tank Bottom.

Inlet and Outlet Pipe Connection:
4” PVC opening

Material Specifications:
Polyester Laminated Glidden 4728 or Equal with over 33% glass content, Owens Corning fiberglass 825-DA-211, Producing cured properties as follows:
A) Flexural Strength – 36,350 PSI
B) Flexural Modulus – 1.49 x 10^6 PSI
C) Tensile Strength 16,210 PSI
D) Heat Distortion temp – 183°F
## NAYADIC INC.
### Aerobic Sewage Treatment Systems
### General Specifications

### MODEL M-1200A

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Treatment</strong></td>
<td>Combination contact stabilization and extended aeration</td>
</tr>
</tbody>
</table>
| **Capacity**         | Holding – 1200 gallons  
                        | Treated – 1000 gallons                                                |
| **Organic Capacity** | 1.7 to 2.5 # BOD/Day                                                  |
| **Efficiency**       | 95% + Reduction (BOD, TSS)                                            |
| **Aeration Rates**   | 2300 cf./lb. BOD/Day                                                  |
| **Weir Overflow Rate**| 45.4 Gallons / foot / Day                                          |
| **Compressor**       | 1/3 HP, 1725 rpm, 60 cycle, 115V Rated                                |
| **Air Line**         | ¾” PVC Sch. 40                                                        |
| **Diffusion**        | Diffuser: disc plate body w/ snap-on  
                        | Check diaphragm                                                       |
| **Warning Device**   | Visual / Audio-Visual                                                 |
| **Treatment Tank**   | Fiberglass Construction                                               |
| **Height**           | 96 1/2” w/o Cover  
                        | 126 1/2” with Cover & Lid                                            |
| **Diameter**         | 94”                                                                   |
| **Weight**           | 950 lbs.                                                              |
| **Maximum Depth of** | 89” Inlet invert to Tank Bottom.                                      |
| **Installation:**    |                                                                       |
| **Inlet and Outlet** | 4” PVC opening                                                       |
| **Pipe Connection:** |                                                                       |

### Material Specifications:
Polyester Laminated Glidden 4728 or Equal with over 33% glass content, Owens Corning fiberglass 825-DA-211, Producing cured properties as follows:

- **A)** Flexural Strength – 36,350 PSI
- **B)** Flexural Modulus – 1.49 x 10⁶ PSI
- **C)** Tensile Strength 16,210 PSI
- **D)** Heat Distortion temp – 183°F
## NAYADIC INC.
Aerobic Sewage Treatment Systems
General Specifications

**MODEL M-2000A**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>Combination contact stabilization and extended aeration</td>
</tr>
</tbody>
</table>
| Capacity                             | Holding – 2000 gallons  
Treated – 1500 gallons                                                       |
| Organic Capacity                     | 2.4 to 4.25 # BOD/Day                                                   |
| Efficiency                           | 95% + Reduction (BOD, TSS)                                              |
| Aeration Rates                       | 2710 cf./lb. BOD/Day                                                    |
| Weir Overflow Rate                   | 50 Gallons / foot / Day                                                 |
| Compressor                           | 1/2 HP, 1725 rpm, 60 cycle, 115V Rated                                  |
| Air Line                             | 1” PVC Sch. 40                                                          |
| Diffusion                            | Diffuser: disc plate body w/ snap-on  
Check diaphragm                                                              |
| Warning Device                       | Visual / Audio-Visual                                                   |
| Treatment Tank Height                | Fiberglass Construction                                                |
| Height                               | 102 1/2” w/o Cover  
133” with Cover & Lid                                                    |
| Diameter                             | 124” x  98”                                                            |
| Weight                               | 1180 lbs.                                                               |
| Maximum Depth of Installation:       | 96 ½” Inlet invert to Tank Bottom.                                      |
| Inlet and Outlet Pipe Connection:    | 4” PVC opening                                                          |
| Material Specifications:             | Polyester Laminated Glidden 4728 or Equal with over 33% glass content, Owens Corning fiberglass 825-DA-211, Producing cured properties as follows:  
A) Flexural Strength – 36,350 PSI  
B) Flexural Modulus – 1.49 x 10⁶ PSI  
C) Tensile Strength 16,210 PSI  
D) Heat Distortion temp – 183°F |
NAYADIC
M - 8A
1/8"-1/4" BLACK-IRON BUSHING-N6010
3/8" NIPPLE-N6005
1/2"-3/8" PVC-BUSHING N5012
1/2" SCH. 40 COUPLING-N5001
PRESSURE SWITCH-A6502
AIR INTAKE FILTER-N6513
3/8" x 1/2" BLACK-IRON TEE-N6006
3/8" NIPPLE-N6005
REDUCING 90o BLACK-IRON ELBOW-N6004
AIR LINE
INNER TANK
RECIRCULATION PIPE
OVERFLOW WEIR
SCUM BAFFLE
OUTER TANK
DIFFUSER
PLAN
ELEVATION
67" I.D.
73" I.D.
73" I.D.
68"
18.568"
4"
30" I.D.
7"
12"
73"
NAYADIC TANK COMPONENTS

Fig. 1.1

TYPICAL INSTALLATION
(Cross Section)

Fig. 1.2
Unless otherwise noted, the instructions within this manual may be used for all models (M6-A, M8-A, M1050-A, M1200-A and M2000-A) of the **NAYADIC** Waste Treatment plant.

*The installation must comply with all state and local regulations.*

**SECTION 1.0 SITE PREPARATION**

**1.10 LOCATION**

1.11 The site plan should show the desired location of the waste treatment plant and the location of the effluent disposal system. **CAUTION:** Check to make sure the site plan accurately reflects the conditions actually existing at the site and that all required set-backs (i.e., to wells, property lines, etc.) are being met.

**1.20 GRADE AND GROUND COUNTOUR**

1.21 Position the waste treatment plant so that surface water and effluent will drain to a lower grade under all known conditions.

**1.30 COVER EXPOSURE**

1.31 The access cover must be exposed at all times to permit the system to function properly and to allow for routine maintenance. There should be a minimum of (2) two inches between the bottom of the lid and the finished grade (refer to Fig. 1.2A and 1.2B).

**1.40 BUILDING SEWER LINE**

1.41 Carefully check all elevations to insure that the building sewer will have the proper fall (slope) to meet the inlet of the **NAYADIC** and maintain the grade requirements to insure proper exposure of the cover. The elevation of the outlet should also be checked to insure proper elevation of the effluent disposal system.

**1.50 EXCAVATION PREPARATION**

1.51 Clear an area at least two (2) feet larger than the dimensions of the **NAYADIC** system which is to be installed.
1.60 EXCAVATION (Refer to Fig. 1.3)

1.61 Determine the required depth of the excavation based upon the elevation of the invert of the inlet sewer line (B) or the elevation of the finished grade (D). These dimensions are given for each model in Figure 1.3. **NOTE:** If the distance from the finish grade elevation to the bottom of the excavation exceeds the dimension (D) shown in Figure 1.3, a riser will be required (refer to Section 2.40).

1.62 Excavate a hole approximately two (2) feet wider than the diameter (A) of the plant as specified in Fig. 1.3. The hole should be dug to the depth where the side of the tank begins to taper (E). **NOTE:** If a riser will be required (refer to Section 1.61.), then the hole should be dug to the additional depth to allow for the riser.

1.63 To complete the excavation, dig a single trench, approximately 3’ wide in the center of the excavation. The trench should be dug to the depth at which the bottom of the tank will rest as indicated in column D of Fig. 1.3. To allow for the tapered sides, the trench should be gradually widened from approximately 3’ at the bottom to a width equal to the diameter (A) of the tank (refer to Fig. 2.1).

1.64 Care should be taken to not dig too large (or too deep) of a hole. If the hole is dug too deep, fill in the bottom of the excavation with a minimum of 6” of sand, pea gravel or crushed stone to the required bottom depth. This material should be well compacted to prevent settling of the tank when it is filled with water.

**NAYADIC TANK DIMENSIONS**

![Fig. 1.3](image-url)

<table>
<thead>
<tr>
<th>MODEL NUMBERS</th>
<th>DIMENSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>M6-A</td>
<td>73</td>
</tr>
<tr>
<td>M8-A</td>
<td>82</td>
</tr>
<tr>
<td>M1050-A</td>
<td>82</td>
</tr>
<tr>
<td>M1200-A</td>
<td>94</td>
</tr>
<tr>
<td>M2000-A</td>
<td>124</td>
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<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Legend:**

- **A** = Outside Diameter
- **B** = Inlet Invert from Bottom of Excavation
- **C** = Outlet Invert from Bottom of Excavation
- **D** = Final Grade from Bottom of Excavation
- **E** = Final Grade to Beginning of Taper
SECTION 2.0 INSTALLATION OF THE TANK

2.10 SETTING THE TREATMENT PLANT (Refer to Fig. 2.1)

2.11 Rig the basin to lift by tying a rope around the inlet coupling and the outlet pipe. CAUTION: The model M2000-A is supplied with 4 lifting hooks which should be used to attach the rope.

2.12 Slowly lower the NAYADIC basin (bottom section of tank) into the hole until the bottom is resting on undisturbed soil or appropriate bedding material. Make sure the inlet pipe is aligned with the building sewer.

2.13 Before filling with water or backfilling around tank, carefully re-check elevations and grades of inlet, outlet and building sewer. If elevations are not correct, remove tank and dig out additional material or add necessary amount of bedding material (refer to Section 1.64).

2.14 When the tank basin is properly set in the hole, begin filling the tank with water. Once there is approximately 3’ of water in the tank, place the cover over the basin to prevent the accidental spillage of dirt into the tank and then backfill around the basin to a depth of 3’, using selected fill or sand. It is important that the fill material be compacted evenly around the basin to prevent uneven settling after the backfilling is completed. With sandy fill materials, it is advisable to “water in” the fill as it is placed in the excavation.

BACKFILLING PROCEDURES

Fig. 2.1
2.15 When the fill material reaches a depth of approximately 1' below the top of the tapered part of the basin, discontinue backfilling and level the tank (refer to Section 2.20).

2.20 LEVELING THE WASTE TREATMENT PLANT

**CAUTION:** The plant must be level to insure proper aeration and clarification.

2.21 Remove the cover and plug the 4” outlet pipe.

2.22 Fill the effluent trough with water until it flows over the top of the effluent weir.

2.23 Level the tank until the surface of the water in the trough is even with the effluent (outer) weir around the entire circumference of the tank.

2.24 **(Alternate leveling method)** Place a long (4’ or greater) level across the top flange of the outer tank (basin). Check this at several locations and adjust the tank until it is level.

2.30 BACKFILLING THE TANK

2.31 Once the basin has been leveled, replace the cover and carefully continue backfilling with selected fill or sand until the lower (tapered) portion of the tank is backfilled. Making certain the tank is level, continue to backfill up to the outlet pipe (refer to Fig. 2.1).

2.32 Glue and firmly insert the inlet and outlet sewer pipes (4” Sch. 40 PVC) into their respective fittings. **CAUTION:** To prevent any damage to the inlet or outlet pipes due to settling or backfilling, make sure that both the inlet and outlet pipes are set on undisturbed or firmly-packed fill material prior to final backfilling procedures.

2.33 Remove the cover and install diffuser and air supply line (see Section 3.0).

2.34 Place cover on top of unit. In order to prevent the infiltration of ground water, silt, sand, etc. into the *Nayadic* effluent line, it may be advisable to seal the cover to the basin using silicone caulk or tar tape. If this is done in an area with a high water table or where the system may be subject to flooding, the tank should be anchored (refer to Item 2.50). **Note:** Before cover is replaced, check to insure that the basin is still level and that any accumulations of mud, sand, gravel, etc., are flushed away and pumped out. Accumulations of mud or gravel with tank bottom will prevent proper operation of the draft tube.

2.35 Finish backfilling to a level approximately 2” below the access lid (refer to Fig. 2.1). When landscaping is completed, the access lid should be at least 2” above the finished grade level.

2.36 Finish filling the tank with water until the water begins overflowing the effluent weir.
2.40 (OPTION) INSTALLING A RISER (LID EXTENSION)

2.41 It is necessary for the access lid to be above grade to allow for routine maintenance and to prevent the entry of surface water. For deep installations, Nayadic provides risers (6", 12" and 24") to bring the lid to grade. DO NOT INSTALL SYSTEM WITH GREATER THAN 24 INCHES OF BACKFILL.

2.42 To install the riser, remove the access lid from the cover.

2.43 Carefully remove the 2 stainless steel backplates from inside of cover.

2.44 Place riser over the 30" access opening of the cover. Slide the riser down as far as it will go.

2.45 Apply a strip of \( \frac{1}{2} \)" tar tape or silicone sealant under the bottom flange of the riser. Check to make sure that the tar tape has properly sealed the bottom of the flange to the top of the Nayadic cover. Apply a second strip of \( \frac{1}{2} \)" tar tape or silicone on the inside of the riser as shown in Fig. 2.2.

**Fig. 2.2**

![Riser Installation Diagram]

2.46 Place the lid on top of the riser. Using the holes in the lid as a guide, drill matching holes in the riser.

2.47 Remove the lid. Using stainless steel rivets, re-attach the backplates to the inside of the riser, making sure they align with the 2 drilled holes.

2.48 Replace access lid. Fasten with tamperproof bolts.

2.50 ANCHORING THE NAYADIC TANK

2.51 When installing the Nayadic in areas with a high water table or in flood-prone areas, it may be advisable to anchor the tanks to prevent floatation or shifting. (see Fig. 2.3).

2.52 To anchor the tank, use four (4) \( \frac{3}{8} \)" galvanized steel eye bolts, four (4) 24-30" auger tie-downs, and \( \frac{1}{8} \)" galvanized or stainless steel cable (minimum 500 lb test).
2.53 Level the tank and backfill to approximately 12" below the inlet pipe.

2.54 Place the cover on the basin.

2.55 Drill (4) $\frac{3}{8}$" holes through the outer flanges of both the cover and basin. These holes should be drilled opposite the four inner tank support brackets.

2.56 Place a 1" washer on the eyebolt and insert into the hole previously drilled in the flange so that the "eye" is on the bottom. Place a second 1" washer on the eyebolt (top of flange) and fasten with nut. Do the same for the remaining 3 holes.

2.57 Screw each of the auger tie-downs into the ground below the 4 eyebolts. Care should be taken to insure the anchors are installed in either undisturbed soil or well-compacted backfill.

2.58 Using the stainless steel cable, fasten the four eyebolts to the respective tie-down. (Option: The cable may be fastened to concrete bumper guards which are buried in surrounding soil at a depth of at least 4’ below grade.)

2.59 Finish backfilling around unit.

**PROCEDURE TO ANCHOR NAYADIC**

Fig. 2.3
SECTION 3.0  INSTALLATION OF COMPRESSOR, AIR SUPPLY LINE, AND DIFFUSER

3.10 ASSEMBLING THE COMPRESSOR

3.11 Check the compressor model number to insure the proper compressor is supplied with NAYADIC plant.

3.12 Open carton and remove compressor, base plate (foot support), air filter package and fittings (3/8" nipple, 3/8" x ¼ " reducing elbow, 3/8" x ½" threaded bushing, ½" female adapter, and 3/8” threaded tee with reducing bushing).

3.13 Attach the plate according to directions provided with compressor. Make sure the base plate is properly attached so that the compressor does not tip.

3.14 Remove plug from air intake opening and screw in air filter.

3.15 Remove plug from ¼" nipple (air discharge). Attach ¼" x 3/8" reducing elbow. Screw 3/8" threaded nipple into elbow. Next, screw the 3/8" tee onto the nipple and screw a second 3/8" nipple onto the other end of the tee. **Note:** There is a reducing bushing screwed into the third opening of the tee. This will be for the attachment of the pressure switch. To assure there is no leakage of air, use pipe dope or similar product on all threaded connections.

3.16 If rigid ½" PVC pipe is to be used for the air supply line to the treatment plant (standard), a 3/8" (threaded) x ½" (slip) PVC reducing bushing should be screwed onto the 3/8" nipple. A ½" x ½" Sch. 40 PVC coupling should then be glued onto the bushing in order to attach the ½" PVC pipe for the airline. (Refer to Fig. 3.1A) The compressor is now ready to attach the PVC airline.

**COMPRESSOR/AIRLINE ASSEMBLY**

*Option: PVC Airline*

---

**Fig. 3.1A**

![Diagram of Compressor/Airline Assembly](image)
3.17 (OPTION) If the installer wishes to use ½” plastic tubing instead of PVC pipe, screw a 3/8” x ½” reducing bushing onto the second 3/8” nipple and then attach the ½” PVC barbed fitting. Secure the plastic tubing (airline) with the stainless steel hose clamp. **Note:** The 3/8” x ½” reducing bushing, barbed fitting, as well as the tubing must be ordered separate. (Refer to Fig. 3.1B)

**COMPRESSOR/AIRLINE ASSEMBLY**

*(Option: Plastic Tubing Airline)*

![Diagram of Compressor/Airline Assembly](image)

3.20 ASSEMBLING THE AIR SUPPLY LINE AND DIFFUSER (Refer to Fig. 3.2A & B)

3.21 Remove the air supply line assembly that is taped to the draft tube (inner tank of basin). The assembly includes: a ½” Sch. 40 PVC air line with diffuser plate and a ½” Sch. 40 air line with female union. **All fittings necessary to attach airline from compressor to the airline/diffuser in the NAYADIC are enclosed in a plastic bag shipped with the compressor.** These include:

1. PVC Pipe Fittings (standard): ½” PVC slip coupling and a ½” PVC slip coupling with a short (1 ½”) PVC extension.
2. Black Flexible Tubing (optional, order separate): ½” PVC (threaded) bushing with ½” PVC extension, ½” PVC slip coupling, 3/8” barbed adapter and hose clamp.

3.22 Slide the shorter ½” diameter air tube (with female union) through the ½” hole in the inner tank. (The hole is located above the 4” inlet pipe.)

3.23 Insert the longer ½” air tube (with diffuser) into the 8” draft tube, so that the diffuser is located near the bottom of the tank. The male end of the coupling (top of air tube) should be aligned with the female end on the shorter air tube previously inserted through the inner tank.
3.24 Connect the two ends of the air supply lines and tighten the union as much as possible by hand. NOTE: The diffuser should be located in the center of the bottom portion of the 8" draft tube. Check to insure that the diffuser does not extend below the bottom of the draft tube.

3.25 Glue a ½” coupling to the outer end of the shorter (top) air supply line. Align the coupling with the ½” hole in the wall of the outer tank. Take the second ½” coupling (that has a ¾” piece of ½” pipe already glued in place) and insert the short piece of pipe through the ½” hole in the wall of the outer tank and glue into the coupling attached to the air supply line. **The unit is now ready to attach the ½” PVC airline from the compressor.**

### ASSEMBLY OF AIRLINE/DIFFUSER

*(Option: PVC Airline)*

**Fig. 3.2A**

3.26 *(Option)* If ½” black flexible tubing is to be used for the airline (Refer to Fig. 3.2B) The threaded bushing that has a 1 ½” long piece of pipe already glued in place should be inserted through the hole in the outer tank and glued onto the coupling attached to the air supply line.
3.27 Screw $\frac{3}{8}''$ barbed adapter onto the end of the bushing. *The unit is now ready to attach the black flexible tubing (airline).* Secure tubing with stainless steel hose clamp.

**ASSEMBLY OF AIRLINE/DIFFUSER**

*(Option: Plastic Tubing Airline)*

**Fig. 3.2B**

3.30 LOCATION OF THE COMPRESSOR

3.31 The compressor can be located either inside or outside. If located outside, a protective housing must be provided (see Item 3.33). The compressor can be located on the floor of a garage, utility building or in a crawlspace. *(Avoid locating the compressor in a tight, enclosed area).*

3.32 Do not attach compressor to the walls, framing, or support pilings of buildings.

3.33 *(Outside location)* If mounted outside, a protective housing must be provided to protect the compressor from excessive dirt, dust and direct rainfall. An approved housing can be purchased from *NAYADIC* for this use.
3.34 It is imperative that the compressor be protected from flooding or direct rainfall. If using the **NAYADIC** enclosed housing, it should be located in such a way as to prevent surface water from entering. If the compressor is mounted outside with an approved housing or in a building, it should be located above any possible flood elevations.

3.35 *Make sure the compressor is properly ventilated to prevent overheating.*

*(Option)* Internal Compressor Housing: **NAYADIC** supplies an internal compressor housing that allows the compressor to be mounted inside the **NAYADIC**. Separate directions for the use and installation of this housing are available from the factory. *(Refer to Fig. 3.3)*

**INTERNAL COMPRESSOR HOUSING**

*Fig. 3.3*

3.40 INSTALLING AIR LINE FROM COMPRESSOR (Refer to Fig. 3.1 and 3.2)

3.41 **PVC pipe, ½” Sch 40.** *(Refer to Fig. 3.1A)* If PVC pipe is to be used, it is necessary to insure that all connections and fittings are properly glued to prevent leakage.

3.42 It is important to minimize the number of elbow fittings required to install the airline in order to minimize air loss. To assure proper air supply, no more than four (4) 90° couplings should be used.

3.43 *(Option) Black plastic air line *(Refer to Fig. 3.1B)* If black plastic tubing is to be used for the airline, it must be ordered separate.

3.44 Slide one end of the tubing over the 3/8” barbed fitting on the compressor.

3.45 Unroll the tubing and cut off a length sufficient to reach the **NAYADIC** plant. **CAUTION:** Allow sufficient length to avoid sharp bends or excess strain on the tubing or fittings.
3.46 Slide the loose end of the tubing over the barbed adapter which extends through the outer wall of the NAYADIC. Hose clamps should be used to further secure both ends of the tubing.

3.47 IMPORTANT:
- The compressor should be located no further than 60’ from the NAYADIC plant. An internal compressor housing should be used if the compressor will be more than 60’ away.
- The airline (black plastic tubing or PVC pipe) should be installed on a solid base, either fastened to the inlet sewer or laid on undisturbed earth. Backfill carefully to avoid damaging the air supply line.

SECTION 4.0 ELECTRICAL SPECIFICATIONS FOR THE M6-A, M8-A, M1050-A, M1200-A and M2000-A INCLUDING ALARM AND COMPRESSOR INSTALLATION DIRECTIONS

4.10 GENERAL INFORMATION

4.11 The electrical power requirements are 120 volt, 60 Hz, 1 phase (unless otherwise specified).

4.12 Provide a two wire with ground approved underground cable sized for the specific compressor model to be used and the length of cable from the power source.

4.13 Provide a minimum 15-amp circuit breaker at the main power source.

4.14 Study the wiring diagram (Fig. 4.1) which is also provided with each alarm (inside of alarm box).

WIRING DIAGRAM: STANDARD ALARM

Fig. 4.1
4.15 CONTENTS OF ALARM SYSTEM:
1 – standard Nayadic alarm
1 – high level float (to sense high water condition)
1 – pressure switch (to sense electrical/mechanical failure)
1 – float clamp assembly
1 – flat cable connector (for cable thru tank)
1 – nylon locknut (for flat cable connector)
4 – wire nuts (2 orange for alarm, 2 yellow for pressure switch)

Note: Outdoor alarm contains 4 orange wire nuts for alarm and 2 yellow wire nuts for pressure switch for power cord connection.

2 – blue wire nuts (waterproof for float)
2 – jumper wires (connected to pressure switch)
1 – metal strain relief and metal locknut (for indoor alarm)
2 – plastic conduit adapters and metal locknuts (for outdoor alarm)

4.20 FLOAT ASSEMBLY (Fig. 4.2)

4.21 Install the flat cable connector through the pre-drilled hole next to the airline hole. After setting the outer tank in the excavation and leveling the tank, insert 3 feet of the flat U.F. underground cable through the cable connector. Tighten the cable connector. Provide sufficient U.F. cable to extend to the compressor.

4.22 Install the float with clamp on airline. Note: The float clamp is to the topside of the airline and away from the inlet pipe.

4.23 Connect the wire of the float to the incoming wire from the alarm system using the blue wire nuts. First strip wire ½” and align frayed strand or conductors. PRE-TWISTING UNNECESSARY. Place stripped wires together with ends even. Twist connector onto wires pushing firmly until tight. DO NOT OVER TORQUE. Since this connection if made within the tank, you will need to provide a sufficient length of electrical cable to allow for the connections to be made near the access cover.

FLOAT ASSEMBLY

Fig. 4.2
4.30 PRESSURE SWITCH ASSEMBLY (Fig. 4.3)

4.31 Thread the pressure switch into the reducing bushing in the tee located on the compressor discharge line (Refer to item 3.15). DO NOT OVERTIGHTEN for that could strip out the fitting from the pressure switch body. Use a wrench to secure the pressure switch into the tee. The pressure switch should be on an angle so that the pressure switch DOES NOT SIT ON THE COMPRESSOR.

4.32 Bring together the three (3) sets of black and white wires from the float, alarm and pressure switch. Using the yellow wire nuts, connect all three white wires and all three black wires.

4.33 Secure the wires from the alarm and float to the airline with the two wire ties.

Fig. 4.3

PRESSURE SWITCH ASSEMBLY

4.40 ALARM ASSEMBLY (Fig. 4.1)

4.41 Remove alarm from packing box. Remove faceplate by unscrewing 4 screws in corners of the faceplate. Turn the faceplate over in order to have access to the wiring components.

4.42 Indoor Alarm (standard): Using the metal locknut fasten the metal strain relief to the opening for the wire from the float and pressure switch. Fasten the two white wires together and the two black wires together with the yellow wire nuts. **Note:** The indoor alarm is provided with a power cord to plug into any 115V outlet.
4.43 Outdoor Alarm (optional): Using the metal locknuts, fasten the two conduit adapters to the alarm box openings. Using conduit (as required by local electrical codes) bring the wires from the pressure switch, float and the 115V power source into the alarm box. Using the yellow wire nuts, connect the two wires from the float switch to the two wires marked “to float and pressure switch” (white to white, black to black); and the three wires from the 115V power source to the three wires from the alarm marked “115V in” (white to white, black to black, green to green /ground).

4.44 Mount the alarm box in a visible location. **CAUTION:** Do not connect the power source to the compressor and alarm until all electrical connections have been completed.

4.45 Carefully replace the faceplate onto the alarm, pulling the excess cable through the metal strain relief. Leave sufficient slack to allow for future removal or service.

4.46 Replace the four faceplate screws.

4.47 Tighten the metal strain relief (on indoor alarm).

4.48 Push “TEST” button to check if the alarm is activated. **Hold for at least 15 seconds.** Reset alarm before leaving.

4.49 The wiring of the **NAYADIC** plant is now complete. **Be sure to place the service sticker of the appropriate service representative on the bottom of the alarm faceplate.**

**SECTION 5.0 START-UP PROCEDURES**

5.10 CHECKING COMPRESSOR AND AIR LINE

5.11 Once the compressor and alarm control have been installed and all electrical work is completed, power should be supplied to the compressor.

5.12 Check the compressor to insure proper operation. If the motor is humming, but the rotor assembly is not moving or is moving slowly, immediately disconnect the power source. **Refer to Item IA of the Trouble Shooting Checklist for corrective action.**

5.13 If the motor runs but provides insufficient air pressure check the internal filters to insure they are properly tightened. Make sure “o” rings are properly sealed.

5.14 Check the **NAYADIC** aeration chamber to insure proper aeration (turbulence) is occurring. If sufficient turbulence is not observed, check union on airline to insure it is properly tightened.
5.15 If no turbulence is observed in the aeration chamber, remove the lower air supply line (with diffuser) by unscrewing the union on the air supply line. If no air is observed coming from the air supply line when the compressor is running, check the air line between the compressor and the **NAYADIC** (including all connections and fittings) to check for leaks or damaged air line. Replace or repair as necessary.

5.20 CHECKING THE ALARM

5.21 With power being supplied to the compressor and alarm, press the “test” button to activate the alarm.

5.22 If the alarm is not activated when the test button is pressed, refer to section II of the Trouble Shooting guide for the proper corrective action to be taken.

5.30 PLANT START-UP

5.31 Once the compressor and alarm have been checked and are operational, the plant is ready to receive sewage flows.

5.32 Normally, it is not necessary to add any chemicals or enzymes to facilitate plant start-up. It is helpful, however, to restrict the discharge of excessive amounts of gray water from showers and laundry during the initial 6-8 weeks of use.

5.33 If the **NAYADIC** system exhibits a gray dishwater appearance in the aeration chamber or has a noticeable odor, contact the factory or the local authorized representative for the proper procedure to follow to attain normal operation.

SECTION 6.0 USE OF A PRE-TANK

The **NAYADIC** has been designed and listed (certified to function without the use of a pre-treatment tank. However, installation of a pre-treatment tank, if used to address local requirements or to reduce maintenance problems, will not adversely affect plant performance if properly sized and installed.

6.10 If a pre-treatment tank is installed, the liquid capacity of the pre-tank should be between 50 - 100% of the treatment capacity of the **NAYADIC**. Slightly larger tanks can be used with the M6-A and M8-A.
6.11 The use of a pre-tank may cause septic odors to escape from the **NAYADIC** during periods of heavy water usage (i.e., laundry). In these cases, a 4” Sch. 40 elbow can be installed on the inlet pipe to the **NAYADIC**. A 12” piece of pipe should be added to extend below the surface of the water. (Refer to Fig. 6.1)

**NAYADIC INLET DEVICE WHEN INSTALLED AFTER A PRE-TANK**

Fig. 6.1
OWNER’S MANUAL

MODEL NUMBERS
M-6-A
M-8-A
M-1050-A
M-1200-A
M-2000-A

Consolidated Treatment Systems, Inc.
1501 Commerce Center Drive
Franklin, OH 45005
Tel: 937-746-2727
Fax: 937-746-1446
www.nayadic.com
THE NAYADIC ONSITE WASTEWATER TREATMENT SYSTEM

CONGRATULATIONS! You are the owner of a complete wastewater treatment system that combines aeration and solids separation in one compact unit. Your system is tested and certified under NSF, International, ANSI/NSF Standard 40, as a Class I system. The Nayadic system meets the needs for onsite wastewater treatment beyond the capabilities of septic tanks. Like all onsite wastewater treatment alternatives, your Nayadic unit must be operated and maintained in accordance with the Manufacturer’s requirements and service provider’s instructions. When properly operated and maintained, your unit will produce an effluent that meets all certification requirements.

HOW DOES THE NAYADIC OPERATE?

One of the features of the Nayadic is that the entire treatment process takes place within a single tank. Wastewater flows into the tank. A compressor blows air to a diffuser that disperses the air. This process transfers oxygen throughout the system. The oxygen, which is dissolved in the water, provides an environment conducive to the growth of aerobic bacteria. These bacteria effectively consume the organic materials.

Unlike other products, Nayadic incorporates a 360° weir that encompasses the circumference of the tank. The result is efficient gravity separation of solids from the effluent.

IMPORTANT ITEMS TO REMEMBER

Nayadic units have an initial break-in period of four-to-six weeks, during which time bacteria establish themselves in the unit. The development of these biological colonies occur naturally with the addition of sanitary wastes, so we recommend you use all your plumbing facilities in a normal manner from initial start-up. You may notice a tendency for the unit to foam from laundry wastes during this period. This is normal, and it should cease by the sixth week. You can help by using moderate amounts of low-sudsing biodegradable detergents. Break-in can be accelerated by “seeding,” which is a process by which microbial growth is introduced from another Nayadic unit.

Nayadic units are designed to treat typical domestic wastewater. Flows from and materials in garage catch basins, storm water drains, sumps, and the like will adversely affect Nayadic operation. Excessive amounts of cleaners, solvents, paints, greases, etc., will lead to a failure and service calls.

Following these simple rules will decrease or eliminate maintenance problems and prolong the life and efficiency of your unit.

- Obtain and maintain a service agreement with an authorized Nayadic service provider.
- Check that your unit’s access lid is securely tightened down.
- Check the alarm by pressing the button to activate the light and buzzer on the audio-visual alarm.
Keep the surface water from ponding around the unit.

Call your service provider at the first sign of trouble.

Follow your service provider’s advice. He/she is trained to ensure that your unit operates at its maximum efficiency.

Use low-sudsing, low phosphate biodegradable detergents.

Contact your service provider if the system is to be used intermittently or if extended periods of non-use is anticipated.

Keep un-disposable items out of your system. These items include, but are not limited to: wet strength paper towels, disposable baby diapers, sanitary napkins, rubber and plastic products, rags, grit, and coffee grounds.

Avoid placing grease into your system. Excessive grease may impede normal operation.

Do not pour solvents, paints, etc., into your system. These substances will harm the bacteria.

Always keep your compressor running unless instructed otherwise by your service provider.

Do not service the unit yourself. Contact your service provider to maintain your Nayadic unit.

ALARM SYSTEM and ALARM CONDITION

Every Nayadic unit comes equipped with an audio-visual alarm system. This alarm should be mounted in a conspicuous location. If an abnormal condition develops, you will be notified by a light and buzzer. Silence the buzzer by pressing the “silence” button on the alarm. If the light should stay on, call your service provider.

Check your audio-visual alarm periodically by holding the “test” button for approximately 10-to-12 seconds or until the light flashes and the buzzer sounds. Contact your service provider if your “test” button fails to activate the alarm.

If your alarm goes off, there are several steps you can take to determine the possible nature of the malfunction.

1. Is the alarm activated during a non-flow period, i.e., late at night, early morning? If so, the probable cause is the compressor.

2. Is the alarm activated intermittently while washing clothes or taking a shower? If so, high water may exist in the system.
MAINTENANCE PROGRAM

YOUR NAYADIC UNIT REQUIRES PERIODIC SERVICING.

Maintenance of your Nayadic is essential to ensure its proper operation and longevity.

During your initial two-year warranty, an authorized service representative will inspect your unit at six-month intervals and make any necessary adjustments to it at no cost to you. The only exception is for the replacement of “out of warranty” and “physically abused” parts or abuse to the treatment process. Moreover, this warranty will not cover other treatment and dispersal components and devices.

For continued service, your service provider will offer an annual service contract at the end of the warranty. Please contact your service provider for details.

In the event a problem arises or service is required, refer to the unit’s data plate (located on the alarm and access lid) or the service label for instructions on contacting your closest service provider. Occasional pumping is required due to accumulation of solids. The pumping cost may not be covered under your maintenance and service program. If you need parts or service, please contact the factory for the name of the service provider nearest you.

Your Nayadic system is designed and intended to treat typical domestic wastewater (i.e., human bodily waste and liquid waste generated by the occupants of dwellings). To insure optimum performance and longevity, do not discharge any type of non-residential wastewater or other high-strength waste, including commercial food service waste, without contacting the manufacturer to determine if this will be acceptable without additional treatment.

IMPORTANT: Nayadic units must be installed and maintained in compliance with all state and local laws and regulations. This includes compliance with all regulations concerning proper effluent disposal and the pumping and disposal of solids and byproducts pumped from the unit.

NAYADIC WARRANTY DOES NOT COVER THE COST OF SERVICE CALLS, LABOR, OR MATERIALS REQUIRED DUE TO THE FOLLOWING:

1. Misuse, abuse, or any repair or alteration performed by anyone other than authorized Nayadic service provider.
2. Use of components other than authorized Nayadic replacement components.
3. Non-wastewater flows caused by infiltration, storm water connections, leakage from improperly maintained plumbing fixtures, water softener backwash, etc.
4. Failure to maintain electrical power to the treatment system in accordance with the requirements of the Manufacturer or the authorized Nayadic service provider.
5. Disposal into the Nayadic of non-biodegradable materials (i.e., plastics, coffee grounds, etc.) chemicals, solvents, grease, oil, paint, or any other substance, including but not limited to medicines, metals, toxins, volatile substances, and the like that are deleterious to the development and maintenance of the biological treatment process.

6. Short-term or daily wastewater flows to the Nayadic that exceeds the unit’s hydraulic or organic design capabilities.

7. Any usage contrary to Nayadic owner’s manual and/or the Nayadic representative’s recommendations.

### NAYADIC MODEL SPECIFICATIONS

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<th>Item</th>
<th>M-6-A</th>
<th>M-8-A</th>
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*From Bottom of Excavation – See Drawings for Details

### NAYADIC WASTEWATER SYSTEM SPECIFICATIONS

Wastewater Treatment Performance (ANSI/NSF Standard 40 Evaluation)

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## NAYADIC COMPONENTS AND SPECIFICATIONS

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WARRANTY

Consolidated Treatment Systems, Inc., warrants the parts in each aerobic treatment unit to be free from defects in material and workmanship for a period of two (2) years from date of installation for treatment of household wastewater when properly registered with the manufacturer. Consolidated Treatment Systems, Inc., sole obligation under this warranty is as follows: Consolidated Treatment Systems, Inc., shall fulfill this warranty by repairing or exchanging any component part, FOB Factory, that shows evidence of defects, provided said component part has been paid for and is returned through an authorized dealer, transportation prepaid. The warrantee must also notify Consolidated Treatment Systems, Inc., of the defect complained of. There is no informal dispute settlement mechanism available under this LIMITED WARRANTY.

No warranty is made as to the field performance of any unit. This LIMITED WARRANTY applies only to the parts manufactured by Consolidated Treatment Systems, Inc., and does not include any portion of the household plumbing, drainage, or installation of disposal system. Components or accessories supplied by Consolidated Treatment Systems, Inc., but manufactured by others, are warranted only to the extent of and by the terms and conditions of the original manufacturer’s warranty. In no event shall Consolidated Treatment Systems, Inc., be responsible for delay or damages of any kind or character resulting from, or caused directly or indirectly by, defective components or materials manufactured by others.

Recommendations for special applications will be based on the best available experience of Consolidated Treatment Systems, Inc., and published industry information. Such recommendations do not constitute a warranty of satisfactory performance.

This LIMITED WARRANTY extends to the consumer of the product. As used herein, “consumer” is defined as the purchaser who first uses the unit or the subsequent user(s) for the 2 years after its initial installation. It is the first user’s or servicing dealer’s obligation to make known to the subsequent user(s) the terms and conditions of this warranty.

This warranty is a LIMITED WARRANTY and no claim of any nature shall be made against Consolidated Treatment Systems, Inc., unless and until the consumer, or his legal representative, notifies Consolidated Treatment Systems, Inc., in writing of the defect complained of and delivers the product and/or defective part(s), freight prepaid, to the factory or an authorized service station.

Consolidated Treatment Systems, Inc., reserves the right to revise, change, or modify the construction and design of the aerobic treatment units for household wastewater, or any component part or parts thereof, without incurring any obligation to make such changes or modifications in equipment previously sold. Consolidated Treatment Systems, Inc., also reserves the right, in making replacements of component parts under this warranty, to furnish a component part which, in its judgment, is equivalent to the part replaced.

UNDER NO CIRCUMSTANCES WILL CONSOLIDATED TREATMENT SYSTEMS, INC., BE RESPONSIBLE TO THE WARRANTEE FOR ANY OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOST PROFITS, LOST INCOME, LABOR CHANGES, DELAYS IN PRODUCTION AND/OR IDLE PRODUCTION, WHICH DAMAGES ARE CAUSED BY A DEFECT IN MATERIAL AND/OR WORKMANSHIP IN ITS PRODUCT OR PARTS. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER EXPRESS OR IMPLIED WARRANTY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS, AND OF ANY OTHER OBLIGATION ON THE PART OF CONSOLIDATED TREATMENT SYSTEMS, INC. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIAL LEGAL RIGHTS AND YOU MAY HAVE OTHER RIGHTS, WHICH VARY FROM STATE TO STATE.
I. BASIC OPERATION AND MAINTENANCE REQUIREMENTS

The following is a description of the normal maintenance required to insure continuous satisfactory operation of the NAYADIC systems:

START UP:
Allow 6-8 weeks for sufficient numbers of bacteria to develop in the NAYADIC in order to provide proper treatment of the wastewater. During this period there may be some sudsing due to laundry wastes. The sudsing can be decreased by reducing the number of loads done at one time and by using a low sudsing detergent. In situations where excessive grey water is expected, it may be necessary to seed the NAYADIC with mixed liquor from another aerobic waste treatment plant. To prevent short-term hydraulic overloads, homeowners should be advised to spread out laundry during this period.

PUMPING EXCESS SOLIDS:
Due to normal accumulation of inorganic solids and dead bacterial cells it is necessary to pump out the excess solids periodically in order to maintain adequate aeration capacity. For a typical single family residence, the NAYADIC will require pumping at 2-4 year intervals. NAYADIC representatives should advise customers when the NAYADIC should be pumped. On heavily used systems or residences with garbage disposals, the provision of a trash trap will reduce pumping frequencies.

COMPRESSOR REPLACEMENT:
The normal life expectancy of the compressor is 3-5 years. For all new installations, there is a two-year warranty on the compressor. For replacement compressors, there is a one-year warranty period. Compressors can also be repaired and/or rebuilt.

ALARM:
The NAYADIC alarm system indicates both loss of air and high water conditions. To prevent unnecessary maintenance costs, the homeowner should contact the service representative as soon as the alarm is activated or unusual odors are noticed.

SERVICE CONTRACT:
The NAYADIC system requires periodic servicing to prevent major operational difficulties. With the purchase of each NAYADIC, the owner receives a two-year service contract that provides warranty on all parts and service, including a minimum of two inspections of the unit each year. After the initial two years of operation, the homeowner is urged to maintain a service contract to insure regular inspection and service of the NAYADIC system.

REPLACEMENT PARTS/SERVICE:
Contact the factory for the name of the closest sales/service representative.

SUMMARY OF RESIDENTIAL MAINTENANCE REQUIREMENTS
Start up period ......................................................... 6-8 weeks after sewage first enters unit
Pumping frequency .................................................. 2-4 years
Compressor replacement......................................... 3-5 years
Routine inspection frequency................................... every 6 months or as required by state/local regulatory authorities

NOTE: Due to differences in raw wastewater strength, increased user abuse and hydraulic surges, additional pre-treatment facilities and/or increased maintenance may be required on non-residential or commercial facilities. Please check with your NAYADIC representative.

II. EQUIPMENT AND MATERIAL ESSENTIAL FOR SERVICING THE NAYADIC SYSTEM

100’ garden hose with spray nozzle
100’ extension cord
1/4 hp submersible pump with outlet made of flex pipe.
Small utility pump with 1/2 - 5/8” garden hose (6’) on inlet and outlet (Teal model IP 579E, Simer Minivac Model M40 or equal.)
Pliers - standard with insulated handles
Pliers - channellock
Caulking gun
Caulking, silicone
Hammer
Electrical tape
Wire nuts
Knife
Screwdriver
Replacement parts:
  - compressor
diffusers
  - compressor repair kit
pressure switches, high level float switch (alarm)
alarm
III. PROCEDURES FOR ROUTINE INSPECTION AND MAINTENANCE

The NAYADIC system requires routine, periodic inspection and maintenance to insure continuous, trouble-free operation. At a minimum, the NAYADIC should be inspected every six (6) months, assuming it is serving a typical single family residence. More frequent inspections may be required if mandated by local or stated regulatory authorities; or, if the NAYADIC is used on a non-residential application.

During the routine inspections, the following items are checked:

COMPRESSOR

1. Check filters for cleanliness. Replace if the filters are dirty or clogged.
2. Check housing and air line fittings for signs of overheating.
3. Check for air leakage at fittings or in air supply line.
4. Check for excessive noise or vibration.
5. Check for moisture or mud accumulations which could indicate possible flooding or direct rainfall on compressor.
6. Check air flow (with gauge), especially if odors or septic conditions are observed. A minimum of 3.0 cfm should be provided on all models except the M2000A.
7. Check carbon vanes for excessive wear. Replace as needed (approx. 2-3 years).

ALARM

1. Check “test” button to insure proper operation.
2. Check alarm function by raising float in tank.
3. Check alarm function by disconnecting airline union in tank.

TREATMENT PLANT AERATION CHAMBER

1. Check for presence of septic odor.
2. Check for color of aeration chamber contents.
3. Check for excessive sudsing or foaming.
4. Check for excessive accumulation of grease balls and non-biodegradable material. Using a wire skimmer basket, remove such material and dispose of it in a proper manner.
5. Check air supply at aeration chamber, especially if odors or septic conditions exist. Air check can be performed by observing amount of turbulence; or, by using an air flow meter. If necessary, check diffuser for clogging.
6. Check aeration chamber solids (MLSS) by collecting a sample of aeration chamber contents while compressor is running. Observe rate of settling, volume of settled solids and clarity of supernatant.

CLARIFICATION CHAMBER

1. Check color and depth of scum layer.
2. Check color and clarity of effluent. An effluent check can be done by running water from a garden hose into the aeration (center) chamber.
3. Check level of effluent weir.

MISCELLANEOUS ITEMS TO BE CHECKED

1. Check access cover to insure that it is properly fastened.
2. Check all peripheral equipment such as chlorinators, dosing pumps, filters, etc.
3. Check effluent disposal system.
4. Check compressor housing if installed outside. The housing should be adequately fastened over the housing; be well ventilated and protect the compressor from direct rainfall.

LABORATORY OR FIELD TESTS

Normally, laboratory testing is not required for the routine operation and maintenance of the NAYADIC system. Occasionally testing may be necessary to identify the source of an operational problem or to satisfy the requirements of the state or local regulatory agency.

SAMPLE COLLECTION

The NAYADIC, when properly sized and maintained, will produce an effluent exceeding the performance requirements of NSF Standard 40 (Class I) for aerobic treatment plants: 30 day average of <25 mg/l CBOD and <30 mg/l TSS.

To collect sample from the NAYADIC, care must be taken to get a reliable and uncontaminated sample of the effluent that is being discharged from the plant at the time of the sampling. To accomplish this, the following steps must be taken:

1. Provide a suitable sampling port on the outlet of the NAYADIC (see Fig. 1). The port should be at least 6” in diameter, with a minimum depth of 8” below the effluent line.
2. Using a clean cloth, wipe the interior of the effluent line where it enters the sampling port. This is to remove any debris that may have accumulated.
3. By opening a faucet or inserting a garden hose into the cleanout before the NAYADIC, generate a flow through the plant. Allow the flow to continue for approximately one (1) minute in order to flush the line.
4. Shut off the water and dip the water out of the sampling port.
5. Turn on the water and collect a sample as the plant effluent flows into the sampling port. Do not collect water that has accumulated in the sampling port. Care needs to be taken to avoid catching dirt or other debris while collecting the sample.
IV. MAINTENANCE PROCEDURES: Pumping (wasting) sludge

Bacteria and other microorganisms present in the wastewater utilize the soluble organic material as a food source, converting it into a non-soluble mass. This non-soluble mass or floc is comprised of living microorganisms, sewage particles, as well as inert (non-biodegradable) material. As the process matures, the numbers of micro-organisms increase until there is an adequate biomass to metabolize or digest all of the soluble organic material in the incoming sewage. At this point, competition for food results in the dying (due to starvation) of organisms as new organisms are formed. These dying organisms, in turn are metabolized, thereby reducing the overall sludge volume.

The volume of solids will gradually increase due to the accumulation of the inert remains of dead organisms (ash), combined with the non-degradable material in the raw wastewater. As the solids increase, the mixed liquor (i.e., contents of the aeration chamber) becomes thicker, developing an increasing darker brown color. Periodically, the excess solids must be pumped (wasted) from the NAYADIC in order to insure continued plant efficiency.

PUMPING FREQUENCY

The rate at which the solids (biomass) accumulates in the NAYADIC, and the subsequent rate at which the excess solids must be pumped out, is dependent upon the total volume and strength (i.e., BOD) of the wastewater entering the plant. The typical residential system will need to be pumped every 2-3 years. Commercial systems or systems that receive close to their design loading may need to be pumped every 1-2 years. Conversely, weekend cottages or systems serving only 1 or 2 people may go 4-5 years or longer.

DETERMINING PUMPING FREQUENCY

In order to insure optimum treatment efficiency and effluent quality, it is necessary to maintain the level of aeration solids (MLSS) within a suitable range (refer to Operational Control Chart). A low level of solids in the aeration chamber (i.e., during the plant start-up) reduces the treatment plant’s ability to provide adequate treatment during peak operating periods. Excessive solids, on the other hand, may result in poor settling during periods of hydraulic surges; or, in the development of septic conditions in the plant. In order to determine when the NAYADIC system should be pumped it is necessary to perform a settleable solids test (30-minute) during each semi-annual service check:

Procedure:

1. Mark a quart jar into 10 equal portions.
2. While the compressor is running, fill the jar with the liquid (MLSS) from the aeration chamber. This sample should be collected at mid-depth in the tank. **Do not collect a sample from within the draft tube.**

3. Allow the sample to sit for 30 minutes. If the sample settles slowly, allow it to sit for 24 hours in order to insure complete settling.

4. Measure the volume of the settled sludge as a percentage of the total volume of the sample. Occasionally, after the sample sits, a portion of the settled sludge may float to the top of the sample. If this occurs, add together the volume of settled sludge and the volume of floating sludge.

5. Compare the percent of settled sludge (i.e., sludge volume) to the figures given in the “Operational Control Chart”. The optimum level of settleable solids is normally between 5-50%. Whenever the sludge volume exceeds 50%, the plant should be pumped.

**PROCEDURE FOR PUMPING THE NAYADIC**

1. Remove 30” access cover.

2. Carefully lower the pumper hose into the inner (aeration) chamber. Slide the hose down the wall of the inner tank until it rests on the bottom of the outer tank (clarifier). **Do not insert the hose down the draft tube unless the airline and diffuser are removed.**

3. Pump solids from the bottom of the outer tank. This will lower the liquid level in both the inner tank and outer tank simultaneously.

4. As the liquid level drops, the scum layer between the inner tank and scum baffle will normally break loose and drop to the bottom of the tank where it can be pumped out. With a garden hose, flush any remaining scum or residue to the bottom of the tank. **If the scum layer is more than 2” thick, it should be removed first.**

5. In areas with a high-water table, immediately re-fill the tank with clear water to prevent shifting or floatation.

**SLUDGE CHARACTERISTICS**

It is important to observe the MLSS (mixed liquor suspended solids) sample that is collected from the aeration chamber. As the sample settles you should note the following:

1. What is the color of the sludge?
2. Do the sludge particles clump together in a dense floc, which settles rapidly?
3. Is the liquid above the settled sludge (supernatant) clear?
4. Does the sample have a noticeable odor?

A good healthy sludge should have a chocolate brown color. It should form a dense floc that settles rapidly leaving a clear, odorless supernatant. A sludge sample that has a grey/black color, settles slowly, has a cloudy supernatant, or has a supernatant containing very fine, suspended particles, usually indicates poor treatment plant operation. Therefore, it is important to compare your observations of the **NAYADIC** plant, as well as the sample of mixed liquor suspended solids to the conditions described on the “Operational Control Chart” to determine if the plant is operating properly or if any corrective action needs to be taken.
V. COMPRESSOR REPLACEMENT

Procedure:
1. Disconnect power before working on compressor.
2. Remove the compressor housing if located outside.
3. Disconnect the airline from the compressor air discharge fitting.
4. Disconnect the compressor’s power cord from the electrical service line that goes to the alarm.
5. Remove the compressor.
6. Take the new compressor out of its packing carton. Remove the plywood shipping base and assemble the base plate (foot support) in accordance with the enclosed directions. NOTE: Keep the box and shipping base to return compressor for warranty.
7. Transfer the air discharge fittings from the original compressor to the replacement unit.
8. Remove plug from the air intake opening and screw in air filter (supplied with compressor).
9. Set the new compressor in place and re-connect the airline and electrical power cord.
10. Replace the housing, if applicable.
11. Re-connect the power and check for proper operation (refer to Section 5.0)

VI. ALARM REPLACEMENT

Procedure:
1. Disconnect power before working on alarm.
2. Unscrew the faceplate of the alarm.
3. Remove the wire nuts and disconnect the following wires:
   a) black and white to float and pressure switch
   b) black, white and green to compressor
4. Remove the alarm faceplate and replace with a new alarm.
5. Reconnect the wires described in item 3.
6. Replace the faceplate and restore power to the alarm.
7. Check alarm by pressing test button and by raising float in the NAYADIC plant.

VII. PRESSURE SWITCH REPLACEMENT

Procedure:
1. Remove the housing from the compressor (if applicable).
2. Disconnect the two sensor wires from the old pressure switch.
3. Unscrew the pressure switch from the airline and replace with a new one.
4. Re-attach the two sensor wires.
5. Check alarm by shutting off the compressor.
6. Replace housing.

VIII. DIFFUSER REPLACEMENT

Procedure:
1. Remove the access lid on NAYADIC.
2. Using a garden hose, wash down the interior surfaces of the center (aeration) tank and airline, including the union on the top of the airline.
3. Unscrew the union and remove the lower portion of the air supply line (with diffuser).
4. Unscrew the diffuser from the end of the airline and replace with a new one.
5. Re-install the airline being careful to insert the airline and diffuser into the draft tube.
6. Tighten union and check to insure that there is adequate turbulence in the tank.
7. Replace the access lid.

IX. FLOAT REPLACEMENT

Procedure:
1. Remove the access lid on NAYADIC.
2. Using a garden hose wash down the interior surfaces of the center (aeration) tank, airline, float, cord and cable connectors.
3. Remove the wire nuts on the float cord and disconnect the two wires.
4. Loosen the clamp on the airline and remove the old float.
5. Replace with a new float, making sure that the float is set at the same distance from the clamp and that the clamp is fastened securely to the topside of the airline and away from the inlet pipe.
6. Reconnect the two wires of the float making sure to use approved water resistant wire nuts.
7. Check the alarm by raising the float.
8. Re-secure the access lid.
# NAYADIC TROUBLE-SHOOTING CHECKLIST

<table>
<thead>
<tr>
<th>PROBLEM/CONDITION OBSERVED</th>
<th>POSSIBLE CAUSE</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(IMPORTANT: Disconnect power to compressor or alarm before attempting repairs.)</td>
<td></td>
</tr>
</tbody>
</table>

## I. COMPRESSOR

A. New compressor will not start but motor hums when power is turned on.

1. Rotary assembly is locked up due to prolonged storage time.

   1. Remove internal filters, muffler box and head plate. Using the palm of your hand turn the rotary assembly until it moves freely. Replace head plate, muffler box and filters. If motor still does not run, return to factory (NAYADIC).

B. New compressor runs but provides insufficient air pressure.

   1. Internal filters are not properly tightened.

   1. Tighten filters by hand. If this does not correct problem, return compressor to factory for repair or replacement.

   2. Kinked or crushed airline. Check with airflow meter at compressor and at NAYADIC tank to detect pressure loss.

   2. Replace airline.

C. Compressor will not start (or hum) when power is turned on.

   1. Breaker is tripped.

   1. Re-set breaker. Check for other appliances connected to breaker.

   2. No power at electrical receptacle.

   2. Check receptacle with voltage meter. If no voltage or low voltage, check with electrician.

   3. Wiring leads are not properly connected.

   3. Check and reconnect if necessary.

   4. Power cord is cut or damaged.

   4. Inspect cord for cut and test with meter for continuity. Replace if necessary.
<table>
<thead>
<tr>
<th>PROBLEM/CONDITION OBSERVED</th>
<th>POSSIBLE CAUSE</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>D. Used compressor does not run but motor hums.</td>
<td>1. Rotary assembly is locked up. This may occur if compressor is not in use for several days.</td>
<td>1. Remove internal filters, muffler box and head plate. Check carbon blades to see if they move freely. If not, clean blade path; check for broken carbon blades. If necessary replace using repair kit (N6508 or N6510).</td>
</tr>
<tr>
<td></td>
<td>2. Rotary assembly is locked up. Compressor shows evidence of being exposed to excessive moisture</td>
<td>2. Remove internal filters, muffler box and head plate. Remove 2 allen bolts from cylinder and remove or flooding. cylinder shield. Clean rusted parts with light grit sand paper. Replace cylinder shield. Install repair kit (N6508 or N6510) If compressor still does not run, return to factory (NAYADIC). CAUTION: Locate compressor in area protected from flooding.</td>
</tr>
<tr>
<td>E. Used compressor runs but provides insufficient air pressure. (Check with air gauge).</td>
<td>1. Filters are clogged.</td>
<td>1. Remove and check both external internal filters. Clean or replace, if necessary. Provide protective enclosure around compressor to protect from dust if located in exposed area.</td>
</tr>
<tr>
<td></td>
<td>2. Internal filters are not properly tightened.</td>
<td>2. Tighten by hand.</td>
</tr>
<tr>
<td></td>
<td>3. Internal filter o-ring hard or cut.</td>
<td>3. Replace.</td>
</tr>
<tr>
<td></td>
<td>4. Muffler box loose.</td>
<td>4. Tighten bolts</td>
</tr>
<tr>
<td>PROBLEM/CONDITION OBSERVED</td>
<td>POSSIBLE CAUSE</td>
<td>CORRECTIVE ACTION</td>
</tr>
<tr>
<td>----------------------------</td>
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</tr>
<tr>
<td>5. Head plate loose.</td>
<td>6. Worn or broken blades in rotary assembly.</td>
<td>5. Remove internal filters and muffler box. Tighten head plate bolts and reassemble.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Disassemble and install repair kit (N6508 or N6510). If compressor still provides insufficient air pressure, return to factory for repair.</td>
</tr>
<tr>
<td>F. Compressor with old style alarm does not run.</td>
<td>1. ON/OFF switch of the alarm is in the “off” position.</td>
<td>1. Turn switch to “on” position. Re-set “test” button.</td>
</tr>
<tr>
<td>II. ALARM (New Installation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Light and buzzer do not come on when pressing test button.</td>
<td>1. Alarm is not properly energized</td>
<td>1. Check to make sure power cable is plugged into 115 vac outlet.</td>
</tr>
<tr>
<td>B. Alarm remains activated after TEST button is pressed. Compressor is running properly.</td>
<td>1. Float activated.</td>
<td>1. Make sure float is in down position.</td>
</tr>
<tr>
<td></td>
<td>2. Faulty float.</td>
<td>2. Replace float.</td>
</tr>
<tr>
<td></td>
<td>3. Pressure switch.</td>
<td>3. Check wiring, making sure connecting wires are on terminal #’s 1 &amp; 2.</td>
</tr>
<tr>
<td></td>
<td>4. Faulty pressure switch.</td>
<td>4. Replace pressure switch.</td>
</tr>
<tr>
<td>C. Alarm is not activated when float is raised.</td>
<td>1. Float is not properly wired in alarm system.</td>
<td>5. Replace alarm.</td>
</tr>
<tr>
<td></td>
<td>2. Wiring connections are loose.</td>
<td>1. Check wiring diagram provided and reconnect if necessary.</td>
</tr>
<tr>
<td></td>
<td>3. Float is faulty.</td>
<td>2. Tighten all wiring connections.</td>
</tr>
</tbody>
</table>

NAYADIC
# TROUBLE-SHOOTING CHECKLIST

**PROBLEM/CONDITION OBSERVED**

<table>
<thead>
<tr>
<th>D.</th>
<th>Alarm is activated, but the compressor is operating properly and the water level is normal.</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.</td>
<td>(Old Style Alarm) Alarm remains activated after TEST/RESET button is pressed. Compressor is running properly.</td>
</tr>
<tr>
<td>F.</td>
<td>(Old Style Alarm) Light does not come on when pressing test button.</td>
</tr>
<tr>
<td>G.</td>
<td>(Old Style Alarm) Compressor shuts off when float (in pump tank) is raised.</td>
</tr>
</tbody>
</table>

**POSSIBLE CAUSE**

<table>
<thead>
<tr>
<th>D.</th>
<th>1. Float is set too low in <strong>NAYADIC</strong>.</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.</td>
<td>1. Alarm is improperly wired. Black wires marked “To 115 vac” and “To Compressor” are reversed.</td>
</tr>
<tr>
<td>F.</td>
<td>1. Alarm is not properly energized.</td>
</tr>
<tr>
<td>G.</td>
<td>1. Float is improperly wired to black wires in alarm box.</td>
</tr>
</tbody>
</table>

**CORRECTIVE ACTION**

<table>
<thead>
<tr>
<th>D.</th>
<th>1. Raise float (alarm) so that it is at or slightly above the normal water level.</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.</td>
<td>1. Rewire alarm so that the black wire from the 115 vac is connected to the ON/OFF switch. The black wire from the compressor should be connected to the TEST/RESET button.</td>
</tr>
<tr>
<td>F.</td>
<td>1. Turn ON/OFF switch to “on” position.</td>
</tr>
<tr>
<td>G.</td>
<td>1. Rewire float so that one wire from is connected to white (neutral) wire; and the second wire from the float is connected to the red wire.</td>
</tr>
</tbody>
</table>

### III. AERATION CHAMBER (Inner Tank)

<table>
<thead>
<tr>
<th>A.</th>
<th>Compressor is running but little or no turbulence is observed in aeration chamber. Aeration contents have greyish (dishwater) appearance. Noticeable odor. Poor effluent quality.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Insufficient air supply due to compressor failure. Check with air flow meter.</td>
</tr>
<tr>
<td>2.</td>
<td>Plugged diffuser.</td>
</tr>
<tr>
<td>3.</td>
<td>Loose connections on airline. Leakage of air at these locations is reducing air to plant.</td>
</tr>
<tr>
<td>4.</td>
<td>Damaged airline. To determine, check <strong>NAYADIC</strong></td>
</tr>
</tbody>
</table>

<p>| 1. | Refer to Trouble-Shooting Checklist, Section I: A-E. |
| 2. | Disconnect union on airline and remove lower airline with diffuser. Clean or replace diffuser. |
| 3. | Check and tighten all airline connections, including union and connections at the compressor and tank. |
| 4. | Expose airline and replace damaged <strong>NAYADIC</strong> |</p>
<table>
<thead>
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</thead>
<tbody>
<tr>
<td>B. Aeration chamber contents has a greyish-brown to black appearance. Slight to strong septic odor observed. Compressor is running and good turbulence is noted. Poor quality effluent has a grey color.</td>
<td>1. Heavy hydraulic surge flows due to excessive grey water discharges from laundry or kitchen activities. Generally this problem observed only on commercial applications. Residential systems will usually be characterized by light or sporadic usage comprised mostly of laundry.</td>
<td>1. For commercial applications, provide surge tank to eliminate surge flows. Residential systems may improve operation by reducing frequency of laundry to 1-2 loads per day. <strong>NOTE:</strong> The use of a large pre-tank may increase the severity of the problem because of the shock load caused by heavy short-term water usage (ie., laundry).</td>
</tr>
<tr>
<td>C. Aeration chamber has a clear appearance with very few solids (MLSS&lt;5%). Effluent is clear, no odor. White suds observed in aeration chamber.</td>
<td>1. Light loading to <strong>NAYADIC</strong> resulting in complete oxidation (digestion) of solids in plant.</td>
<td>1. No action required if effluent is clear. Typical of intermittent use. (See also Section III - D).</td>
</tr>
<tr>
<td>D. Aeration chamber has the same appearance as III-C (above). However, the effluent is somewhat turbid. Settleable solids test indicates &lt;5% solids with very fine suspended particles in supernatant.</td>
<td>1. Excessive aeration due to light loading of plant. Turbidity in effluent due to &quot;ash&quot; particles that settle very slowly.</td>
<td>1. Reduce air by providing timer on compressor. Settings should cause the compressor to run 2 hours and be off for 2 hours. <strong>Contact factory before making this change.</strong></td>
</tr>
<tr>
<td>E. Aeration chamber has greyish appearance with a slightly septic odor. Systems has been in use for less than 6 months.</td>
<td>1. Oversized septic tank preceeding the <strong>NAYADIC</strong> causing slow start-up. This problem is more noticeable during cold weather.</td>
<td>1. Seed plant with 100 gal. of fresh activated sludge to help initiate start-up.</td>
</tr>
</tbody>
</table>

2. Excessive surge flows (grey water) due to heavy laundry activities. (Problem

**NAYADIC**
## TROUBLE-SHOOTING CHECKLIST

<table>
<thead>
<tr>
<th>PROBLEM/CONDITION OBSERVED</th>
<th>POSSIBLE CAUSE</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>is worse when <strong>NAYADIC</strong> is preceeded by a large septic tank.</td>
<td>normal operation, the laundry usage may be increased somewhat. Extreme condition (or commercial application) may require flow equalization.</td>
</tr>
<tr>
<td>F. Aeration chamber has a grey, dishwater appearance. Effluent has a grey septic odor. Accumulation of grease balls are observed.</td>
<td>1. Organic overload due to excessive use of garbage disposal (See also cause #3 below).</td>
<td>1. Eliminate discharge of food scrap, grease, oil, etc. into garbage disposal.</td>
</tr>
<tr>
<td></td>
<td>2. Excessive laundry usage.</td>
<td>2. See Section III-E corrective action.</td>
</tr>
<tr>
<td></td>
<td>3. Insufficient air being supplied. The minimum air flow on all models except the M2000A should be at least 5.0 cfm. <strong>NOTE:</strong> Older M6A plants may have a Gast 323 compressor which would have a minimum air flow of 3.0 cfm.</td>
<td>3. Check airflow (cfm) at compressor and at <strong>NAYADIC</strong>. If appropriate for specific Model, check dissolved oxygen in aeration tank. Shut off compressor 10-15 minutes before test. If DO is less than 1.0 ppm during peak usage period, contact factory for assistance.</td>
</tr>
</tbody>
</table>

### IV. CLARIFIER (Settling Chamber)

<p>| <strong>A.</strong> (Start-up) Effluent is slightly turbid or cloudy. Slight odor detected. Plant is in the first 3 months of operation. Excessive amount of white suds in aeration chamber. | 1. Normal start-up period of 6-8 weeks is required to attain sufficient numbers of bacteria. During this period treatment efficiency may not be at its highest, especially during periods of hydraulic surge loading, (ie. laundry periods). | 1. No major action is required. Reducing the frequency of laundry will help. Re-check plant in 4-6 months unless other problems develop sooner. |
| | 2. Septic tank is installed prior to the <strong>NAYADIC</strong>. This problem is usually apparent when the daily flow is light or when excessive laundry usage occurs. | 2. Reduce frequency of laundry until plant achieves normal operation (6-8 weeks). Seeding the <strong>NAYADIC</strong> with 100 gallons of fresh &quot;activated&quot; sludge may reduce start-up period. |</p>
<table>
<thead>
<tr>
<th>PROBLEM/CONDITION OBSERVED</th>
<th>POSSIBLE CAUSE</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B.</strong> Effluent has very fine suspended particles which settle slowly leaving a clear supernatant.</td>
<td>1. Over-aeration</td>
<td>1. Refer to Section III-D.</td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>C.</strong> Effluent contains brown suspended solids. Condition is more noticeable during periods of heavy water usage. System has not been pumped in 2-3 years. Settleable solids test indicates sludge volume &gt; 50%.</td>
<td>1. Heavy build-up of MLSS (mixed liquor suspended solids) due to normal, long-term usage.</td>
<td>1. Pump <strong>NAYADIC</strong>. Refer to &quot;Maintenance Procedures: Pumping (wasting) sludge&quot;.</td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>D.</strong> Excessive (&gt;5 inches) of scum has accumulated in 6-12 months of use. Grease balls may be observed in aeration chamber. System requires pumping on a frequent basis.</td>
<td>1. Over-use (or abuse) of garbage disposal.</td>
<td>1. Discontinue dumping grease, food scraps, etc. into the disposal. This material should be put in garbage can.</td>
</tr>
<tr>
<td></td>
<td>2. Excessive use of powdered laundry</td>
<td>2. Use liquid detergent or the detergent. &quot;concentrated&quot; powders.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>E.</strong> Excessive (&gt;5&quot;) of scum has accumulated in 6-12 months of use. Noticeable odor from scum layer. Aeration chamber has very low suspended solids (MLSS).</td>
<td>1. Settled sludge or inorganic solids (i.e., paper, trash, etc) may be restricting return of solids into aeration chamber. This may be caused by the draft tube being too close to the bottom of the tank.</td>
<td>1. Contact the factory for advice and the proper equipment to shorten the draft tube. <strong>This can be done without pumping the tank.</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>F.</strong> Excessive solids carry-over with Effluent aeration chamber has Normal color but sludge (MLSS) Settles slowly, forming a light floc that does not compact. Most common with commercial (especially food service) facilities.</td>
<td>1. Overabundance of &quot;filamentous&quot; micro-organisms that prevent compaction and settling of sludge. The presence of these organisms should be confirmed by laboratory (micro-biological) examination.</td>
<td>1. Contact the factory for specific recommendations.</td>
</tr>
</tbody>
</table>
# NAYADIC WASTE TREATMENT SYSTEM
## OPERATIONAL CONTROL CHART

<table>
<thead>
<tr>
<th>OPERATION CONDITION</th>
<th>COLOR: AERATION TANK</th>
<th>ODOR</th>
<th>SLUDGE VOLUME</th>
<th>EFFLUENT QUALITY</th>
<th>AERATION TANK</th>
<th>POSSIBLE PROBLEM</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant start up 0-6 weeks</td>
<td>Clear to light brown</td>
<td>None</td>
<td>Settleable solids &lt;5% Scum &lt;1”</td>
<td>Slightly turbid to clear</td>
<td>Good turbulence White foam/suds</td>
<td>No problem: Normal start-up condition</td>
<td>No action required Re-check in 6 months</td>
</tr>
<tr>
<td>Plant in operation for More than 3 months</td>
<td>Clear to light brown</td>
<td>None to slight</td>
<td>Settleable solids &lt;5%; very fine suspended particles Scum &lt;1”</td>
<td>Slightly turbid to clear</td>
<td>Good turbulence White foam/suds</td>
<td>Light loading to plant; Insufficient food for organisms</td>
<td>Refer to Troubleshooting Section III-C &amp; III-D</td>
</tr>
<tr>
<td>Plant in operation for 0-6 months (Plant preceded by septic tank)</td>
<td>Light grey</td>
<td>Slightly septic</td>
<td>Settleable solids &lt;5% Scum &lt;1”</td>
<td>Slightly turbid with slight odor</td>
<td>Good turbulence</td>
<td>Slow start-up due to septic tank; probable hydraulic surges (i.e., laundry)</td>
<td>Check air pressure at diffuser; reduce laundry frequency to 3x day. Refer to Trouble-shooting Section III-E</td>
</tr>
<tr>
<td>Normal operation: Typically less than 2 years of use since last pumping</td>
<td>Light brown to medium brown</td>
<td>None</td>
<td>Settleable solids = 5-30% with clear supernatent scum &lt;2”</td>
<td>Clear</td>
<td>Good turbulence with light brown foam</td>
<td>No problem</td>
<td>None, re-check in 6 months (routine)</td>
</tr>
<tr>
<td>Normal operation: Typically, 2-3 years of use since last pumping</td>
<td>Very dark brown</td>
<td>Slight</td>
<td>Settleable solids = 20 – 50% Scum &gt; 6”</td>
<td>Clear</td>
<td>Good turbulence with heavy brown foam</td>
<td>No immediate problem; anticipate pumping tank in 6-12 months</td>
<td>None; re-check in 6 months (routine) (Pumping recommended if not on service contract)</td>
</tr>
<tr>
<td>Plant in operation for more than 3 months Poor treatment</td>
<td>Grey (similar to dishwasher)</td>
<td>Slight to moderate septic or ammonia odor</td>
<td>Settleable solids &lt;5% Scum &gt; 4” Scum has yellowish color and noticeable odor</td>
<td>Turbid to bluish-grey</td>
<td>Slight to moderate turbulence; patches of foam across tank surface</td>
<td>Insufficient aeration due to reduced air flow at plant</td>
<td>Refer to Troubleshooting Section III-E</td>
</tr>
<tr>
<td>Plant in operation for more than 3 months Poor treatment</td>
<td>Greyish-brown to Grey to black</td>
<td>Slight to strong septic odor</td>
<td>Settleable solids &lt;5% Scum &gt; 4” Possible presence of grease balls</td>
<td>Grey</td>
<td>Good turbulence; 4-6” ring of foam around circumference of inner tank</td>
<td>Organic overload</td>
<td>Refer to Troubleshooting Section III-F</td>
</tr>
<tr>
<td>Previous plant operation has been normal; Sudden, unexpected development of poor treatment and operation</td>
<td>Grey to black</td>
<td>Strong, may be septic or from some type of chemical</td>
<td>Settleable solids = 0-50% Scum &gt; 4”</td>
<td>Turbid to bluish-grey</td>
<td>Good turbulence Possible presences of grease balls or oil</td>
<td>Plant die-off due to discharge of toxic materials or oil/grease</td>
<td>1. Identify source of toxic material 2. Eliminate above source 3. Pump plant completely and allow to start up</td>
</tr>
</tbody>
</table>
UNIT MUST RUN 24 HOURS PER DAY: If leaving residence unoccupied for long periods of time, contact your servicing dealer. Timers should not be installed unless specifically authorized by the servicing dealer.

DETERGENTS: Low sudsing detergents should be used. If powdered detergents are used, only the concentrated forms are recommended. Filler materials used in the "economy size" containers do not dissolve readily. Below are a few suggestions:

- Ultra Cheer with advance color guard powder
- Liquid Tide with bleach alternative
- Ultra ERA liquid
- Arm and Hammer Powder with Bleach
- Lanosoft (available thru your dealer)

NEVER USE MORE THAN THE MANUFACTURER'S RECOMMENDED AMOUNT OF DETERGENT: If excessive sudsing or foaming occurs during laundry, reduce the amount of detergent used to 1/2 of the recommended amount.

BLEACH: Chlorine bleach should not be used. Oxygen bleaches are recommended. Oxygen bleaches can be used in any form, liquid, powder, or pellets. Most laundry detergents contain sodium perborate or bleach which releases boron as it breaks down. Boron has a bactericidal effect which in excessive quantities could damage your treatment plant so that it is wise to keep bleach levels to a minimum.

DRAIN CLEANERS: Non-caustic biodegradable drain and toilet bowl cleaners are recommended when available. **DO NOT USE TOILET BOWL CLEANERS SUCH AS 2000 FLUSHED; OR DRAIN CLEANERS SUCH AS DRANO.**

GARBAGE DISPOSAL: Care should be taken not to dispose of grease or fat in the disposal. Food scraps should be scraped into the garbage container and not flushed down the disposal.

NEVER flush paper towels, newspapers, wrapping paper, feminine articles, and rags into the system.

NEVER allow large, irregular, intermittent or constant volumes of clear water into the system as with a leaking toilet or faucet. Do not allow the water softener waste discharge line to be connected to the aerobic system.

WASHING MACHINES are responsible for large volumes of water entering the system all at once. This surge of water can hydraulically overload the unit and interfere with the smooth operation of the system. Space washings throughout the week rather than doing several loads in one day.

COOKING OILS AND GREASE are troublemakers. The type of bacteria found in aerobic systems do not live well in solidified grease. **GREASE AND COOKING FATS SHOULD NEVER BE PLACED DOWN ANY DRAINS.**

Under no circumstances should you put any of the following products down the sink, toilets or drains as they will significantly affect the efficiency of your sewage plant: medicines, cooking oil or melted fat, motor oils or other car products, garden chemicals, paints, paint thinners and other solvents.

Please read the owners manual and the conditions of the warranty. Your aerobic system is a biological treatment system designed to achieve a high degree of treatment of domestic sewage. Providing routine maintenance and following the recommendations of the owner’s manual and your authorized servicing agent will help insure optimum performance as well eliminate the cost of unnecessary service calls.
**Procedure for Pumping the NAYADIC:**

1. Remove 30" access cover.
2. Carefully lower the pumper hose into the inner (aeration) chamber. Slide the hose down the wall of the inner tank until it rests on the bottom of the outer tank (clarifier). Do not insert the hose down the draft tube unless the airline and diffuser are removed.
3. Pump solids from the bottom of the outer tank. This will lower the liquid level in both the inner tank and outer tank simultaneously.
4. As the liquid level drops, the scum layer between the inner tank and scum baffle will normally break loose and drop to the bottom of the tank where it can be pumped out. With a garden hose, flush any remaining scum or residue to the bottom of the tank. If the scum layer is more than 2" thick, it should be removed first.
5. In areas with a high water table, immediately re-fill the tank with clear water to prevent shifting or floatation.