PORT DAVEY TIN SMELTER PROPOSAL

Proposed EHRP Category	Item of Engineering Interest.		
Item Name:	Port Davey Tin Smelter		
Other/Former Names:			
Locality:	Port Davey Tasmania		
Address:	Melaleuca Inlet		
Co-ordinates	*-43.414875, 146.164937*		
Current Owner:	National Parks		
Original Owner:	Peter Wilson		
Current use:	Not operating		
Former use:	Smelting of tin ore mined at Port Davey		
Proposed use:	Operations permanently ceased		
Item Condition:	The mine and associated buildings remain today and condition is unknown.		
Designer:	Peter Wilson		
Builder:	Peter Wilson		
Started:	1992	**Completed:**	1992
History: **(100 to 600 words)**	Peter Wilson, a mining engineer, acquired the tin leases from Deny King and commenced extracting cassiterite ore from the alluvial sands under the button grass and top soil cover. In 1992 he decided to build a tin smelter on site. Initially he built a blast furnace but it was so hot that it could only be operated in sleeting weather. In 1997 he built a more suitable reverberatory furnace. This he operated until 2011 when he relinquished the majority of their leases to the Tasmanian Wilderness World Heritage Area.		
Description: **(100 to 600 words):**	**Smelting**: The reverberatory furnace required cassiterite concentrate, diesel oil for fuel, coke for redundant and shell grit for flux. In combination with significant heat, these facilitated a chemical reaction that reduces cassiterite to tin. The shell grit, coke and diesel oil were transported into Melaleuca by boat during half-yearly provisioning trips to Hobart. The smelting process began with warming up the furnace with a wood fire for 12 hours. At the end of this period, the charge was weighed out, tipped into the top of the furnace. The intake and exhaust fans were then turned on and the burner ignited. More charges were tipped into the top of the furnace and		

	distributed inside until it was at capacity and the correct temperature (1300°C) was reached. The chemical reaction took several hours to complete and reduced the charge to a molten pool of tin inside the furnace. the furnace was tapped through a small hole in the base. The molten tin ran out into 30 kg inverted pyramid moulds. **Refining**: To improve the quality of the product, two separate refining processes were undertaken. The primary refining processes took place while the furnace was still hot. A large inclined iron plate was placed on top of the furnace and heated during the smelting process. The 30 kg pyramids of smelter product were placed one at a time on the plate. As the pyramids slowly melted, the tin trickled down the plate into another mould leaving the impurities on the plate. Peter constructed a 'kettle' in which the secondary refining process took place. The kettle consisted of a deep steel tub with an inclined plate to one side and an outlet at the base. This sat on top of a wood-fuelled firebox and the whole apparatus rested on a wheeled base. To start the secondary refining process, the firebox was lit and several 30 kg pyramids of recovered tin were placed in the kettle. Once the tin was molten inside the Kettle, a pipe was submerged, and compressed air was gently bubbled through the molten tin. Impurities were entrapped by the bubbles as they rose to the surface. The impurity-rich froth was then scraped off and placed on the inclined plate. Any remaining tin trickled back down into the Kettle leaving the impurities on the plate. Once the secondary refining process was complete, the final 10 kg moulds were filled with refined molten tin from the kettle. The 10 kg bars were sold to foundries. The product was so pure that it was used as a direct input into the foundry processes. After the closure of the Sydney and Brisbane smelters, Peter and Barbara's smelter was the only remaining tin smelter in Australia. Consequently, Peter reduced mine production to ensure that the entire cassiterite concentrate could be smelted for sale. Stockpiling the smelted tin.
Engineering Significance:	After the closure of the Sydney and Brisbane smelters, Peter Wilson's smelter was the only remaining tin smelter in Australia. The Tin smelter refinery was built in an extremely remote area from first principles. Transport operations were restricted to small boats from Hobart. During operations it was the only Tin smelter / refinery in Australia. Clever methods were designed to remove impurities from the smelter product, achieving 99.9% purity.
Webpage Summary: (200 to 300 words)	In 1974 Peter Willson, a mining engineer, acquired the tin leases from Deny King at Port Davey in south-west Tasmania and commenced extracting cassiterite ore from the alluvial sands under the button grass and top soil cover. Food, stores and equipment could only be transported by boat from Hobart. In 1992 he decided to build a tin smelter on site. Initially he built a blast furnace but it was so hot that it could only be operated in sleeting weather. In 1997 he built a more suitable reverberatory furnace. After smelting the tin was refined to 99.9% purity. He continued his operations until 2011 when he relinquished the

	majority of their leases to the Tasmanian Wilderness World Heritage Area.
Bart.Engineering Theme:	Mining and smelting
Heritage Listing:	Not listed
References:	Tin Mining and Smelting in Tasmania - Engineering Heritage …

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EHA Branch Chair:	Indrek Tults	**Approval Date:**	

Images: .

Rabbling the charge

Tapping the furnace to release the molten tin.

Stock piling the smelted tin