Borax Argentina S.A.

Borax has operated in the Salta and Jujuy regions for over 50 years and was acquired from Rio Tinto in August 2012. The Borax operations include two open pit mines, concentrators, refining capacity and significant land holdings. The mining operations are located in Tincalayu and Sijes with neither operation requiring a TSF. A boric acid plant is operated at Campo Quijano, Salta and utilises the following evaporation ponds and waste dumps for storage of excess process water and solid waste.

Evaporation Ponds

Pond	Location	Area (ha)	Volume (m^3)	Dam height (m)	Status
1	24º54'51''S 65º38'24''W	1.0	10,000	3.0	Operating since 1998
2	24º54'57''S 65º38'21''W	1.0	10,000	3.0	Operating since 2002
3	24º55'15''S 65º38'04''W	3.7	64,000	3.5	Operating since 2003
4	24º55'22''S 65º37'58''W	3.2	64,000	3.5	Operating since 2003
5	24º55'32''S 65º37'53''W	2.0	35,000	3.5	Under design and construction

Solid Waste Stockpiles

	Location	Area (ha)	Capacity (m^3)	Status
1	24º55'02''S 65º38'13''W	7.5	350,000	Closed. Under restoration
2	24º55'09''S 65º38'08''W	4.3	250,000	Operating since 2003

Construction

The evaporation pond walls were constructed with excavated ground from the pond area (a mixture of clay and coarse round gravels); this excavated ground was used for constructing the walls in ascending layers. Each layer was compacted until it reached the control factor called "Proctor Assay" which ensures the maximum density for the material after compaction and leads to the maximum shear resistance.

Senior internal engineering staff have reviewed all Proctor Assay results. The minimum density stated for approving the compaction was 85% and all results reviewed are above 95%. The base of the ponds was prepared in a similar manner with the excavated material compacted with the same Proctor controlling factor.

Following compaction of the base and walls a High-Density Polyethylene liner was installed ensuring that water does not enter the walls and base of the ponds.

Review Activities

An internal review of the evaporation ponds was conducted in April 2019. No signs of instability, damage or water spillage were detected. The pond walls were considered stable and able to withstand severe conditions (high intensity rainstorms plus earthquake).

A further stability study will be conducted by an external consultancy which is expected to be completed by the end of 2019.

The waste stockpiles have not yet been reviewed in depth as their stability is driven by the slope angle, which is much lower than the limit of stability angle. However, a review will be performed by external consultants as part of the review of evaporation ponds.

REFERENCE INFORMATION

Tailings Storage Dam Definition

Tailings dams are typically constructed in stages or on a continuous basis over many years, while conventional dams are usually constructed as a single stage in a short time period. As a result, the condition of the tailings facility is continually changing, and so its safety must be continually re-evaluated. In some respects, this renders tailings dam stewardship more onerous than is the case for conventional dams. A steady state condition is not achieved until after the mine operation has ceased.[1]

Tailings dams differ from water reservoir dams in two significant ways – dam-life design, and dam-construction design.

Firstly, unlike a dam built for impounding water, which can ultimately be drained if the structural integrity becomes questionable, a tailings dam must be designed to safely impound the material behind the dam in perpetuity. This consideration should entail additional design requirements, especially regarding the seismic and hydrologic events the dam might experience.

Secondly, while water dams are all the down-stream-type construction, the construction of tailings dams can be either (1) single lift, (2) multiple raise, (3) downstream, (4) centerline, (5) upstream, or a combination of any of the previous methods.[2]

Orocobre's evaporation ponds are designed to store brine or excess process water rather than solid tailings material and as such are more akin to water dams.

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About Orocobre Limited
Orocobre Limited (Orocobre) is a dynamic global lithium carbonate supplier and an established producer of boron. Orocobre is dual listed on the Australia and Toronto Stock Exchanges (ASX: ORE), (TSX: ORL). Orocobre's operations include its Olaroz Lithium Facility in Northern Argentina, Borax Argentina, an established Argentine boron minerals and refined chemicals producer and a 34.7% interest in Advantage Lithium. For further information, please visit www.orocobre.com.

[1] **https://pubs.iied.org/pdfs/G01027.pdf**
[2] **https://www.nps.gov/articles/aps-v13-i2-c8.htm**

Appendix – Olaroz Evaporation Pond Locations

Pond 1B

Corner	North	East	Elevation
V1	7397158.41	3422979.34	3961.52
V2	7395660.24	3424086.40	3961.60
V3	7395560.47	3423783.37	3961.93
V4	7396896.66	3422795.36	3964.70

Pond 2A

Corner	North	East	Elevation
V1	7397453.03	3423186.43	3954.97
V2	7395771.90	3424428.77	3956.69
V3	7395669.52	3424117.75	3956.95
V4	7397184.41	3422997.61	3957.55

Pond 2B

Corner	North	East	Elevation
V1	7397746.00	3423392.35	3951.69
V2	7396767.67	3424341.78	3951.96
V3	7396585.71	3424065.35	3951.69
V4	7397475.25	3423202.04	3953.11

Pond 4A

Corner	North	East	Elevation
V1	7396750.89	3424348.67	3951.61
V2	7395524.63	3424864.60	3950.80
V3	7395455.16	3424546.25	3950.80
V4	7396571.74	3424076.50	3951.61

Pond 3A

Corner	North	East	Elevation
V1	7398035.50	3423595.83	3948.57
V2	7396955.71	3424641.65	3948.27
V3	7396775.53	3424367.91	3948.27
V4	7397767.39	3423407.37	3948.57

Pond 3B

Corner	North	East	Elevation
V1	7396954.88	3424642.16	3948.42
V2	7395601.48	3425213.56	3947.37
V3	7395530.24	3424890.06	3947.19
V4	7396771.86	3424366.03	3949.01

Pond 4B

Corner	North	East	Elevation
V1	7396163.26	3423449.00	3969.91
V2	7394587.42	3423851.65	3968.53
V3	7394586.32	3423556.62	3968.79
V4	7395990.12	3423185.82	3969.97

Pond P1

Corner	North	East	Elevation
V1	7396516.62	3422407.98	3970.00
V2	7396558.73	3422434.94	3969.95
V3	7396511.42	3422505.75	3970.44
V4	7396470.51	3422476.99	3970.56

Pond P2

Corner	North	East	Elevation
V1	7396563.79	3422438.18	3969.96
V2	7396605.89	3422465.14	3969.92
V3	7396557.23	3422537.95	3970.50
V4	7396516.32	3422509.20	3970.37

Pond P3

Corner	North	East	Elevation
V1	7396610.95	3422468.37	3969.93
V2	7396653.06	3422495.33	3969.98
V3	7396603.05	3422570.15	3970.22
V4	7396562.14	3422541.40	3970.62

Pond R1

Corner	North	East	Elevation
V1	7396586.89	3422574.05	3971.60
V2	7396491.34	3422699.94	3971.43
V3	7396290.85	3422535.87	3971.43
V4	7396374.95	3422425.08	3971.45

Pond R2

Corner	North	East	Elevation
V1	7396486.28	3422706.13	3971.43
V2	7396381.78	3422824.70	3971.42
V3	7396193.82	3422646.42	3971.46
V4	7396285.79	3422542.06	3971.44

Pond 6A

Corner	North	East	Elevation
V1	7394909.91	3423528.48	3971.45
V2	7394586.04	3423530.77	3971.45
V3	7394603.15	3423272.27	3971.45
V4	7394889.15	3423270.25	3971.45

Pond 6B

Corner	North	East	Elevation
V1	7395237.96	3423478.36	3971.45
V2	7394917.88	3423527.84	3971.45
V3	7394897.12	3423269.61	3971.45
V4	7395179.78	3423225.91	3971.45

Pond 7A

Corner	North	East	Elevation
V1	7395555.20	3423380.94	3971.23
V2	7395245.76	3423476.56	3971.25
V3	7395187.57	3423224.11	3971.39
V4	7395460.83	3423139.68	3971.36

Pond 7B

Corner	North	East	Elevation
V1	7395854.85	3423238.31	3971.42
V2	7395562.65	3423378.02	3971.42
V3	7395468.28	3423136.76	3971.45
V4	7395726.31	3423013.38	3971.49

Pond 8A

Corner	North	East	Elevation
V1	7396130.50	3423053.51	3971.45
V2	7395861.80	3423234.34	3971.45
V3	7395733.26	3423009.41	3971.53
V4	7395970.55	3422849.73	3971.43

Pond 8B

Corner	North	East	Elevation
V1	7396376.27	3422830.50	3971.42
V2	7396136.80	3423048.57	3971.42
V3	7395976.84	3422844.79	3971.45
V4	7396188.31	3422652.22	3971.49

Pond 1A

Corner	North	East	Elevation
V1	7397199.23	3422141.88	3971.46
V2	7396175.76	3423449.65	3971.48
V3	7395996.66	3423177.57	3971.51
V4	7396892.17	3422033.15	3971.49

Pond 5A

Corner	North	East	Elevation
V1	7395757.02	3424433.62	3956.70
V2	7395448.97	3424517.21	3953.58
V3	7395378.46	3424197.45	3953.92
V4	7395656.35	3424122.05	3956.84

Pond 5B

Corner	North	East	Elevation
V1	7395647.15	3424096.75	3961.63
V2	7395372.67	3424171.19	3958.62
V3	7395304.87	3423863.66	3958.61
V4	7395550.36	3423797.08	3961.90

Pond 15A

Corner	North	East	Elevation
V1	7395429.67	3424520.32	3955.33
V2	7394509.05	3424611.20	3955.29
V3	7394524.67	3424286.41	3955.42
V4	7395361.46	3424203.20	3955.30

Pond 15B

Corner	North	East	Elevation
V1	7395348.09	3424168.90	3960.17
V2	7394526.00	3424251.59	3960.20
V3	7394549.63	3423919.67	3960.30
V4	7395271.15	3423867.27	3960.26

Pond 16A

Corner	North	East	Elevation
V1	7394575.29	3423205.19	3978.75
V2	7394302.02	3423160.92	3978.74
V3	7394366.35	3422874.96	3978.85
V4	7394597.35	3422976.03	3978.86

Pond 16B

Corner	North	East	Elevation
V1	7394868.79	3423205.48	3977.54
V2	7394606.18	3423206.40	3977.47
V3	7394625.10	3422912.32	3977.57
V4	7394869.33	3423201.93	3977.54

Pond 17A

Corner	North	East	Elevation
V1	7395163.46	3423159.95	3977.53
V2	7394891.34	3423205.16	3977.59
V3	7394868.19	3422910.66	3977.62
V4	7395098.35	3422875.71	3977.55

Pond 17B

Corner	North	East	Elevation
V1	7395438.42	3423079.53	3977.63
V2	7395171.73	3423160.00	3977.60
V3	7395105.20	3422873.22	3977.68
V4	7395330.59	3422803.73	3977.84

Pond 18A

Corner	North	East	Elevation
V1	7395696.25	3422956.89	3977.54
V2	7395444.09	3423076.72	3977.64
V3	7395336.46	3422800.78	3977.78
V4	7395550.63	3422704.89	3977.50

Pond 18B

Corner	North	East	Elevation
V1	7395929.86	3422797.68	3977.50
V2	7395700.41	3422952.10	3977.65
V3	7395553.99	3422697.15	3977.54
V4	7395748.78	3422566.06	3977.53

Pond R11

Corner	North	East	Elevation
V1	7396139.34	3422606.86	3977.27
V2	7396044.59	3422701.55	3977.46
V3	7395846.67	3422483.60	3977.49
V4	7395927.56	3422403.50	3977.58

Pond R12

Corner	North	East	Elevation
V1	7396038.98	3422706.05	3977.46
V2	7395936.32	3422791.97	3977.45
V3	7395753.61	3422561.93	3977.39
V4	7395841.11	3422488.02	3977.44

Salt Stockpile

Corner	North	East	Elevation
V1	7395744.40	3422548.32	3980.35
V2	7395380.94	3422765.69	3980.34
V3	7395380.94	3422463.23	3986.86
V4	7395540.24	3422289.77	3986.87