China
Brightoil’s
Zhoushan Petroleum
Products Storage Facility
**Assessment:**
Construction at the Zhoushan storage facility, which began during 2011, is continuing. Phase I construction is nearing completion. Phase II construction appears to have begun, seven storage tanks are complete and 22 are under construction. One transfer jetty (with six berths) and one general cargo jetty are complete and two transfer jetties are under construction. At the present rate of construction the facility could begin initial operations during late-2014 or early 2015.

**Overview:**
During 2010, as part of the continued expansion of the petroleum infrastructure in China, Brightoil Petroleum (Holdings) Limited announced that it intended to construct a new petroleum products storage facility in the Zhoushan area. The Zhoushan area is emerging as a major petrochemical and trading hub for eastern China supporting the import and regional trade not only for the greater Yangtze River delta region (e.g., Shanghai, etc.), but also for China’s East China Sea coast.

While Brightoil has a 100 percent interest in the new storage facility, it formed a joint venture, in which it has a 55 percent interest, with the Zhoushan Port Group Ltd. Company to construct the jetties and service the oil storage facility. The jetties will include berths that could accommodate vessels ranging from 1,000-300,000 dead weight tons (DWT).

The Zhoushan storage facility is being developed on the island of Waidiao Shan (Wai Island), 153 km southeast of Shanghai and 500 meters off the western shore of Zhoushan Qundao, on China’s east coast. Construction of the Zhoushan project is divided into two phases that are anticipated to commence operations in 2014 and 2015 respectively. When finished the facility will have a total capacity of 3.16 million cubic meters. Phase I began during 2011 and when complete will have a total capacity of 1.94 million m³ and include storage facilities for crude oil, fuel oil, gasoline, diesel, jet fuel, and chemical tanks. Phase II will expand upon storage capacity, berthing and infrastructure on the island.

**Location:**
Waidiao Shan (a.k.a., Wai Island), Zhoushan, Qundao, Zhejiang, China

**Coordinates:**
30° 03' 30.42" N, 121° 57' 55.29" E

**Date of Report:**
February 3, 2014

**Date of Imagery:**
April 10, 2010–March 15, 2014

**China:** Brightoil’s Zhoushan Petroleum Products Storage Facility
Development:
April 23, 2010 satellite imagery (Figure 3) shows Waidiao prior to the commencement of construction for the Zhoushan Storage Facility. The island covers approximately 94 km², of which approximately 50 percent was under cultivation.

Satellite imagery from June 3, 2011 image (Figure 4) shows the dramatic changes that have taken place in the 14 months since the previous image. Extensive excavation of Waidao’s central ridge, and the concurrent earthmoving and landfilling operations, has resulted in the island’s landmass being increased to approximately 1.1 km². All cultivated land has been filled and dredging operations are being conducted off the northeast and southwest shores. Twenty-three temporary building have been erected in the north central section of the island for construction crews and their equipment. Several temporary construction buildings have been erected on the southwest shore. A temporary batch-plant has been erected on the northern tip of the island.

The following year, on November 6, 2012, satellite imagery (Figure 5) the extensive nature of excavation, earthmoving and landfilling operations are visible. The latter have resulted in the landmass being increased to approximately 1.2 km². The temporary worker housing and equipment camp has been moved 200 m to the northwest, additional construction buildings are present on the southwest shore, and the temporary batch-plant is in the process of being moved 175 meter to the southwest. Approximately 1,500 meters of sea wall have been constructed along the southern half of the island. A 185 meter-long general cargo dock has been constructed, an 871 meter-long transfer jetty is under construction on the eastern shore of the island, and pilings for a second transfer jetty are being placed. Foundations for seven 81-meter (unpaved), five 44-meter (paved) and two 29-meter storage tanks are under construction.

Table 1. Storage Tank Status, 2010-2014

<table>
<thead>
<tr>
<th>Under Construction 29-meter</th>
<th>Under Construction 44-meter</th>
<th>Under Construction 81-meter</th>
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</thead>
<tbody>
<tr>
<td>Completed 29-meter</td>
<td>Completed 44-meter</td>
<td>Completed 81-meter</td>
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China: Brightoil’s Zhoushan Petroleum Products Storage Facility
Satellite imagery from July 23, 2013 (Figure 6) show that excavation, earthmoving and landfilling operations have continued—most notably in the northeast corner of the island. The temporary worker housing and equipment camp has been reduced to 17 buildings, there are no significant changes to the construction buildings along the southwest shore, and the temporary batch-plant remains in its previous location. No significant progress on the construction of the sea wall is apparent. The 185-meter-long general cargo dock is unchanged, major construction on the 871-meter-long transfer jetty is complete, construction of the second transfer jetty (approximately 930-meters-long at this point in construction). Foundations for seven 81-meter, five 44-meter and two 29-meter storage tanks are essentially complete.

Six months later, on January 23, 2014, satellite imagery shows (Figure 7) that excavation, earthmoving and landfilling operations have continued at a slower pace than previously and suggests that Phase II construction has begun. The temporary worker housing and equipment camp remains at 7 buildings, no significant increase in the number construction buildings along the southwest shore, and one of the two batch plants on the northern tip of the island has been removed. The sea wall on the north shore remains essentially unchanged. The general cargo and first transfer jetty are complete and remain unchanged, construction continues on the second transfer jetty (now approximately 930-meters-long) and construction of a third transfer jetty has begun on the west side of the island. A total of 25 storage tanks are under construction: twelve 81-meter tanks—five foundations, four with foundations and walls and three with foundations, walls and floating tops; seven 44-meter tanks—three foundations, four with foundations and walls; and six 29-meter—six foundations. Pipes connecting the transfer jetties, pumping stations and storage tanks are being laid.

Most recently a satellite image from March 9, 2014, shows (Figure 8) no significant additional excavation, earthmoving and landfilling operations. The temporary worker housing and equipment camp has been reduced to 7 buildings, there has been a dramatic expansion to the number construction buildings along the southwest shore, and a second batch plant has been constructed on the northern tip of the island. Approximately 575 meters of sea wall have been added on the north shore. The general cargo and first transfer jetty are complete and remain unchanged, construction continues on the second transfer jetty (now approximately 930-meters-long) and construction of a third transfer jetty has begun on the west side of the island. A total of 29 storage tanks have been completed or are under construction: twelve 81-meter tanks—five foundations, three with foundations and walls and four essentially complete with walls and floating tops; nine 44-meter tanks—four foundations, two with foundations and walls, three essentially complete with foundations, walls and floating tops; and eight 29-meter—eight foundations. Pipes connecting the transfer jetties, pumping stations and storage tanks are still being laid.

**Recommendations:**
Continued monitoring and analysis of Brightoil Petroleum’s Zhoushan Storage Facility on a quarterly basis is recommended to determine: operational status, storage levels and shipping activity. Such monitoring and analysis may provide advanced insight into historical and future import/export trends and status of petroleum reserves for China’s eastern provinces.
4.23.13 Waidiao several months prior to the beginning of construction.
Figure 4

ZHOU SHAN PETROLEUM STORAGE FACILITY

Newly constructed sea wall

Temporary batch plant

Temporary housing and construction camp

Excavation and landfill operations

Laotangshan

HENGSHUI YANG (CHANNEL)

Zhoushan Petroleum Storage Facility
ZHOU SHAN PETROLEUM STORAGE FACILITY

Figure 5

Temporary housing and construction camp

Temporary batch plant

7 storage tanks (~82 m)

2 storage tanks (~28 m)

5 storage tanks (~43 m)

Transfer jetty (~87 m)

Transfer jetty under construction

Cargo jetty (~185 m)

Laotangshan

7 storage tanks (~82 m)

Zhoushan Petroleum Products Storage Facility.

11.06.12
Zhoushan Petroleum Products Storage Facility.

7.23.13
Zhoushan Petroleum Products Storage Facility.

1.23.14 ZHOUHSAN PETROLEUM STORAGE FACILITY

Figure 7

Temporary batch plant

Transfer jetty under construction

12 storage tanks (~82 m)

Continued excavation and earth-moving operations

5 storage tanks (~43 m)

2 storage tanks (~28 m)

Transfer jetty under construction

Temporary housing and construction camp

Zhoushan Petroleum Storage Facility.
Zhoushan Petroleum Products Storage Facility.

- Newly constructed seawall
- Temporary housing and construction camp
- 12 storage tanks (~82 m)
- Transfer jetty under construction
- 8 storage tanks (~28 m)
- Temporary batch plant
- 9 storage tanks (~43 m)
- Transfer jetty under construction
- New construction seawall
- Zhoushan
- 8 storage tanks (~28 m)

3.09.14

Zhoushan Petroleum Products Storage Facility.
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