Common DFN Model ReadMe

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This visualization model has elements for a DFN…

BUT IT DOES NOT INDEPENDENTLY FUNCTION AS A DFN. THE INTENT HERE IS TO PROVIDE EGS COLLAB TEAM MEMBERS WITH A BASELINE, 'COMMON' FRACTURE FRAMEWORK – PRIMARILY IN TERMS OF LOCATION AND ORIENTATION. TEAM MEMBERS CAN THEN LEVERAGE THIS MODEL AND ITS COMPONENTS TO CUSTOMIZE, IMPORT, AND INTERPRET AS THEY SEE FIT. THE MODEL IS A WORK IN PROGRESS JUST AS THE EXPERIMENT IS IN PROGRESS – WE WILL KEEP IT UPDATED AS BEST WE CAN!

DRIFT, WELLS, & SCANLINES

- 4850 W Drift outlined

- Wells are labeled and annotated with depths in feet

- Scanlines were used for weep mapping along the drift, for example the weeping that was observed in the drift ~30-40 feet away from PST during the Oct/Nov 2018 injection/flow test @ 164' notch
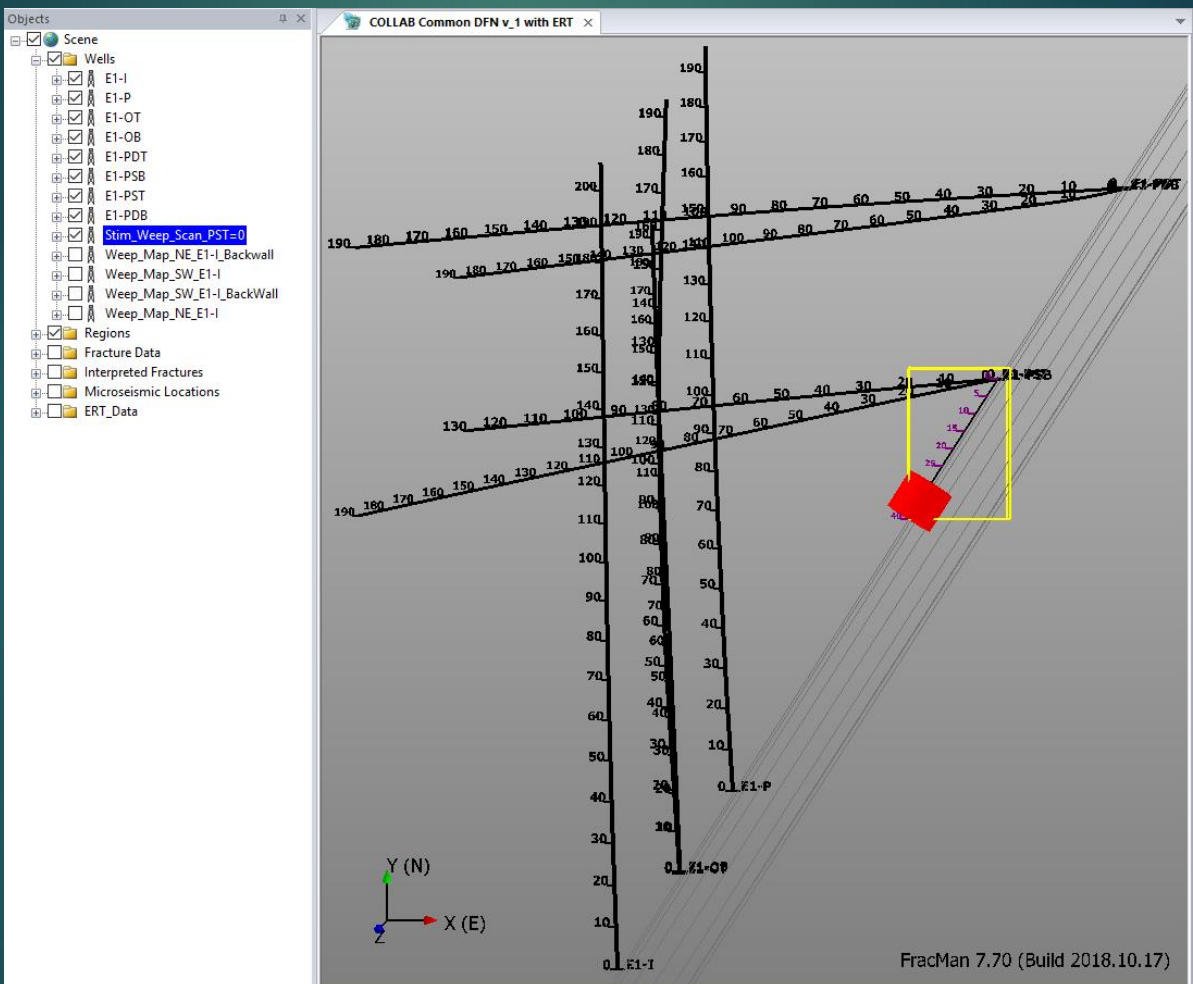
DRIFT, WELLS, & SCANLINES
Fracture Export

- Wells contain 'fracture log' databases that can be put into a spreadsheet, see also 'Common DFN Summary' – right click on the log and select 'View Data'

- **Note that fracture labels correspond to wells & depths (feet)**

- Many other fracture/DFN attributes also available

FRACTURE DATA

Features in this group have been 'ground-truthed'. These were identified by examining the drift, the core, and downhole camera footage.
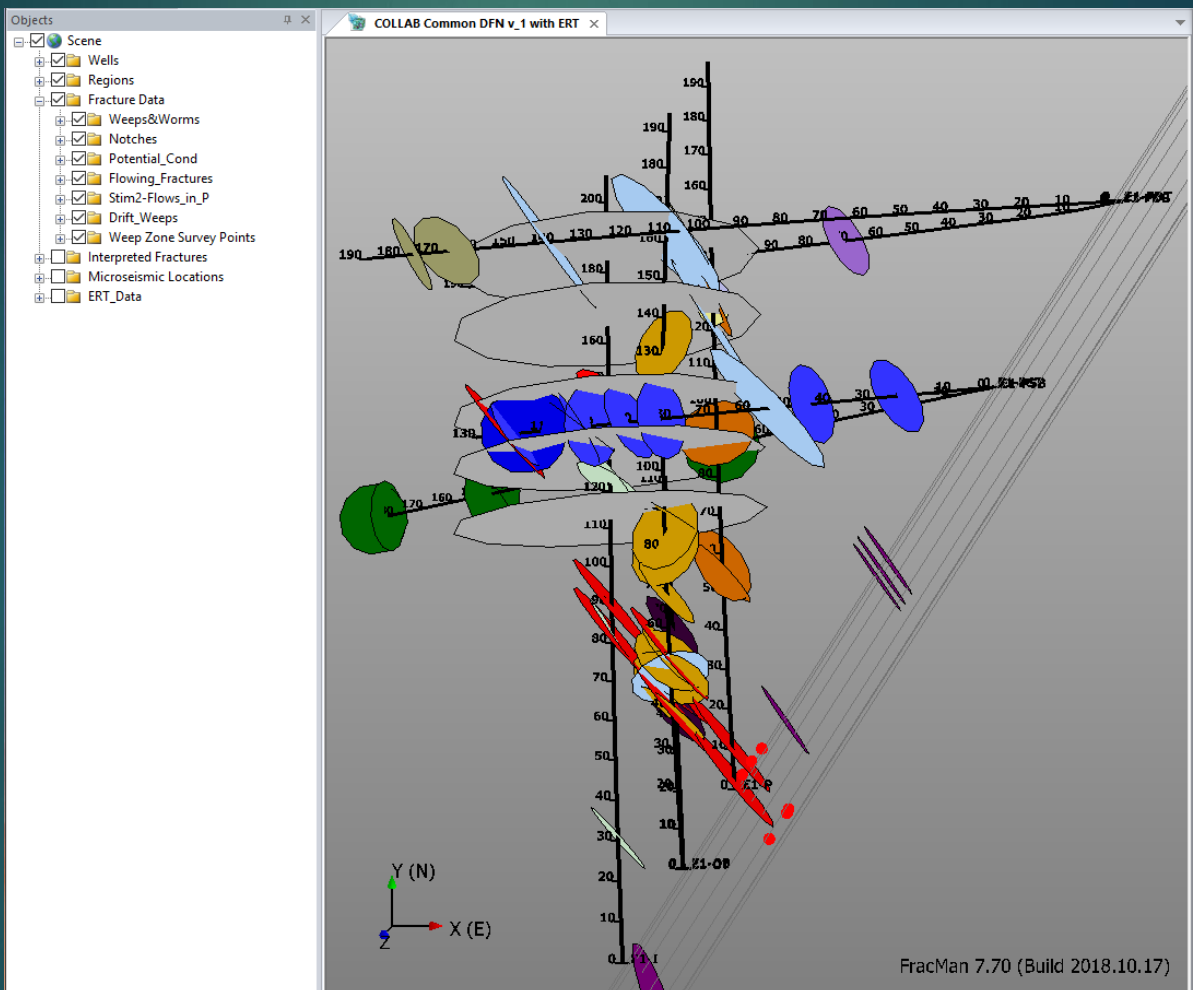
FRACTURE DATA
Weeps & Worms

- Primarily weep Zone on Drift at E1-P Collar
- Zones of high fracture intensity, breccia, dissolution
- Bounds not oriented in general, set at pole 50,0
- Zone in PST uncertain in orientation
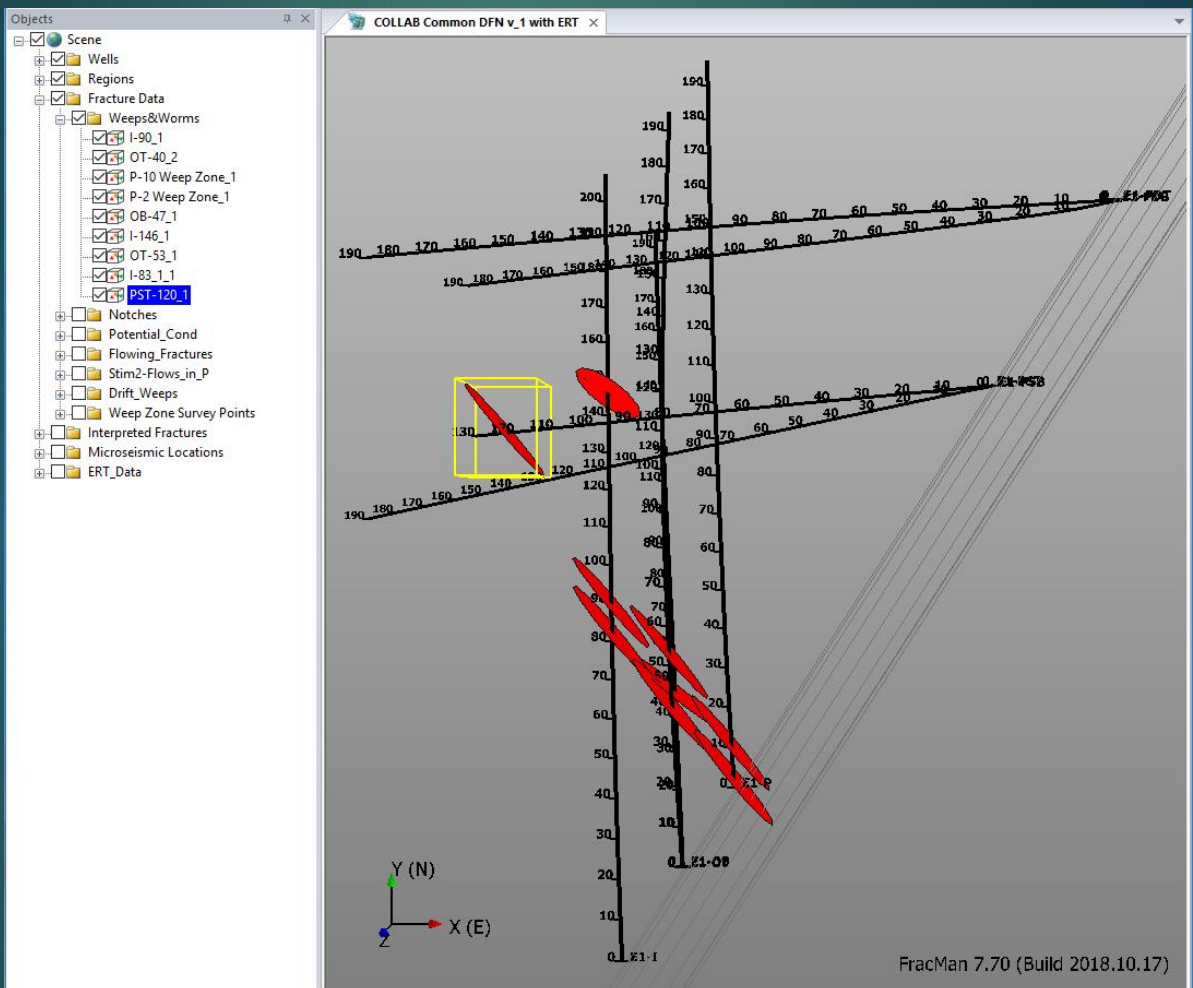
FRACTURE DATA
Notches

- Displayed as 'penny cracks'
- Depth registered to optical televiewer
- Normal to kISMET σ_{Hmin} (pole 355,9.3)
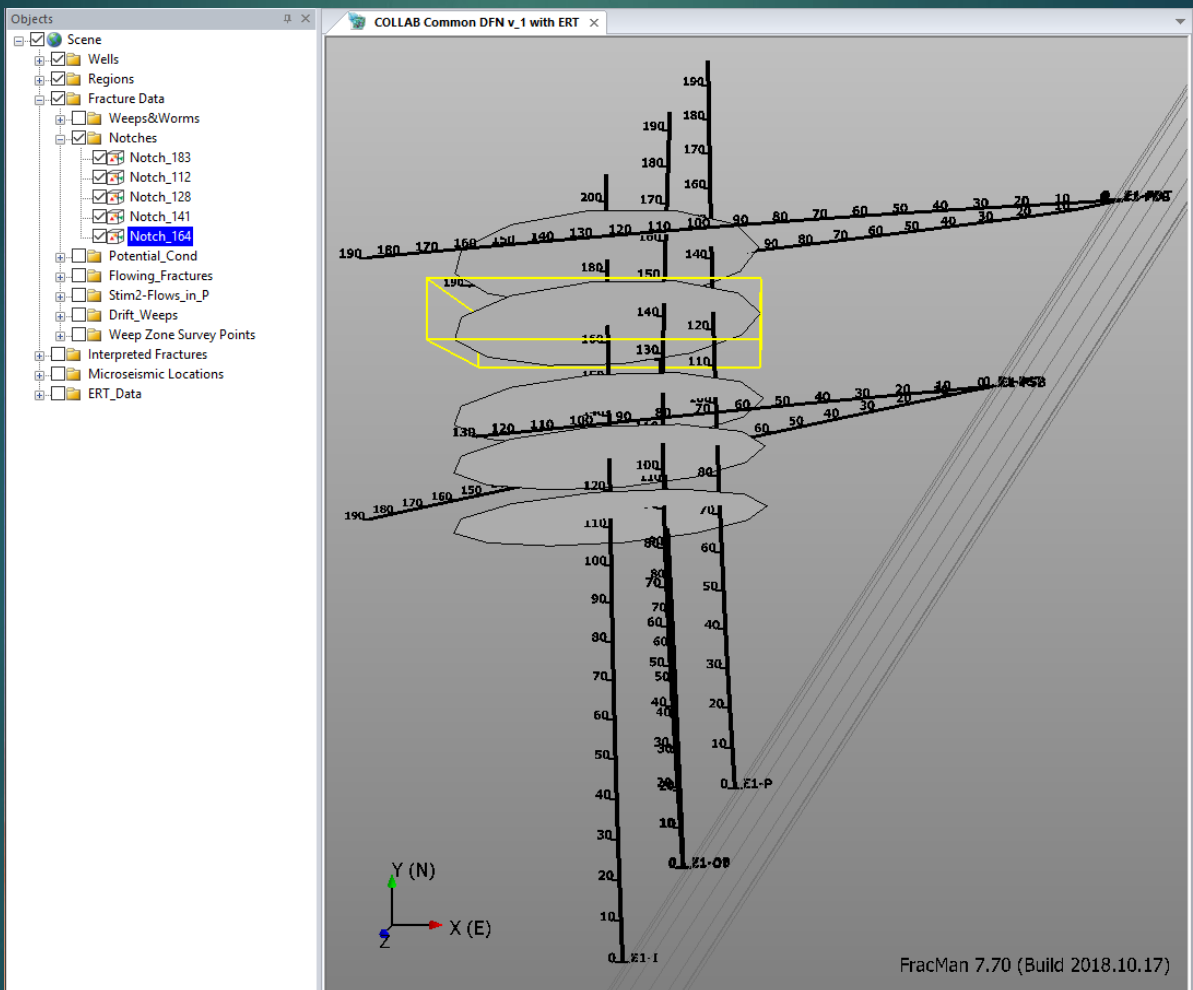
FRACTURE DATA
Potential Conductors

- Identified during Sep 2018 core review
  - Single-well intersections – extents not constrained
- Color-coded by well intersection
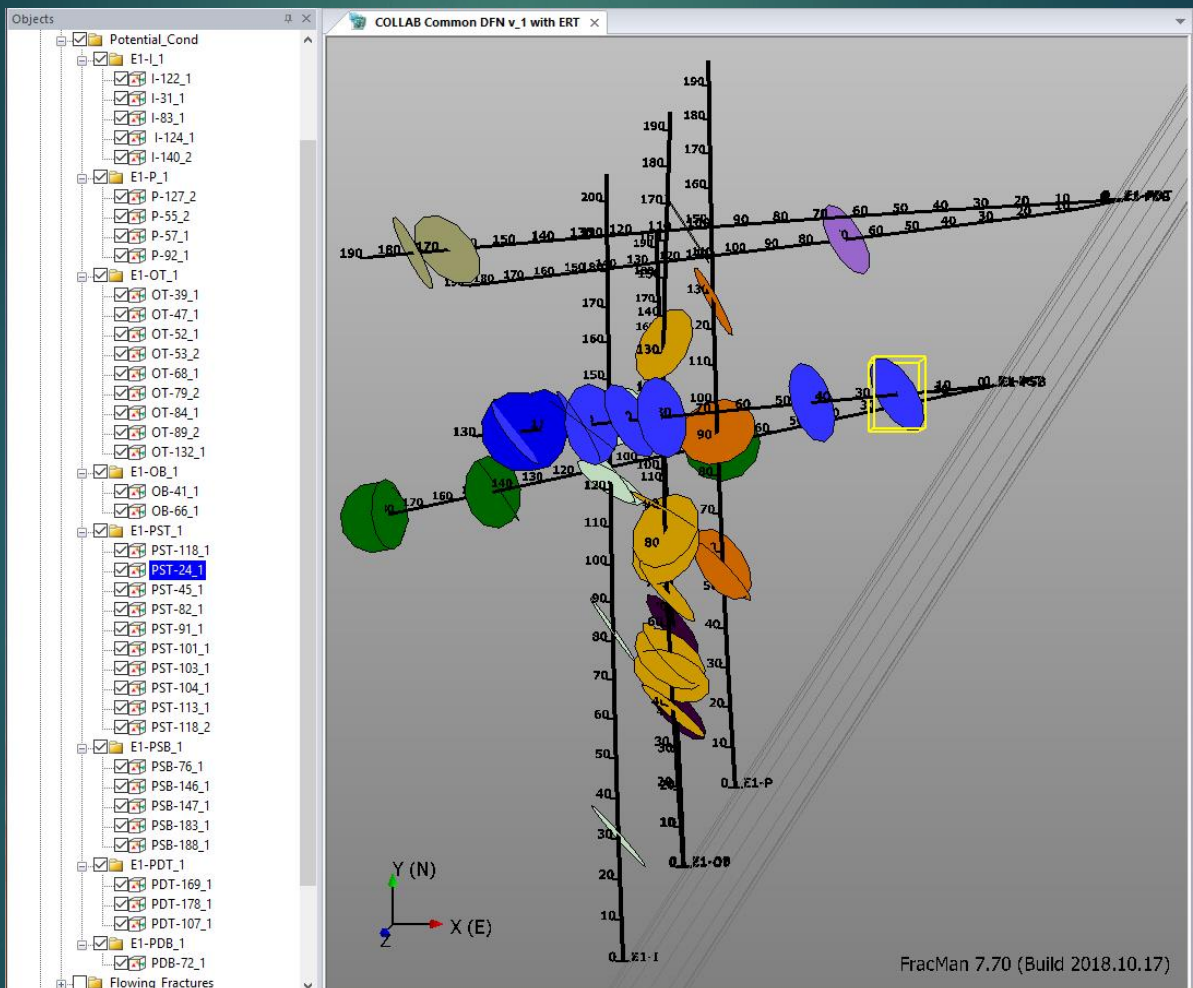
FRACTURE DATA
Flowing Fractures

- Identified during Feb 2018 flow testing w/ downhole camera
  - P-122 & OT-161 showed connection
  - PDT-142 showed connection when flowed into E1-I, but flow into E1-PDT did not reveal connection to E1-I
  - OT-48 & PST-56 were free-flowing fractures – no discernable connection to other wells
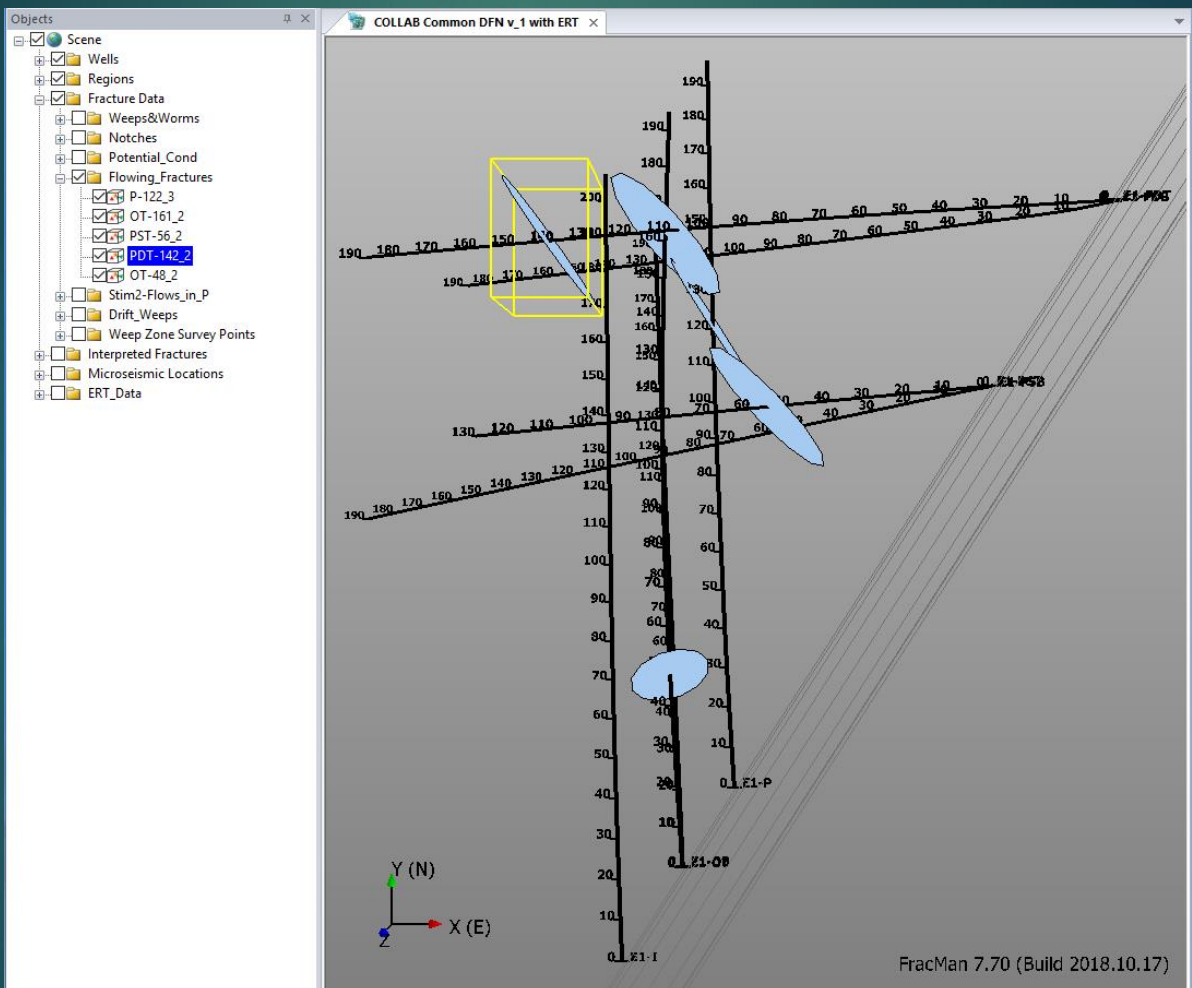
FRACTURE DATA
'Stim 2' Flows in P

- Identified during May 2018 injection at Notch 164 in E1-I – jet flows observed via downhole camera in E1-P
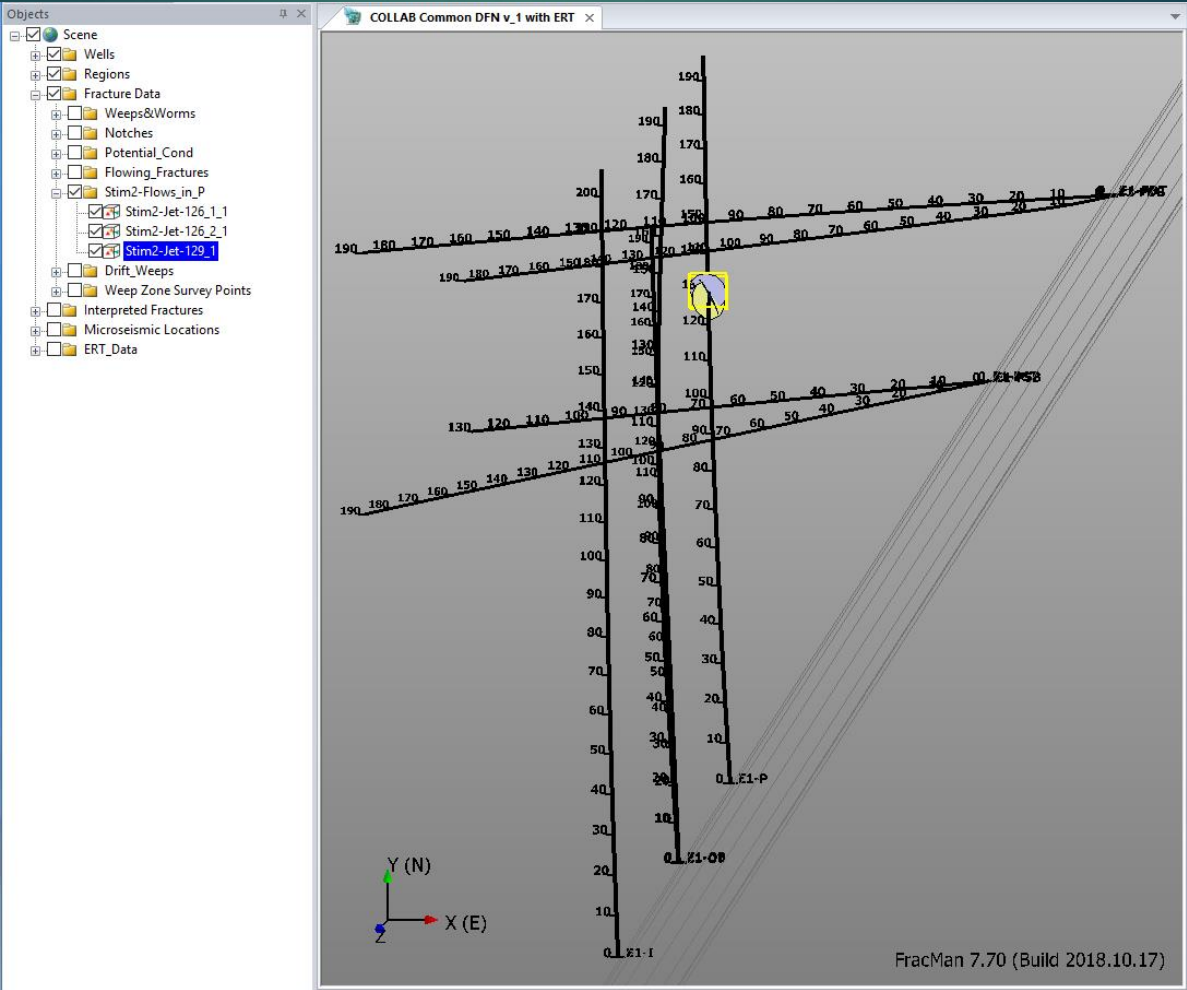
FRACTURE DATA
Drift Weeps

- Mapping of seeps and encrustations on drift Sep 2018

- Uncertain: 10' radius. One drift wall, encrustations only up to ~ 3';

- Likely: 20' radius. Two walls, higher encrustations, possible drips

- Certain: 40' radius, two walls and crown, observable seepage

- Orientation from Bill R's notes. If none, Pole = (55,0)

- Points are surveyed edges of Main Weep Zone
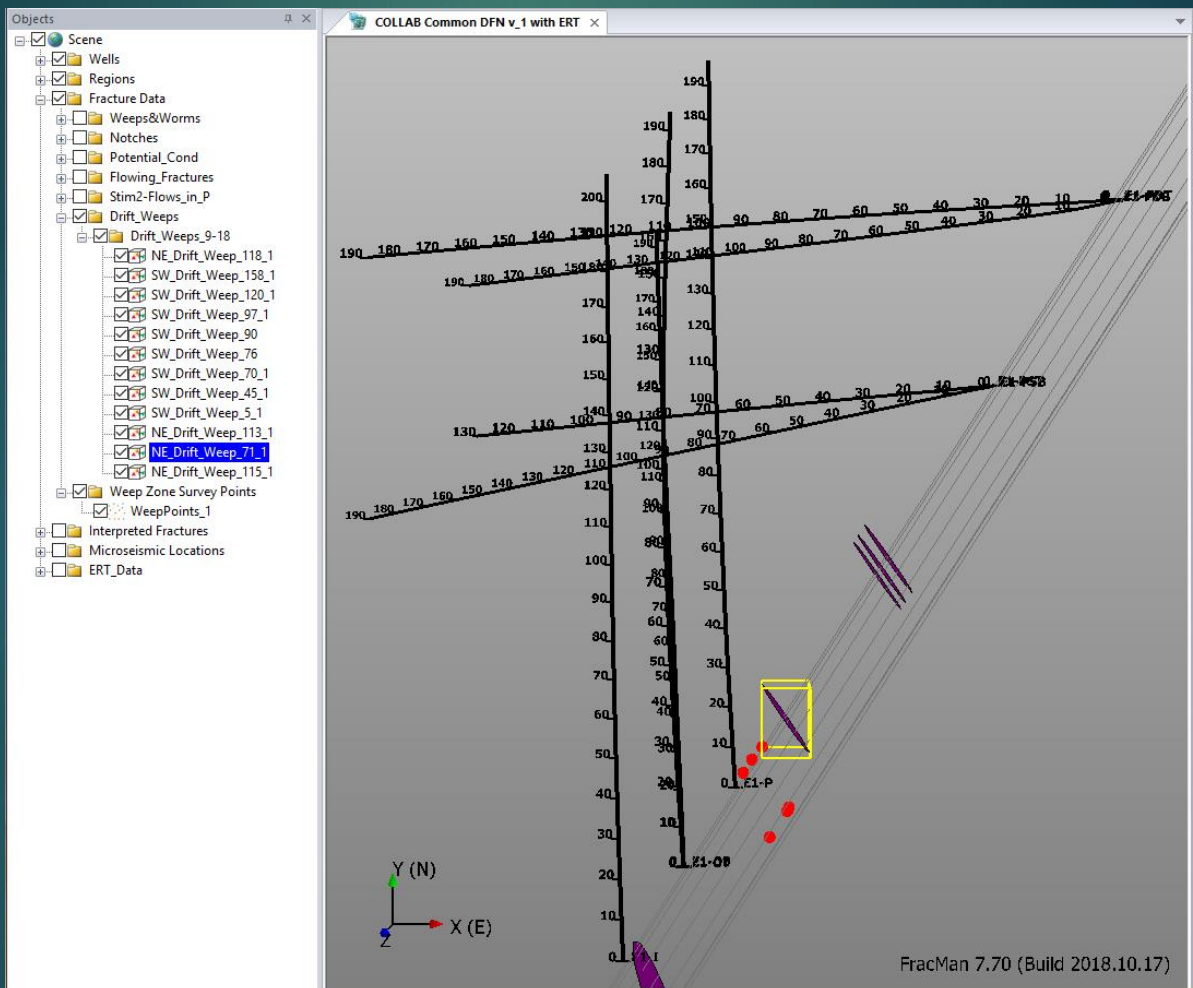
INTERPRETED FRACTURES

Features in this category are inferred from geophysical data, hypothesized from stim/flow observations, and grouped/extrapolated by possible but not necessarily verified connectivity.
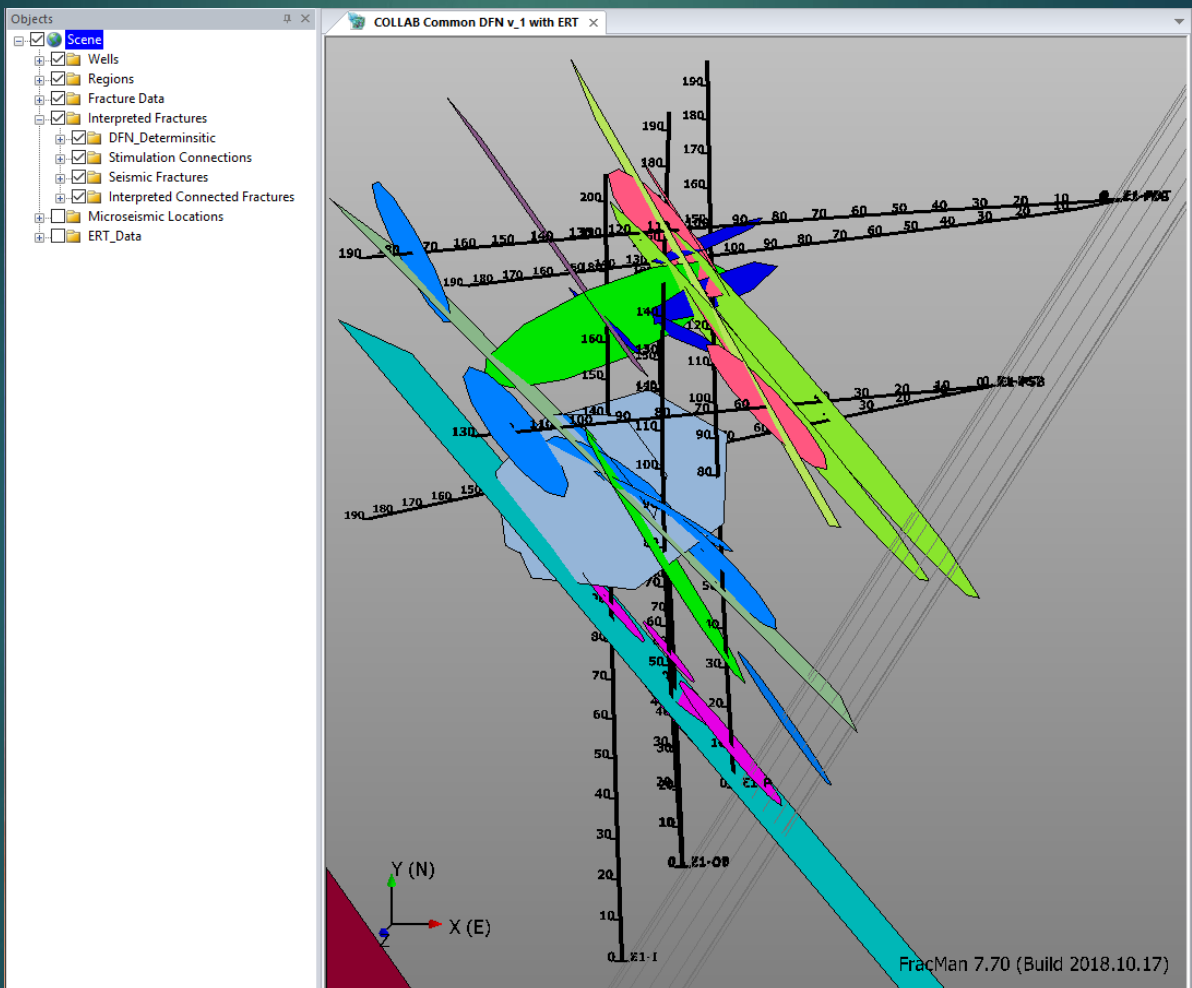
INTERPRETED FRACTURES
Interpreted Fracture Zones

- Three 'main zones' of inferred connectivity – weep, intermediate, deep

  - Weep = weep zone from drift and 'weeps & worms' alignment

  - Intermediate = inferred from fracture alignment

  - Deep = OT-P connector and inferred fracture alignment
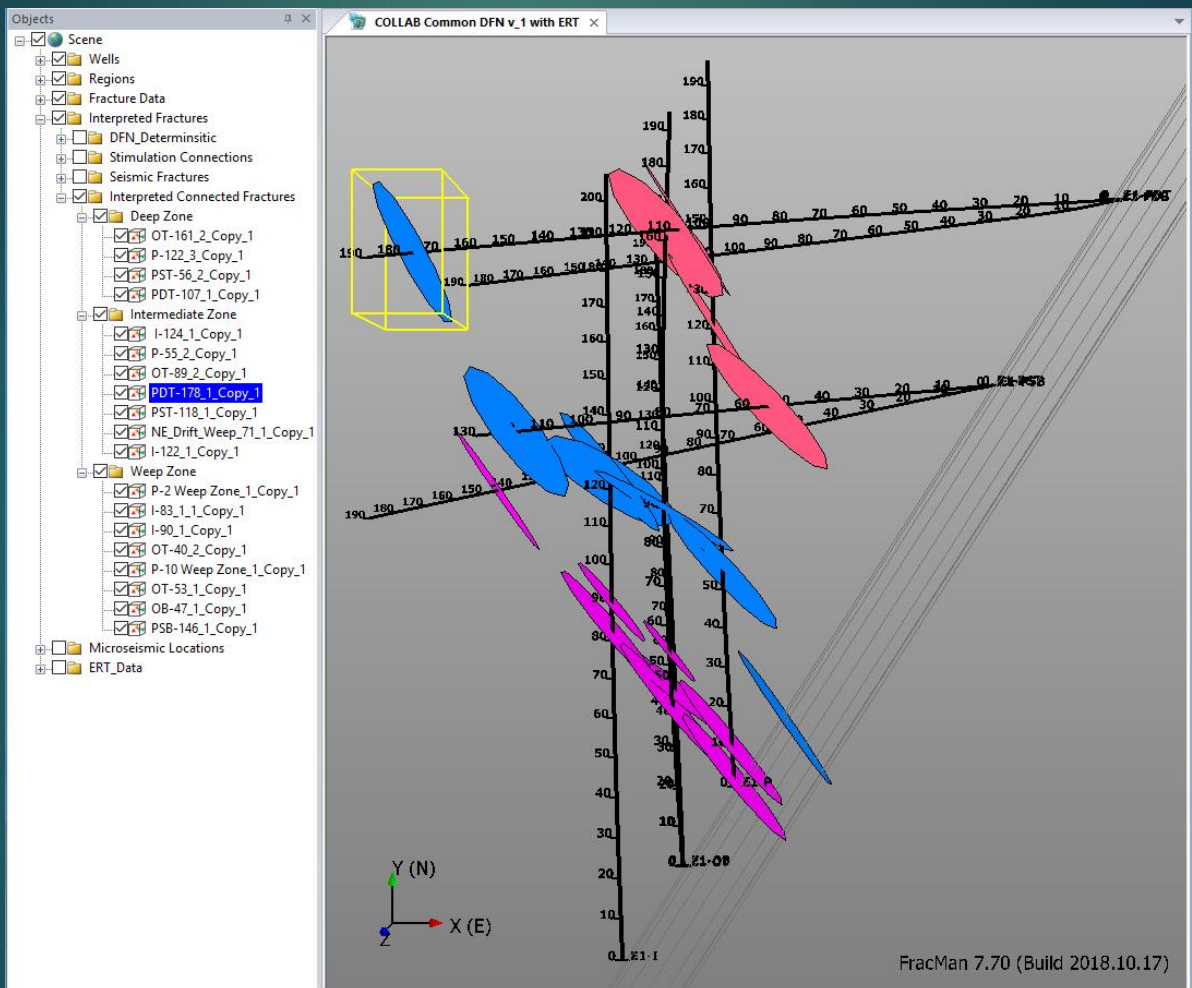
INTERPRETED FRACTURES
Deterministic DFN Planes

- Fit to interpreted zones of possible/likely connectivity
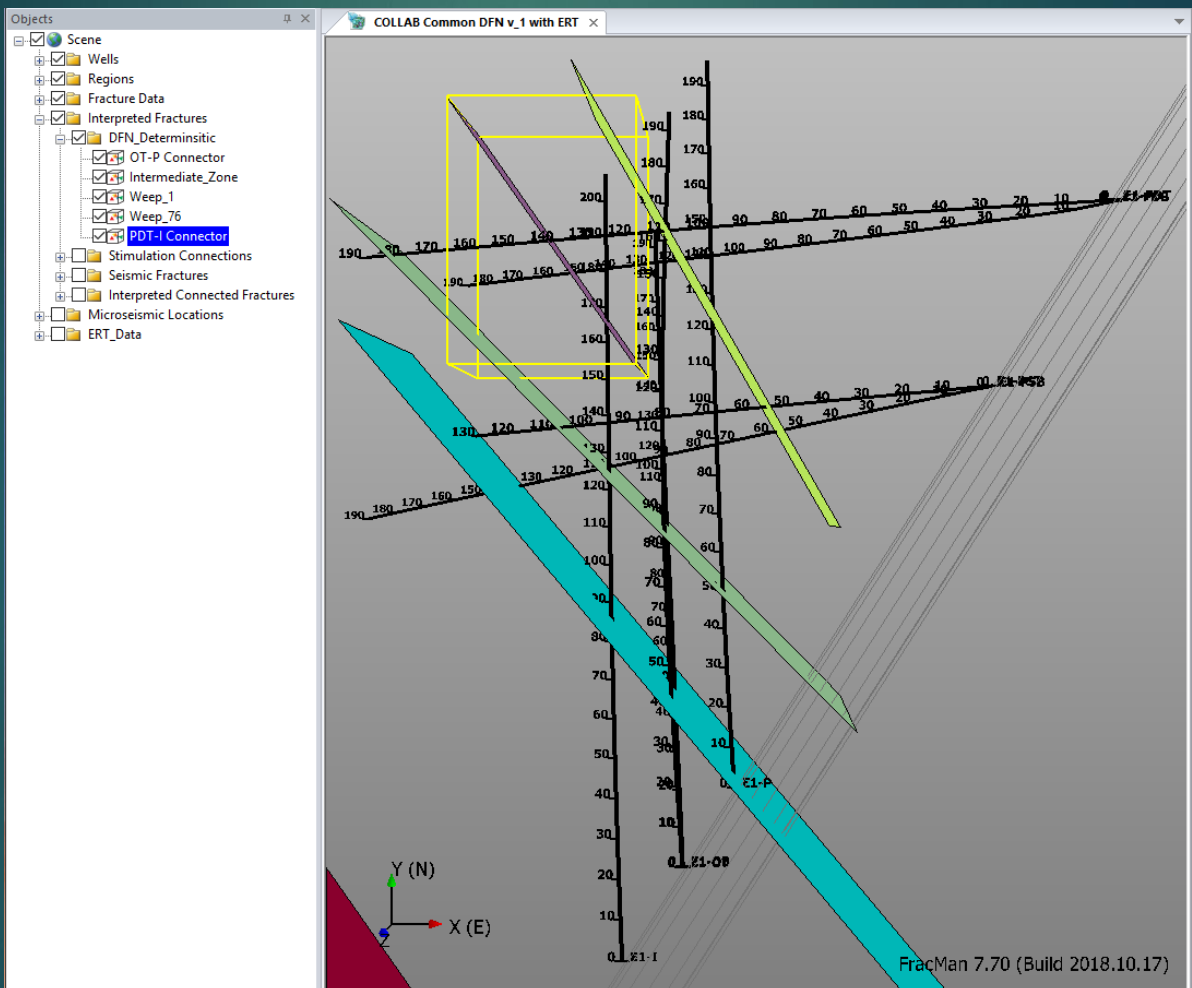
  - OT-P connector and other fractures in that approx. alignment

  - Hypothesized intermediate fracture zone

  - Weep_1 = weep zone from drift and 'weeps & worms'

  - Weep_76 = weep zone identified towards Gov's corner

  - PDT-I connector extrapolated from PDT frac that flowed from I

INTERPRETED FRACTURES
## Stimulation Connections

- Connections inferred from stim/flow testing
  - Stim 2 = injection at 164' notch and apparent intersection w/ E1-P
  - DTS Stim 3 = injection at 128' notch and apparent intersection w/ E1-OT
  - Tracer Connections = injection at 164' notch and apparent drift intersection
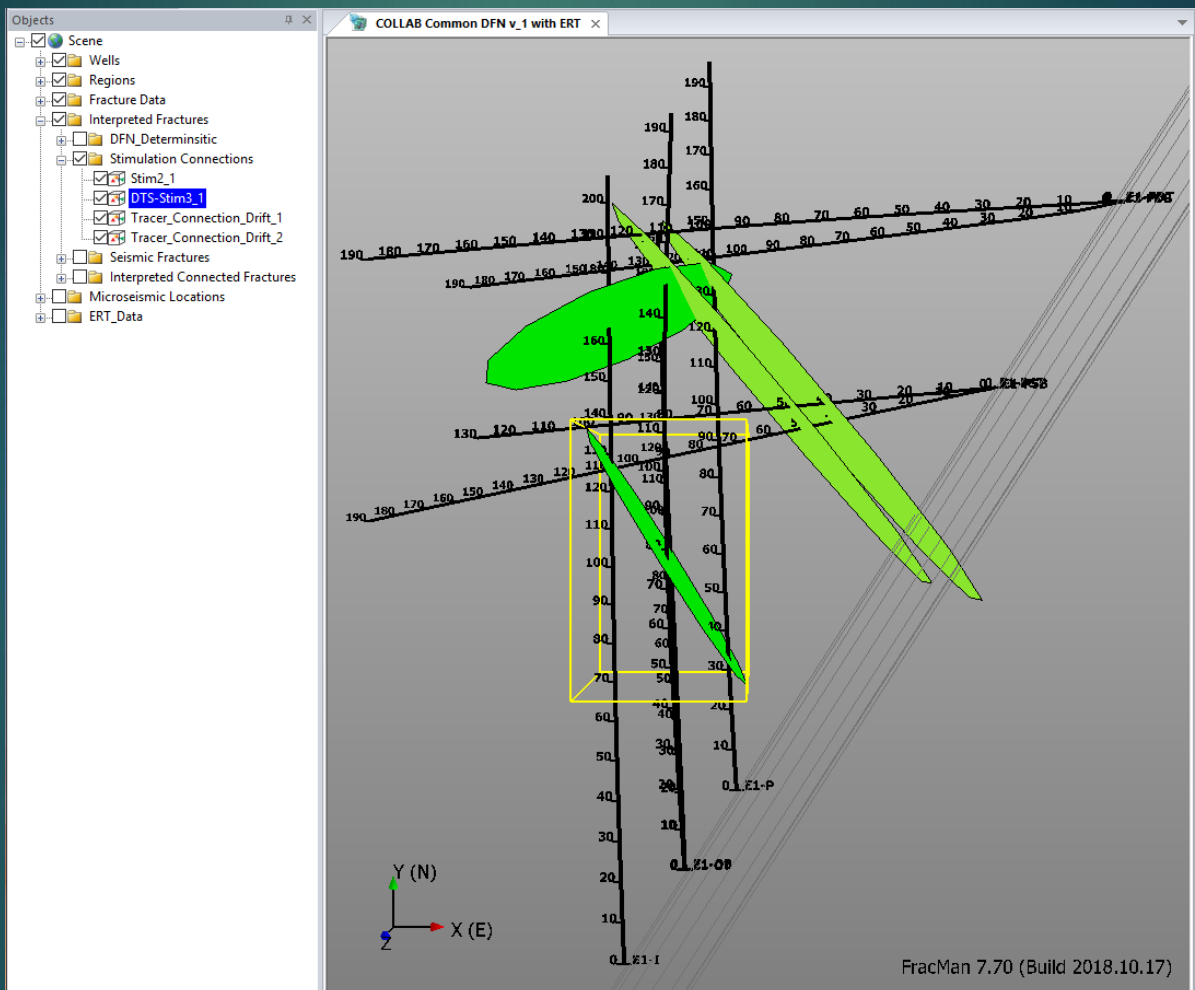
INTERPRETED FRACTURES
Seismic Fractures

- Interpreted fracture plane fits to hypocenter point clouds
- Note dates of hypocenter clouds (Mo-Dy-Yr)
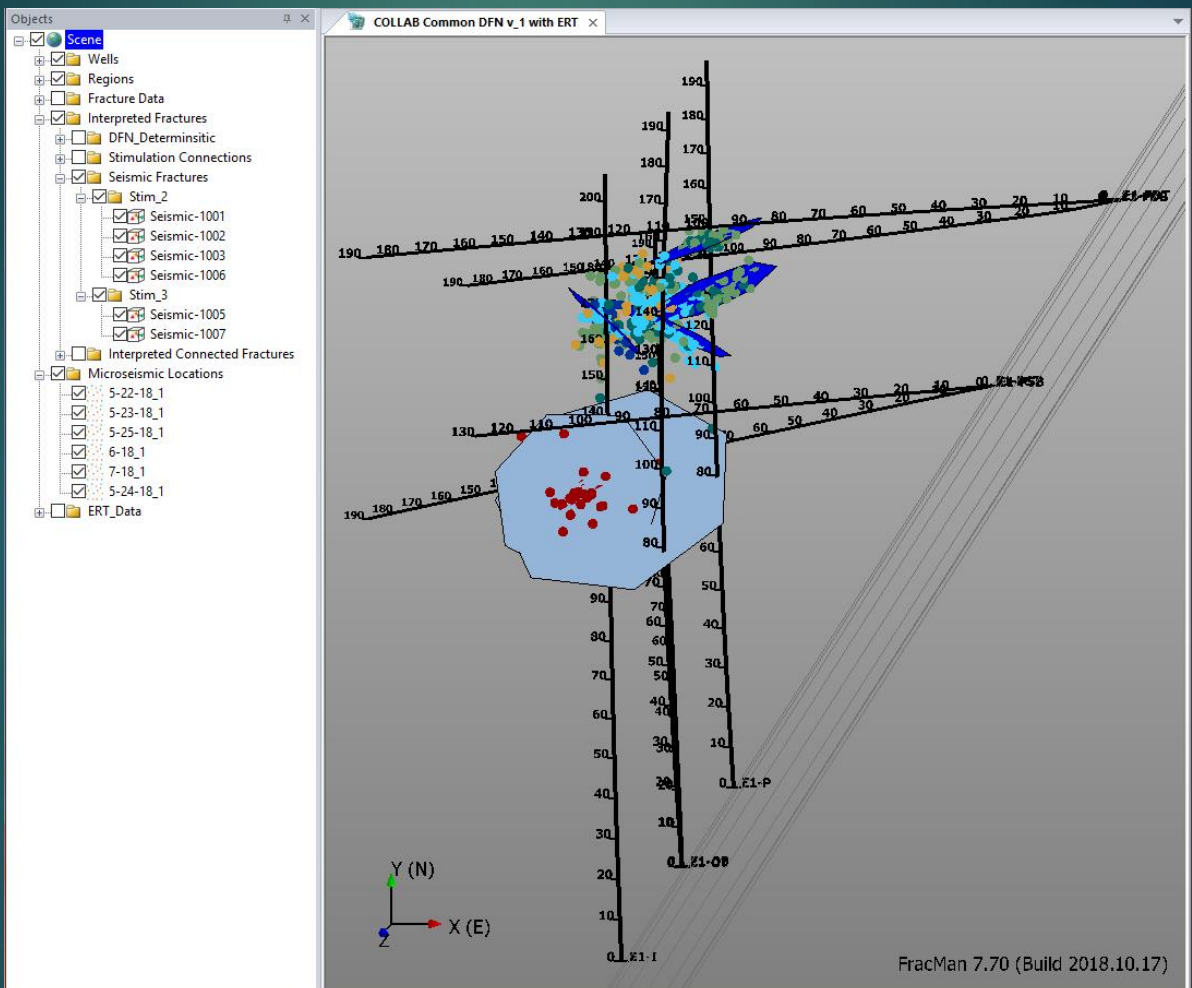
GEOPHYSICAL VISUALS
Electrical Resistivity Tomo

- From ERT baseline characterization phase
- Point clouds in 'slice zones' for examination
- Right-click to visualize conductivity
- For visualization/interpretation use