

**GREGORY POWER PARTNERS**  
Sherwin Alumina  
Gregory, TX

**MARGINAL**

Sample ID: GPP-297228  
Equip. Desc.: GTG 1A; Gas Turbine  
Lubricant Type: Chevron GST-32  
Reservoir Cap.: 6,200.00 Gal(s) 23,467.00 Ltr(s)  
Machine Time: 72,874.0 Hr(s)  
Lube Time: 1,587.6 Hr(s)

Sample Date: 6/30/2013  
Received Date: 7/9/2013  
Test Date: 7/10/2013  
Prev. Sample: 5/12/2013 **N**  
First Sample: 4/9/2001  
No. Samples: 137

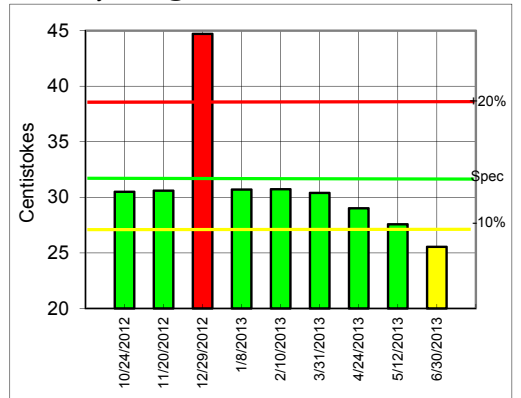
**Recommendation(s):**

CHANGE OIL to correct LOW viscosity and reduce high Iron, Nitration and Solvent levels. Oxidation levels have continue to increase from 0.61 to 2.87 to 4.89 Abs/cm, Nitration levels increased from 0.00 to 6.10 Abs/cm. Sulfates increased from 0.88 to 1.07 Abs/cm and Solvent levels 0.00 to 1.31 to 11.11 Abs/cm. Moisture contamination has increased slightly from 433 to 464 ppm.

**PHYSICAL PROPERTIES**

Sample Date(s)	02/10/13	03/31/13	04/24/13	05/12/13	06/30/13	REF.
Viscosity D-445	30.73	30.40	29.01	27.57	25.54	31.00
Water-IR: ppm	Neg	456	515	433	464	≤ 500
D-974 TAN mg/KOH	0.01	0.08	0.14	1.50	2.12	≤ 2.00
D-1500 Color	2.0	0.0	1.0	1.5	2.0	≤ 2.0
D-92 Flash °F	415°F	410°F	405°F	390°F	375°F	≥ 400
D-2272 R-BOT min.	N/P	2,468	N/P	N/P	1,560	≥ 500
D-130 Cu Corrosion	N/P	1A	N/P	N/P	1B	1B

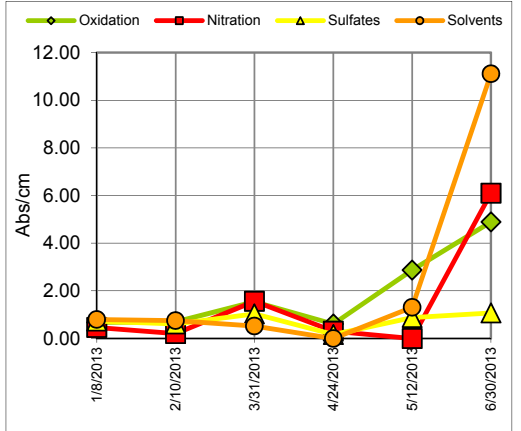
Viscosity cSt @ 40°C ASTM-D-445



**ASTM-D-7418 FT-IR ANALYSIS**

	02/10/13	03/31/13	04/24/13	05/12/13	06/30/13	REF.
Oxidation Abs/cm	0.70	1.54	0.61	2.87	4.89	≤ 1.00
Nitration Abs/cm	0.21	1.56	0.31	0.00	6.10	≤ 0.40
Sulfates Abs/cm	0.61	1.03	0.17	0.88	1.07	≤ 0.10
Solvents Abs/cm	0.75	0.52	0.00	1.31	11.11	≤ 0.10

FT-IR Abs/cm ASTM-D-7418



**ASTM-D-5185 ELEMENTAL ANALYSIS**

WEAR ELEMENTS (ppm)		02/10/13	03/31/13	04/24/13	05/12/13	06/30/13	REF.
Iron <sup>26</sup> (Fe) <sub>55.8</sub>		1	2	2	1	87	0
Chrome <sup>24</sup> (Cr) <sub>51.9</sub>		0	0	0	0	0	0
Aluminum <sup>13</sup> (Al) <sub>26.9</sub>		0	0	0	0	67	0
Copper <sup>29</sup> (Cu) <sub>63.5</sub>		0	0	0	0	34	0
Lead <sup>82</sup> (Pb) <sub>207.2</sub>		0	1	2	0	11	0
Tin <sup>58</sup> (Sn) <sub>118.6</sub>		0	1	1	0	8	0
Silver <sup>47</sup> (Ag) <sub>107.8</sub>		0	0	0	0	0	0
Nickel <sup>28</sup> (Ni) <sub>58.7</sub>		0	0	1	0	0	0
Indium <sup>49</sup> (In) <sub>114.8</sub>		0	0	0	0	0	0
Antimony <sup>51</sup> (Sb) <sub>121.7</sub>		0	0	0	0	0	0
ADDITIVE PACKAGE ELEMENTS (ppm)							
Molybdenum <sup>42</sup> (Mo) <sub>95.9</sub>		0	1	1	0	0	0
Magnesium <sup>12</sup> (Mg) <sub>24.3</sub>		0	0	0	0	12	0
Calcium <sup>20</sup> (Ca) <sub>40.0</sub>		0	0	0	1	6	147
Barium <sup>56</sup> (Ba) <sub>137.3</sub>		0	0	0	0	0	115
Phosphorous <sup>15</sup> (P) <sub>30.9</sub>		0	0	268	159	485	597
Zinc <sup>30</sup> (Zn) <sub>65.3</sub>		98	0	1	1	0	651
CONTAMINANT ELEMENTS (ppm)							
Sodium <sup>11</sup> (Na) <sub>22.9</sub>		0	0	0	0	0	0
Silicon <sup>14</sup> (Si) <sub>28.0</sub>		0	1	0	0	0	0
Potassium <sup>19</sup> (K) <sub>39.0</sub>		0	0	0	0	0	0
Boron <sup>5</sup> (B) <sub>10.8</sub>		0	0	0	0	0	0
TRACE METAL ELEMENTS (ppm)							
Vanadium <sup>23</sup> (V) <sub>50.9</sub>		0	0	0	0	1	0
Titanium <sup>22</sup> (Ti) <sub>47.9</sub>		0	0	0	0	0	0
Cadmium <sup>48</sup> (Cd) <sub>112.4</sub>		0	0	0	0	1	0

Element(s) ppm ASTM-D-5185

