CS-03

LANDSCAPE · SEAWATER · ALTERNATIVE SOURCES

EPIC CASE STUDY

AL SAMMALEAH ISLAND

ABU DHABI, UNITED ARAB EMIRATES · 2007

Four EPIC plots on four different water sources, against a metered sprinkler control. One ran on seawater straight out of the Arabian Gulf, pumped by a solar panel.

78.91%	45,000+	Solar
METERED WATER SAVING	PPM GULF SEAWATER	PUMP
1 Aug to 9 Sep 2007	Irrigated directly	On the seawater plot

EVIDENCE LEVEL

MEASURED · Metered A/B turf trial, 1 Aug to 9 Sep 2007 · plus three source-demonstration plots

EPIC sub-surface fresh water irrigation system on Al Sammaleah Island, Abu Dhabi, developed for multi-use green parking and recreation.

PROJECT RECORD

LOCATION	Al Sammaleah Island, Abu Dhabi, UAE
YEAR	2007
TRIAL PERIOD	1 August to 9 September 2007
PLOT 1: EPIC	Bermuda grass, 126 m^2, sub-surface irrigation, metered
PLOT 2: CONTROL	Same turf, 138.75 m^2, traditional pop-up spray sprinklers, metered
SEAWATER PLOT	Sesuvium portulacastrum, irrigated on seawater direct from the Arabian Gulf at 45,000 to over 50,000 ppm, with a drain line back to the Gulf and a solar-powered pump
FURTHER PLOTS	One on air-conditioning condensate, one on grey water from an office building; the grey water introduced directly with no pre-filtering

THE PROBLEM

The question the island was set up to answer was a blunt one: how much water does a conventional landscape actually waste, and can a sub-surface system be run on water nobody else wants?

The Arabian Gulf carries a variable salt concentration of anywhere from 45,000 ppm to over 50,000 ppm, much higher than most ocean concentrations.

And on an island, electricity for a pressurised irrigation system is not a given.

WHAT EPIC BUILT

Several demonstration plots. Two of them, one EPIC and one on traditional pop-up spray sprinklers, same turf, both metered, formed the water-saving comparison.

The seawater plot was built like every other EPIC system with one addition: alongside the normal supply line, a drain line back to the Gulf, to stop salt building up in the soil. After a short hardening process the Sesuvium grew well.

The pump on that plot was powered by a small solar panel. A traditional irrigation system running at much higher water pressure would need a very large and expensive solar delivery system to do the same job.

Two further small plots ran on air-conditioning condensate and on grey water. Because the EPIC System does not clog, the grey water was introduced directly with no pre-filtering.



The seawater plot under construction: chambers ballasted on the liner beside the Gulf.



Sesuvium ground cover established on the same seawater plot.

78.91%
METERED WATER SAVING
1 AUG TO 9 SEP 2007

45,000+
PPM GULF SEAWATER
IRRIGATED DIRECTLY

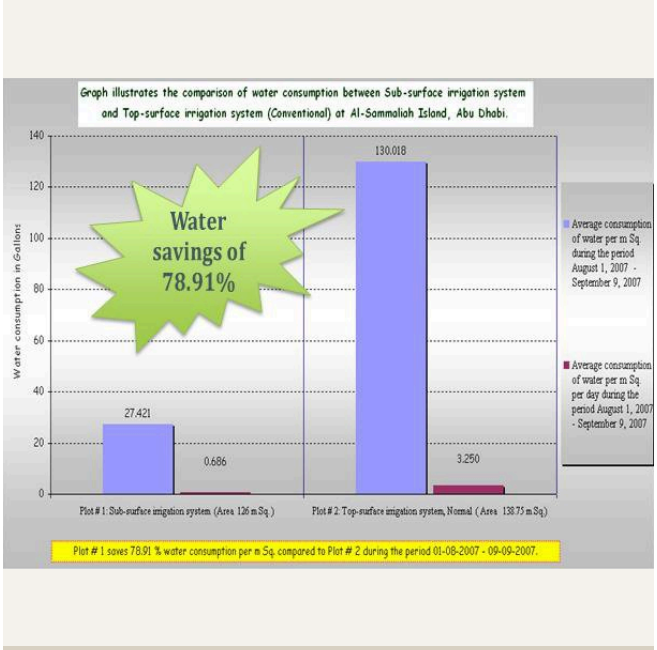
Solar
PUMP ON THE
SEAWATER PLOT

THE RECORD

Both turf plots were metered over the same 40-day period.

1 AUG TO 9 SEP 2007	PLOT 1: EPIC SUB-SURFACE	PLOT 2: POP-UP SPRINKLERS
Plot area	126 m²	138.75 m²
Average consumption per m²	27.421 US gal	130.018 US gal
Average per m² per day	0.686 US gal	3.250 US gal
Same, converted to litres	2.60 L/m²/day	12.30 L/m²/day
Water saving	78.91%	

Plot 1 saved 78.91% water consumption per m² compared with Plot 2 over the period; the written case study gives the result as over 78%. The two plots differ slightly in area, so the comparison is made per square metre. The litre row is a conversion at 3.785 L per US gallon, not a separate measurement.



The metered comparison chart from the time: 78.91% water saving, 1 Aug to 9 Sep 2007.



The conventional fresh water top-surface irrigation system: the metered control plot.

ALSO ON THE RECORD

- **Seawater.** The Sesuvium plot was irrigated on seawater taken straight from the Arabian Gulf, at 45,000 to over 50,000 ppm, and grew well after a short hardening process.
- **Salt control.** Salt build-up was prevented not by treatment but by plumbing: a drain line returning to the Gulf.
- **Solar.** The seawater plot's pump ran on a small solar panel, demonstrating irrigation supply where no electricity is available.
- **Grey water, unfiltered.** Grey water from an office building was introduced directly into the system with no pre-filtering required, because the system does not clog.



Pop-up spray in operation on the conventional control plot.



The seawater plot on Al Sammaleah Island.



The plot supplied with waste water and air-conditioner condensate.



Site signage: Environmentally Friendly Sub-Surface Irrigation.

RECORDS EPIC case study for Al Sammaleah Island, Abu Dhabi; Al Sammaleah Island presentation, with the metered comparison graph for 1 August to 9 September 2007 and site photographs.