Plant Name: Bazhou, Hebei Province
Date of Report: 19th December 2002

Brief Description: A municipal waste water treatment plant and the matched pipeline and pumps with daily capacity of 40,000m³.

Plant Space / Layout: Total area is 33500m², including plant of 13333m², and green zone 16048m², and access road and clear space of 4104m².

Input Water Quality: COD=350mg/L, BOD=200mg/L, SS=200mg/L, and Ammonium nitrate =40mg/L.

Output Water Quality: COD<=100mg/L, BOD<=300mg/L, SS<=30mg/L, and Ammonium nitrate <=25mg/L. Based on GB8978-1996 standards.

Labor Force: Projected workforce of 16 persons, including management team of 3, technical/operating group of 10, and support crew of 3.

Brief Description of Concession Area:
- Location: Bazhou is located in the middle of Beijing, Tianjin and Baoding.
- Climate: Having continental climate, the city have four seasons. The average temperature is 12.1 degree and the average annual rainfall is 583 mm. There are 2615 hours of sunshine in the place, leading to a sunshine percentage of 62%. Frost free period is 188 days in a year. Main wind direction is northeast-southwest.
- Total city area is 785km², consisting of 6 towns, 1 district and 6 villages. Total population in 2001 is 553,500. Total 2001 GDP is RMB6.5bn, average per capita GDP is RMB11,747. Key economic sectors are construction materials, machinery production and light industries.

Summary of Environment:
- Water: Drought in last 2 years had dried the nearby river. Based on 1999 results, the water quality in the nearby river exceeded Surface Water Quality Standard GB3838 – 88 type V class water quality standards.
- Noise: Generally meets City Noise Level Standard GB3096 – 93 level II, with exceedance in some instances.

Standards Applied for the Plant:
- Environmental Standard
  - Surface water: 3838-2002, type V
  - Atmosphere: GB3095-1996, level 2
  - Noise: GB3096-93: level 2
- Waste Discharge Standard
  - Waste water disposal: GB 8978 – 1996 level 2 ; GB5084-92 for farming area
  - Odor pollutant: GB 14554 – 93, level 2
  - Boiler gas emission: GB 13271 -2001 Type 2
  - Noise: GB 12348 – 90 level 2
  - Sludge to be applied as fertilizer: GB 4284 - 84
- Overall Control Standard
  - COD: 1460 t/a
  - SO2: 2.47 t/a
  - Soot: 0.55 t/a

Key Waste Produced:
<table>
<thead>
<tr>
<th>Item</th>
<th>Before treatment</th>
<th>After treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor</td>
<td>&lt;10 (at plant boundary)</td>
<td></td>
</tr>
<tr>
<td>Soot</td>
<td>1800mg/Nm3, 4.9t/a</td>
<td>180mg/Nm3, 0.49t/a</td>
</tr>
<tr>
<td>SO2</td>
<td>1110mg/Nm3, 3.05t/a</td>
<td>668mg/Nm3, 1.83t/a</td>
</tr>
<tr>
<td>pH</td>
<td>6-9</td>
<td>6-9</td>
</tr>
<tr>
<td>COD</td>
<td>350 mg/l, 5110 t/a</td>
<td>&lt;= 100 mg/l, 1752 t/a</td>
</tr>
<tr>
<td>BOD</td>
<td>200 mg/l, 2920 t/a</td>
<td>&lt;= 30 mg/l, 438 t/a</td>
</tr>
</tbody>
</table>
### Summary of Key Impacts on the Environment during operations

<table>
<thead>
<tr>
<th></th>
<th>COD</th>
<th>BOD</th>
<th>SS</th>
<th>Ammonium Nitrate</th>
<th>Sludge</th>
<th>Slag</th>
<th>Living Waste</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3650 t/year</td>
<td>2482 t/year</td>
<td>2482 t/year</td>
<td>219 t/year</td>
<td>12410 t/a</td>
<td>47 t/a</td>
<td>5.84 t/a</td>
</tr>
</tbody>
</table>

- **Waste water**
  After treatment, the wastewater quality improves significantly: COD decreases by 3650 t/year, BOD by 2482 t/year, SS by 2482 t/year, ammonium nitrate by 219 t/year.

- **Gas emission**
  BIOLAK technique is applied. It is expected that the plant will meet the gas emission requirements.

- **Noise pollution**
  Key source of noise pollution is from the plant machinery. It is expected that the plant will meet the noise pollution requirement. In addition, there is a 400m buffer zone.

- **Sludge / other physical materials**
  13922.84 ton of solid waste is produced per year, and will be sent to the landfill. The treatment of 12410 ton sludge is to be decided by the actual metal content. It will be used a fertilizer if it satisfies GB 4284 – 84.

### Conclusion and Recommendation

- **Conclusion**
  - The project benefits the environment. The applied technology satisfies requirements from Ministry of Construction, National Environmental Bureau and City Development Guide [2000] 124 Article.
  - Site selection is consistent with the municipal city planning, and suits wastewater collection and discharge.
  - Key pollutants from the plant would be odor, solid waste and noise. BIOLAK technology is applied and odor pollution will stay within limits. In addition, there is a buffer zone. The solid waste / sludge will be properly treated before sending to landfill or be used as fertilizers. Through proper arrangement, the noise level will be within limits.
  - The key pollutants from the plant will not affect the environment, and the plant will improve the city’s wastewater issue.
  - The applied technology and pollution mitigating measures are sufficient to ensure the pollution stays within limits.

The project meets national policies, and the site selection is appropriate. The possible pollution from the plant is appropriately managed, and the plant will improve the city surrounding.

### Approval
- Obtained