

Your Ref :
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**DAS Steel (Pty) Ltd.
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Attention: Mr Suresh Mirchandani

**ASSESSMENT OF THE WATER HARVESTING POTENTIAL OF THE PROPOSED STEEL
RECYCLING PLANT ON THE REMAINDER OF PTN 155 (OF 117)**

Dear Suresh,

Terratest (Pty) Ltd. (Terratest) were appointed to undertake an assessment of the water harvesting potential of the proposed steel recycling plant on the remainder of PTN 155 (of 117) of the farm Riet Vallei No 851. KwaZulu-Natal. The water harvesting potential of two development phases on the afore-mentioned property were assessed. The first phase consists of a steel recycling plant while the second phase includes a rolling mill shed. The demands for each of the phases are as follows:

Phase 1 – Process demand 18 m³/day and potable demand 16 m³/day

Phase 2 – Process demand 41 m³/day and potable demand 33 m³/day

Herewith please find the methodology and the results of the investigation. The projected assurance of supply is based on historical rainfall data.

In order to provide an assessment of the water harvesting potential of the afore-mentioned structures, rainfall data at a daily time step was required. Data from the South African Weather Services rain gauge 0181426 W was used as it has an acceptable reliability, rainfall record and is in close proximity to the site. Daily rainfall spanning a 52 year period between 1950 through to 2001 was used to assess the water harvesting potential at both the steel recycling plant and rolling mill shed. The analysis consisted of quantifying the volume of water harvested daily by the surface areas of the Phase 1 (8 192.2 m²) and Phase 2 (13 444.12 m²) structures over a period of 52 years. Several scenarios consisting of tanks of different storage volumes on the proposed

development site were then used to assess the number of days that a tank with a given storage capacity could supply the process, potable and total water demands for a 365.25 day year. The results of the water harvesting potential for Phase 1 of the proposed development are shown in **Figure 1** while those for the Phase 2 are shown in **Figure 2**.

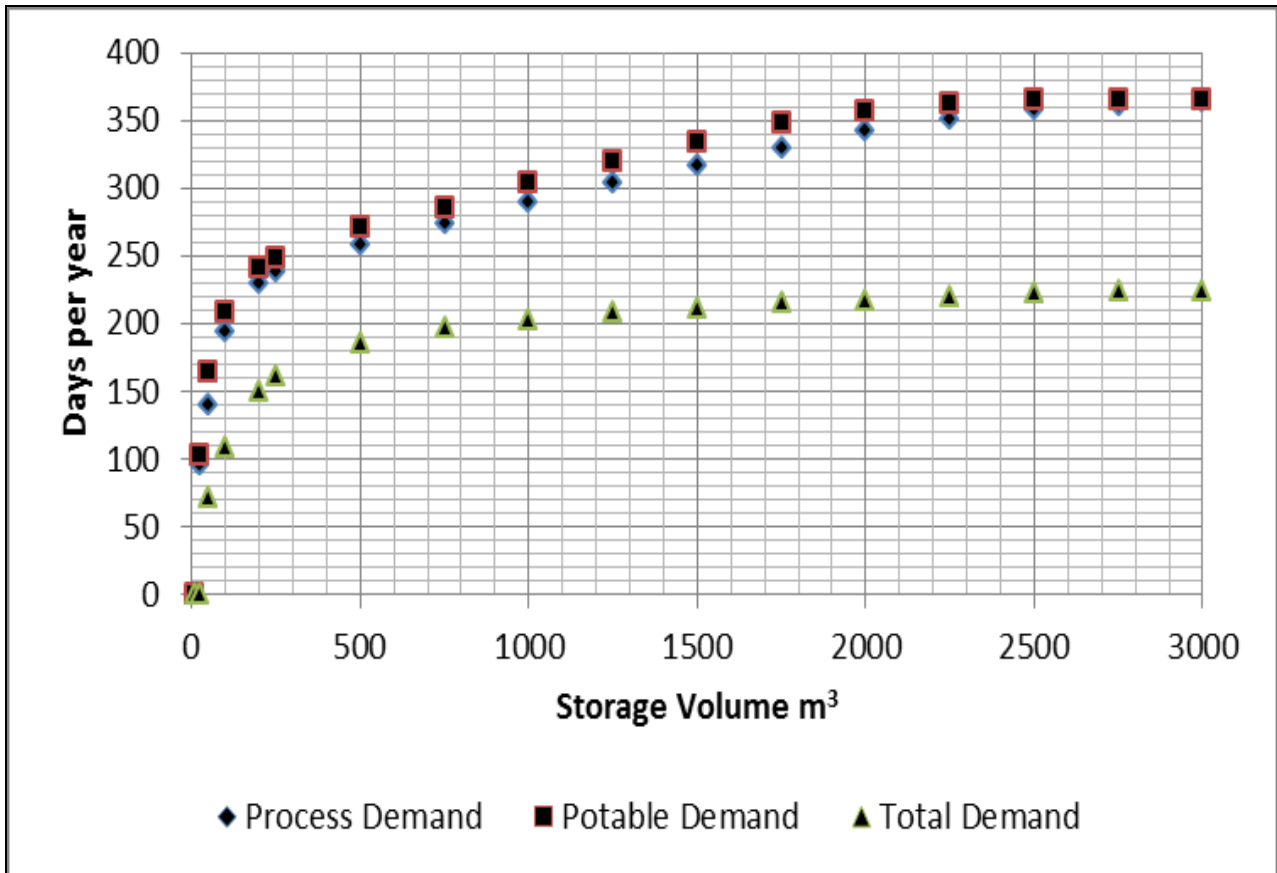


Figure 1 Estimated Number of Days that the Process, Potable and Total Water Demands Will Be Satisfied During Phase 1 of the Proposed Development

The results for the scenarios in Phase 1 (**Figure 1**) and Phase 2 (**Figure 2**) of the proposed development indicate that in both situations, the potential for storage tanks of varying volumes to meet the proposed water demands increases rapidly up until a storage tank capacity of approximately 250 m³. Thereafter, there is a decrease in the rate of the number of days supplied by an increase in storage tank capacity. Furthermore, the rate of increase of the number of days which the total water demands can be met for a 365.25 day year flattens out at a storage capacity of approximately 1 000 m³ for both Phase 1 and Phase 2. This may be an indication of the fact that the rainfall of the area of interest is of an insufficient volume to meet the combined process and potable water demands. A summary of the findings is presented in **Table 1**.

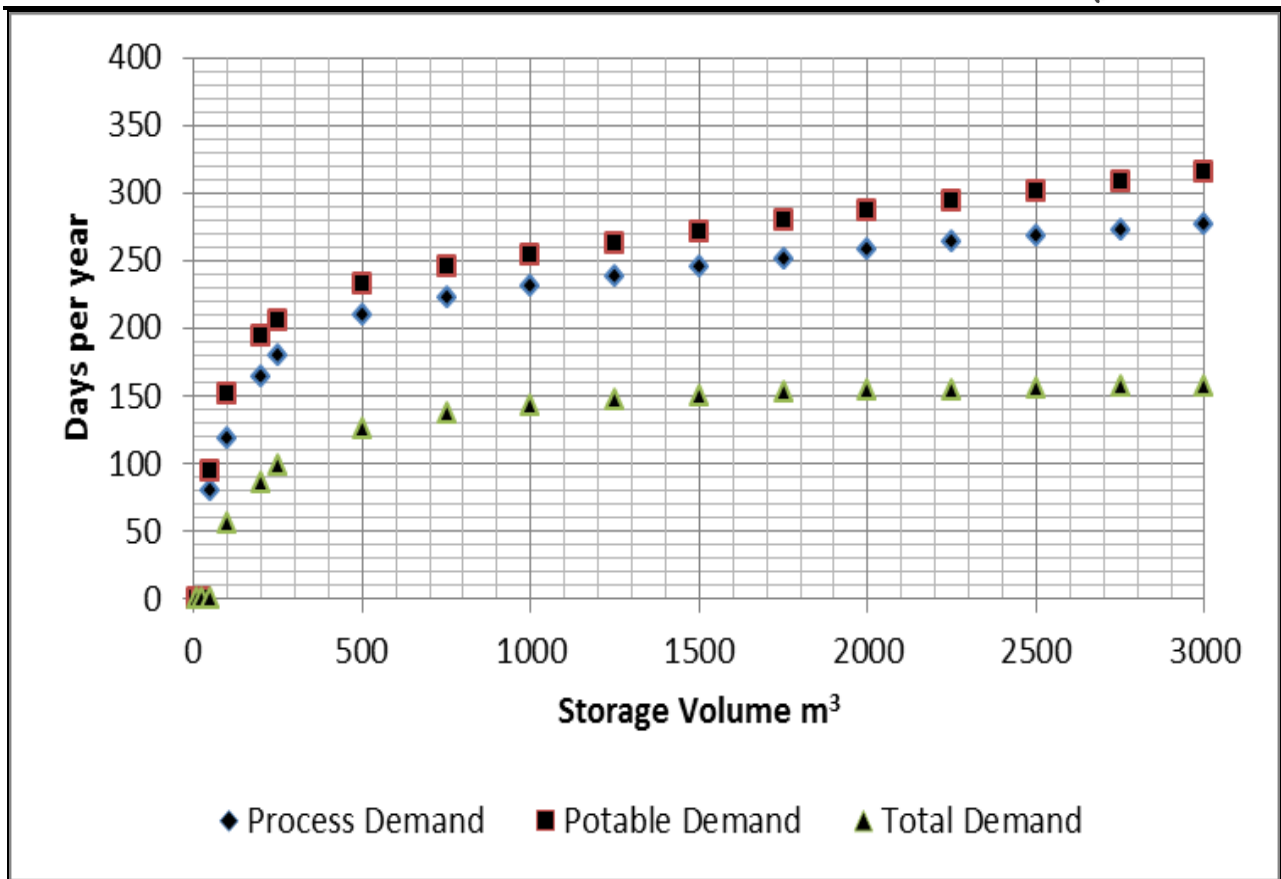


Figure 2 Estimated Number of Days that the Process, Potable and Total Water Demands Will Be Satisfied During Phase 2 of the Proposed Development

In the light of the findings of the investigation, it is recommended that storage tanks which sum a total volume of between 700 m³ and 1000 m³ be installed to store the water harvested by the steel recycling plant and the rolling mill shed. The benefit of constructing storage tank which sum a total volume greater than 1000 m³ is limited. For example, a total storage volume of 700 m³ will supply water for the total demand of 74 m³/day for an average of 134.8 days a year, while a total storage volume of 1000 m³ will only be able to supply water for an average of 143 days a year for the total demand of 74 m³/day.

Table 1 Estimated Number of Days that the Total Water Demand Will Be Satisfied for Phase 1 (P1) and for Phase 2 (P2)

Estimated Assurance of Supply		Storage Tank Volume (m ³)							
		25	50	100	200	250	500	700	1000
Days of the year	P1	0.0	71.2	109.0	150.2	160.7	185.2	193.8	202.7
	P2	0.0	0.0	55.7	86.2	98.3	124.9	134.8	143.0

Kind Regards,

Ernest Oakes

Hydrologist

For: TERRATEST

Shalen Jangali

Executive Associate