



End of Job Report


ADK-GT-01-S1 well clean-out and flatpack + permanent ESP installation

Operator: ECW Geo Andijk B.V.
Agriport 109
1775 TA Middenmeer


Prepared by: Well Engineering Partners
Toldijk 17-19
7900 AP Hoogeveen (NL)
Tel: +31 (0)528 227710
<https://wellengineeringpartners.com/>

Version: 1.1
Publication date: November 28th, 2018




	End of Job Report – Clean-out, Flatpack & ESP installation		
	ADK-GT-01-S1		
	Revision No.		1.1
	Operator:		ECW Geo Andijk B.V.

Document signature sheet:

	Name	Function	Signature	Date
Approved by	Bertran de Lange	Project Manager		28/11/2018


Document Revision Control:

Revision no.	Version	Date	Changed Items
0	1	14/11/2018	Initial draft for internal review and ECW's review
1	1.1	26/11/2018	Processed ECW's feedback

	End of Job Report – Clean-out, Flatpack & ESP installation	
	ADK-GT-01-S1	
	Revision No.	1.1
	Operator:	ECW Geo Andijk B.V.


Contents

1. General Project data	4
1.1 <i>Planned operation</i>	<i>4</i>
1.2 <i>Objectives</i>	<i>4</i>
2. Technical Summary.....	5
2.1 <i>Final Well Status.....</i>	<i>5</i>
2.2 <i>Wellhead & Xmas Tree</i>	<i>6</i>
3. Contractor List	7

	End of Job Report – Clean-out, Flatpack & ESP installation	
	ADK-GT-01-S1	
	Revision No.	1.1
	Operator:	ECW Geo Andijk B.V.

GLOSSARY

AH	Along hole	P/U	Pick up
BGL	Below ground level	PUW	Pick up weight
BHA	Bottom hole assembly	RIH	Run in hole
BHGE	Baker Hughes General Electric	RPM	Rounds per minute
CHH	Casing head housing	RT	Rotary table
ESP	Electric submersible pump	s.g.	Specific gravity
GL	Ground level	SodM	Staatstoezicht op de Mijnen
HSE	Health, Safety & Environment	SOW	Slack off weight
MD	Measured Depth	SSV	Site Supervisor
M/U	Make up	TD	Total depth
NAP	Normaal Amsterdams Peil	TOC	Top of cement
NPT	Non-productive time	TOL	Top of liner
PJSM	Pre-job safety meeting	TVD	True vertical depth
POOH	Pull out of hole	WEP	Well Engineering Partners
ppf	pounds per foot	WH	WellHead

	End of Job Report – Clean-out, Flatpack & ESP installation	
	ADK-GT-01-S1	
	Revision No.	1.1
	Operator:	ECW Geo Andijk B.V.

1. General Project data

Table 1: General Project Data

License	Andijk	
Well Number	ADK-GT-01-S1	
Well Name	Andijk-geothermal-#1	
Well Type	Geothermal Producer	
Commence Rig up Date	03/09/2018 07:00 hrs	
End of Operations Date	13/10/2018 19:00 hrs	
Total Days Operational	5 + 3 = 8 days	
Operator	ECW Geo Andijk B.V.	
Surface Location (Rijksdriehoek)	X: 141,923.43 Y: 526,448.44	
Surface Location (ETRS89)	N: 52° 43' 30.91029" E: 5° 11' 37.12308"	
Well Site Address	Nieuwe Dijk 2, Andijk, 1619 PK	
Personnel		
Project Manager	Bertran de Lange	03/09/18-07/09/18 11/10/18-13/10/18
Operation Manager	Peter Hoving	
Senior Well Engineer	Dirk Brinkgreve	
HSE Manager	Peter Breed	
Wellsite Supervisor	Thomas Schreuder	03/09/18-07/09/18
	Art de Vetter	11/10/18-13/10/18
Night Wellsite Supervisor	Jacco Bleeker	03/09/18-07/09/18 11/10/18-13/10/18


1.1 Planned operation

Initial installation of the permanent ESP assembly, as well as a flatpack control/inhibitor line. Due to the corrosive nature of the production fluid, it was decided to install a corrosion inhibitor line just above the 7" top of liner to apply a protective film and reduce the corrosion rate of the exposed casing.

1.2 Objectives

Table 2: Objectives vs results

Clean-out well until full basin, prove inter-wells communication, and use well as injector while producing from other three Andijk wells	Well cleaned until basin full, inter-wells communication confirmed, injection successful during entire well clean-out campaign
Removal and replacement of Xmas tree assembly (dispensation received) with good pressure test(s)	P-test 5/15min, 20/100 bar (ok)
Installation of flatpack inhibitor line on 4" OD bullnose with 7 ½" centralizers (4x wings/ribs) to ~5m from 7" TOL	Successfully installed above 7" TOL without issues and within estimated timing. 7" TOL at 2051m AHBGL, HUD observed at 2044.5m, flatpack nose installed at 2041m AHBGL.
ESP installation with Motor Centralizer (3-Wing) dressed with epratone (low friction) extensions (310mm/12.20" OD) to prevent local corrosion/wear.	Nose installed at ~722m (intake at ~699m)

	End of Job Report – Clean-out, Flatpack & ESP installation			
	ADK-GT-01-S1			
	Revision No.		1.1	
	Operator:		ECW Geo Andijk B.V.	

2. Technical Summary

2.1 Final Well Status

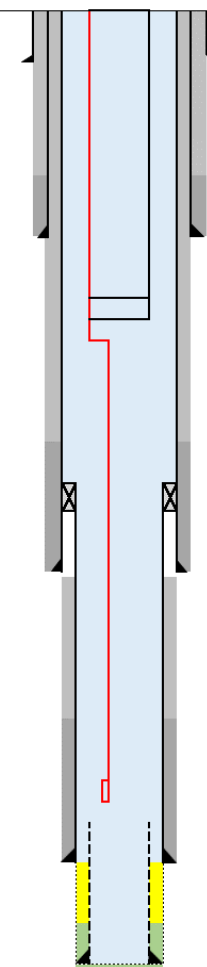
Nr.	Item Description	ADK-GT-01-S1 ≥13 5/8" 5000psi VWH	Depth rt	Depth rt	Depth bgl	Depth bgl	Hole ID	Pipe OD	Collar OD	Pipe ID	Pipe ID
			m ah	m tvd	m ah	m tvd	in	in	in (nom)	in	in (drift)
1	28" casing, X70, welded		100	100	91	91	driven	28.000	welded	26.250	25.043
	Theoretical top of tail cement		339	339	330	330					
2	18 5/8" casing, 87.5#, K55, BTC		510	509	501	500	24.000	18.625	20.000	17.755	17.568
	8 3/4" coated production tbg. 40#, L80, HC Polseal1				695	691	12.347	8.625	9.650	7.725	7.600
	ESP Intake Depth				699	695	12.347	10.750			
	ESP WNE 1600 Bullnose depth.				722	717	12.347	12.200			
	Theoretical top of tail cement		1055	1041	1046	1032					
	9 5/8" Liner Hanger/Packer + PBR		1217	1186	1208	1177	Top of liner				
3	13 3/8" casing, 72#, L80, VAM Top		1270	1231	1261	1222	17.500	13.375	14.236	12.347	12.250
	Theoretical top of lead cement		1331	1298	1322	1289					
			1390	1326	1381	1317					
	Theoretical top of tail cement		1912	1721	1903	1712					
	3/8" Chemical injection line(flatpack 28x22mm)				2041	1821					
	Chemical injection line Bullnose										
4	7" Liner with PBR		2060	1853	2051	1844	Top of liner				
	9 5/8" liner, 53.5#, L80, VAM Top		2111	1874	2102	1865	12.250	9.625	10.520	8.535	8.500
	Top Slochteren (Reservoir)		2116	1878	2107	1869					
	Base Slochteren (Reservoir)		2356	2059	2347	2050					
5	7" pre-perforated liner, 26#, P110, VA Roughneck		2358	2063	2349	2053	8.500	7.000	7.644	6.184	6.059
	8 1/2" (TD)		2358	2063	2349	2054	8.500				

Figure 1: Final Well Schematic

2.2 Wellhead & Xmas Tree

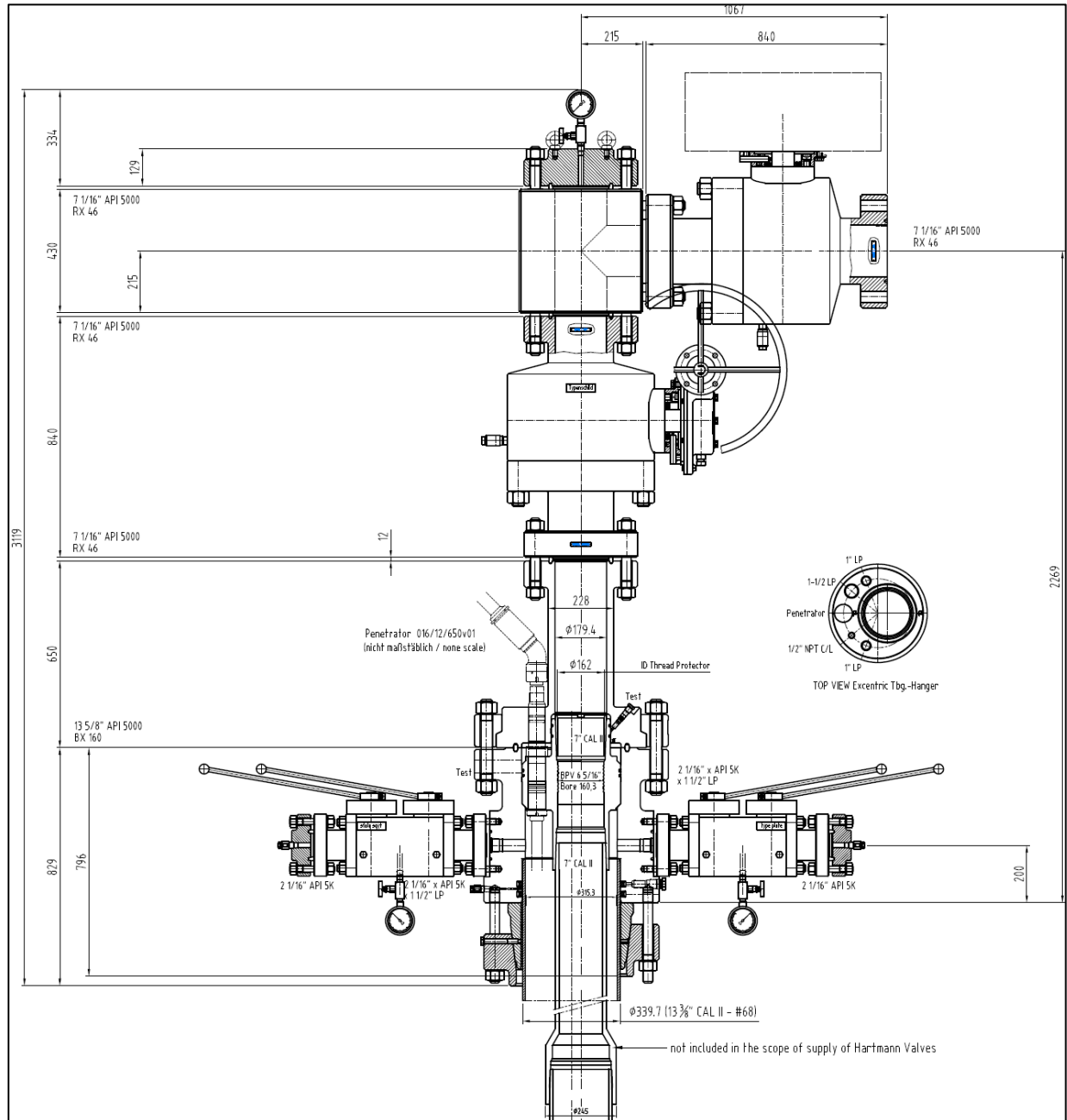



Figure 2: Wellhead & Xmas tree schematic

	End of Job Report – Clean-out, Flatpack & ESP installation	
	ADK-GT-01-S1	
	Revision No.	1.1
	Operator:	ECW Geo Andijk B.V.

3. Contractor List

Company	Supplier of
ECW	Operator, Day-supervision & execution of work program
Panterra geoconsultants	Well Test & samples analysis
Baker Hughes General Electric (BHGE) Centrilift	ESP equipment & installation
PST Power	Medium Voltage connections
Bakker Oilfield Supply (BOS)	Well Test equipment, service & installation
Odfjell Well services (OWS)	Work Platform & Tubular Running
Wagenborg	Crane services
Deep Drill Services	Wellhead & Xmas Tree installation & P-testing
Baker Hughes General Electric (BHGE) Capillary Coil	Flatpack + accessories & installation
Expro	Wireline services (sampling)
Stralingsupport B.V.	Measuring & define NORM / LSA measurements. Radioactive analysis of produced solids
Q-con GmbH	Seismic monitoring
Well Engineering Partners B.V. (WEP)	Advisor & Office Support, Night-supervision