Data Source	Description	Input Files	Software	Output Files	Report Reference
Regional Geomechanical Model	A regional geomechanical model has been constructed in *3DEC* from the interpreted geological structure developed through 2A of the project. The model is 10 x 10 x 3.5 km in dimension and acts as a container for the relevant geomechanical data, including geological faults, lithologies, far-field stresses, and rock mechanics data. Analysis of the slip tendency on all faults in the regional scale model predicts stable conditions given the faults properties and in-situ stresses derived from the breakout analysis.	Regional Scale Model • model_properties.txt • Fault geometry • Strata layer geometry • Temperature surface geometry	*3DEC*	Contour Plots: Slip tendency	Section 3.1, pp. 17-18 Section 3.2.1, pp. 19-20
Well Positions and Geometry	Four geometries are designed to test two sub-horizontal wells with laterals 750 m long positioned next to one another and positioned above one another. In two of the options, the wells are parallel at 300 m apart, and in two of the options, the wells are converging toward the toe. The converging options give the opportunity to design experiments in the FORGE field laboratory over different reservoir distances between the two wells for different stimulated zones along the laterals. The target depth for the lateral sections is 2470 m below ground surface	AutoCAD DXF format files with information from the Regional Scale Model • Fault geometry • Strata layer geometry • Temperature surface geometry	*InSite*	Text-format DOF files containing well trajectories for borehole pairs	Section 2.3
Principal Stress Field	Stress magnitudes at the reservoir depth have been examined using the regional model, borehole breakout data from acoustic televiewer measurements at the site, and assuming a normal faulting stress regime. The best estimates of the minimum and maximum horizontal principal stresses are 56% and 80% of the vertical stress, respectively.	Borehole Model • model_properties.txt • Fault geometry • Strata layer geometry • FOH-3D geometry Deviated Borehole Calculations Fracture Stress Polygons and Mohr's Circles Stress Profile	*3DEC* *Excel 2016* *Excel 2016* *Excel 2016*	Image files matrix_results.xlsx	Section 3.2.2, pp. 20-22 Section 3.2.5, pp. 33-35 Section 3.2.3, pp. 22-31 Section 3.2.4, pp. 31-33 Section 3.2.6, pp. 35-37
Capability for Hydraulic Fractures	A single hydraulic fracture model was constructed in *3DEC* to determine fracture growth behavior in the assumed stress regime and at different injection rates. After 1 hour of injection at 20 kg/s, the total fracture height is 440 m versus a width of 340 m.	Single Hydraulic Fracture Model • model_properties.txt • Fault geometry • Strata layer geometry Analytical "penny" shaped fracture solution • fracture_properties.txt	*3DEC*	Contour Plots: fracture aperture Plots: fracture radius vs. time	Section 4.8, pp. 58-63
Capability for Hydro-shearing	Hydro-shearing was tested by evaluating what percentage of the existing fractures can be hydraulically sheared assuming that they are open (permeable). In the worst-case scenario, more than half the fractures observed in borehole FOH-3D would slip at injection fluid pressures lower than required for hydraulic fracturing.	*3DEC* script and fracture orientation data • HS_vs_HF.3ddat • FOH-3D.txt	*3DEC*	Summary of results: Hydro-shearing.xlsx (Excel file) Stereonet plots Plots: percent fracture slip vs. pressure.	Section 3.3, pp. 39-40

Reservoir Geomechanical Model – Stimulation into Multiple Zones	The reservoir-scale model in *3DEC* is a 1500 x 1200 x 1200 m volume around the positions of conceptual sub-horizontal well designs at the Fallon FORGE site. It contains relevant geological structure and a joint network (DFN) constructed using borehole data. Stimulation has been performed in six stages/zones along the horizontal well using both openhole borehole (low injection rate at 5 kg/s) and cased borehole (combination of high, 80 kg/s, and low injection rates) completions. The pattern of joint stimulation in the two models has been analyzed and quantitatively assessed. Results indicate that the FORGE site is ideally suited for hydraulic stimulation of an EGS in sub-horizontal multistage wells due to orientations of the natural joint network in the regional principal stress field.	Model geometry: text model_properties and input stresses.txt · Fault geometry (defined in model geometry file) · Strata layer geometry · (defined in model geometry file) Discrete Fracture Network Input: text Well Geometries: text	*3DEC*	Stresses at injection locations: format text file DFN size distribution: text: format text file Calculate metrics, including average DFN and HF aperture, Leakoff ratio, shear stimulated area and ratio: format: Excel file Plots: (a) hydraulic fracture aperture, (b) Shear stimulated fracture aperture, and (c) Shear displacement on factures for all six stages format png Fracture_Pressure_Displacements: Pore pressures, shear and normal displacements on fractures at the end of stage 6 for the openhole and cased models. Csv format	Section 4.4, 4.6, 4.10
Modeled Thermal Behavior during Circulation	A fast hydro-thermal modeling capability, suitable for modeling production from an EGS, is used to estimate reservoir performance. Heat production analysis is performed for the openhole model with side-by-side parallel well geometry. A thermal drawdown of approximately 10ºC over 10 years is observed, assuming a total rate of 30 kg/s with equal distribution to six isolated zones giving a rate of 5 kg/s per zone.	All Reservoir model properties Thermal properties: text file Injection and production borehole geometry: text Coordinate of injection and production flow-knots (injection points): text	*3DEC* *Inhouse developed Python Algorithms*	Thermal drawdown history curve: text Plots of fractures with decreased temperature: png	Section 5.3, 5.4
Microseismicity	Microseismic data has been calculated from slip observed on joints in the reservoir geomechanical models. The clouds of microseismic locations delineate the activated fractures and can be used in the future as a method of model validation. The microseismic cloud delineates the stimulated zone analogous to field monitoring. Maximum moment magnitudes observed in the models are Mw = 2.4 for the cased hole model and Mw = 2.1 for the open hole model. Magnitude distributions appear realistic with b-values of b = 1.3 and b = 1.5 for the cased hole and open hole models respectively. The largest events represent slipping of significant portions of the largest fractures (up to 500 m diameter).	UserInputMicroseismic.txt	*3DEC*	Locations, times and moment magnitudes for openhole and cased hole: Forge_Final_Open030_06032018.csv Forge_Final_Cased030_06032018.csv	Section 6