LOW FREQUENCY ELECTROMAGNETIC TECHNIQUE

INSPECTION REPORT

OF THE

UNIT: CLARIFIER RING (EFFLUENT PIPE)

AT

IN

BY

TESTEX, INC.

TESTED: MAY 21, 2013 TO MAY 23, 2013

AUTHOR: [REMOVED] REVIEWED BY: [REMOVED]

REVIEW DATE: JUNE 21, 2013
CLARIFIER RING (EFFLUENT PIPE)

The Clarifier Ring – Effluent Pipe was inspected on May 21, 2013 May 23, 2013 using the Testex Inc. developed TS-2000 Digital System and Low Frequency Electromagnetic Technique (LFET). Addition testing was performed using the KRAUTKRAMER DMS-2 Ultrasonic Meter. For more information on the Ultrasonic Testing and the calibration procedures used, see 6.0 Test Methods and Procedures at the end of this report. The results of the testing are detailed below.

The Clarifier Ring (Effluent Pipe) was inspected along the bottom of the pipe’s straight section that was accessible. Areas that were inaccessible along the Effluent Pipe were covered with a pipe saddle, dresser coupling, circumferential weld or fiber glass. Plus 4" before and after each saddle and dresser coupling was inaccessible. A total length of 2' 10" scanned with LFET showed wall thinning/loss ranging from 0.075" 0.320" remaining. The flaw indications were found at various locations along the pipe Clarifier tank north and south side.

The North Effluent Pipe inspection was performed across a 4" wide area along the longitude on the bottom of the pipe. The Effluent pipe on the north side was inspected from west to east. Indications of thinning were found between 250' 0" 251' 8" were the Downspout is located. ~65' 0" of the north side of the Clarifier Ring could not be inspected due to H2S alarm within the area.

The South Effluent Pipe inspection was performed across a 4" wide area along the longitude on the bottom of the pipe. The Effluent pipe on the south side was inspected from east to west. Indications of thinning were found between 121' 10" 123' 1" where the Downspout is located and 169' 5" 169' 9" near a dresser coupling.
### CLARIFIER RING (EFFLUENT PIPE)

<table>
<thead>
<tr>
<th><strong>Orientation:</strong></th>
<th>Horizontal</th>
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<tbody>
<tr>
<td><strong>Tube Length:</strong></td>
<td>~ 675 ft.</td>
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<tr>
<td><strong>Tube Dimensions:</strong></td>
<td>30&quot;/36&quot; O.D. 0.375-0.500&quot; NWT</td>
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<tr>
<td><strong>Tube Material:</strong></td>
<td>Carbon Steel</td>
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<tr>
<td><strong>Clarifier Ring:</strong></td>
<td>675' 2&quot; Accessible Area</td>
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<tr>
<td><strong>North Effluent Pipe</strong></td>
<td>229' 0&quot; SCANNED / 76' 6' NOT SCANNED</td>
</tr>
<tr>
<td><strong>South Effluent Pipe</strong></td>
<td>275' 2&quot; SCANNED / 94' 6' NOT SCANNED</td>
</tr>
<tr>
<td><strong>Pipe Numbering System:</strong></td>
<td>See 3.0 TUBE SHEET MAP</td>
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</table>
UNIT: CLARIFIER RING (EFFLUENT PIPE)

NOT DRAWN TO SCALE.
CLARIFIER RING LEGEND

- **1’ 6” 0** MEASURE FOR LENGTH
- **1’** MEASURE FOR DIAMETER OF PIPE
- **PIPE SADDLE**
- **DRESSER COUPLING**
- **FLANGE**
- **CIRCUMFERENTIAL WELD**
- **DOWNSPOUT**
- **NOZZEL**
- **AREAS NOT SCANNED / INACCESSIBLE**
- **AREAS LESS THAN NOMINAL THICKNESS**
CLARIFIER RING
(NORTH EFFLUENT WASTE PIPE)

30° DIAMETER
0.375-0.500" NWT
CLARIFIER RING
(NORTH EFFLUENT WASTE PIPE)
INACCESSIBLE DUE TO H2S GAS.
3.0 PIPE MAP

UNIT: CLARIFIER RING

CLARIFIER RING
(SOUTH EFFLUENT WASTE PIPE)

36" DIAMETER
0.375-0.500" NWT

SCANNED EAST - WEST
3.0 PIPE MAP

UNIT: CLARIFIER RING

CLARIFIER RING
(SOUTH EFFLUENT WASTE PIPE)

30" / 36" DIAMETER
0.375-0.500" NWT

SCANNED EAST - WEST
3.0 PIPE MAP

UNIT: CLARIFIER RING

CLARIFIER RING
(SOUTH EFFLUENT WASTE PIPE)

36" DIAMETER
0.375-0.500" NWT

S22  S21  S20  S19  S25  S24  S23

192 191 190 189 188 187 186 185 184 183 182 181 180 179 178 177 176 175 174 173 172 171 170 169 168 167 166 165 164 163 162 161

224 223 222 221 220 219 218 217 216 215 214 213 212 211 210 209 208 207 206 205 204 203 202 201 199 198 197 196 195 194 193

SCANNED EAST - WEST
3.0 PIPE MAP

UNIT: CLARIFIER RING

CLARIFIER RING
(SOUTH EFFLUENT WASTE PIPE)

36" DIAMETER
0.375-0.500" NWT

SCANNED EAST - WEST
5.0 WAVEFORMS

**CLARIFIER RING (EFFLUENT PIPE)**

**Figure 1:** Example of a typical waveform from the South side of the clarifier ring between saddle 4 and saddle 5.

**Figure 2:** Indication located at 169' 5" - 169' 9" between saddle 19 and saddle 20 on the South side of the clarifier ring, showing 0.320" remaining.
5.0 WAVEFORMS

CLARIFIER RING (EFFLUENT PIPE)

Figure 3: Indication located at 121' 10" - 123' 1" between saddle 13 and saddle 14 on the South side of the clarifier ring. Showing 0.089" remaining, this is the lowest reading of the 1’ 3” X 5” area found. This indication is located near the Downspout.
5.0 WAVEFORMS

Figure 5: Example of a typical waveform from the South side of the clarifier ring between saddle 9 and saddle 10.

Figure 6: Indication located at 250' 0" and 250' 2" between saddle 29 and saddle 30 on the North side of the clarifier ring, showing readings of 0.084" and 0.077" remaining.
Figure 7: Indication located at 250' 6" between saddle 29 and saddle 30 on the North side of the clarifier ring, showing readings of 0.075" remaining.