Sub-Audio Magnetics (SAM)

Galvanic Source EM Example

Central Bore, WA

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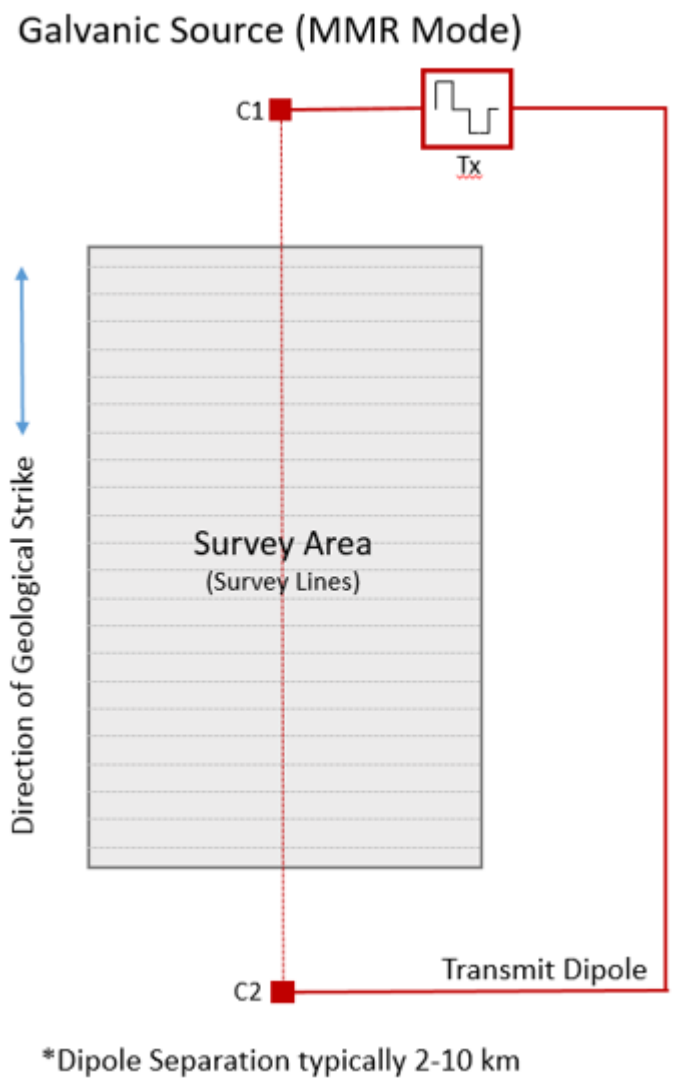
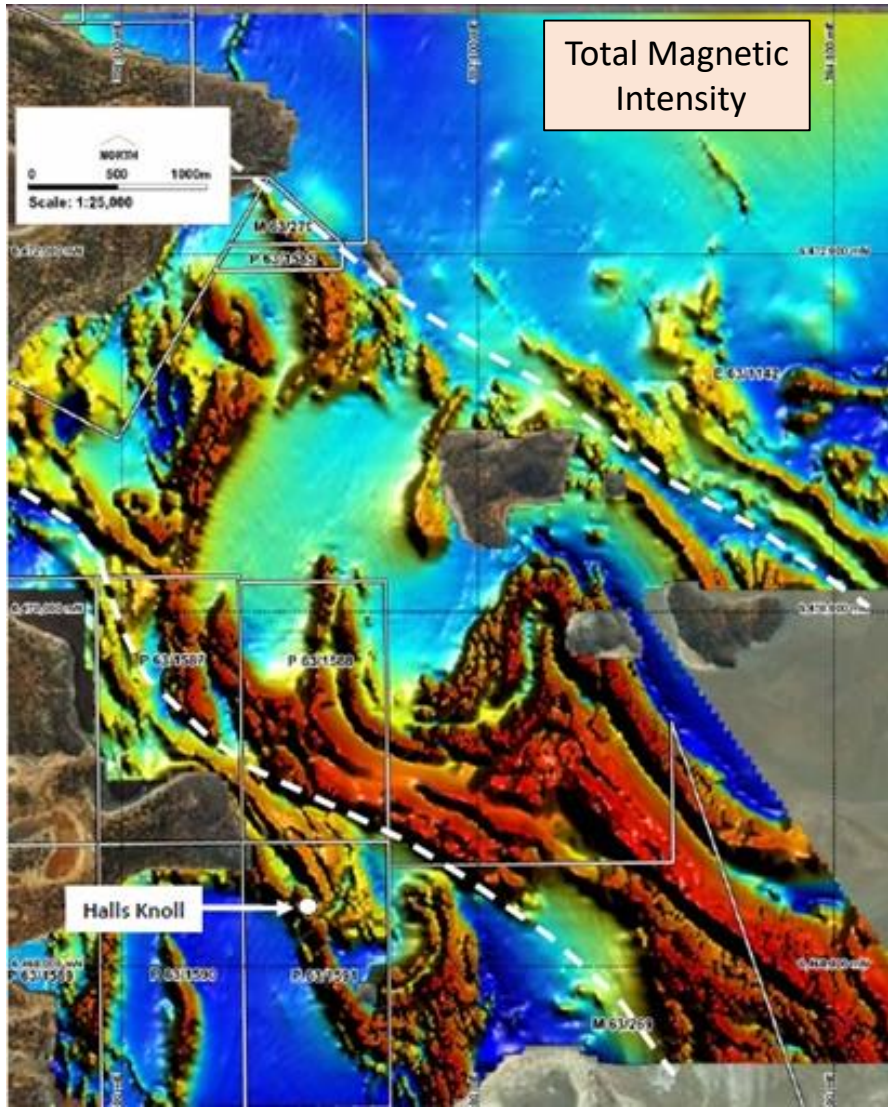
SAM MMR Surveys

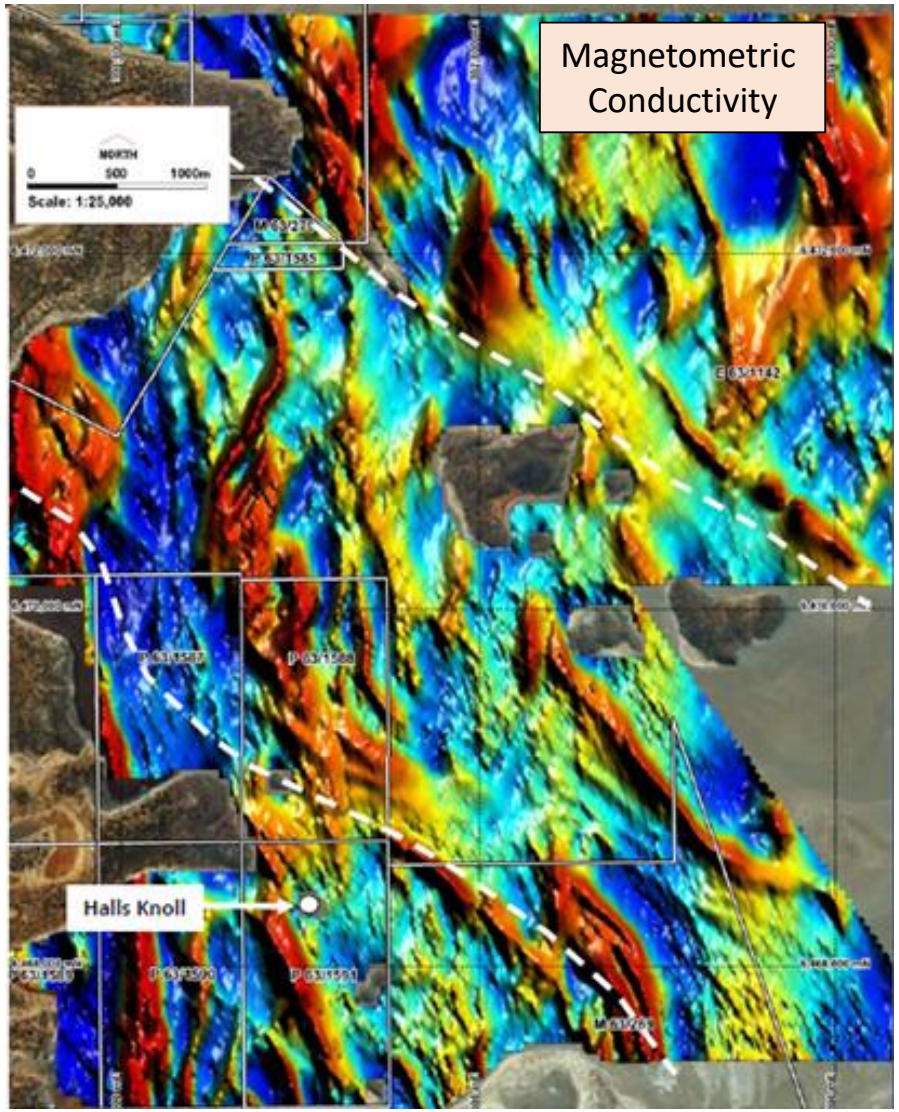
- Current channelling technique suitable for mapping vertical / sub-vertical linear stratigraphy and structures
  - Rapid acquisition
  - Extremely high detail
  - Multi-parameter data sets
  - Relatively inexpensive – value for money
  - TMI / MMC data sets offer multiple, complementary views of the geology
  - Recent refinement of Galvanic Source TFEM .

- Examples
  - Polar Bear – Salt Lake Survey, WA
  - Gold Road – Yamarna Belt Survey, WA



SAM MMR Case Study – Polar Bear, WA





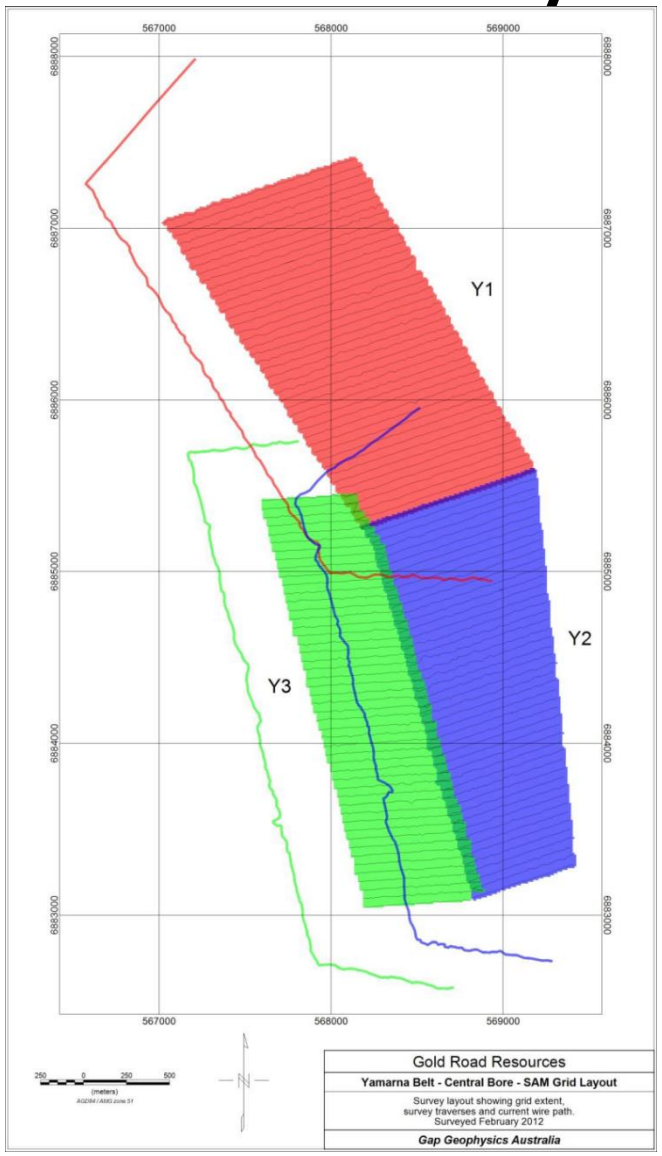
SAM from Polar Bear Prospect, WA (Sirius)

- Towed sled on salt lake
- Extremely conductive area
- Smaller survey grids
- Approx 20 grids
- Approx 30 sq km
- Approx 600 line km
- 20 days to survey
- Tx freq – 1Hz
- Current ~15A
- Sees fine detail of stratigraphy and structure to allow definition of new gold and nickel targets

* From a Presentation by Mark Bennett (Sirius Resources) at the Sydney Resources Roundup, 12th May 2010

SAM MMR Case Study-Central Bore, WA

Survey Layout

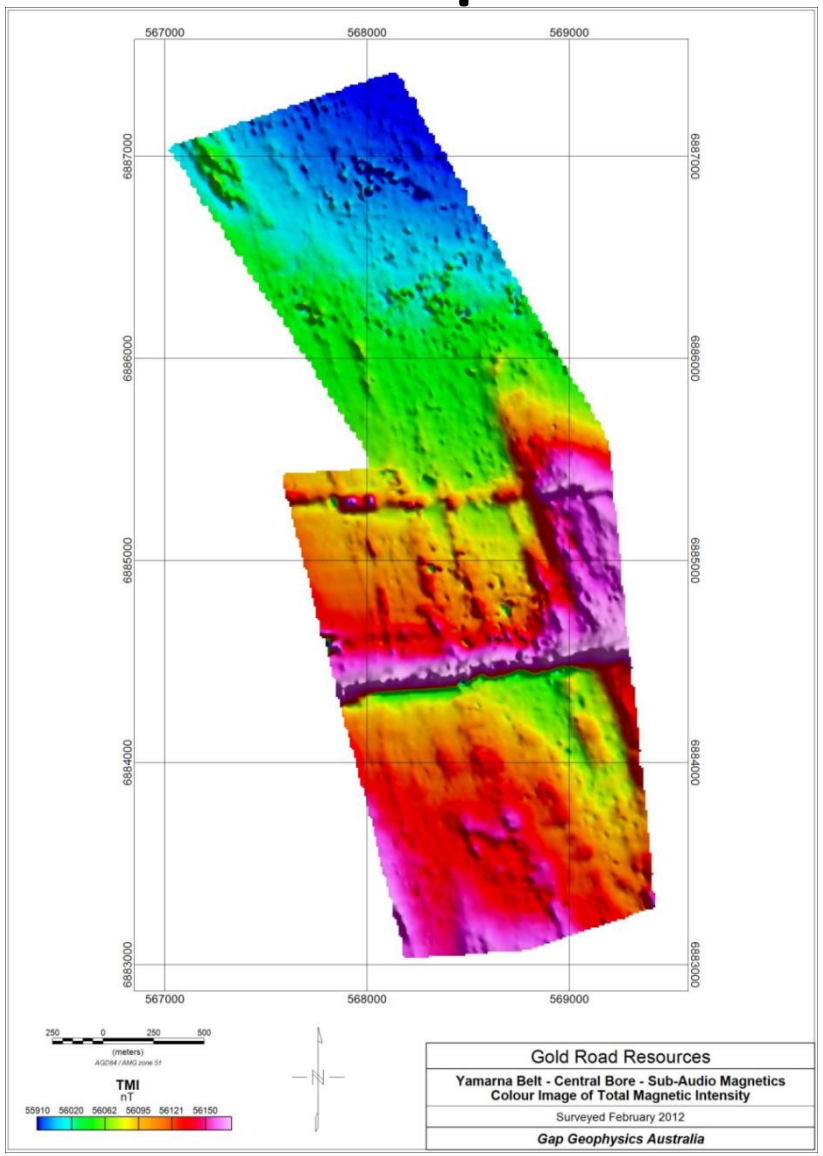


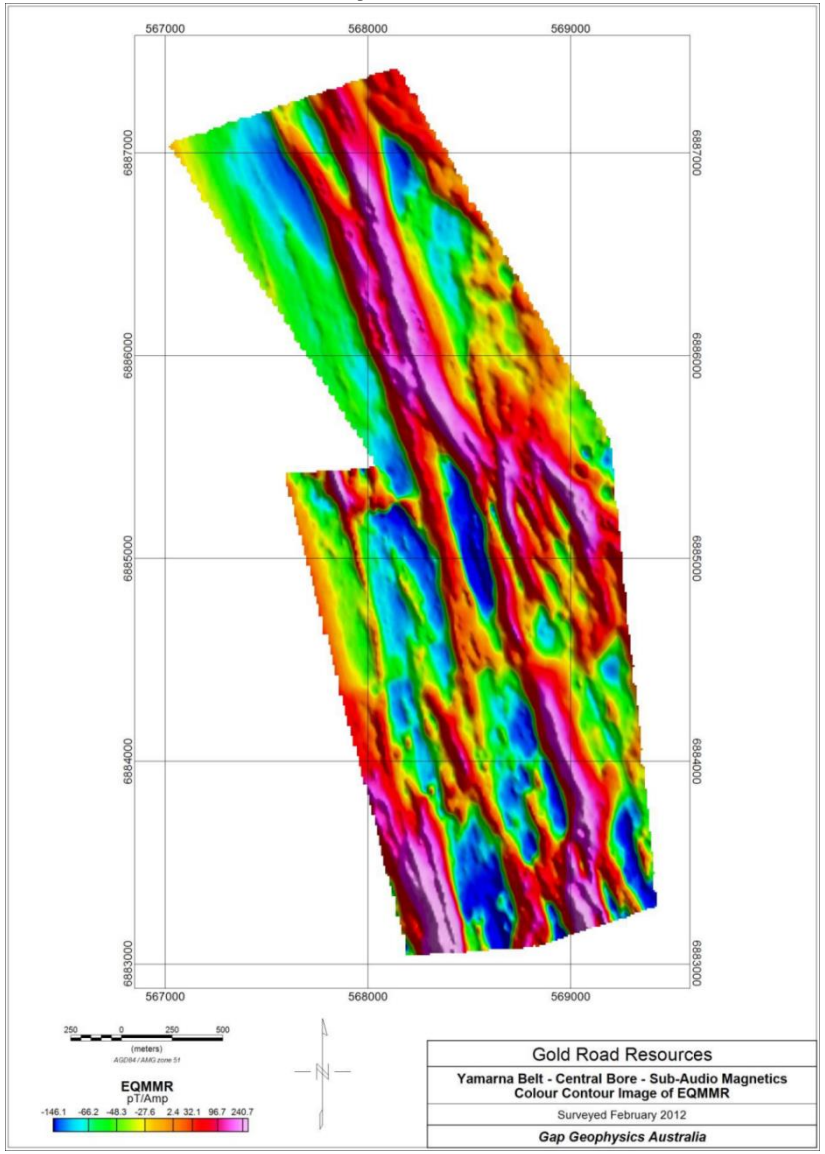
SAM Survey – Central Bore
Yamarna Belt, WA

- Ground Acquisition
- Moderate Conductivity
- Surveyed as three grids
- Approx 6 sq km
- 120 line km
- 7 days acquisition
- Tx freq – 8 Hz
- Current ~20A
- Designed to map stratigraphy and structure to allow definition of new gold and nickel targets

SAM MMR Example - Central Bore, WA

Total Magnetic Intensity

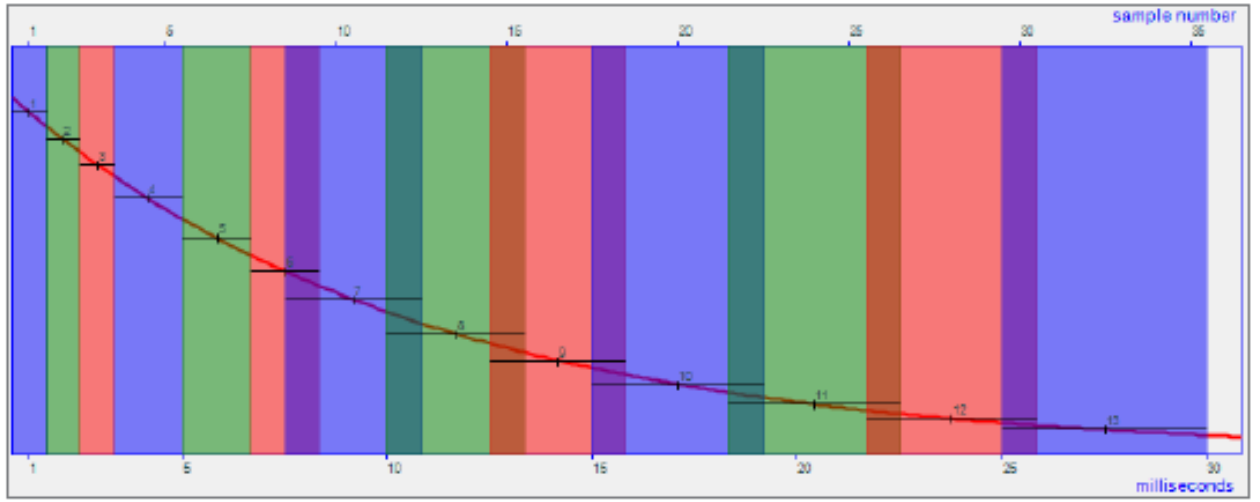




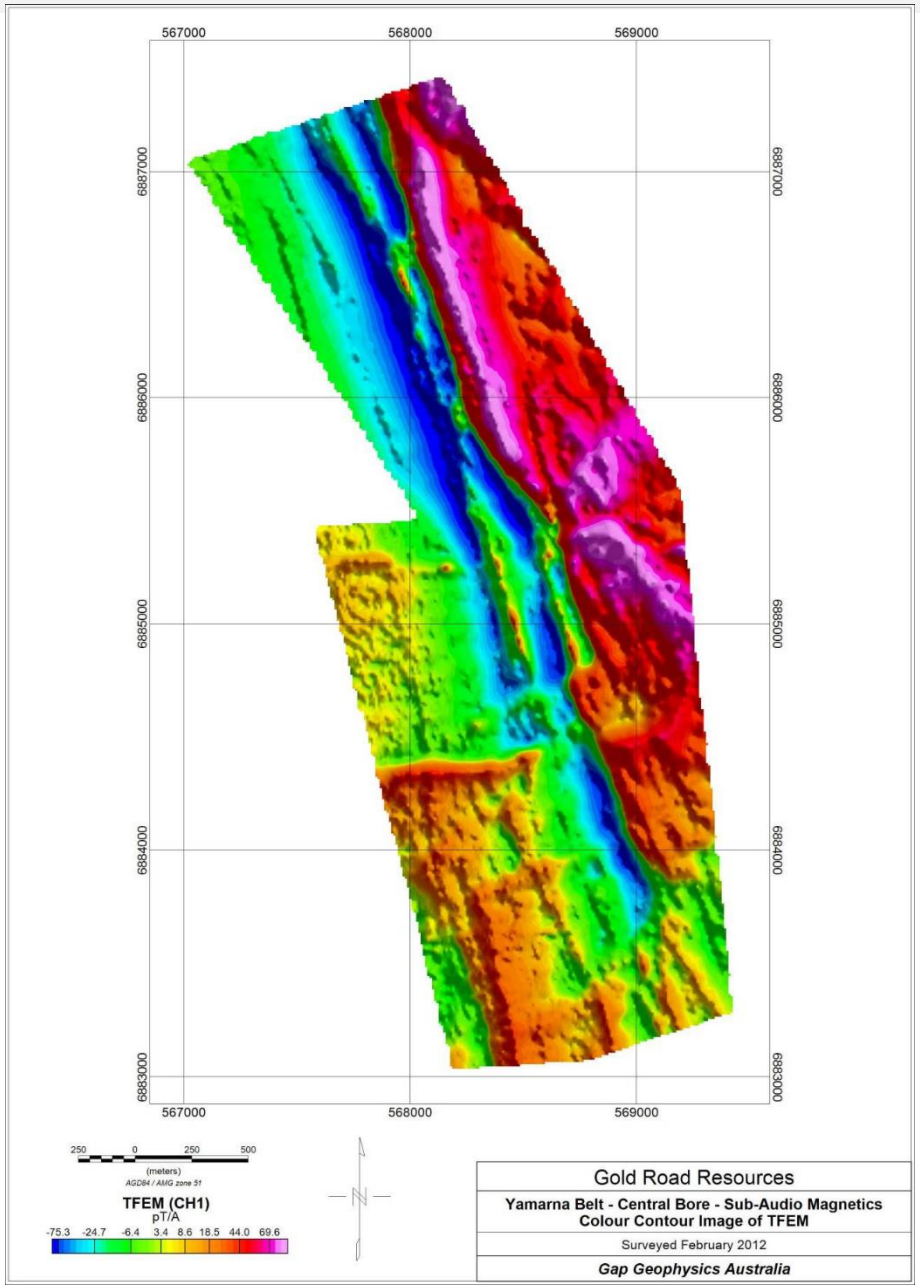
Magnetometric Conductivity

Galvanic Source TFEM Channels

Channel	Window Start (ms)	Window Centre (ms)	Window End (ms)	Window Width (ms)
1	0.833	1.250	1.667	0.833
2	1.667	2.083	2.500	0.833
3	2.500	2.917	3.333	0.833
4	3.333	4.167	5.000	1.667
5	5.000	5.833	6.667	1.667
6	6.667	7.500	8.333	1.667
7	7.500	9.167	10.833	3.333
8	10.000	11.667	13.333	3.333
9	12.500	14.167	15.833	3.333
10	15.000	17.083	19.167	4.167
11	18.333	20.416	22.500	4.167
12	21.667	23.750	25.834	4.167
13	25.000	27.500	30.000	5.000



TFEM Channel 1



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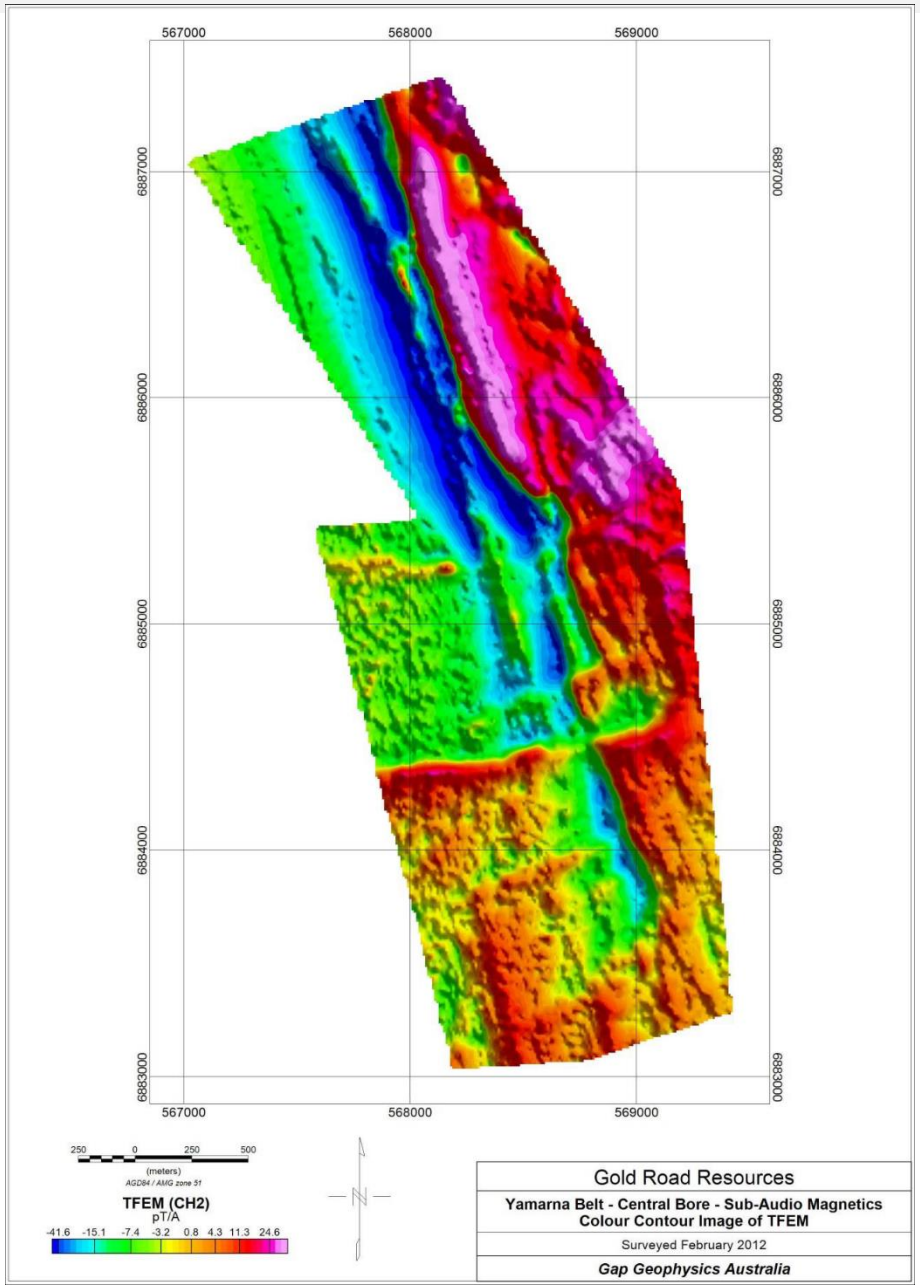
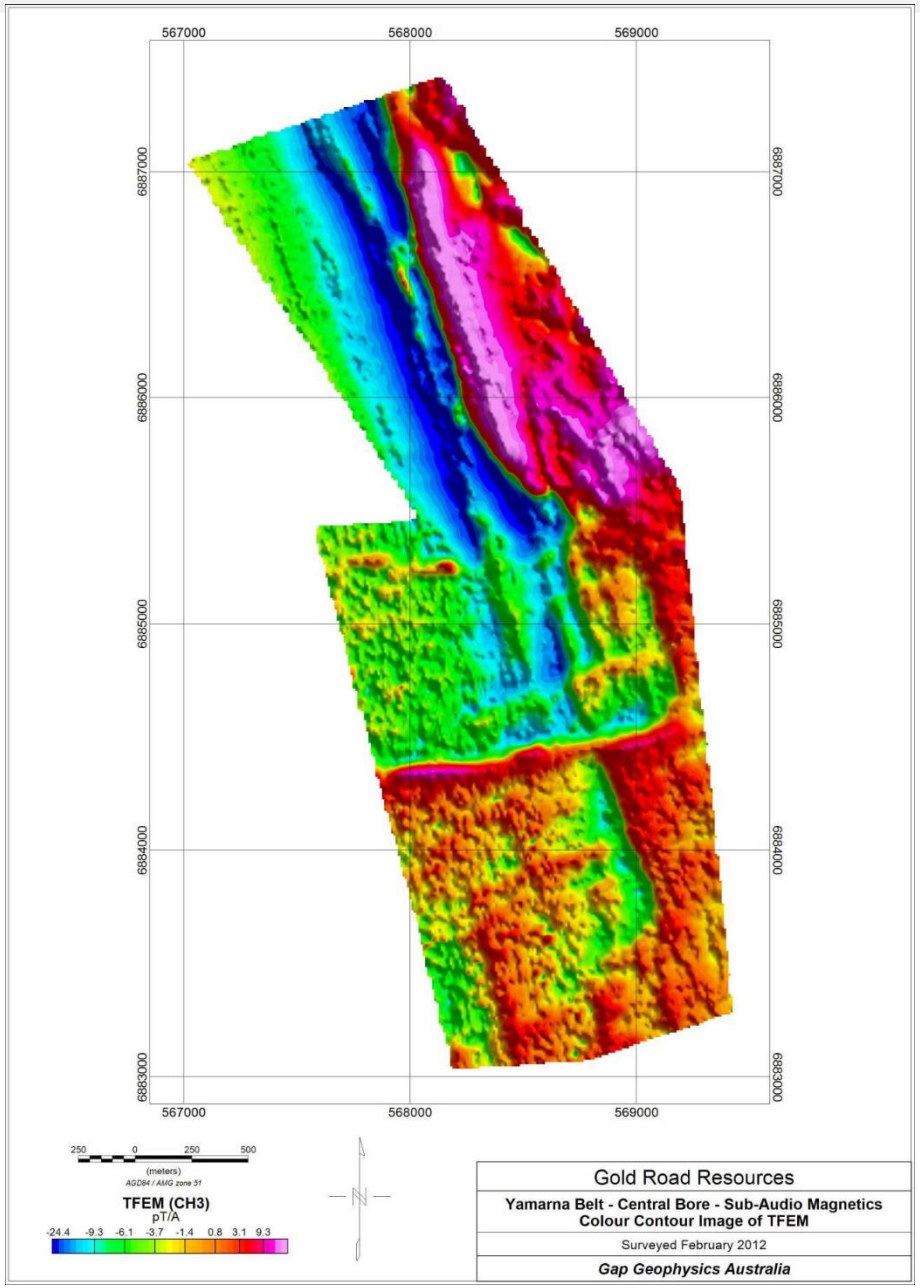
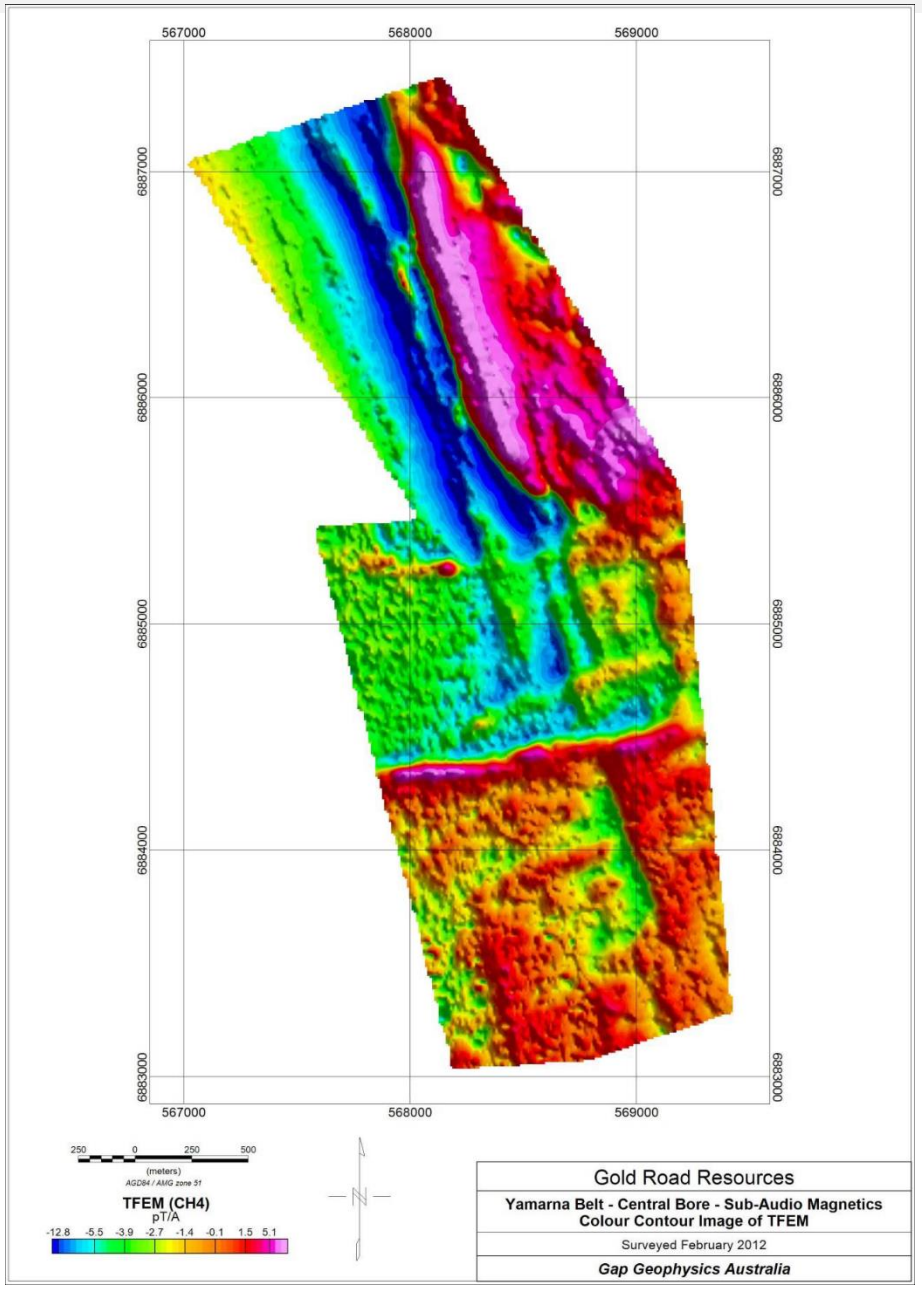


TFEM Channel 3



TFEM Channel 4



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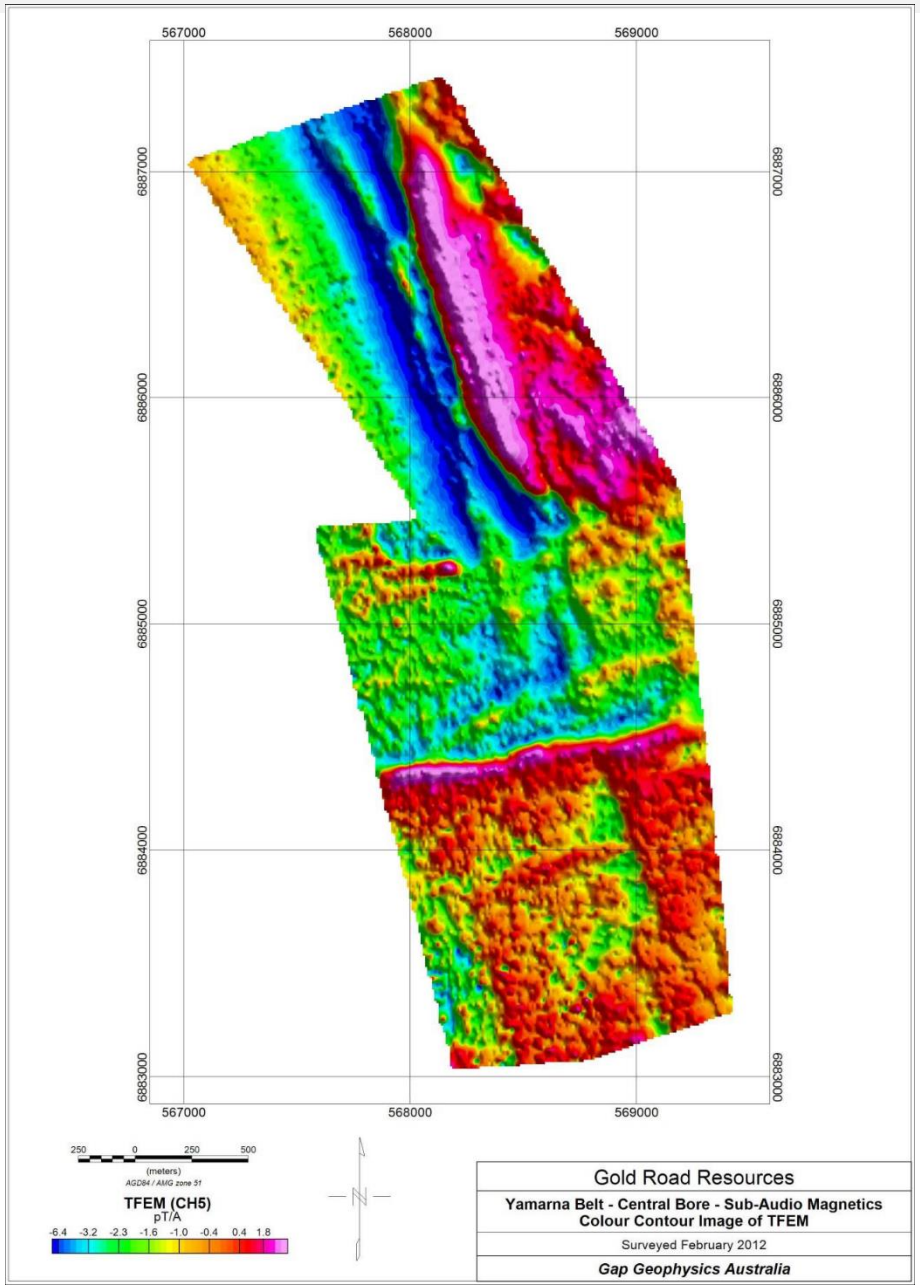

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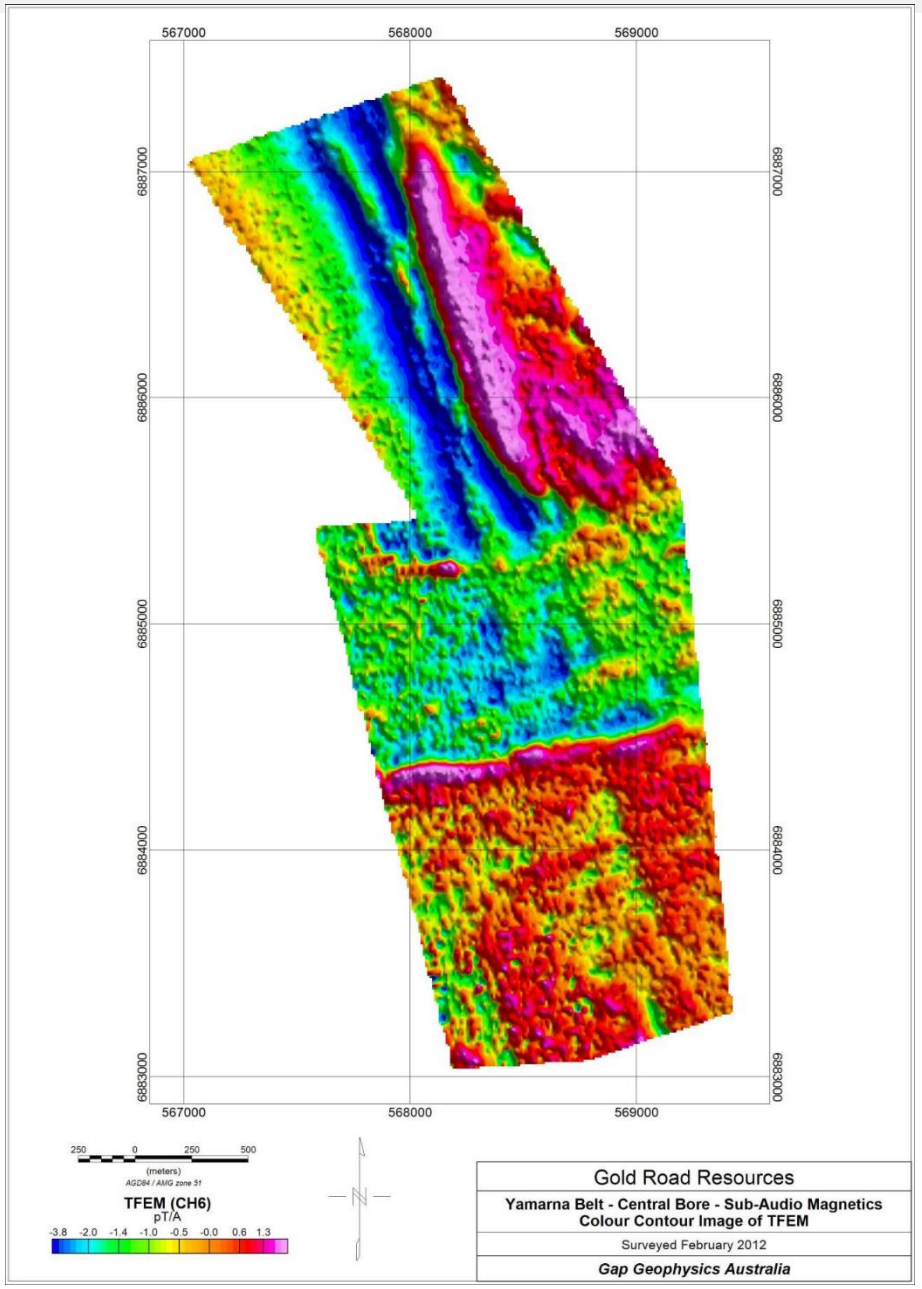
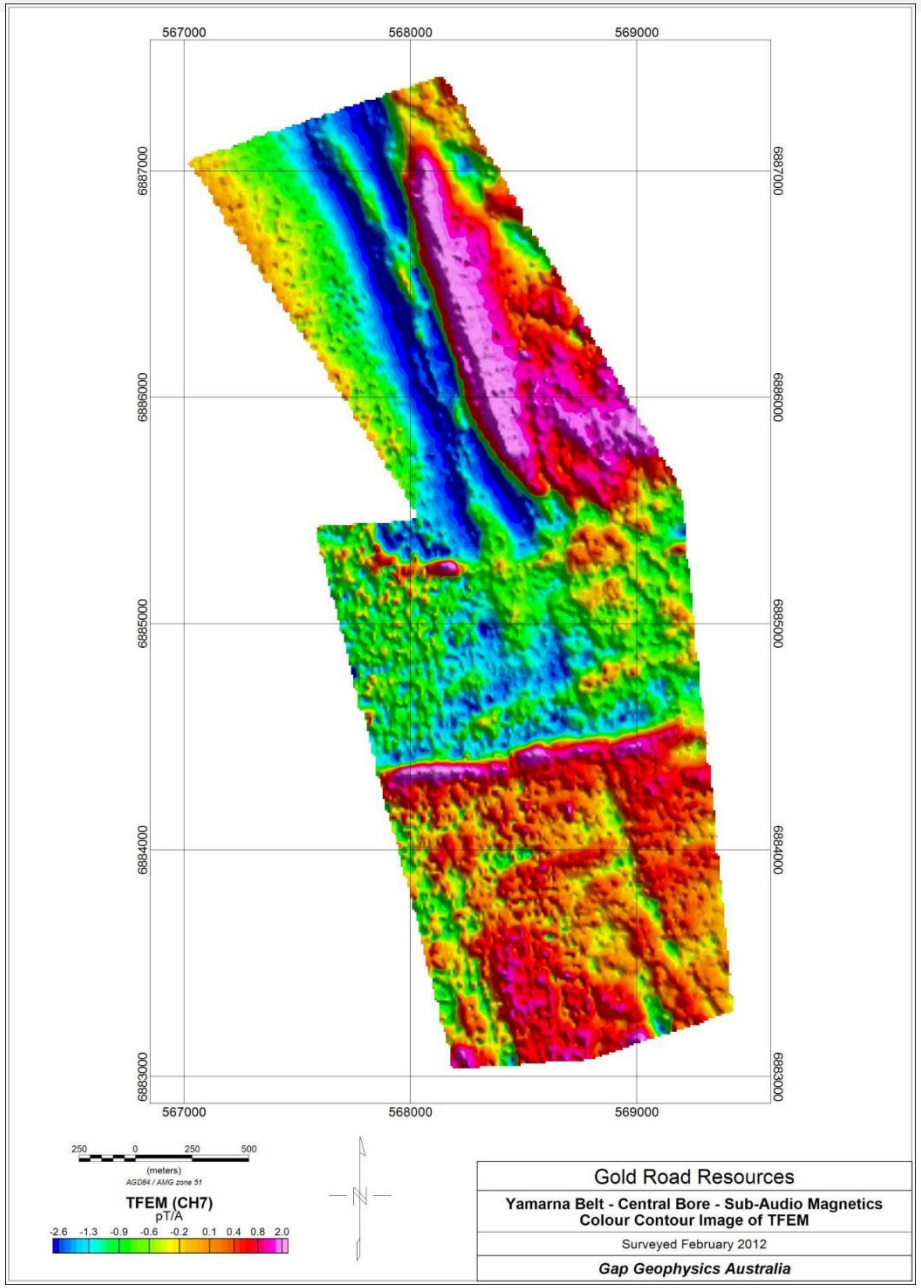
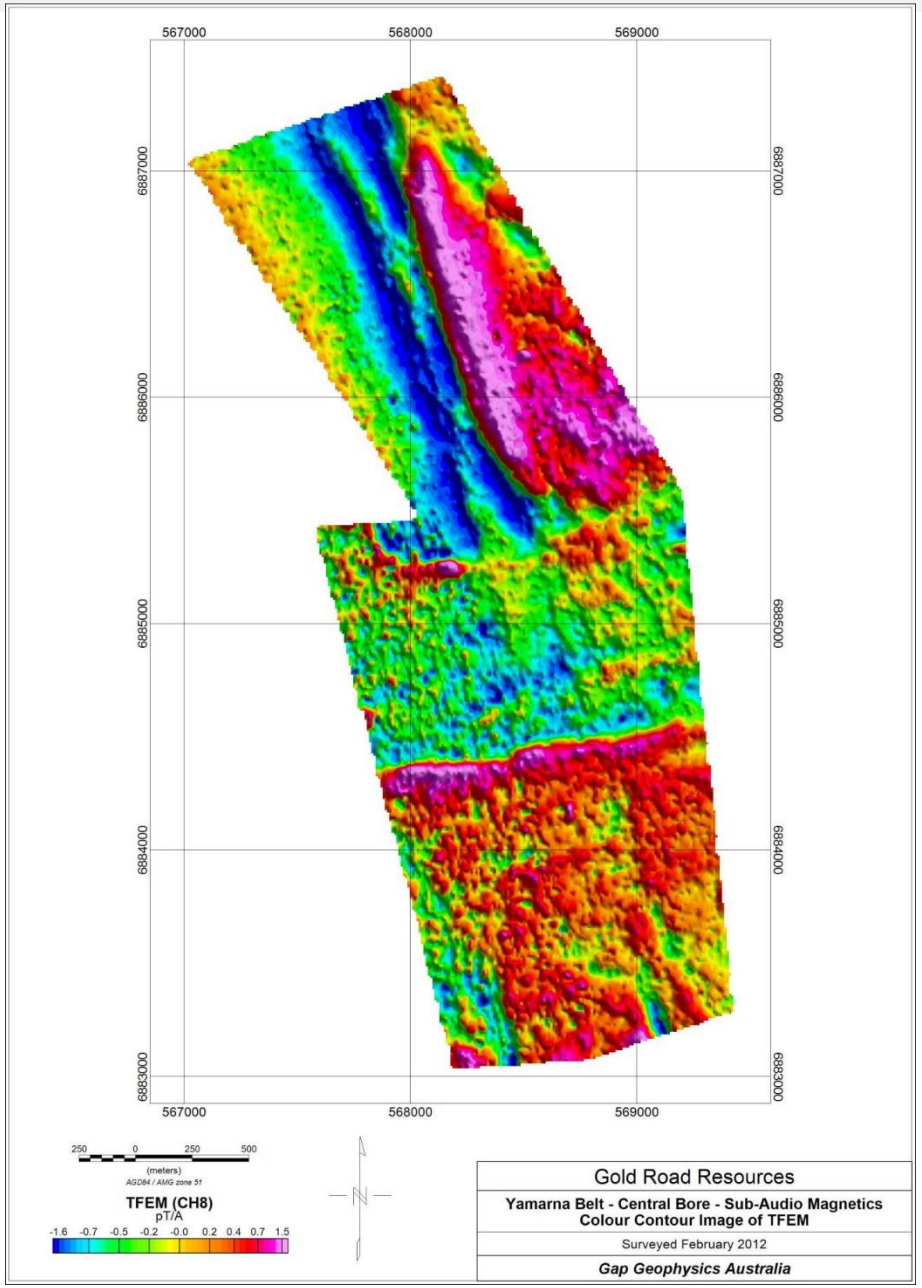


TFEM Channel 7



TFEM Channel 8



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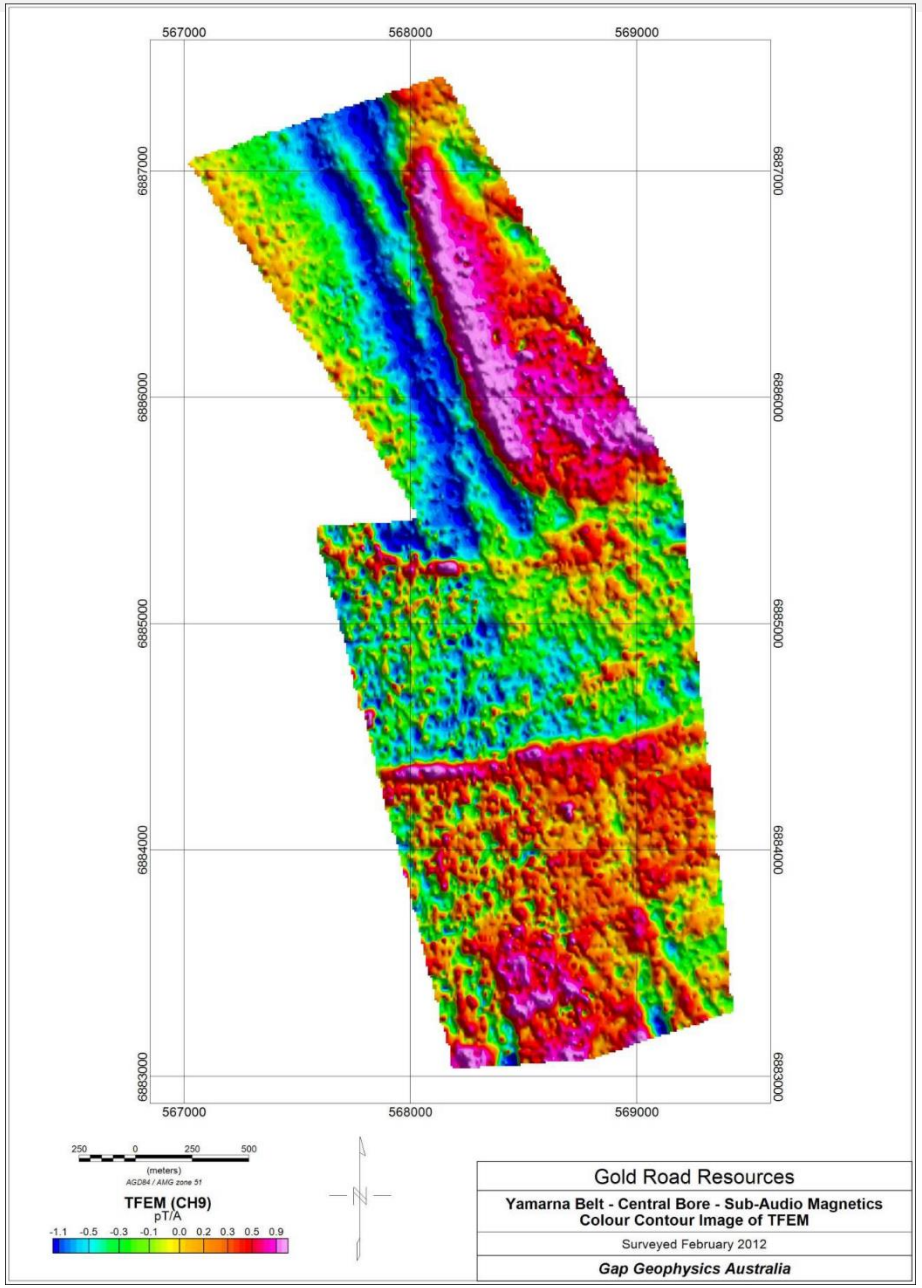
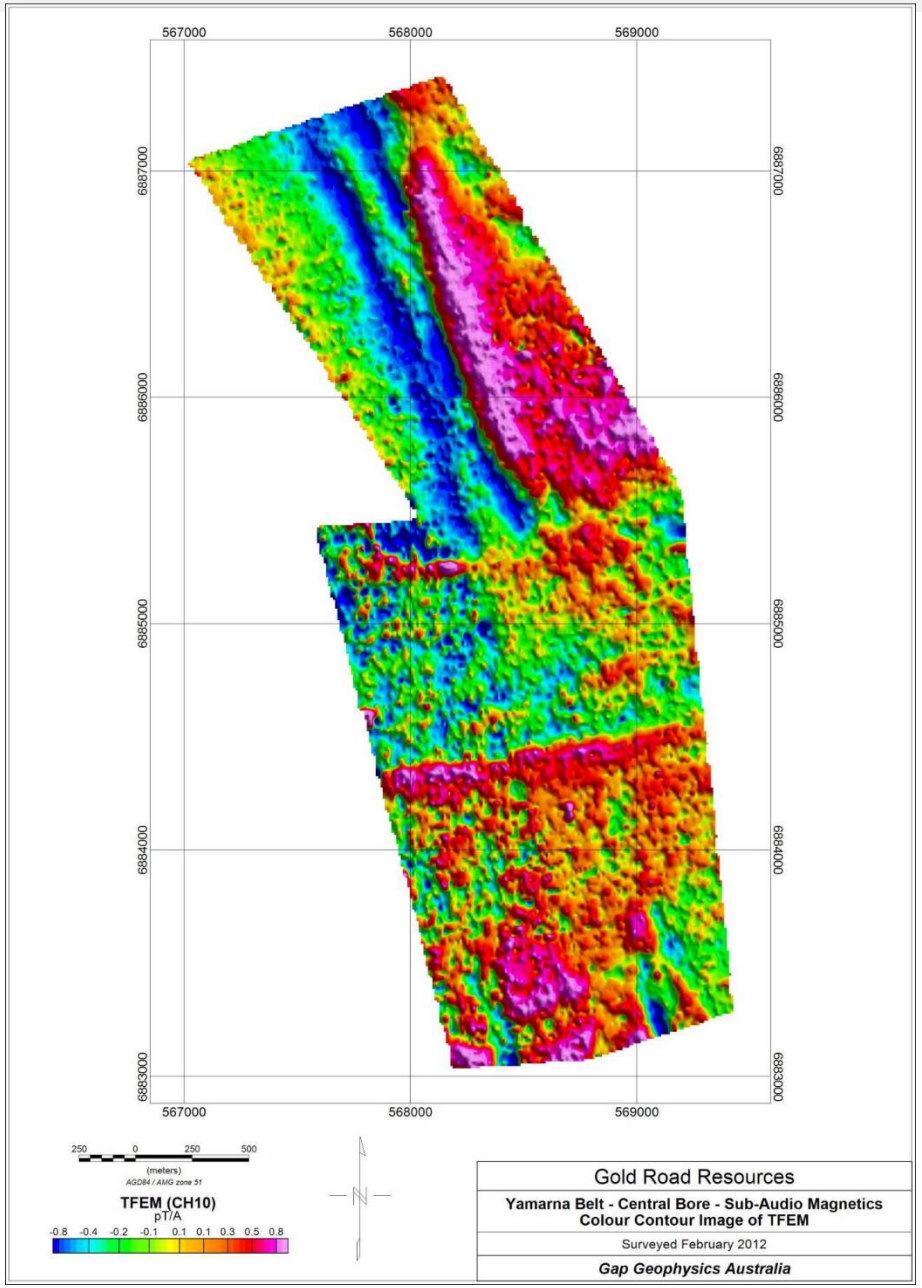


TFEM Channel 10



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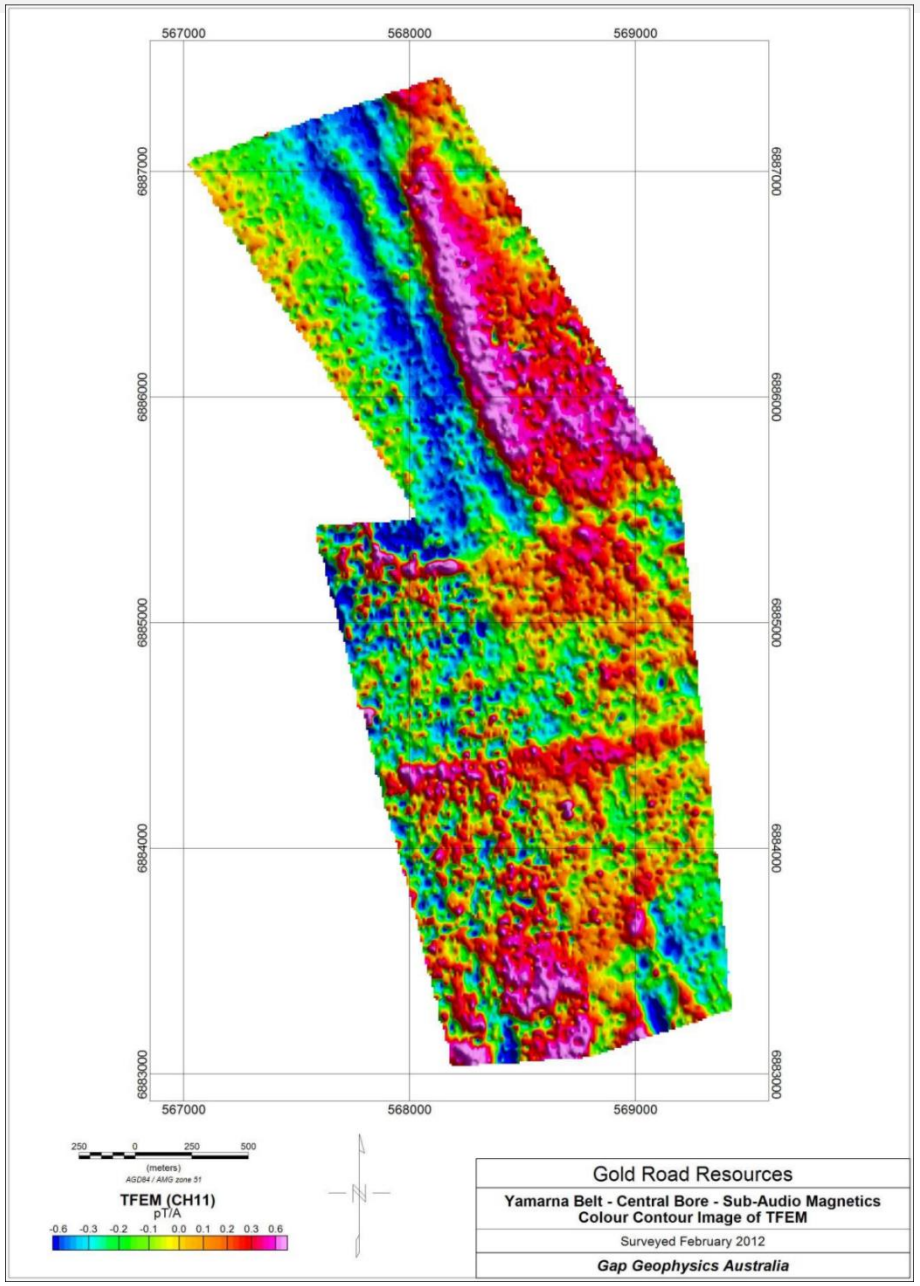
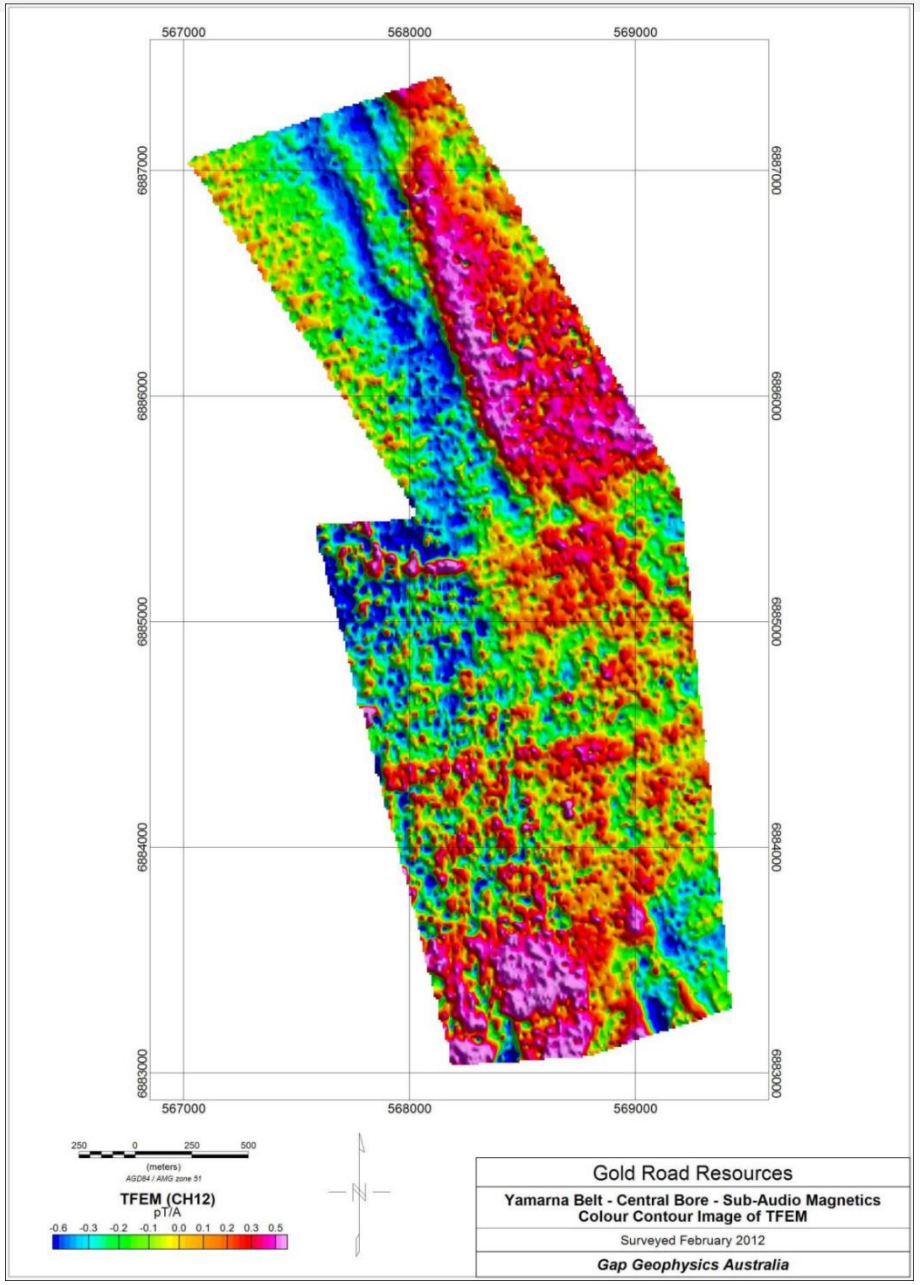
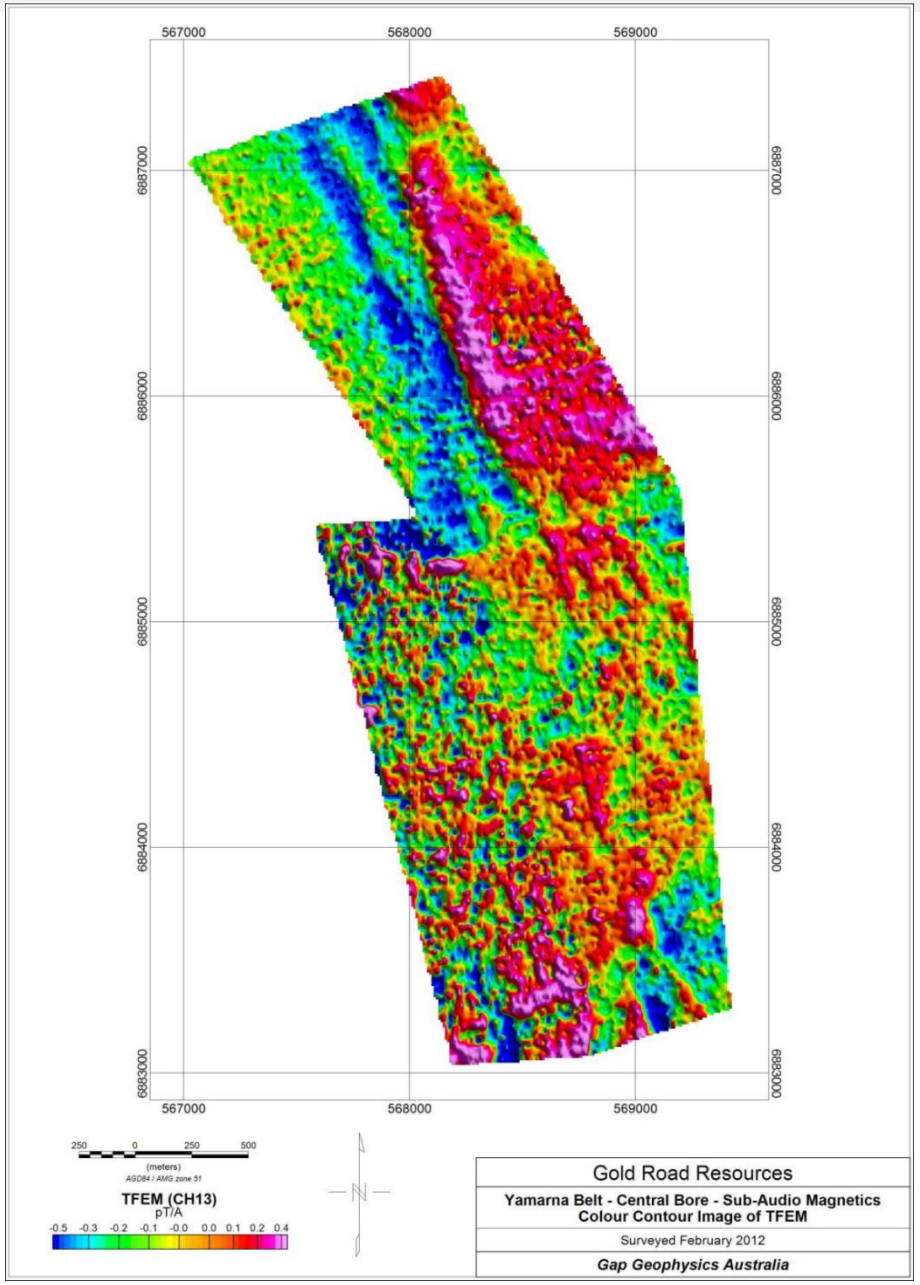


TFEM Channel 12



TFEM Channel 13



3D inversion of Galvanic source SAM

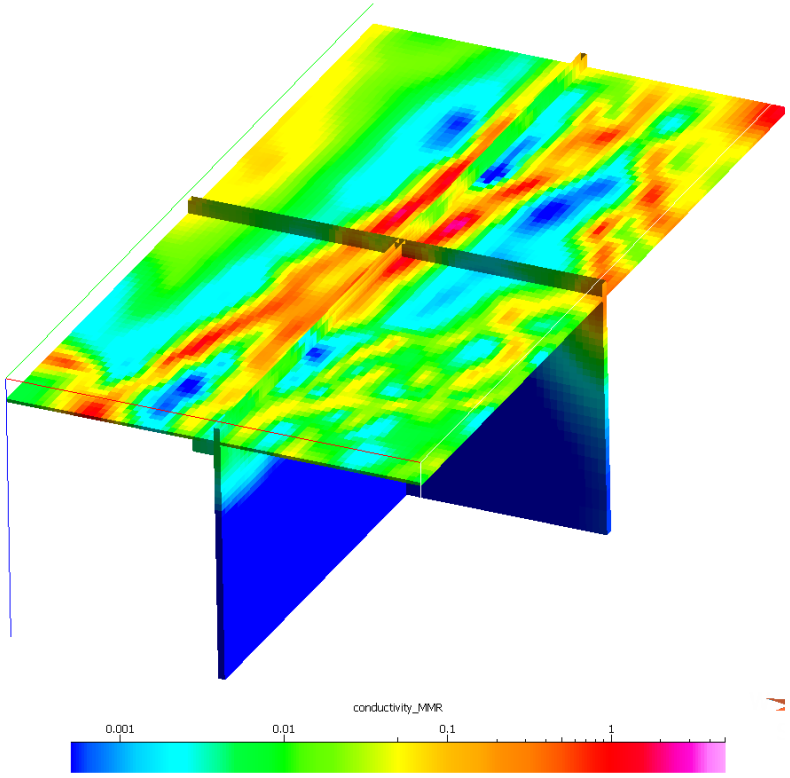
- 2 approaches for 3D inversion under investigation by Mira Geoscience (Scott Napier) and Fullagar Geophysics (Peter Fullagar)
  - Rapid approximate inversion of EM SAM with VPEM3D
    - Minutes on a Dell Notebook
  - Full 3D solution MMR + EM with UBC-GIF 3D EM inversion programs
    - 24-36 hours on a cluster computer

3D inversion of Galvanic source SAM

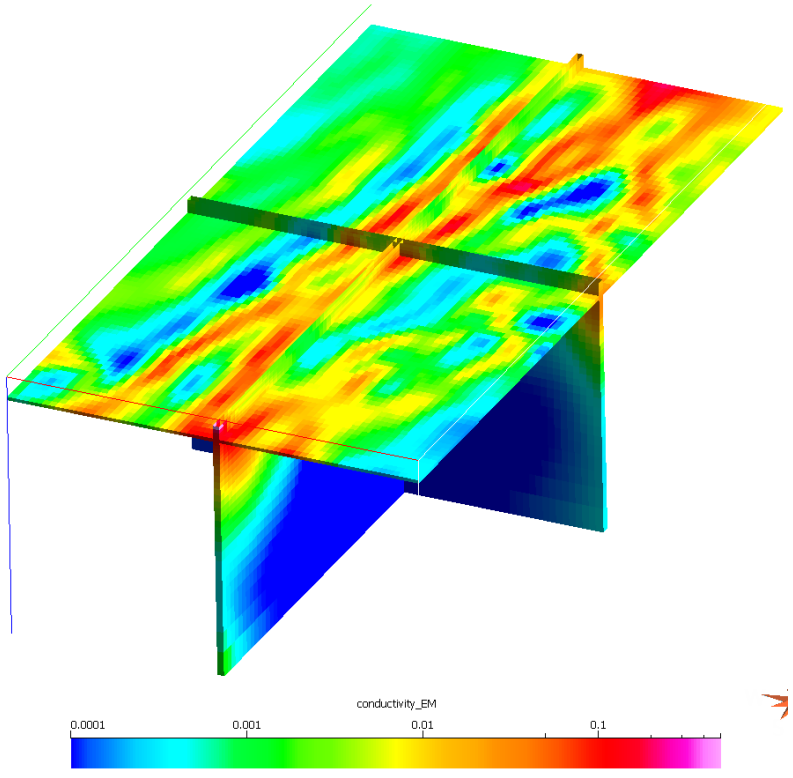
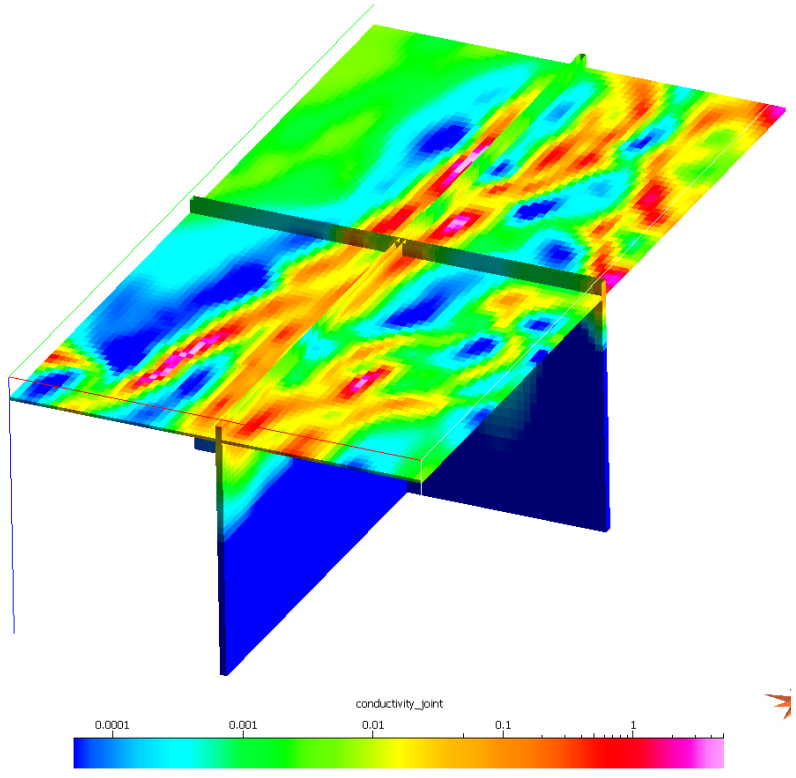
Full 3D inversion solution using H3DTDinv – Preliminary Results

Increasing level of detail recovered →

MMR only



EM only



Joint EM + MMR