



7TH REGIONAL
african water
LEAKAGE SUMMIT

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Zamdela Water Loss Reduction Project – A Case Study

Presented by: Rivash Panday

Participating and supporting organisations :




Preamble



- **Water has been ranked by the World Economic Forum's Global Risk Report as one of the biggest threats facing the planet over the next decade. This threat is amplified:**
 - in water scarce regions like South Africa;
 - in companies with large and complex footprints like Sasol (compared to our peers we have an unusually large water demand from water scarce regions).
- **Water has strategic importance for Sasol due to our upstream manufacturing activities.**
- **Companies that identify the lack of water as a significant risk to their business are taking action via improved water management practices referred to as corporate water stewardship.**
- **Water stewardship is a stakeholder-inclusive process that involves site-and-catchment based actions to decrease water risk exposure.**
- **Sasol has been a signatory to the UN Global Compact CEO Water Mandate since 2007 and has adopted the mandate's water stewardship framework in responding to water risks.**
- **Driving water partnerships is advocated by the UNGC CEO Water Mandate (collective action and community engagement).**

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Sasol Continues to Endorse the UNGC CEO Water Mandate's Water Stewardship Framework



SIX KEY FOCUS AREAS

- TRANSPARENCY
- DIRECT OPERATIONS
- WATERSHED/SUPPLY CHAIN
- COLLECTIVE ACTION
- COMMUNITY ENGAGEMENT
- PUBLIC POLICY


The CEO Water Mandate

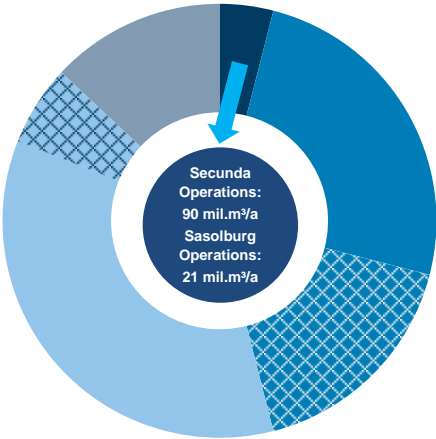
Water stewardship is about responding to a shared challenge, taking collective responsibility and being transparent and accountable

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Risk facing the Integrated Vaal River System (IVRS)



Vaal system water demand per sector (total demand 2900 mil.m3/a)



- 4% Sasol
- 42% Domestic
- 17% Domestic Losses
- 41% Irrigation
- 6% Unlawful Irrigation
- 13% Eskom

Secunda Operations: 90 mil.m³/a
Sasolburg Operations: 21 mil.m³/a

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Business case for Water Partnership Incentives



SA stats*(WRP,2017):

- Non-revenue water is close to 37%.
- 45% of municipalities have poor/no water loss information and plans.
- Average water consumption in SA is 238 L/capita/day as apposed to international which is 178 L/c/d.

The Department of Water and Sanitation (DWS) Response:

- Reconciliation Strategy identified meeting 15% savings target in reducing urban water losses by Municipalities as a significant opportunity in bringing the IVRS into balance.
- Appeal to the private sector to support Government initiatives in water conservation/water demand management (WC/WDM).
- The DWS included the development of a Water Offsetting Policy (being revised to Water Stewardship framework policy) in the National Water Resource Strategy 2 (NWRS2) as an incentive for Business to participate.
- In discussion with the DWS to consider merging the 2 policies to be called Incentive Based Partnership Policy Framework.
- A company may offset for good corporate stewardship, or may seek a regulatory benefit such as higher-priority access to water in times of drought
- (Hastings & Pegram; 2012)

Sasol has concluded that water security for our operations can be improved in a more meaningful way by saving water beyond our factory fence line.

*WRP, Status Report on Water Losses within the 8 large water supply systems, March 2017.

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War on Leaks in Metsimaholo Local Municipality – A Case for Water Offsets

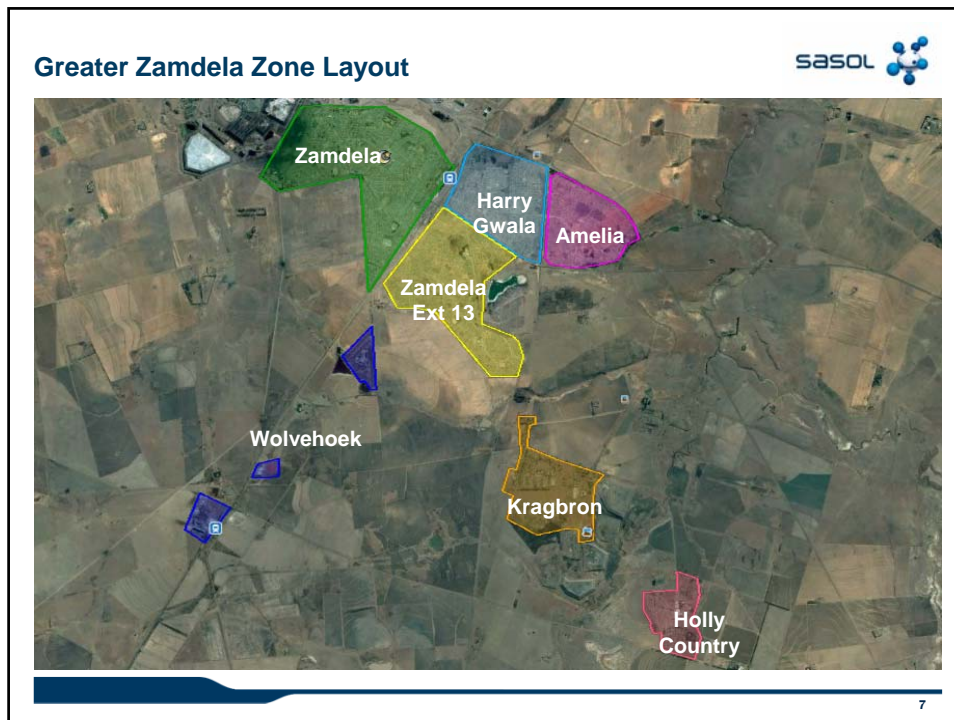


Summary:

- Sasol is involved in a water conservation/water demand management project for MLM in Sasolburg, in collaboration with Rand Water, GiZ and the DWS.
- A feasibility study completed in 2012 concluded that the focus of the MLM War on leaks project should be in the Greater Zamdela area.
- The DWS contributed R4 million (baseline establishment), Sasol R2.9 million (advanced pressure management) and GiZ 60,000 Euros (education and awareness raising).
- The partnership support contributed to MLM achieving a reduction in potable water demand in the greater Zamdela area by 23% (3.1 ML/day) due to pressure reduction (equates to savings of approx. R9 million/annum).
- Saving equates to offsetting 5% of SO's raw water demand (60 ML/day) and 72% of SO's potable water demand (4.3 ML/day).



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Scope of Work


The map displays the following service areas:

- Zamdela
- Harry Gwala
- Amelia
- Zamdela Ext 13
- Wolvehoek
- Kragbron
- Holly Country

- Baseline Establishment
- Advanced Pressure Management in Zamdela and Harry Gwala
- Harry Gwala Reservoir Complex Remedial Works
- Large Consumer Meter Audits and Meter Installations
- Large Consumer Meter Monitoring
- Control Valve Training

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Greater Zamdela KPI Summary



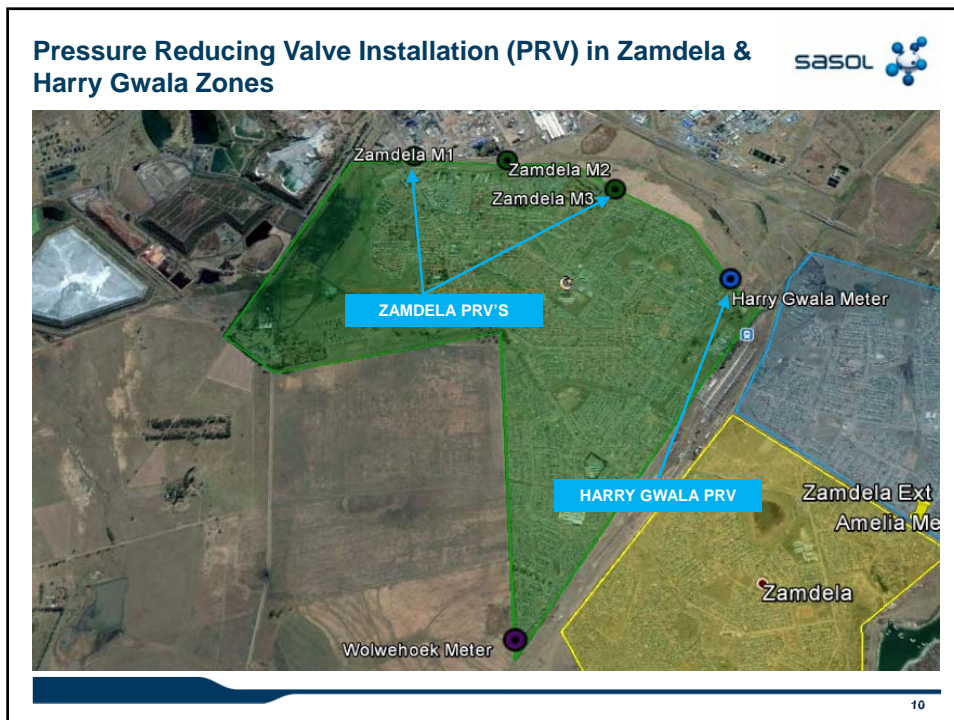
AREA	NO. PROPERTIES	ESTIMATED POPULATION PER PROPERTY	ESTIMATED POPULATION	MEASURED DAILY DEMAND (M ³ /DAY)	DEMAND / HOUSEHOLD / MONTH (M ³)*	LITRE / CAPITA / DAY **	MNF / AVERAGE
Zamdela	7386	6	44316	11 448	47.1	258	85%
Harry Gwala	3265	5	16325	3 558	33.1	218	82%
Zamdela X13	5338	4	21352	1 559	8.9	73	N/A
Amelia	3150	4	12600	1 105	10.7	88	N/A
Kragbron	389	4	1556	193	15.1	124	50%
Holly Country	208	4	832	148	21.6	178	0%
Wolvehoek	N/A	N/A	N/A	836	N/A	N/A	N/A
Total	19736	4.9	96981	18 294	28.2	189	

*MNF = Minimum Night Flow

* Norm Average = 15 – 20 m³/month

** Norm Average = 100 - 130l/capita/day

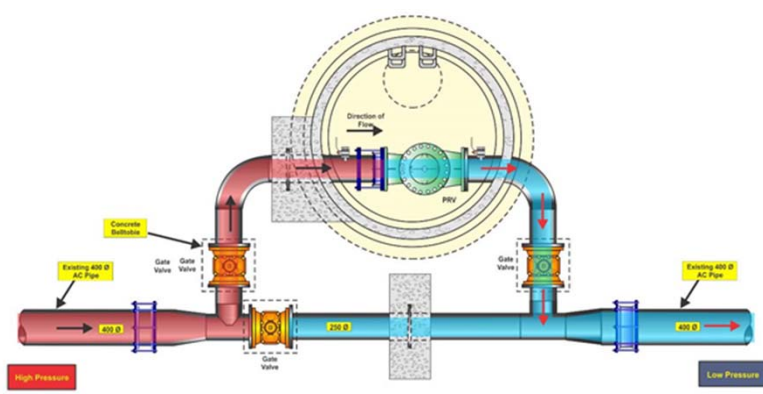
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PRV Installation Designs



250mm PRV Installation Pipeline details (Zamdela Pipeline 3)



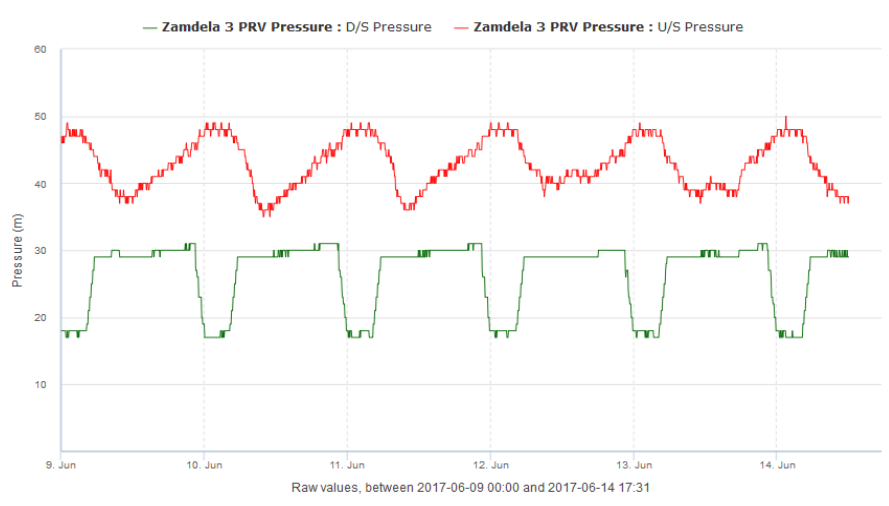
Zamdela 3 PRV Construction



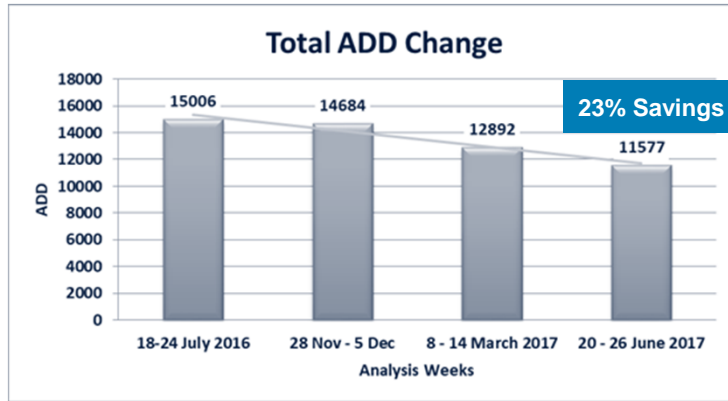
Pressure Controller Installations



Results – Upstream Vs Downstream Pressure



Average Daily Demand (ADD) Change for Zamdela & Harry Gwala



Financial Savings



Area	Baseline ADD (m³/day)	Current ADD (m³/day)	Daily Savings (m³/day)	Monthly Savings (m³/month)	Yearly Savings (m³/year)
Zamdela	11 448	8 424	3 024	91 980	1 103 760
Harry Gwala	3 558	3 153	405	12 319	147 825
Total	15 006	11 577	3 107	94 505	1 251 585

Using Rand Water Tariff

Area	Daily Savings (R/day)	Monthly Savings (R/month)	Yearly Savings (R/year)
Zamdela	R 22 861	R 695 369	R 8 344 426
Harry Gwala	R 3 062	R 93 130	R 1 117 557
Total	R 25 923	R 788 499	R 9 461 983

Large Consumer Meter Audits and Meter Replacements



- 15 top consumers were audited.
- Design for new meters. →
- Installation of 11 Consumer (budget constraints)
- Temporary Logging of meters



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Summary of Large Consumer Logging Results to Date



LARGE CONSUMER	AVERAGE FLOW RATE (M ³ /H)	MINIMUM NIGHT FLOW (M ³ /H)	AVERAGE DAILY CONSUMPTION (M ³ /DAY)	ESTIMATED LEAKAGE (M ³ /DAY)
1	22,6	13,9	538	300,2
2	5,5	4,6	106	99,4
3	0,3	0	7	0
4	0,3	0	8,3	0
5	15	12,7	315	274,3
6	10,5	6,5	253	140,4
7	3,4	0	80,8	0
8	8,5	6,4	137,8	138,2
9	1,9	1,6	47	34,6
10	2,5	0	50	0
11	0,67	0,4	15	0
Total				987

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Control Valve Training



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Lessons Learnt in Water Partnership Projects



- Leak reduction projects should be done on a large enough scale to see savings on bulk purchases.
- A proper baseline needs to be established in order for losses to be measured.
- Municipality needs to dedicate resources to the project.
- Project Management is required for the success of partnership projects.
- Ensure that partners contribute equally in the process.
- Education and awareness on water conservation needs to be ongoing and part of the municipalities business model for sustainability of such a project.
- Proper project governance needs to be administered.
- Stakeholder management – communities and political stakeholders needs to be kept informed.
- Assess beneficiaries capabilities to ensure sustainability.

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Conclusion and Recommendation



- The Zamdela water loss reduction project was a success; there are still opportunities for further leakage reduction.
- Sasol is aligned to a stakeholder approach in mitigating our water risks hence we support water partnerships.
- Municipalities are under immense pressure to meet their WC/WDM targets hence this case study demonstrates a need for incentives for private sector investment beyond the factory fence-line.
- It is therefore recommended that the DWS enable incentives like Water Offsetting to be recognised in law to attract private sector investment in Public infrastructure.