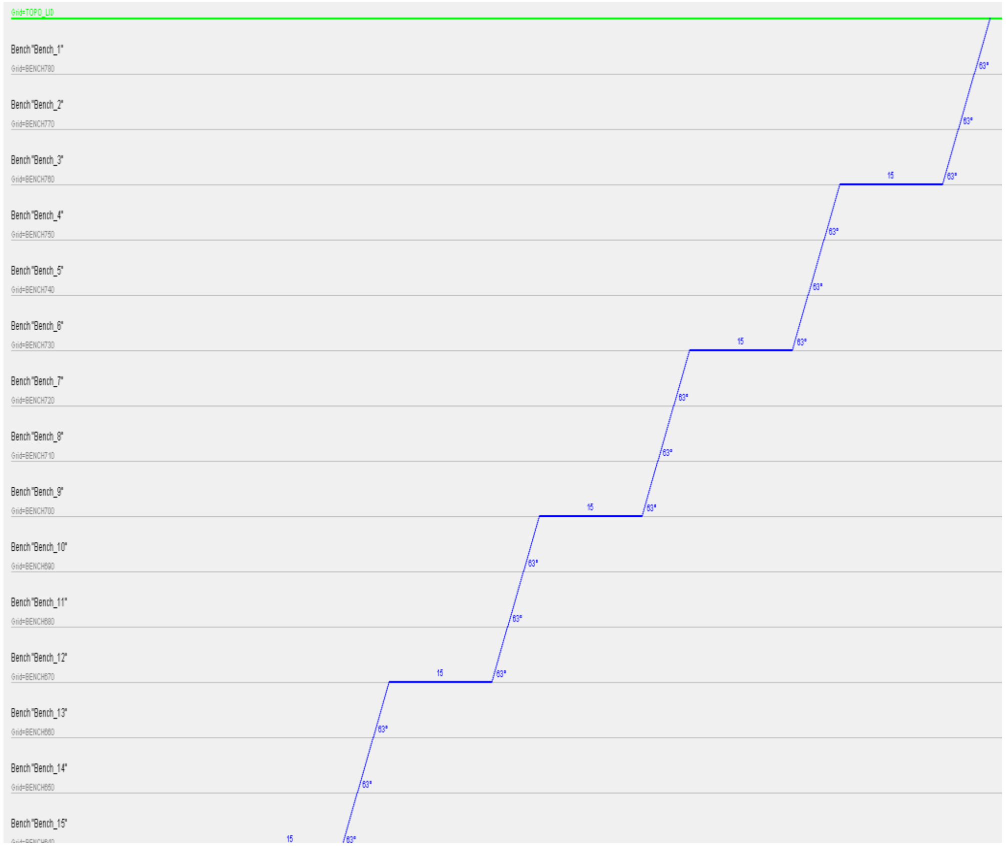
TE KUHA PROJECT – STEVENSON MINING LIMITED

AVERY CONSULTING – JUNE 2014 – V4

MINE DESIGN AND PLANNING

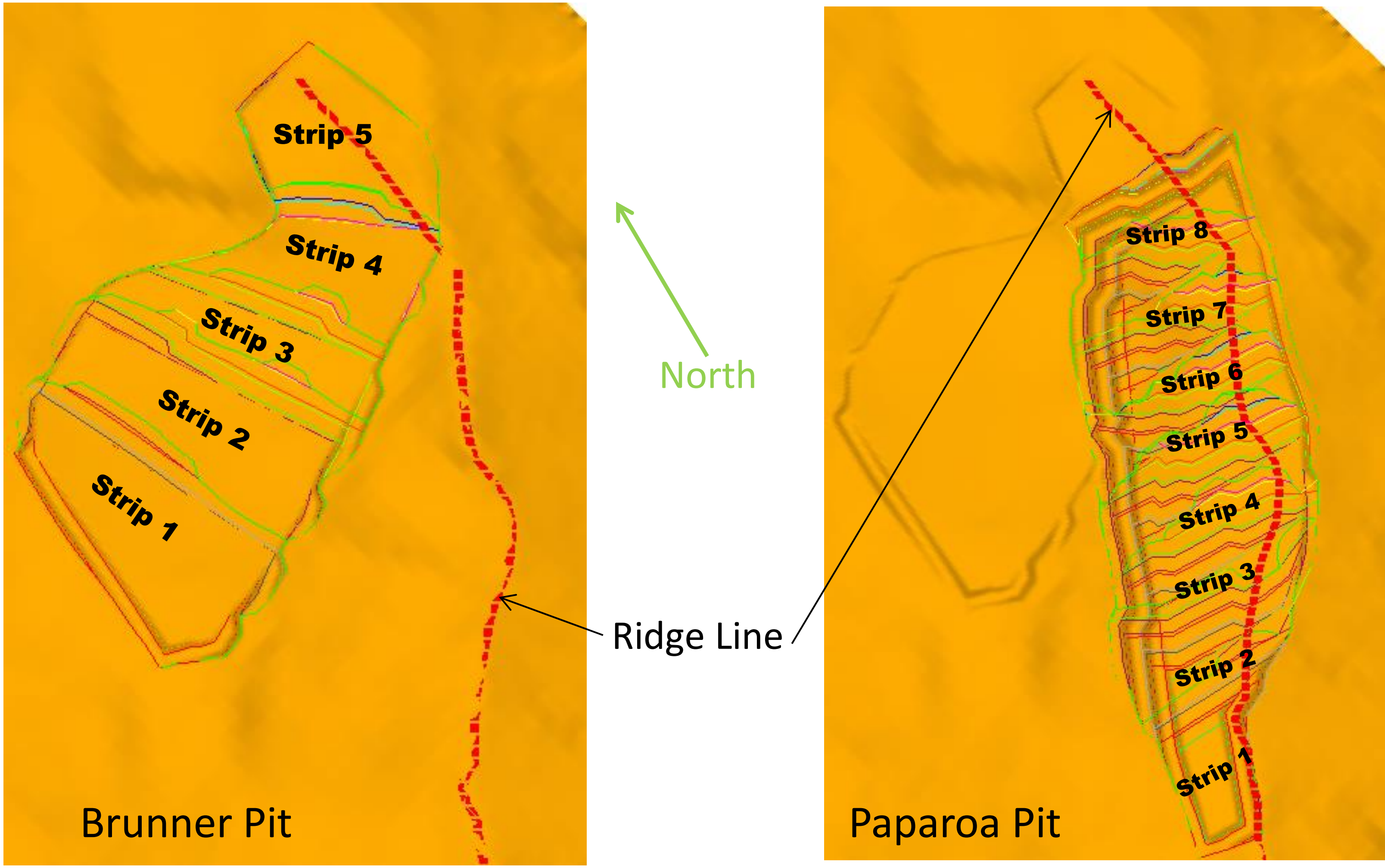
MINE DESIGN

PIT DESIGN



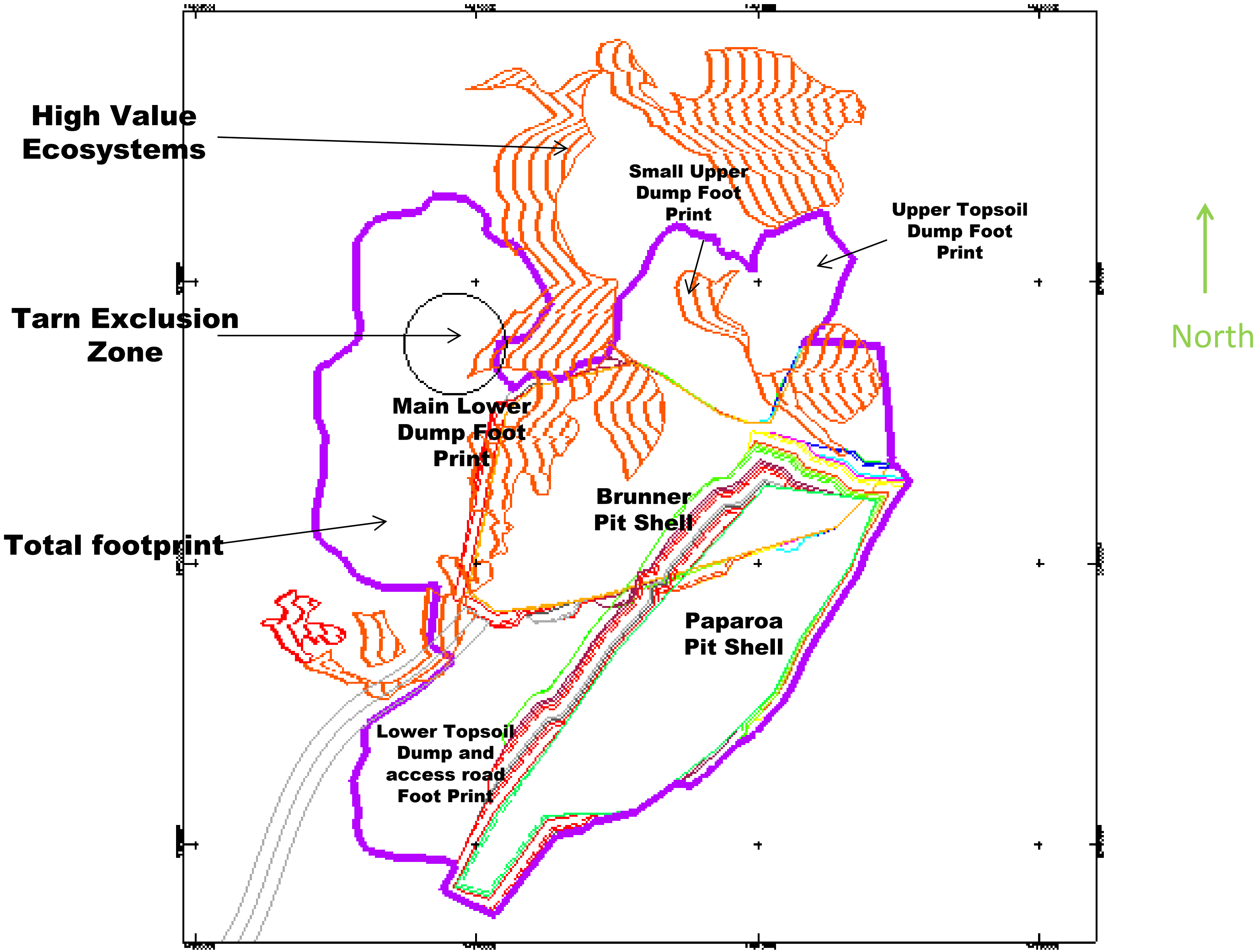
- Pit Slope Design is based on 10m high horizontal benches to allow for steep dipping coal to be uncovered and removed along each bench
- Final Pit wall (Blue line) - has bench design angles of 63 degrees with a 15m offset on every third bench
- Average Final Pit wall overall design angle is 50 degrees and Active Mining Strip wall overall design angle is 38 degrees
- **Further detailed geotechnical testing and evaluation are required for the dump and pit design to ensure stability**

PIT DESIGN – PLAN VIEW

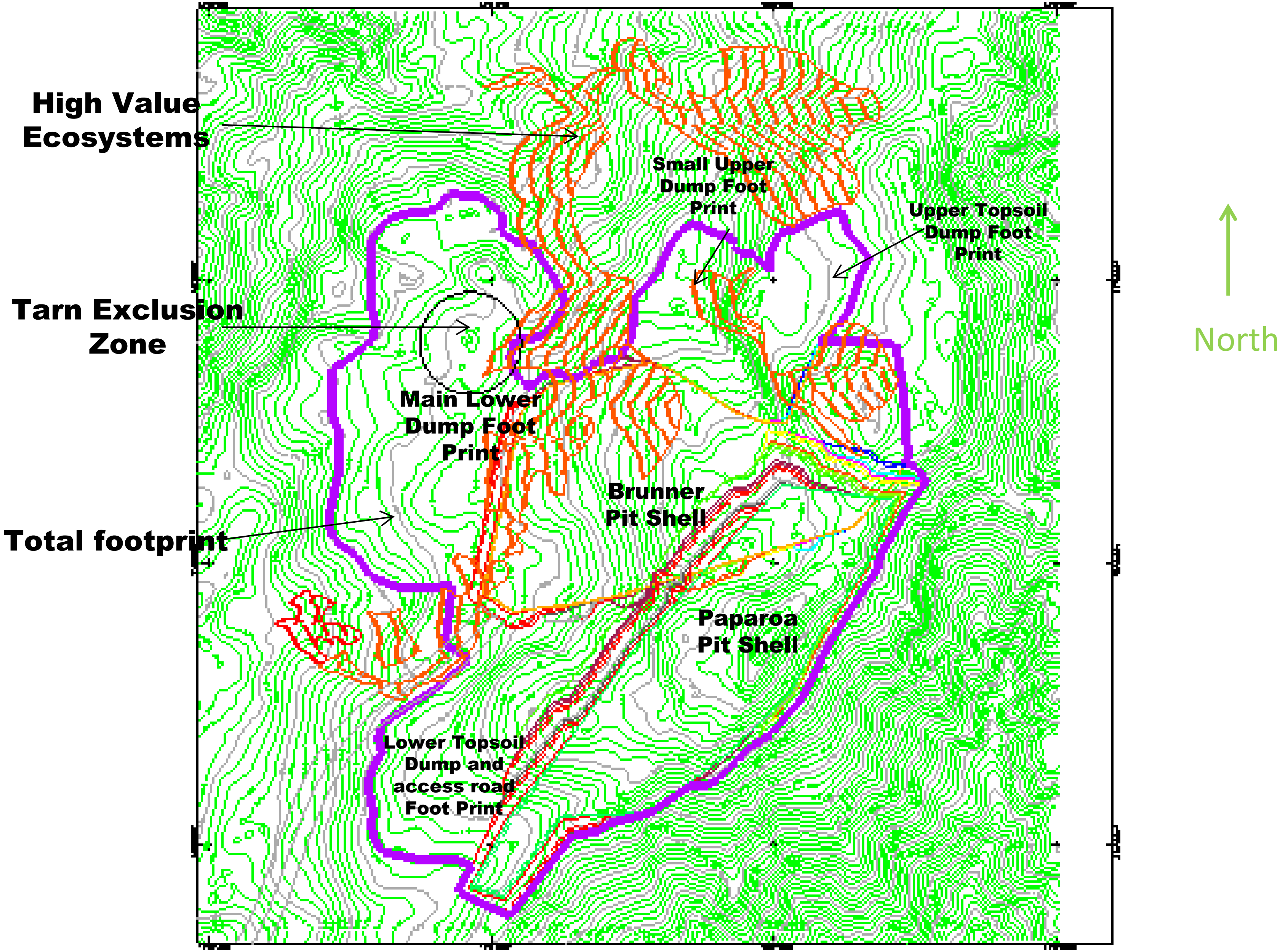


- Brunner Pit design is based on 5 x 140m wide strips
- Paparoa Pit design is based on 8 x 100 m wide strips
- In areas where the Brunner Pit overlaps the lower Paparoa Pit , the Brunner Pit is mined before the Paparoa Pit extends into the area

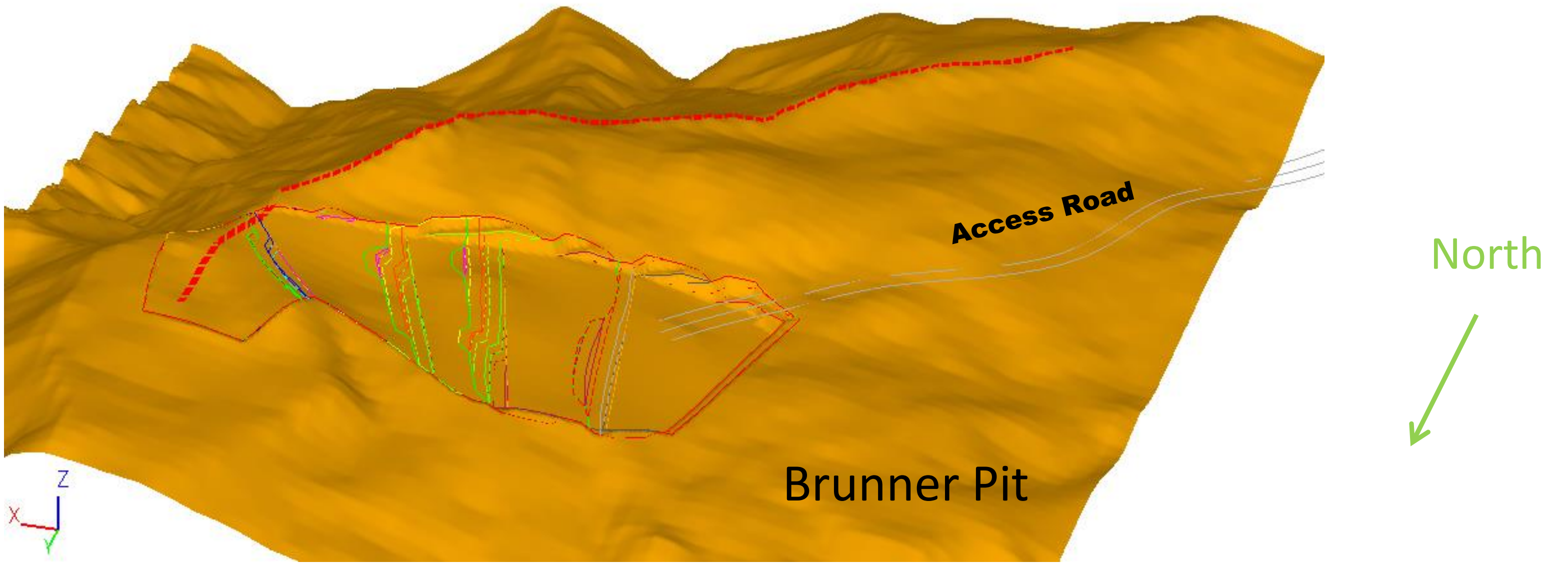
PIT DESIGN – PLAN VIEW

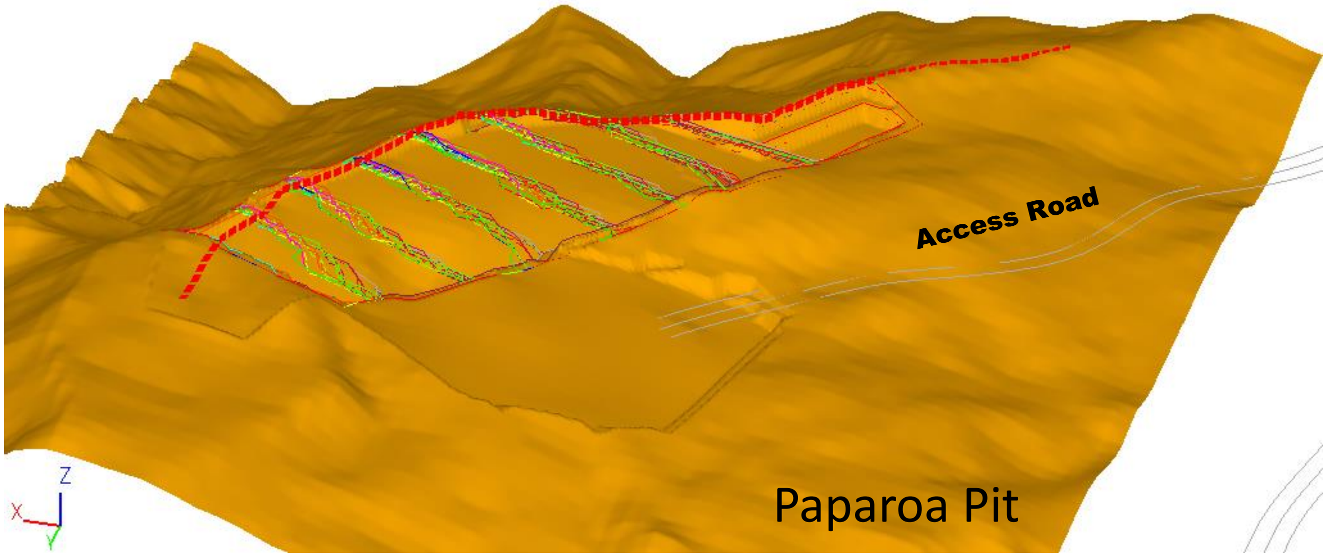


PIT DESIGN – PLAN VIEW with 5m CONTOURS



PIT DESIGN – LOOKING SOUTH EAST





DUMPING STRATEGY

- There are two out of pit dumps required:
  - Main Lower Dump which holds the majority of the out of pit dumped material
  - Small Upper Dump which is needed from Year 5 on
  - The Main Lower and Small Upper Dumps eventually form one Dump as they are joined and blended into the in pit back fill material dumped
- Swell factor used on all dumped material is plus 20% of in situ volumes
- Key drivers in dump design are to:
  - Minimise impact on high value ecosystems
  - Minimise amount of rehandle
- The Main Lower Dump includes the ROM pad in the design
- Dumping included the tarn area – this allowed the overall dump footprint to be reduced by having a volume efficient well sized dump which is kept down hill (out of sight of the reserve) and adjacent to the Brunner pit
- Paparoa waste (non acid forming) is required to be hauled to the Main Lower Dump initially – the non acid forming waste will be used to line the dump
- The Dumps are built from the bottom up following the development of both the Brunner and Paparoa Pits and progressing from out of pit to in-pit
- Rehabilitation is designed to progressively occur each year and follow the progression of the dumps up hill
- Approximately 40% of the progressively rehabilitated area will eventually need to be rehandled to allow material to be recovered to fill the final void

FINAL VOID STRATEGY

- Final void has a volume of 4.9 M cubic metres when compared to original topography and is located in the last strips of the Paparoa Pit
- A final rehabilitation surface has been designed taking into account:
  - Return as much of the disturbed area to natural topography where possible
  - Limit final slopes to a maximum slope of not greater than 2:1 (27 degrees)
  - Majority of Paparoa Pit is returned to original topography (excluding the ridge line which had to be slightly reduced to stay within maximum slope angles of 27 degrees)
  - Remaining Brunner Pit has been designed to a slightly lower level from the original topography in order to reduce the amount of rehandle required to fill the final void – a reduction of 1.1 M cubic metres has been achieved
  - All overburden that is dumped and shaped below the ROM pad level does not need to be reshaped
- This redesigning of final topography landform reduces the rehandle volume required to fill the final void to 3.8 M cubic metres
- The final void takes approximately 3 years to fill, with an average of 1.3 M cubic meters being rehandled each year
- Final rehabilitation of the entire area is expected to take an extra year due to the size required to be rehabilitated
- The estimated cost to fill the final void is approximately 3.8 M cubic metres at $2.50 per cubic metre giving a cost of approximately $9.5M

MINE SCHEDULE

SCHEDULE BY YEAR - COMBINED OUTPUT BOTH PITS

Year	Waste Volume	ROM Coal Mined	Strip Ratio	Raw RD	Raw Ash	CSN	Calorific Value	Inherent Moisture	Total Moisture	Total Sulphur	Volatile Matter
	bcm	Tonnes	bcm/t	t/bcm	%		MJ/kg	%	%	%	**%**
1	1,168,096	223,333	5.2	#1.26	6.3	8.38	34.01	0.88	8.81	1.22	**24.65**
2	1,188,779	250,198	4.8	#1.28	7.99	7.29	33.22	1.6	11.78	0.8	**24.7**
3	1,192,012	249,991	4.8	#1.25	5.27	7.46	33.74	1.4	10.65	1.18	**24.95**
4	1,177,446	250,018	4.7	#1.26	4.72	7.47	34.01	1.46	11.22	1.12	**25.38**
5	1,199,121	249,796	4.8	#1.29	7.78	7.06	33.47	1.99	8.21	0.65	**25.09**
6	1,194,659	249,823	4.8	#1.28	5.79	7.08	33.89	1.95	10.25	0.75	**25.54**
7	1,190,934	250,321	4.8	#1.26	3.75	6.34	32.98	2.35	14.54	1	**25.77**
8	1,196,168	249,848	4.8	#1.30	6.89	4.32	31	3.79	13.97	0.5	**26.09**
9	820,000	250,116	3.3	#1.25	4.94	5.23	30.81	1.29	17.73	0.54	**24.26**
10	820,000	250,134	3.3	#1.25	3.88	6.47	32.12	2.46	14.06	0.76	**25.74**
11	820,000	250,195	3.3	#1.23	4.23	#8.17	#34.44	#0.47	#10.03	#0.70	**#25.19**
12	820,000	250,759	3.3	#1.23	2.93	#8.30	#34.64	#0.49	#10.52	#0.87	**#25.70**
13	820,000	253,127	3.2	#1.22	3.32	#5.00	#33.96	#1.77	#13.27	#0.55	**#24.68**
14	820,000	250,167	3.3	#1.25	4.61	#7.83	#34.94	#0.73	#10.58	#0.99	**#24.55**
15	778,399	76,160	10.2	#1.25	4.69	#8.54	#34.87	#0.60	#8.47	#0.94	**#24.82**
Total	15,205,614	3,553,986	4.3								

is where a default number has been used in calculation because there are no coal quality grids for the minor seams

No minimum thickness / loss or dilution have been applied – Not compliant to JORC or Valmin code

SCHEDULE OUTPUTS

The schedule is shown on a year by year basis from two different perspectives:

- The first sequence is looking to the north east
- The second sequence is looking due south

Each output has the following information highlighted:

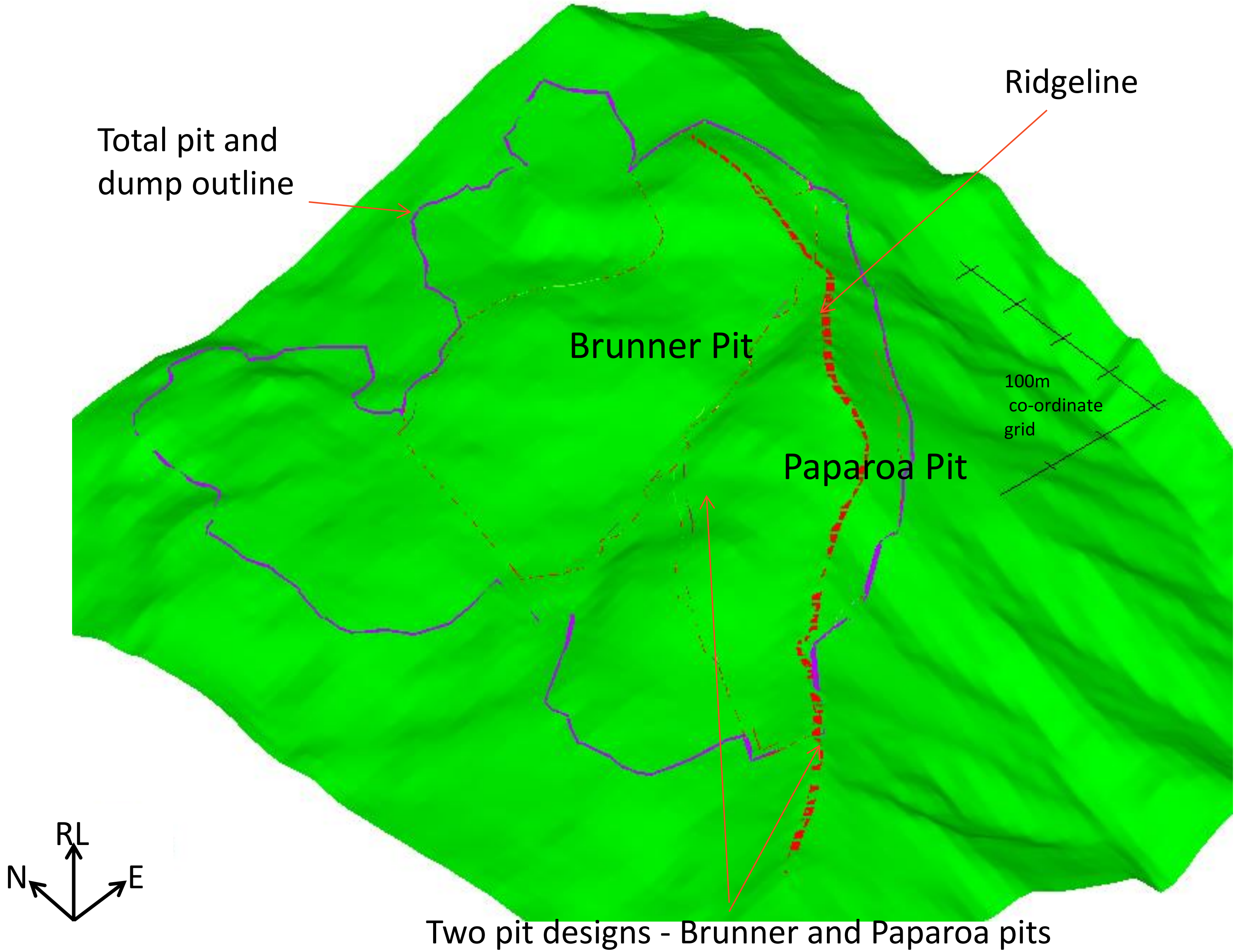
- Access road – brown
- ROM – black
- Topsoil pile – brown/maroon
- Pit and dump outline – purple line

Also shown changing on a year by year basis is:

- New Dump – purple
- Mining Area – brown/orange
- Final Rehabilitation Area – light green
- Temporary Rehabilitation Area – darker green
- Ridgeline returned to same level as original – Bold dashed red line
- Ridgeline returned to lower level than original – Bold dashed blue line
- Drainage line – light blue line (first four years only)
- Dam – light blue area

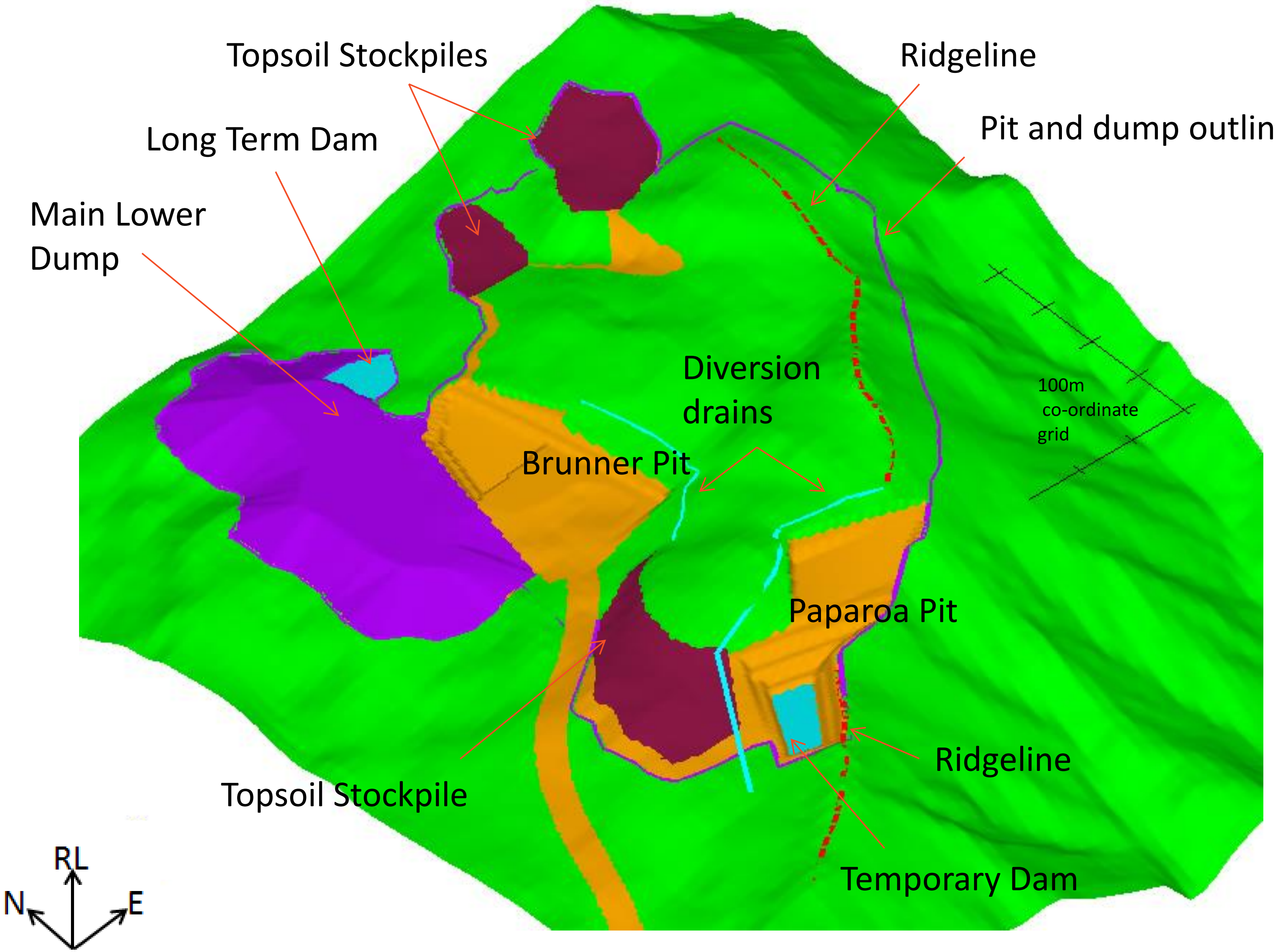
MINE SCHEDULE – LOOKING NORTH EAST

SCHEDULE – TOPOGRAPHY AT START



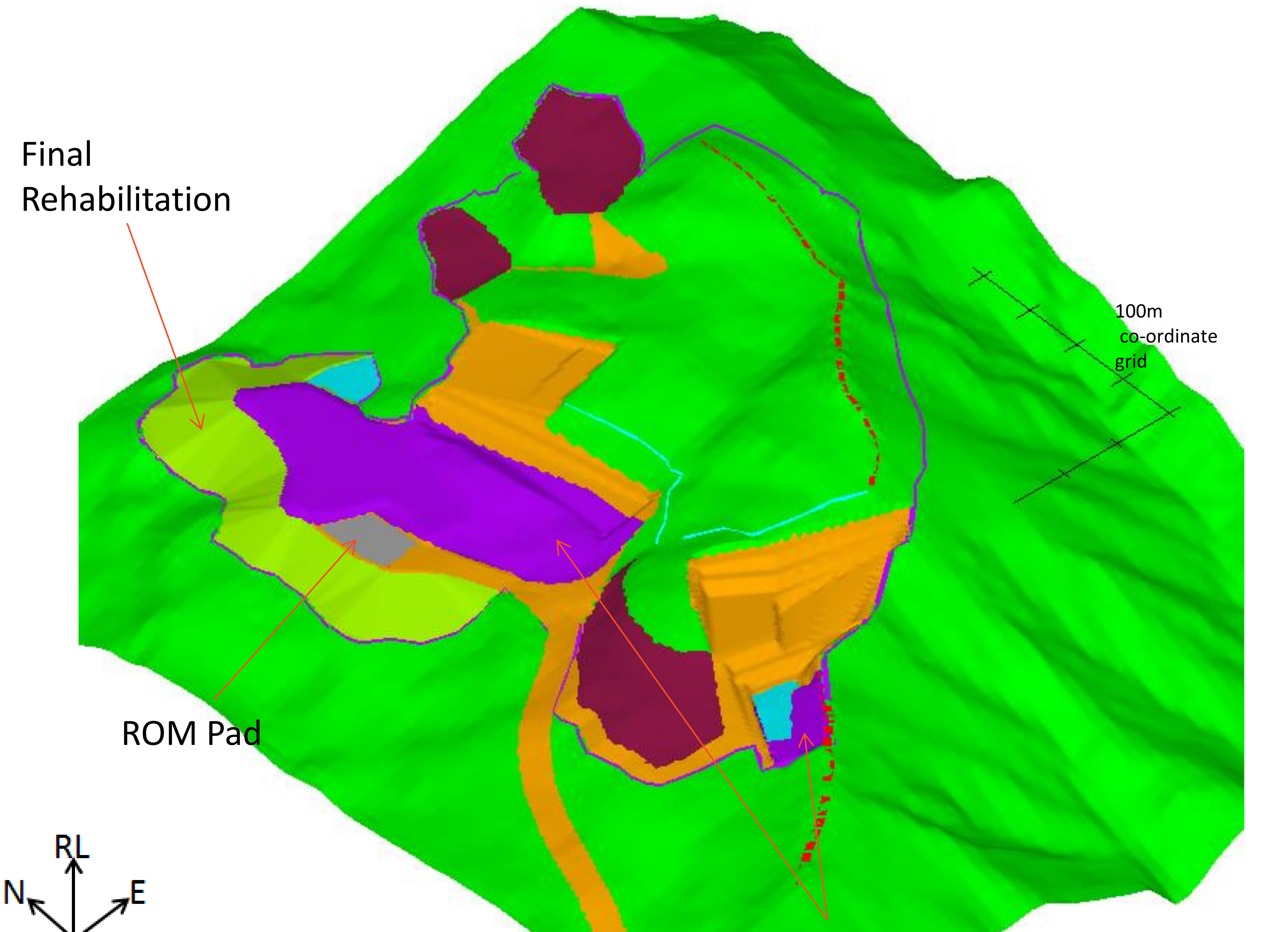
SCHEDULE – LOOKING NORTH EAST

SCHEDULE – YEAR 1

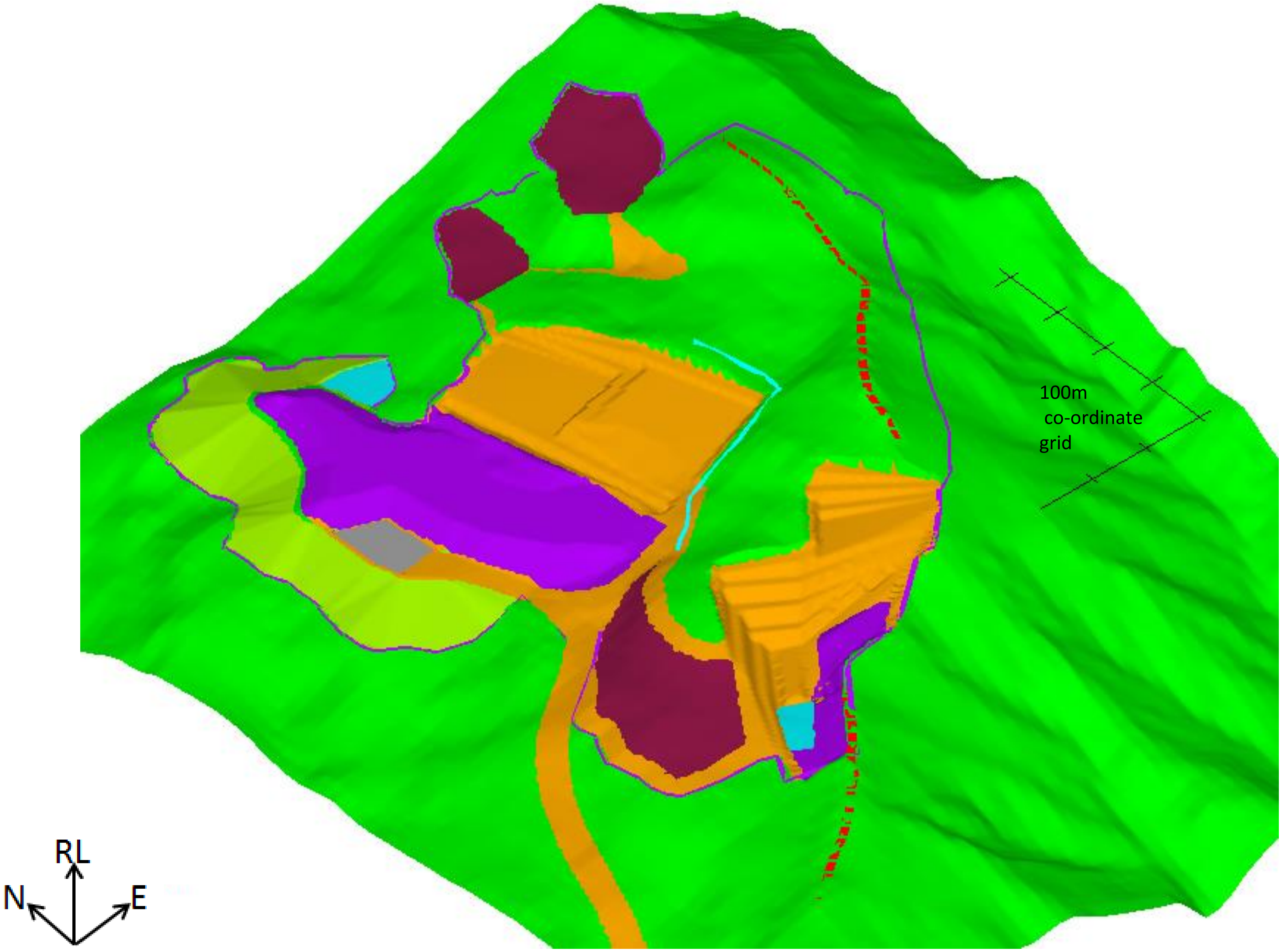


SCHEDULE – LOOKING NORTH EAST

SCHEDULE – YEAR 2

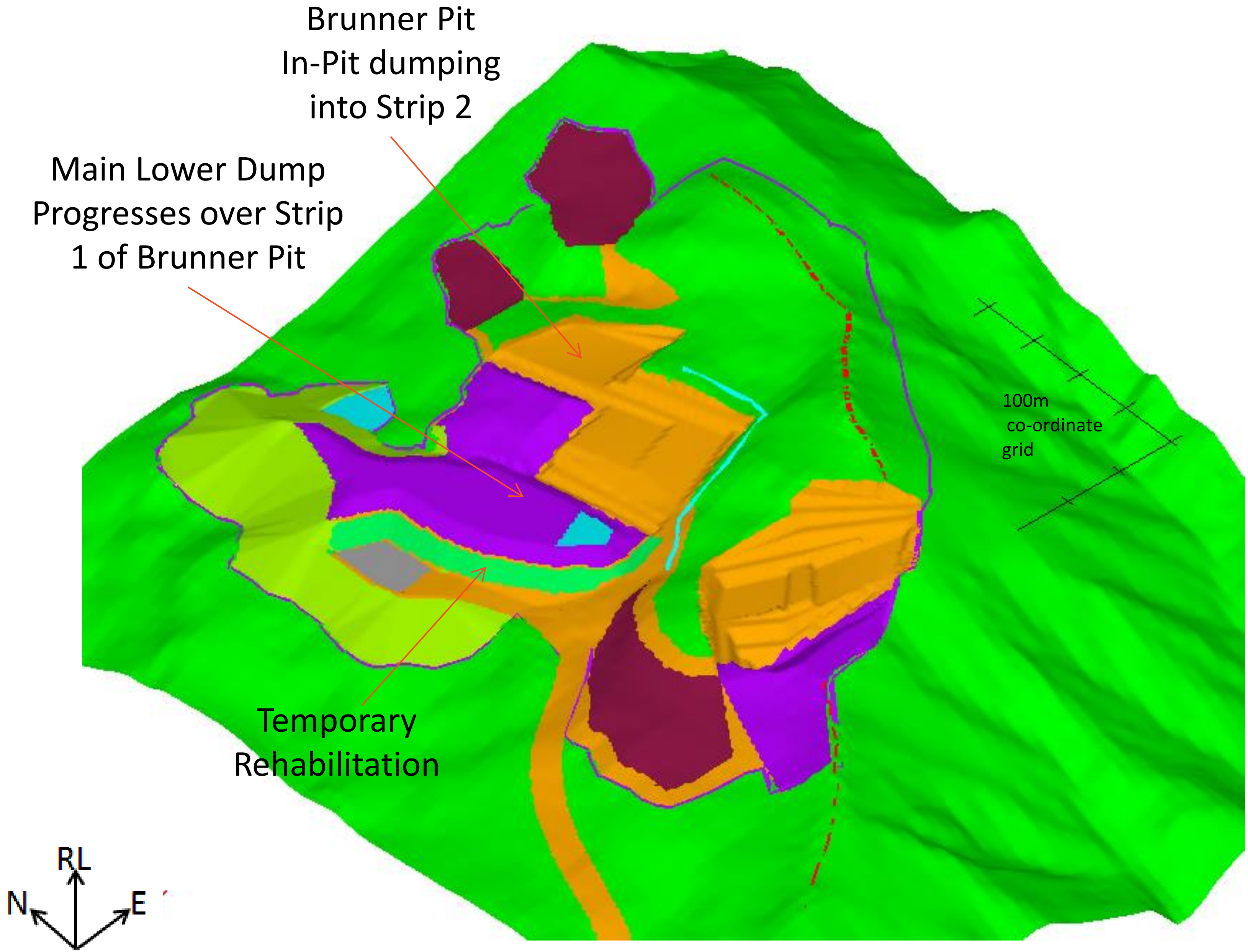


SCHEDULE – YEAR 3



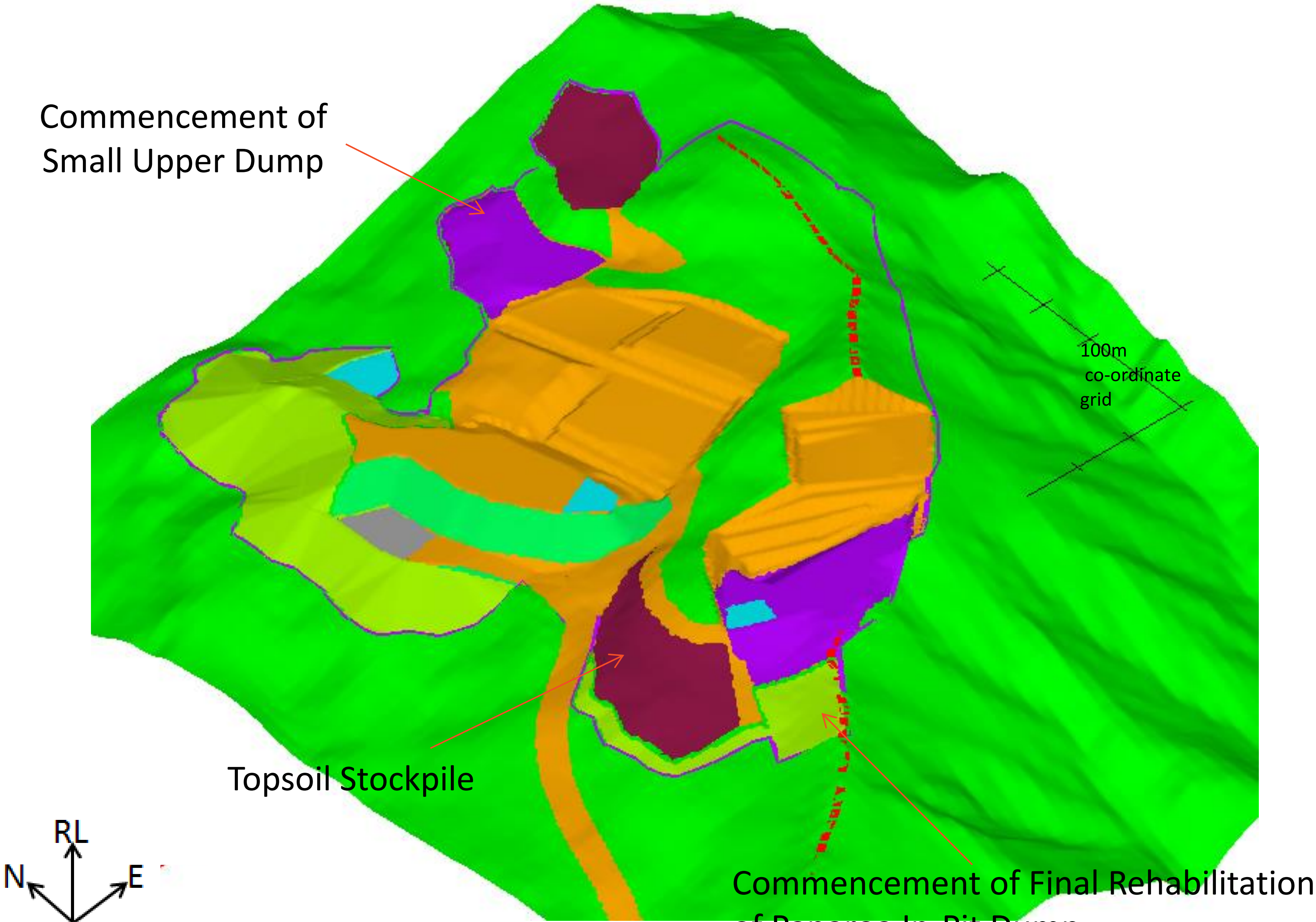
SCHEDULE – LOOKING NORTH EAST

SCHEDULE – YEAR 4

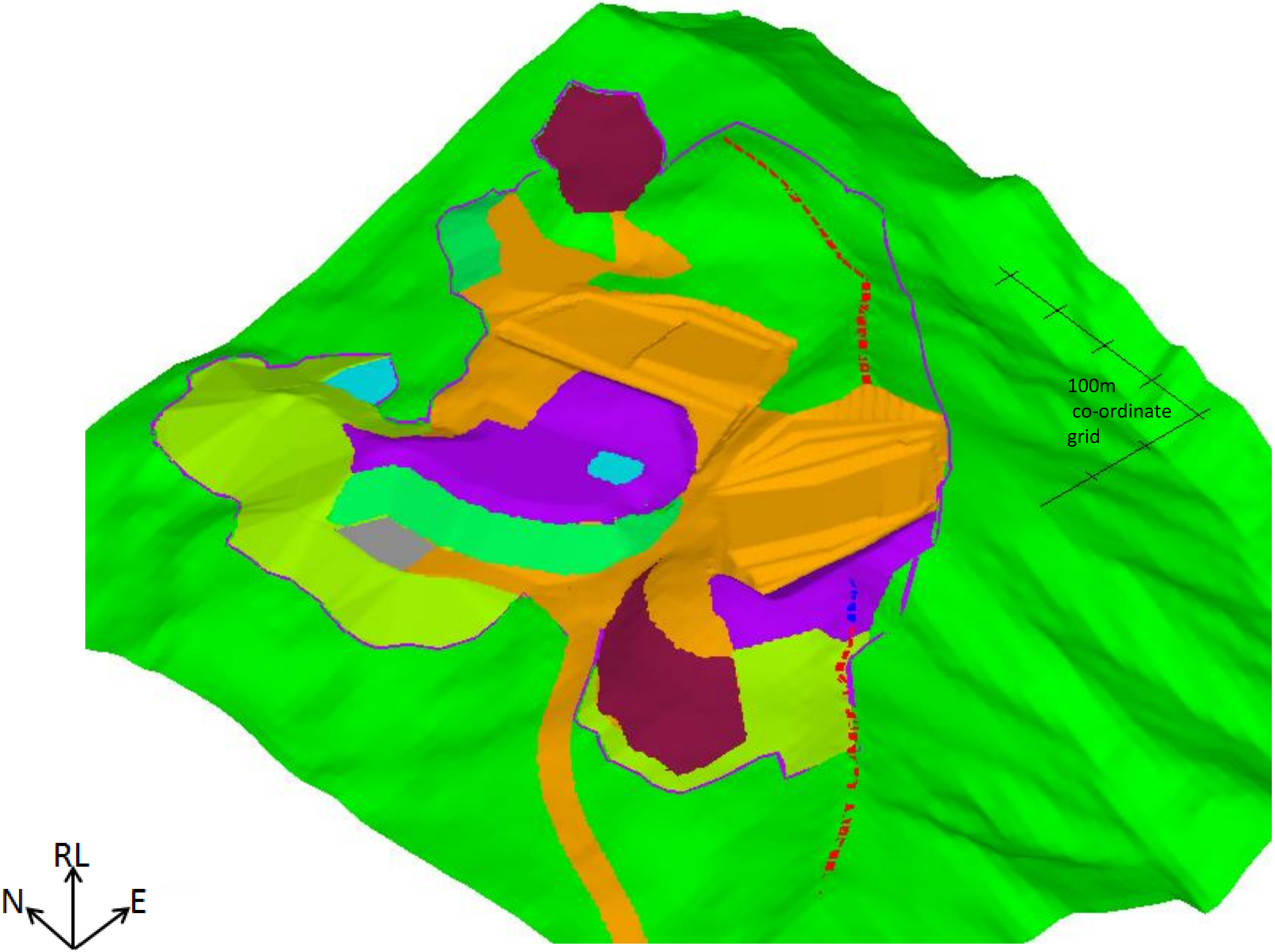


SCHEDULE – YEAR 5

SCHEDULE – LOOKING NORTH EAST

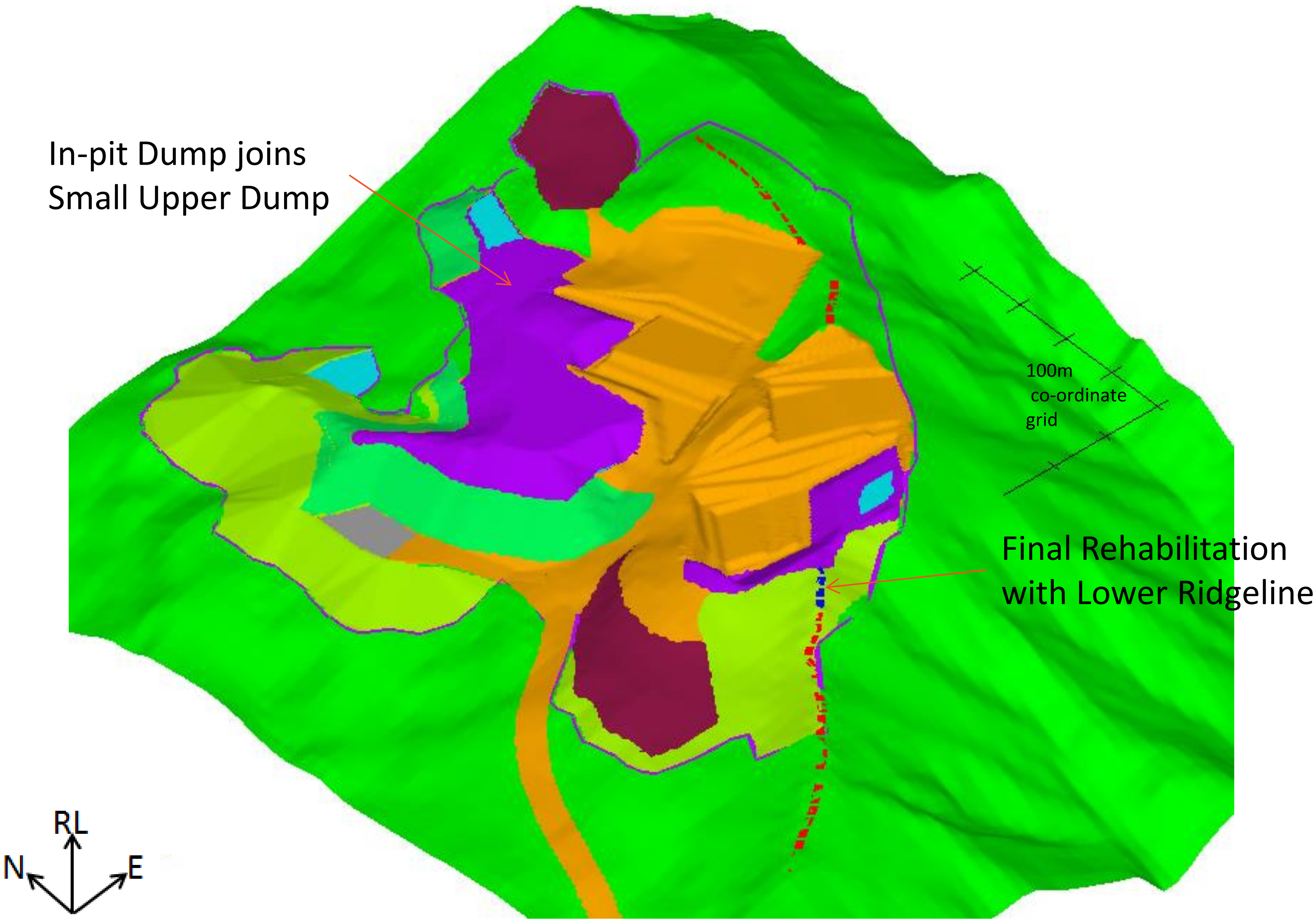


SCHEDULE – YEAR 6

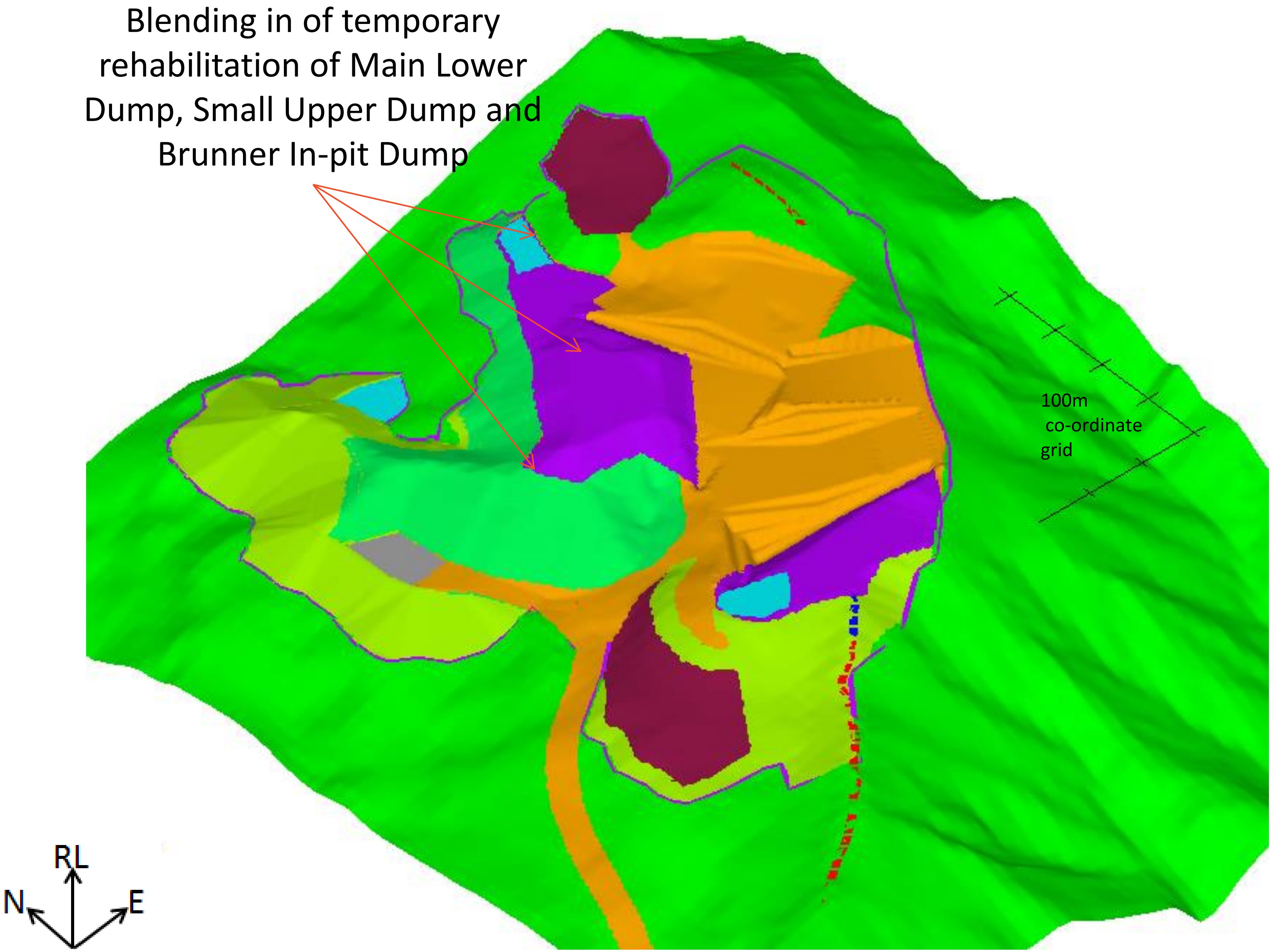


SCHEDULE – LOOKING NORTH EAST

SCHEDULE – YEAR 7

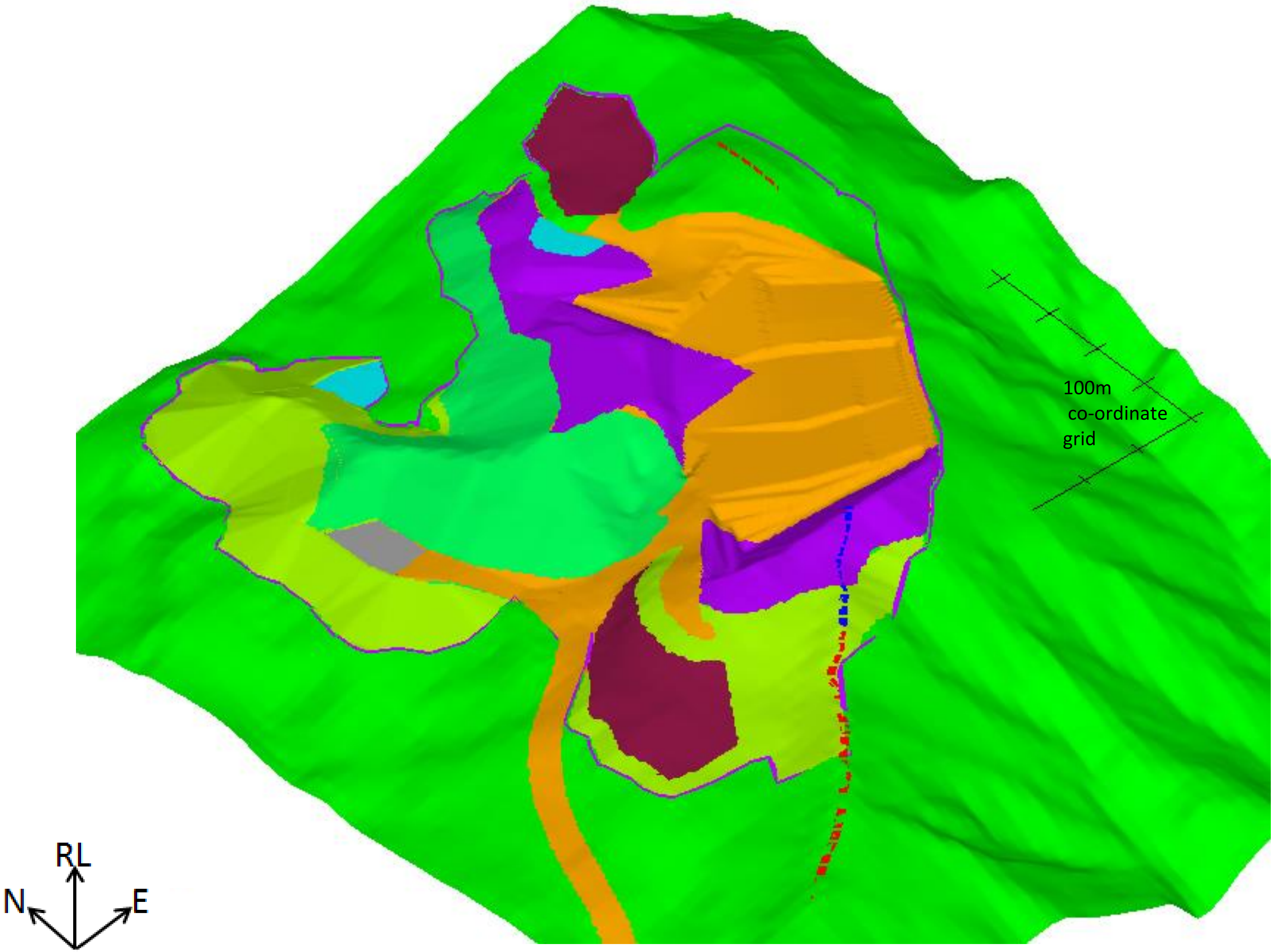


SCHEDULE – YEAR 8



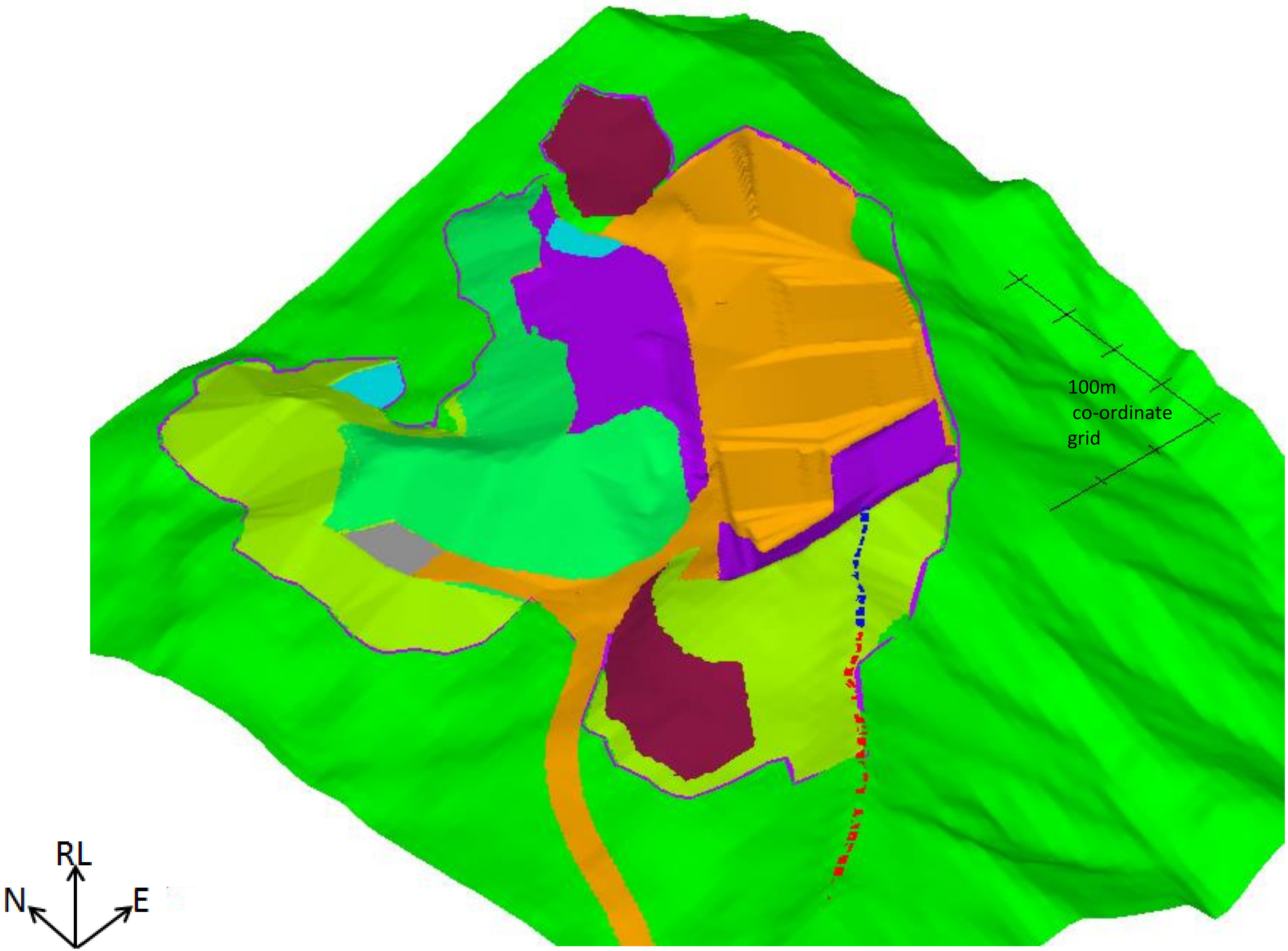
SCHEDULE – LOOKING NORTH EAST

SCHEDULE – YEAR 9



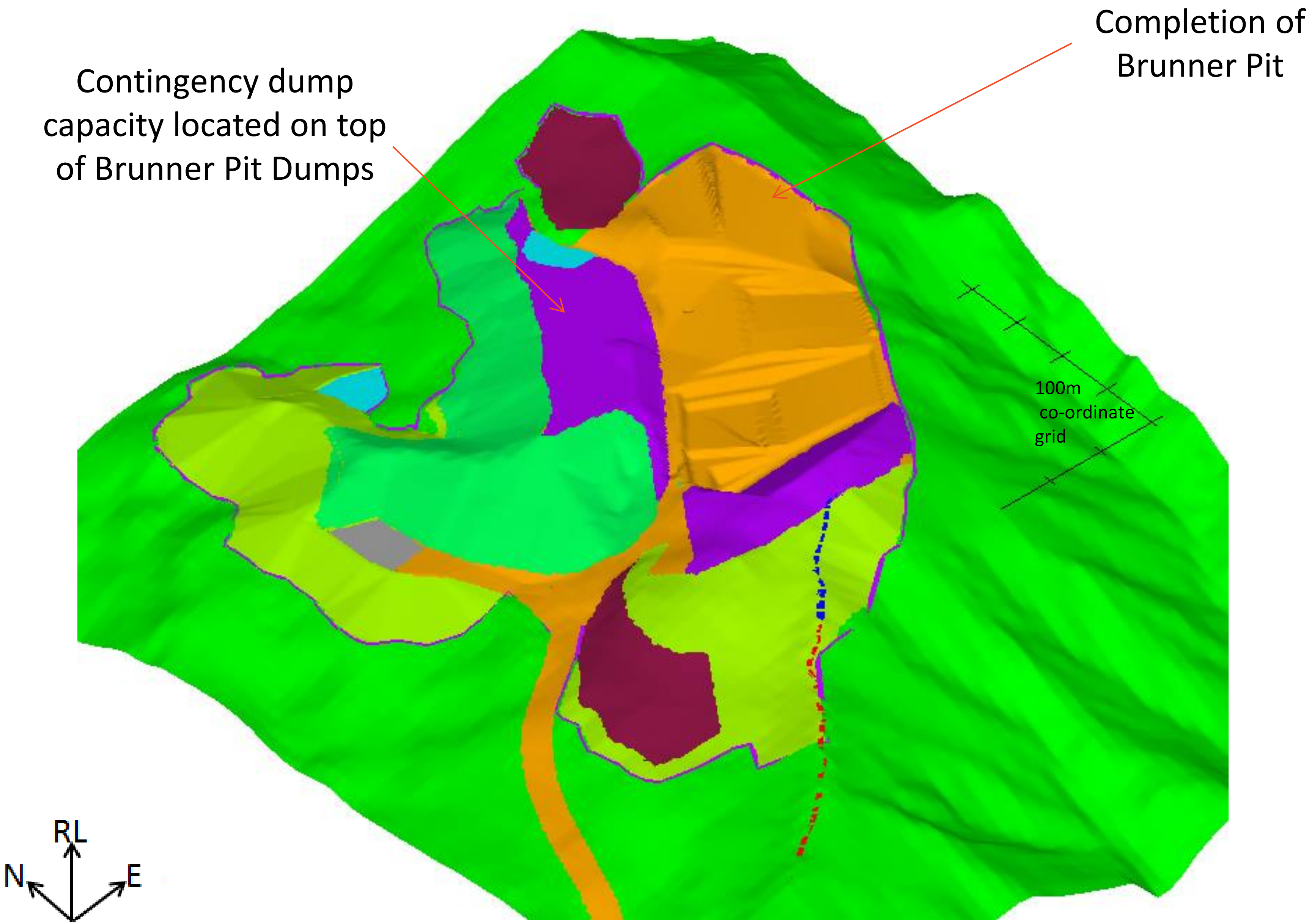
SCHEDULE – LOOKING NORTH EAST

SCHEDULE – YEAR 10



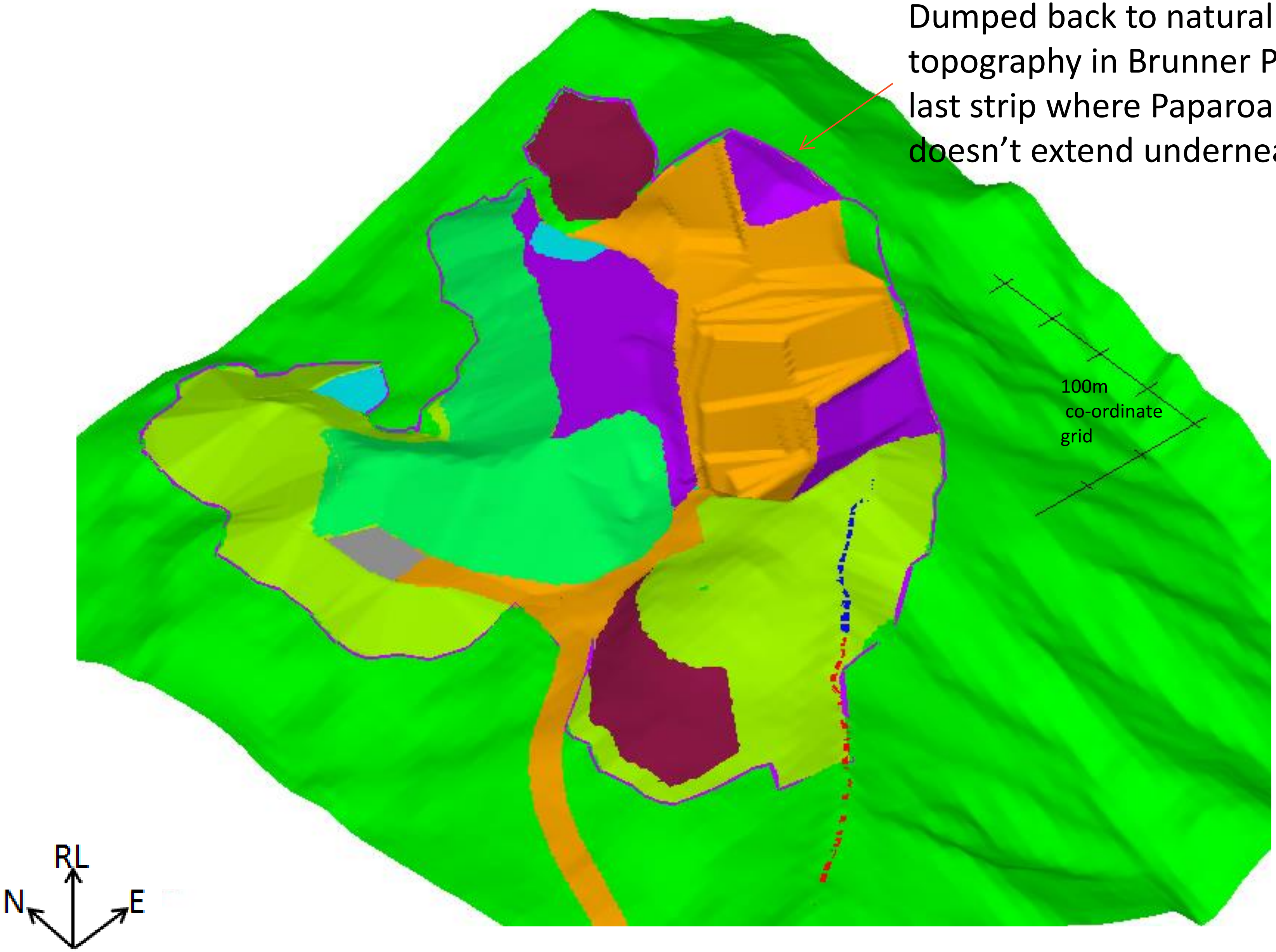
SCHEDULE – LOOKING NORTH EAST

SCHEDULE – YEAR 11



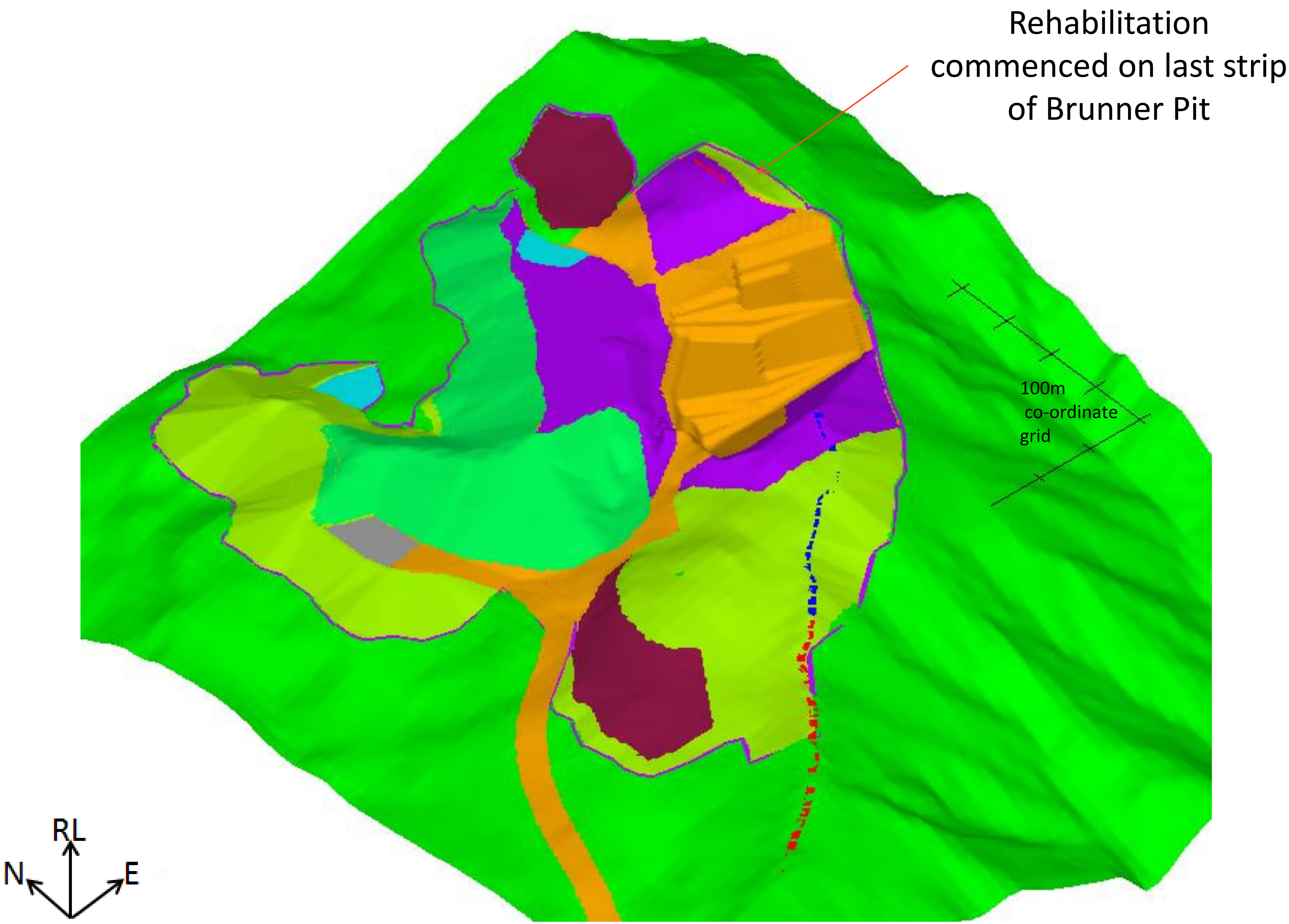
SCHEDULE – YEAR 12

Dumped back to natural topography in Brunner Pit last strip where Paparoa Pit doesn't extend underneath

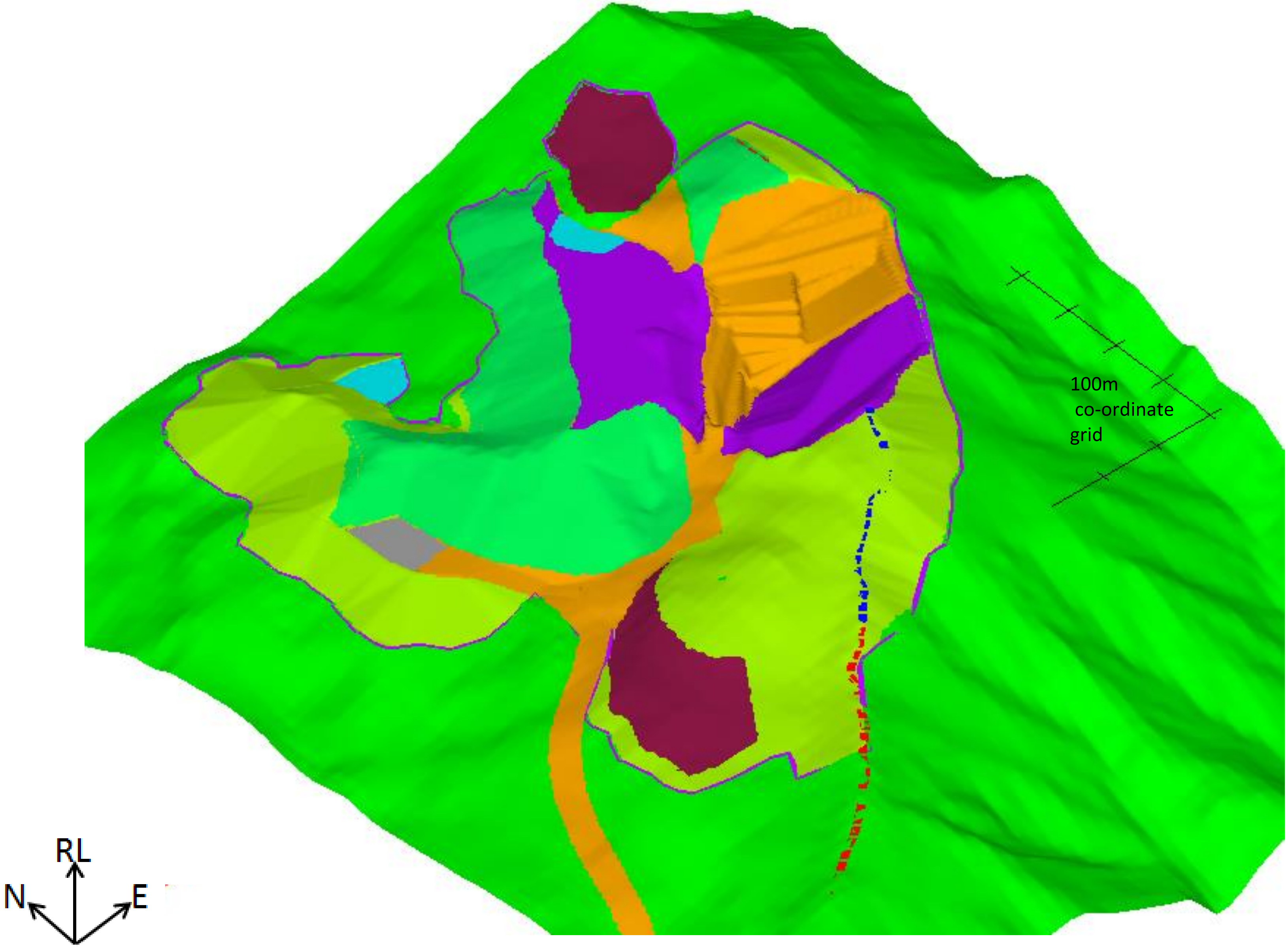


SCHEDULE – LOOKING NORTH EAST

SCHEDULE – YEAR 13

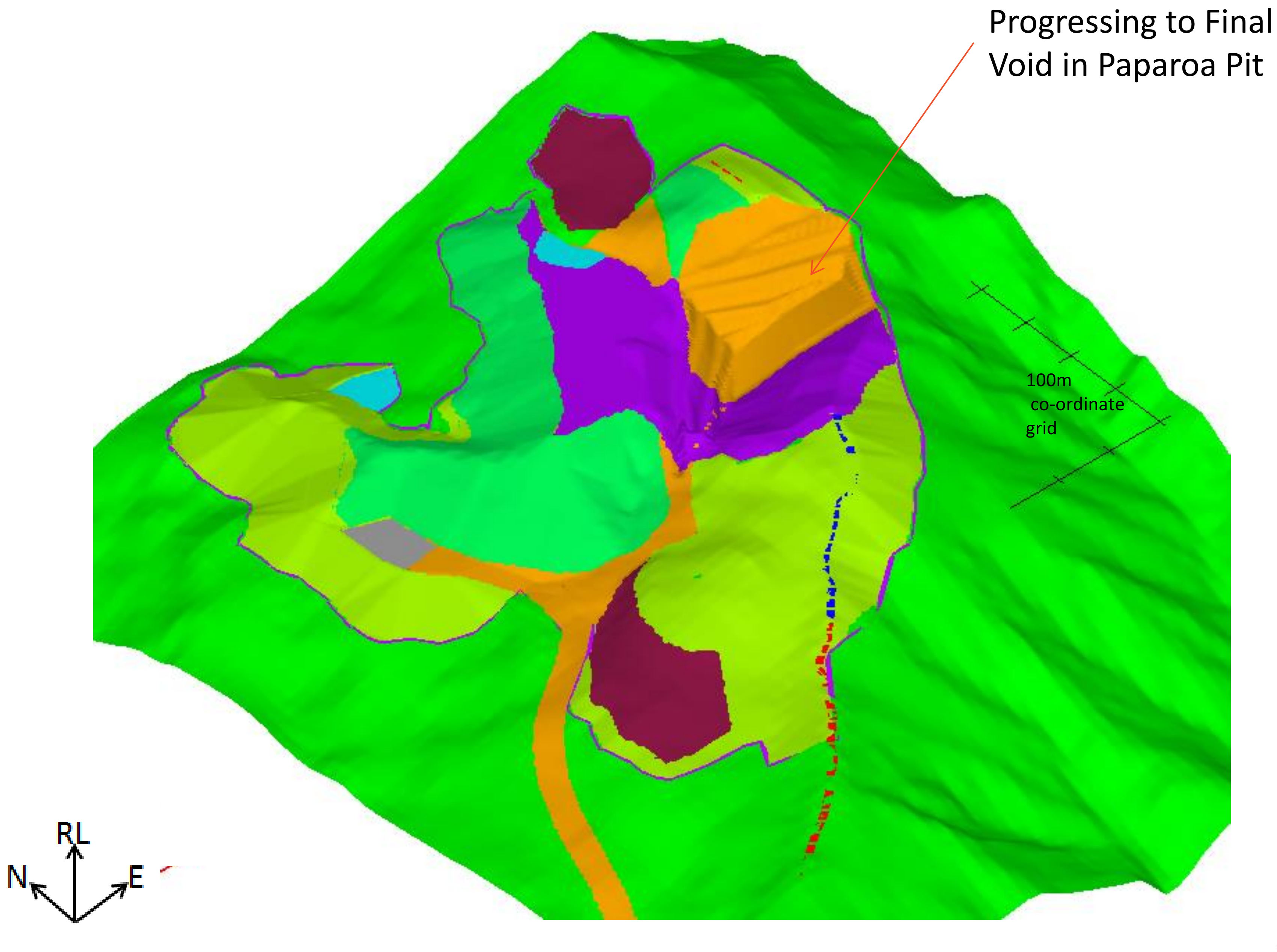


SCHEDULE – YEAR 14

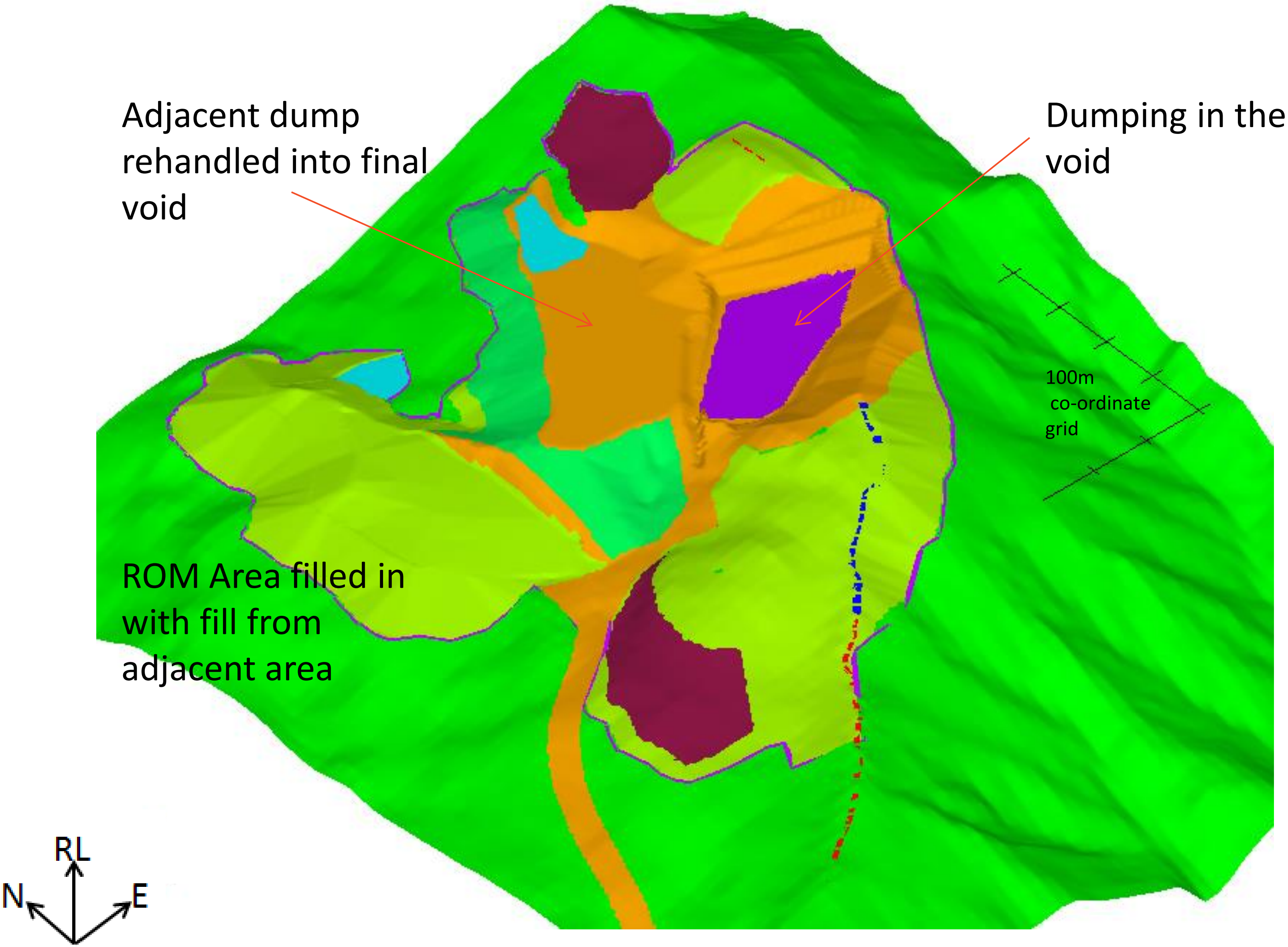


SCHEDULE – LOOKING NORTH EAST

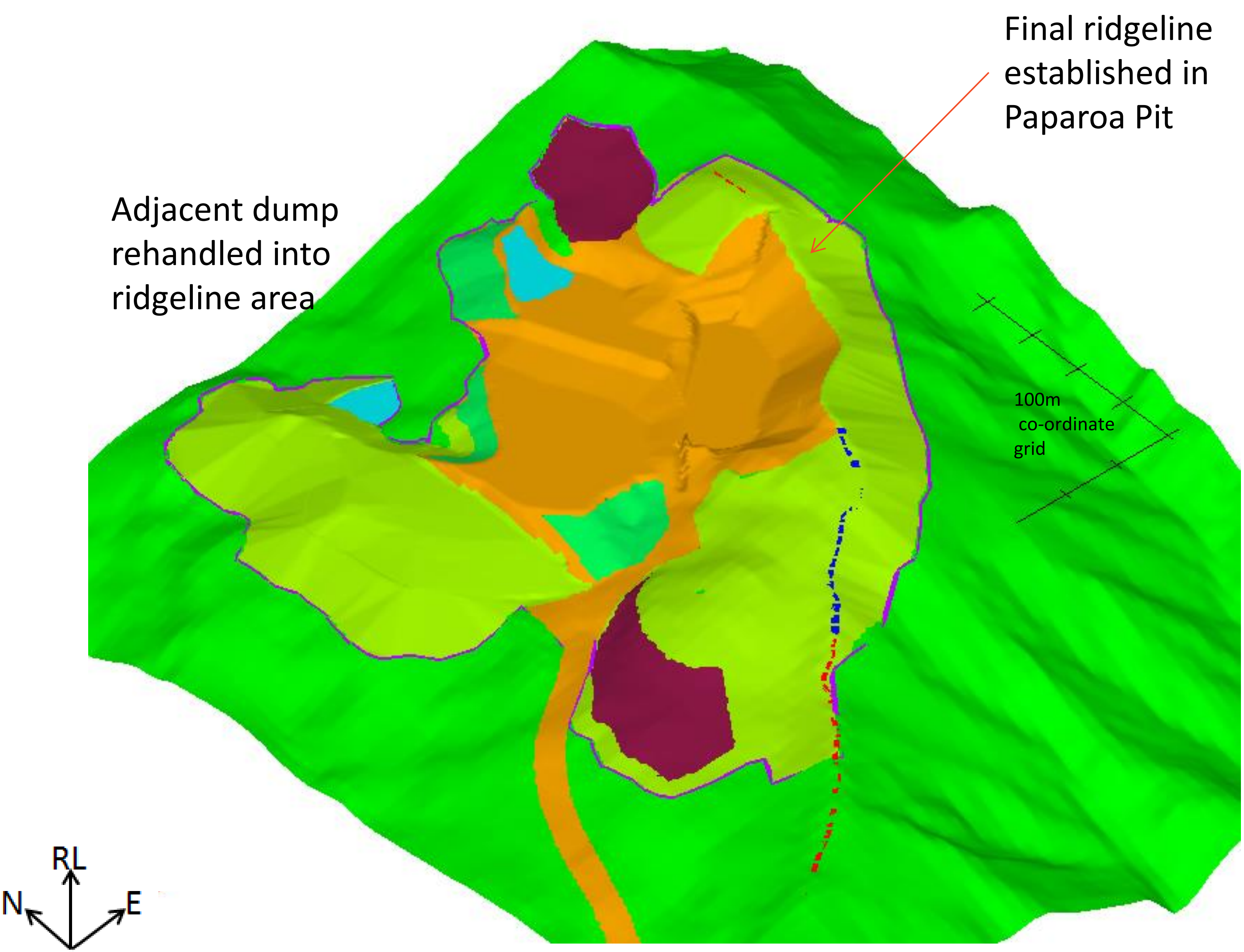
SCHEDULE – YEAR 15



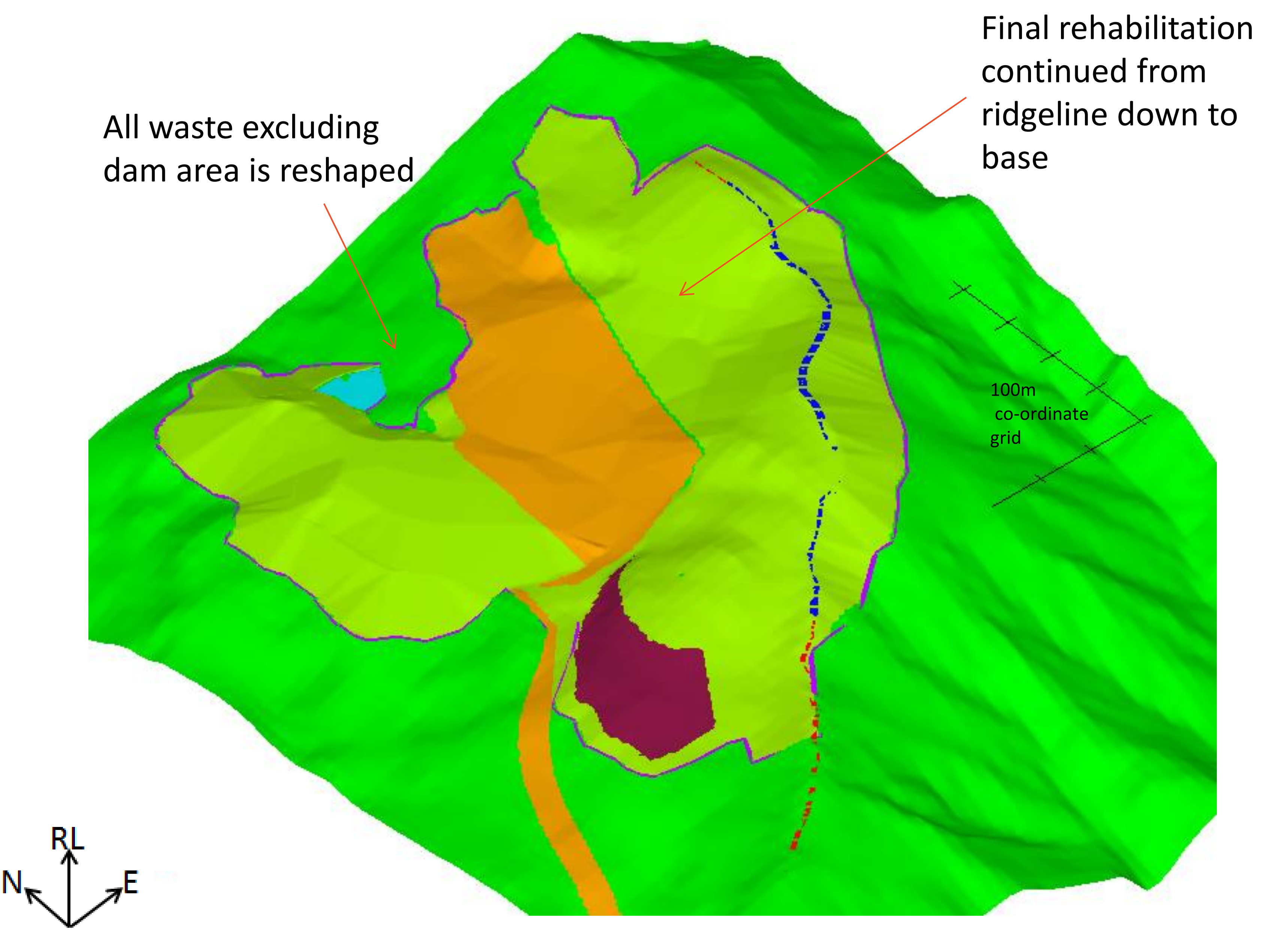
SCHEDULE – YEAR 16



SCHEDULE – YEAR 17

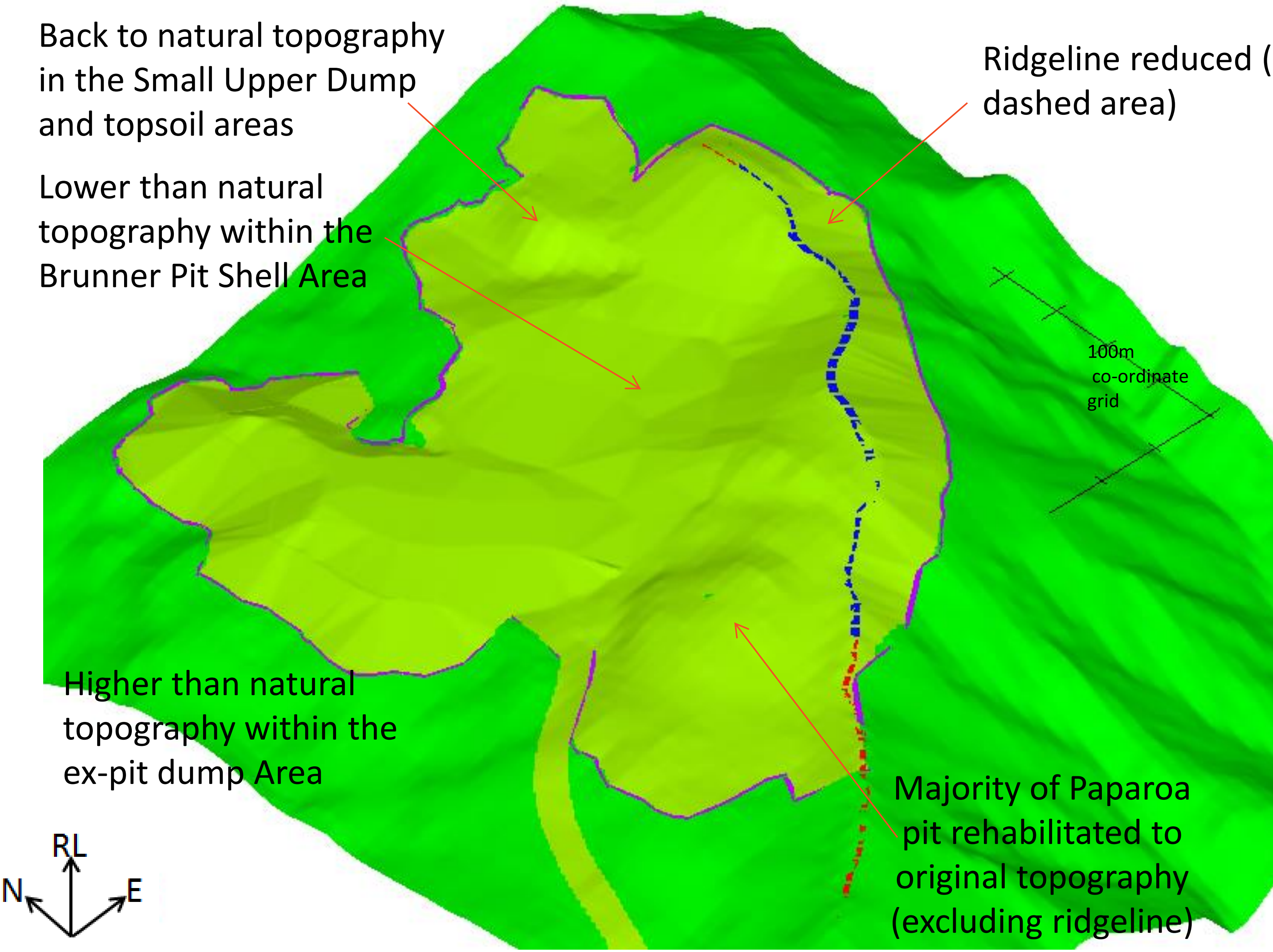


SCHEDULE – YEAR 18

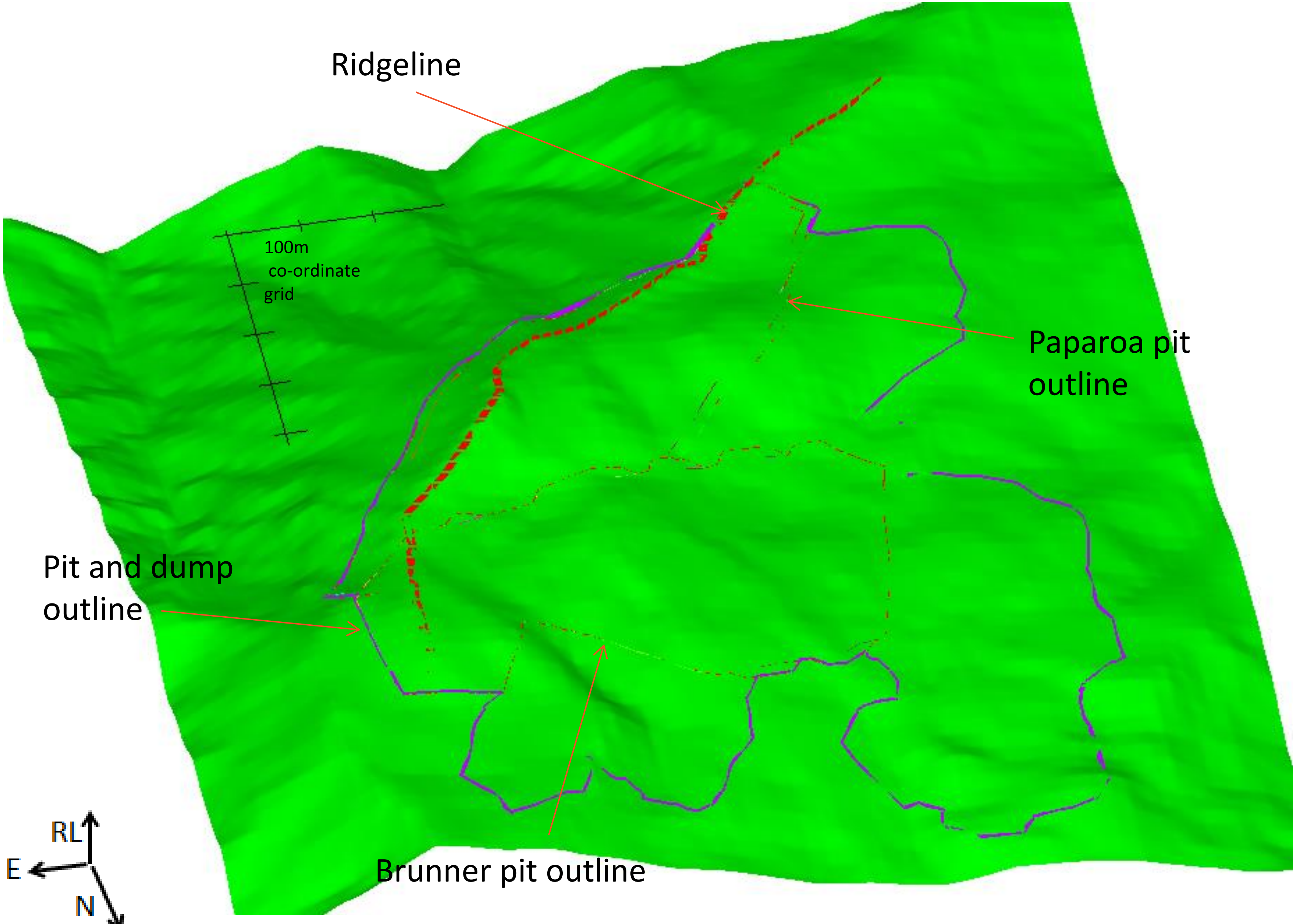


SCHEDULE – LOOKING NORTH EAST

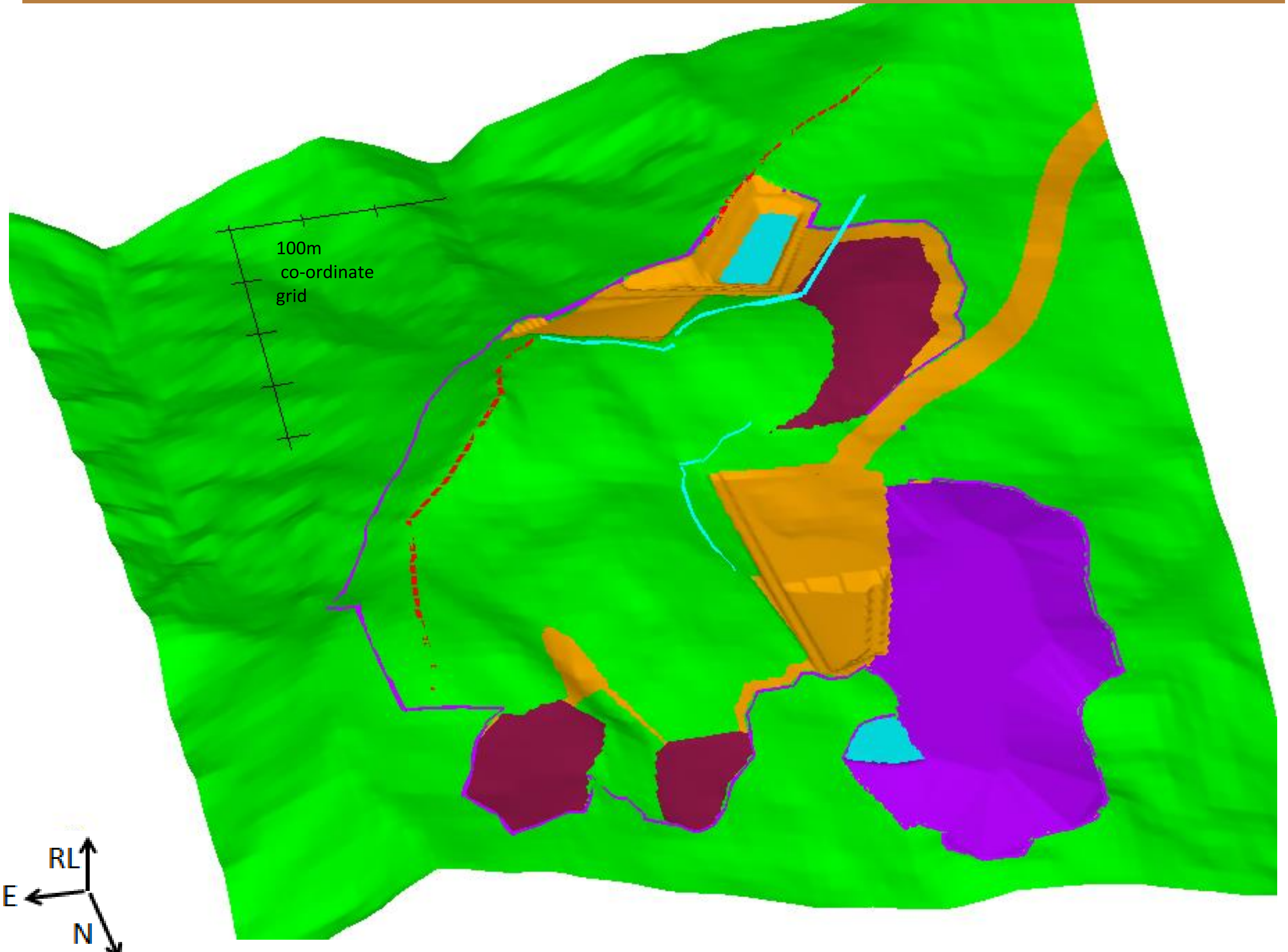
SCHEDULE – FINAL



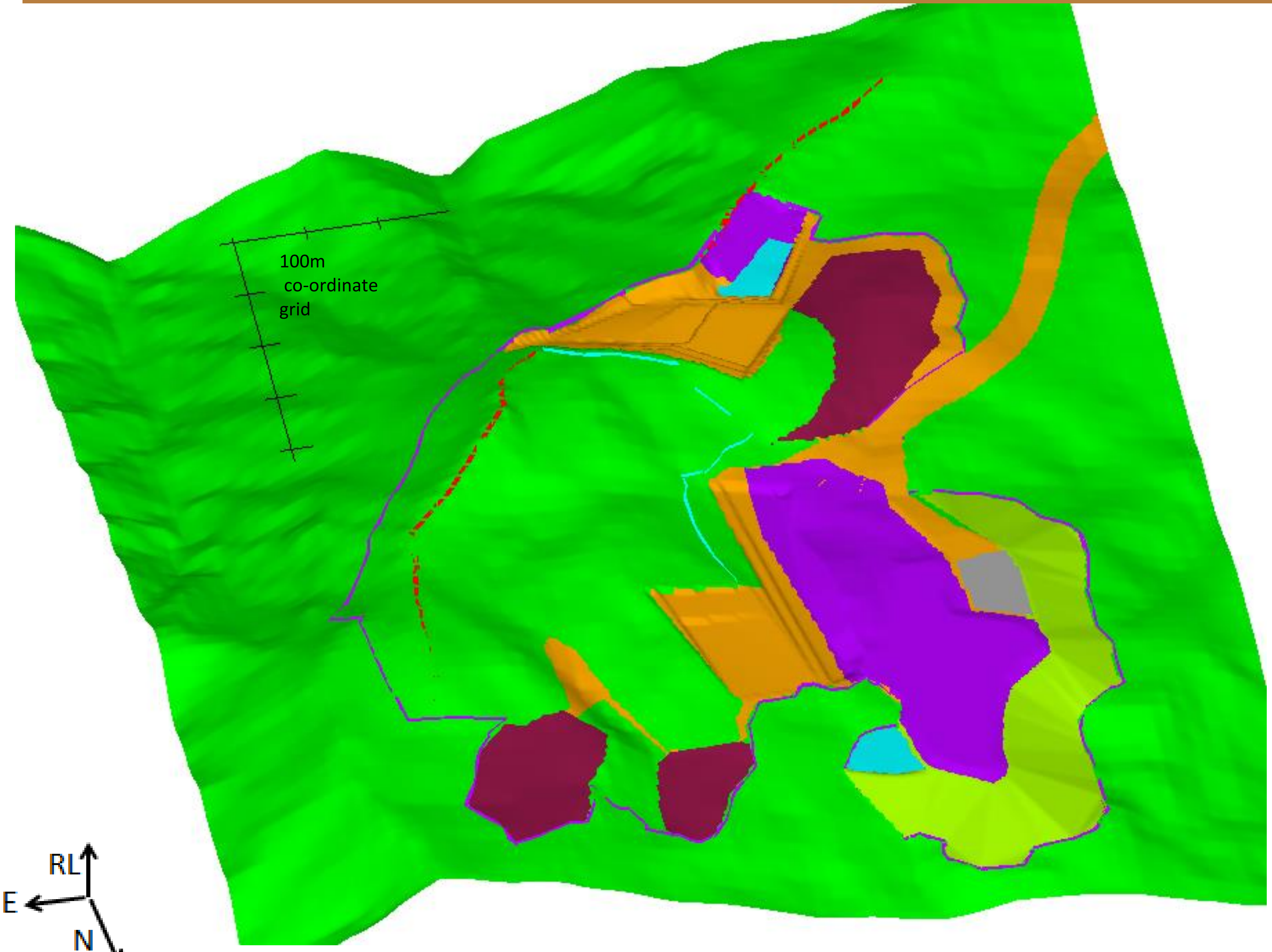
MINE SCHEDULE – LOOKING SOUTH


Ridgeline
100m
co-ordinate
grid
Paparoa pit
outline
Pit and dump
outline
Brunner pit outline
RL
E
N

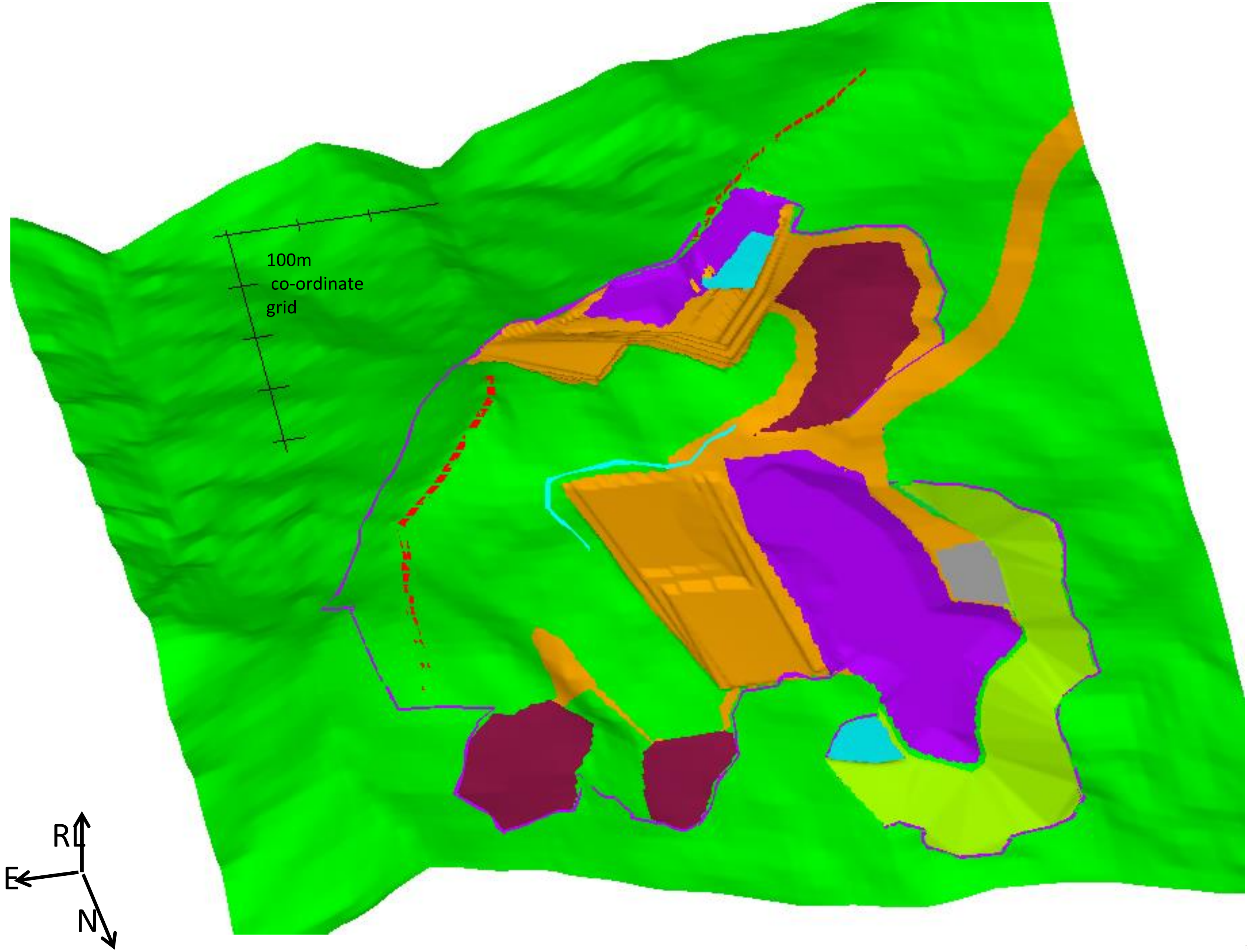
SCHEDULE – YEAR 1



SCHEDULE – YEAR 2

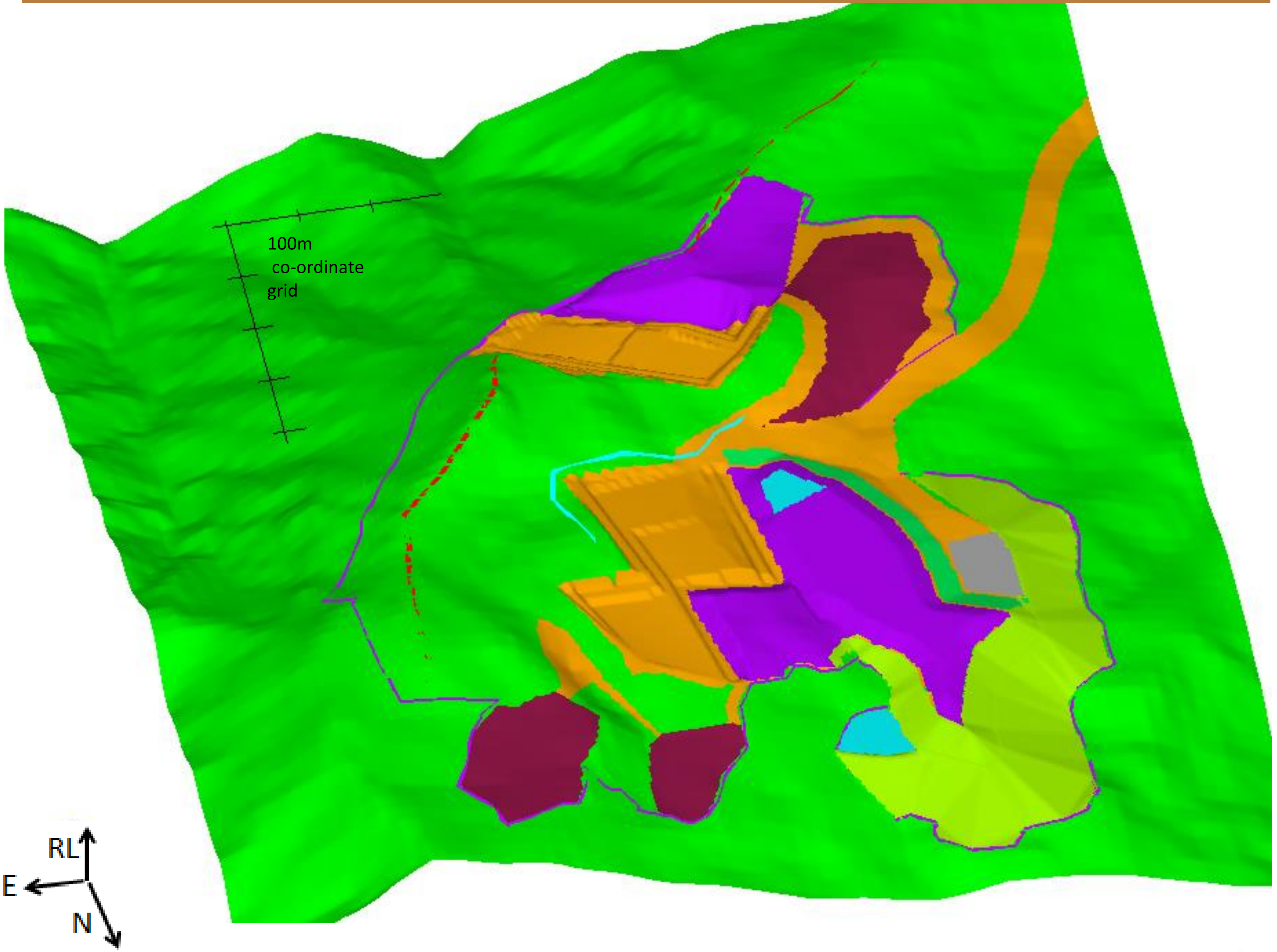


SCHEDULE – YEAR 3



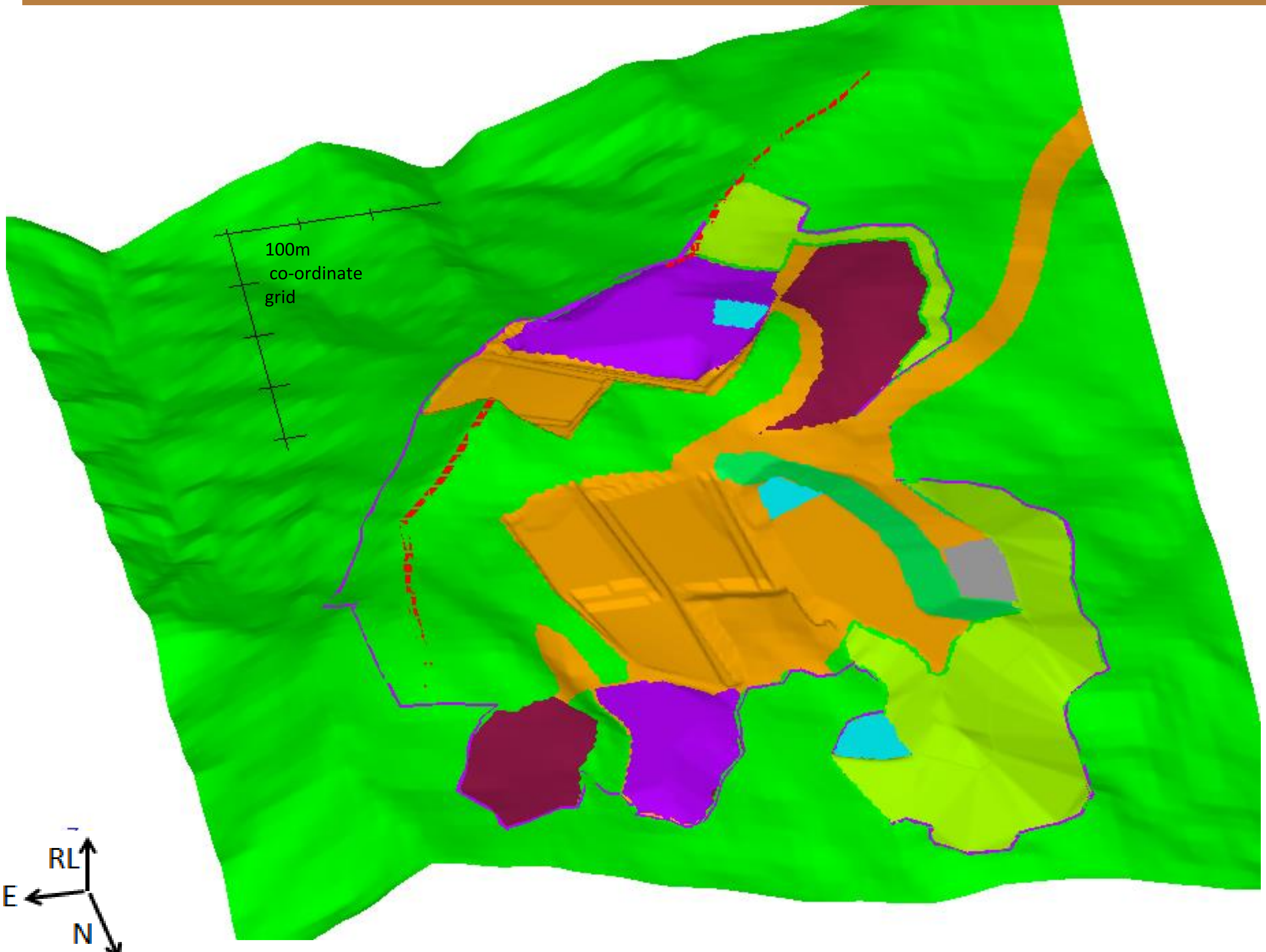
SCHEDULE – LOOKING SOUTH

SCHEDULE – YEAR 4



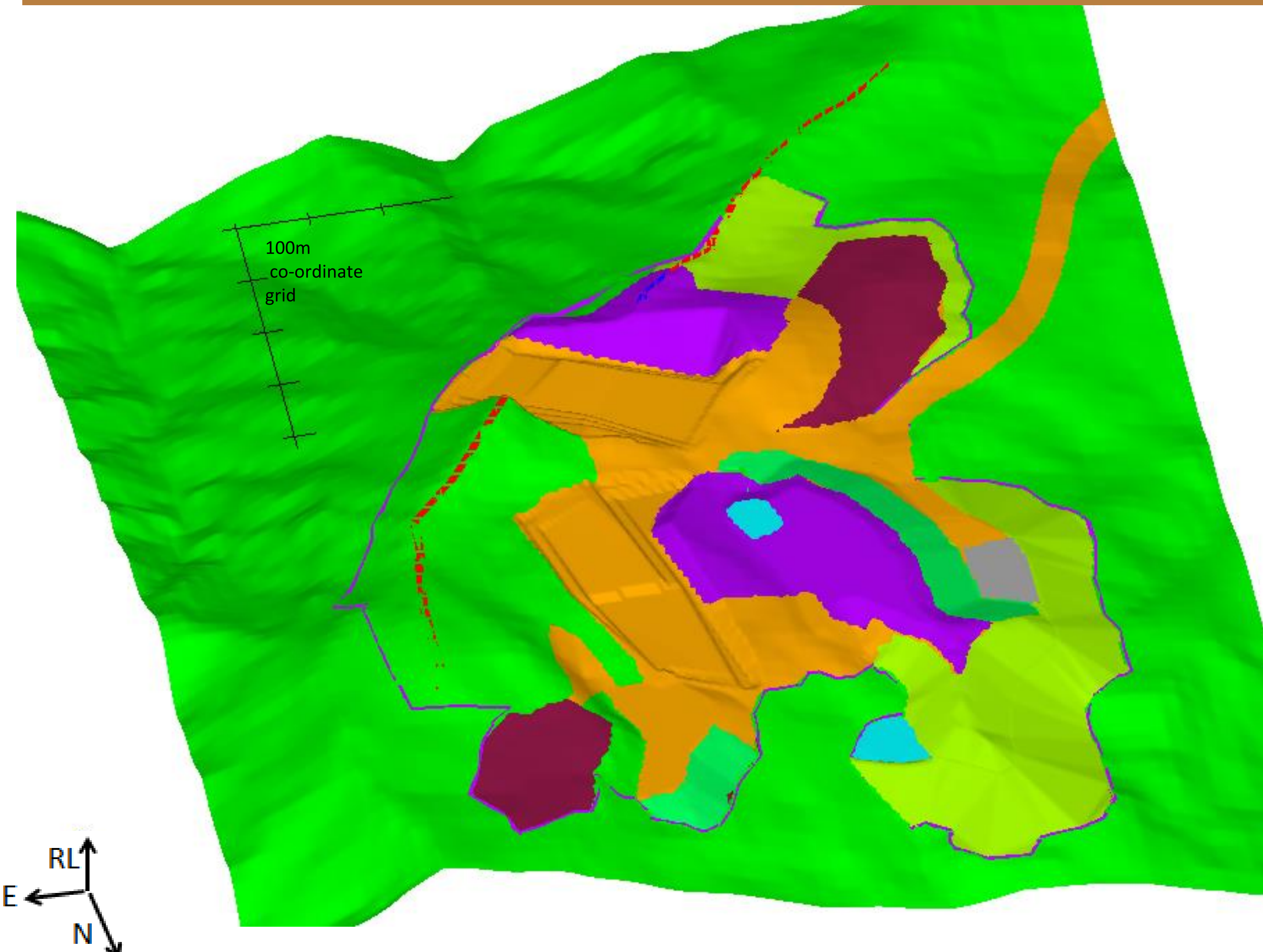
SCHEDULE – LOOKING SOUTH

SCHEDULE – YEAR 5

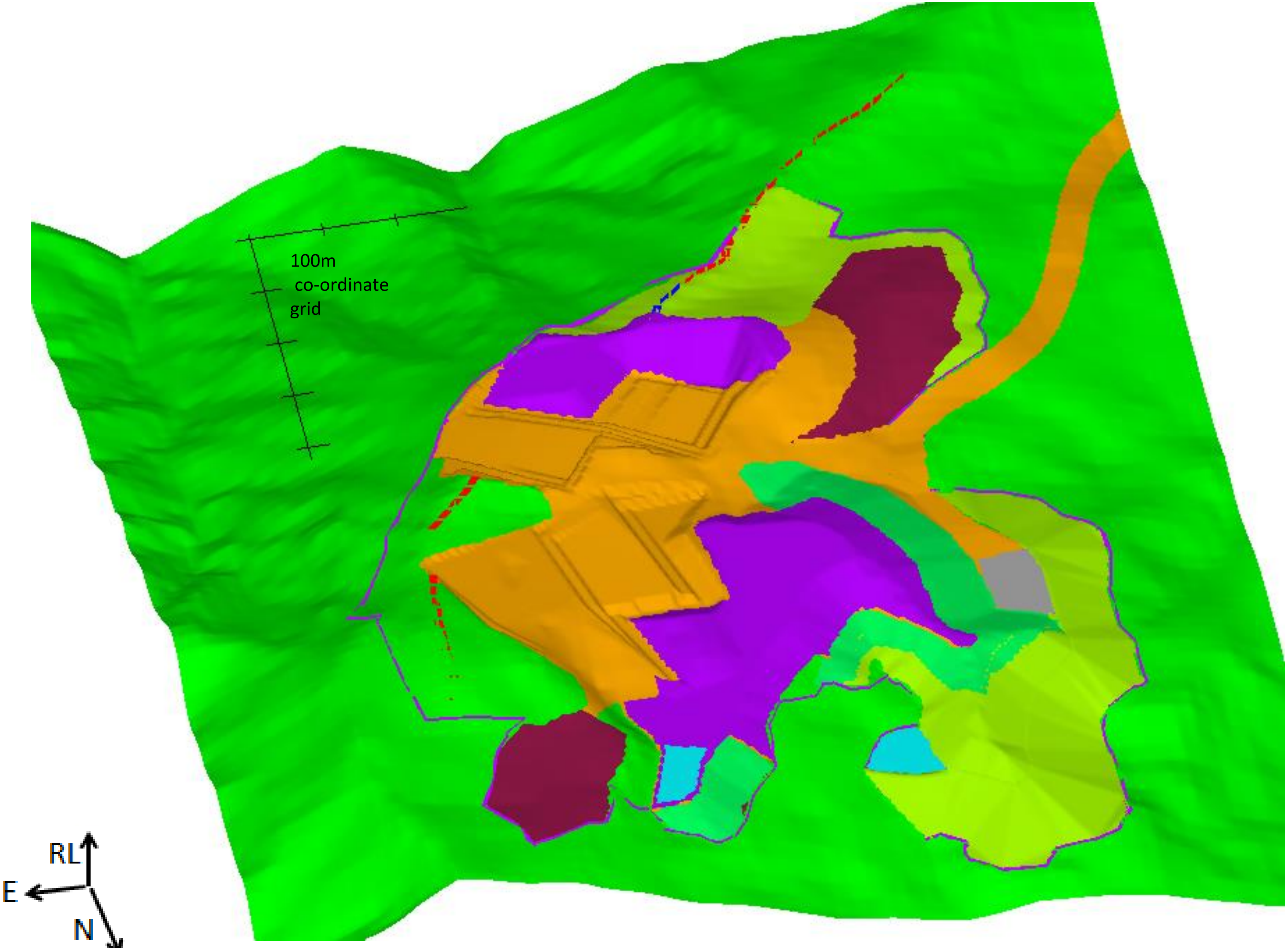


SCHEDULE – LOOKING SOUTH

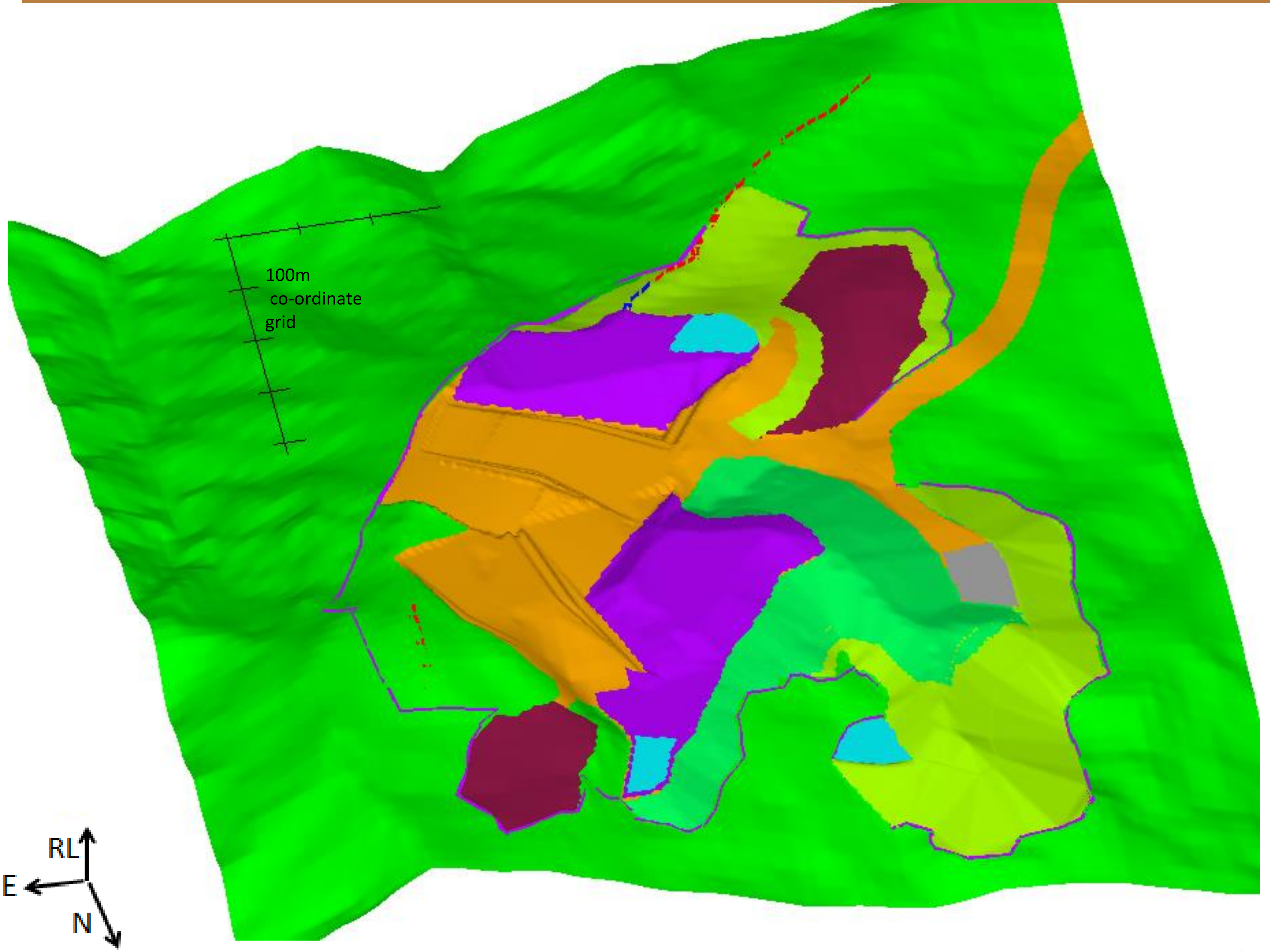
SCHEDULE – YEAR 6



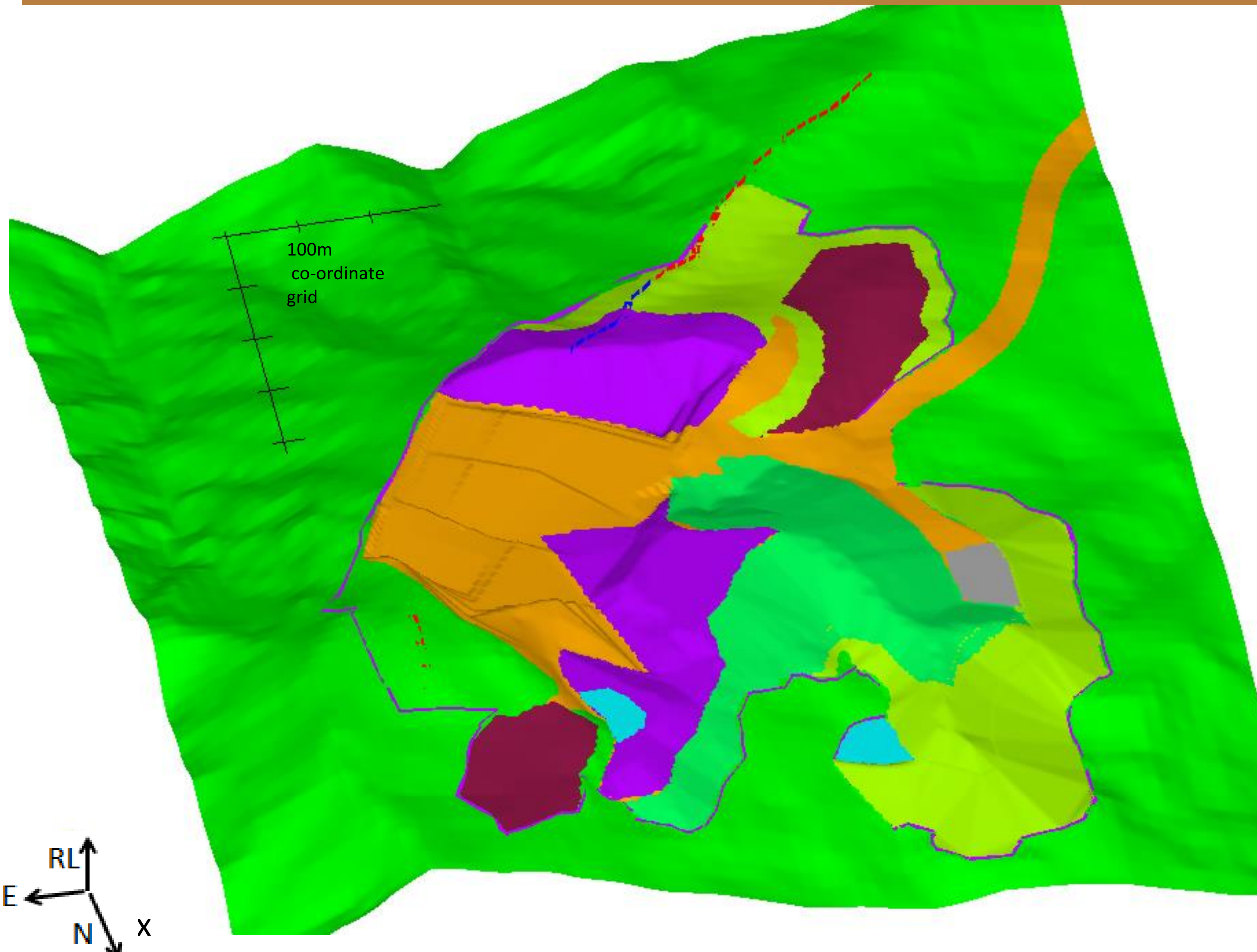
SCHEDULE – YEAR 7



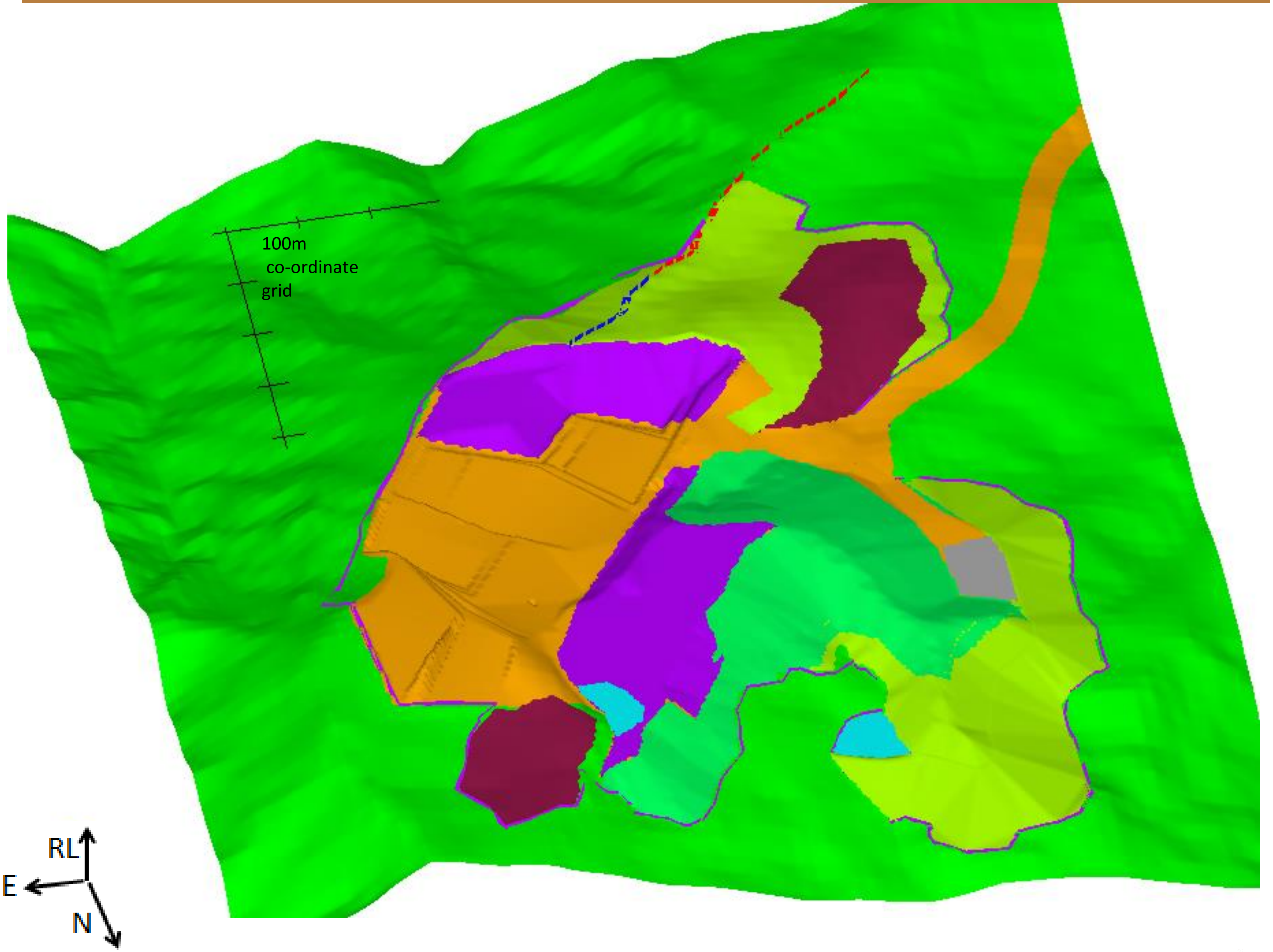
SCHEDULE – YEAR 8



SCHEDULE – YEAR 9

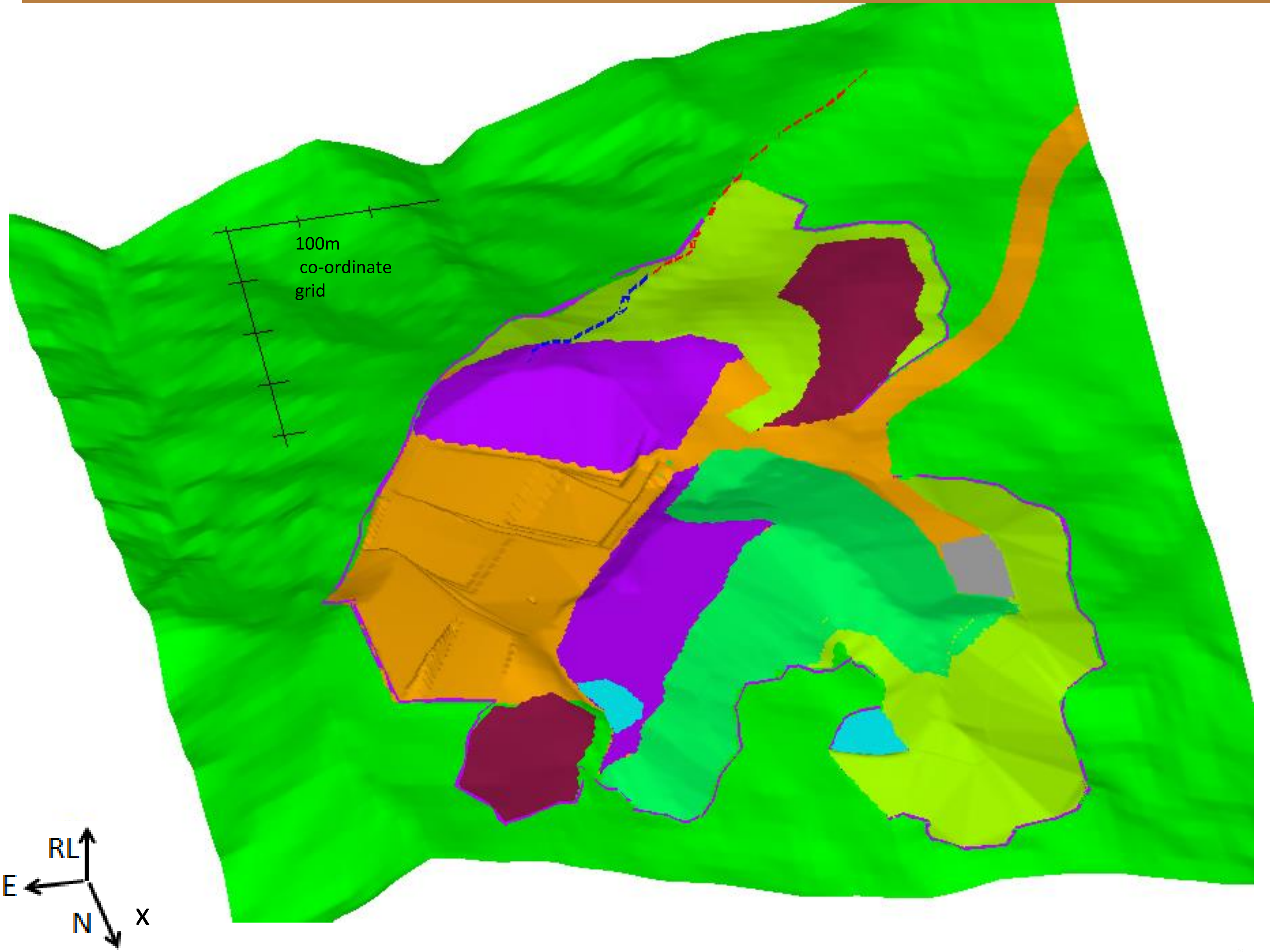


SCHEDULE – YEAR 10



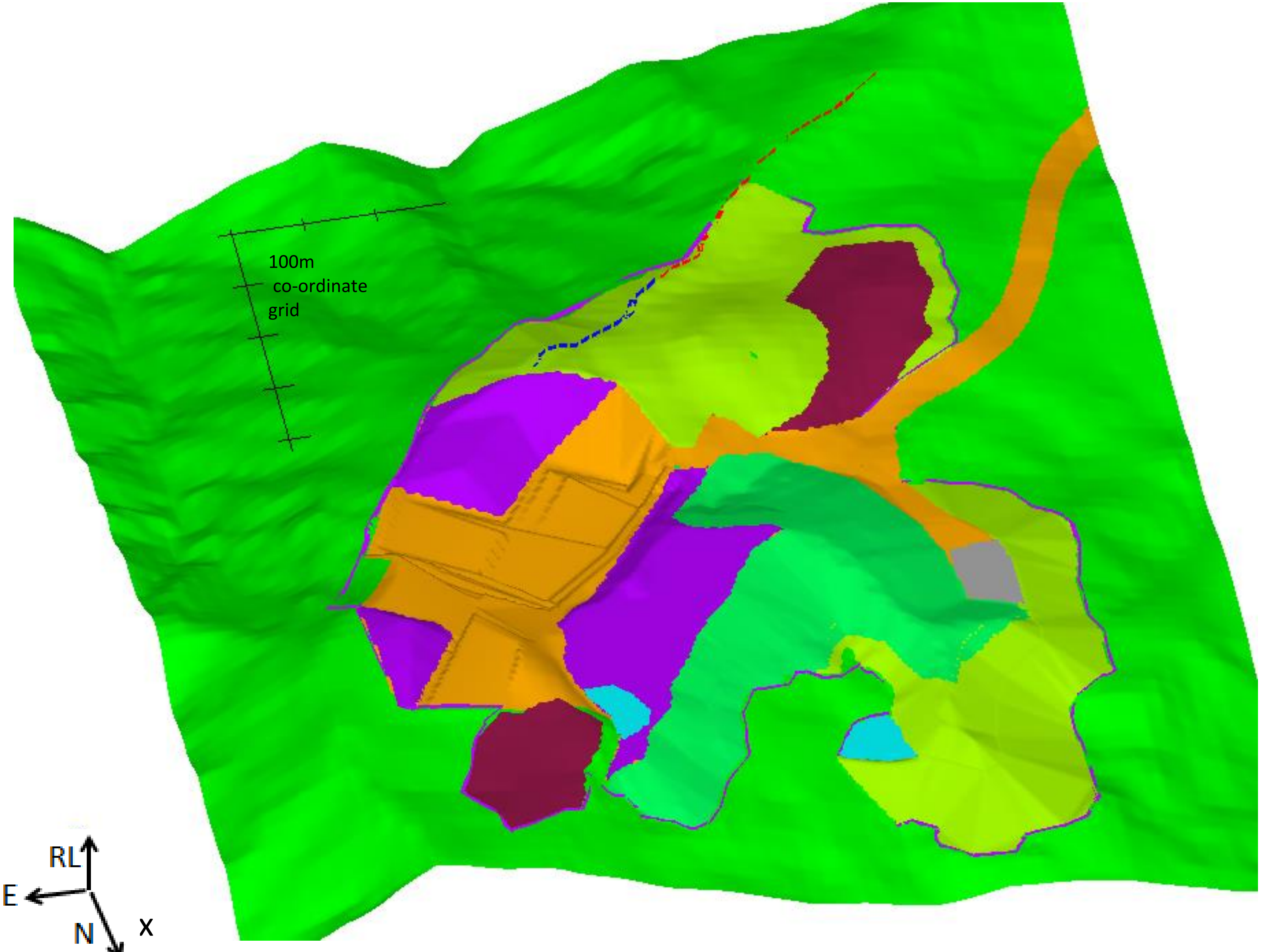
SCHEDULE – LOOKING SOUTH

SCHEDULE – YEAR 11

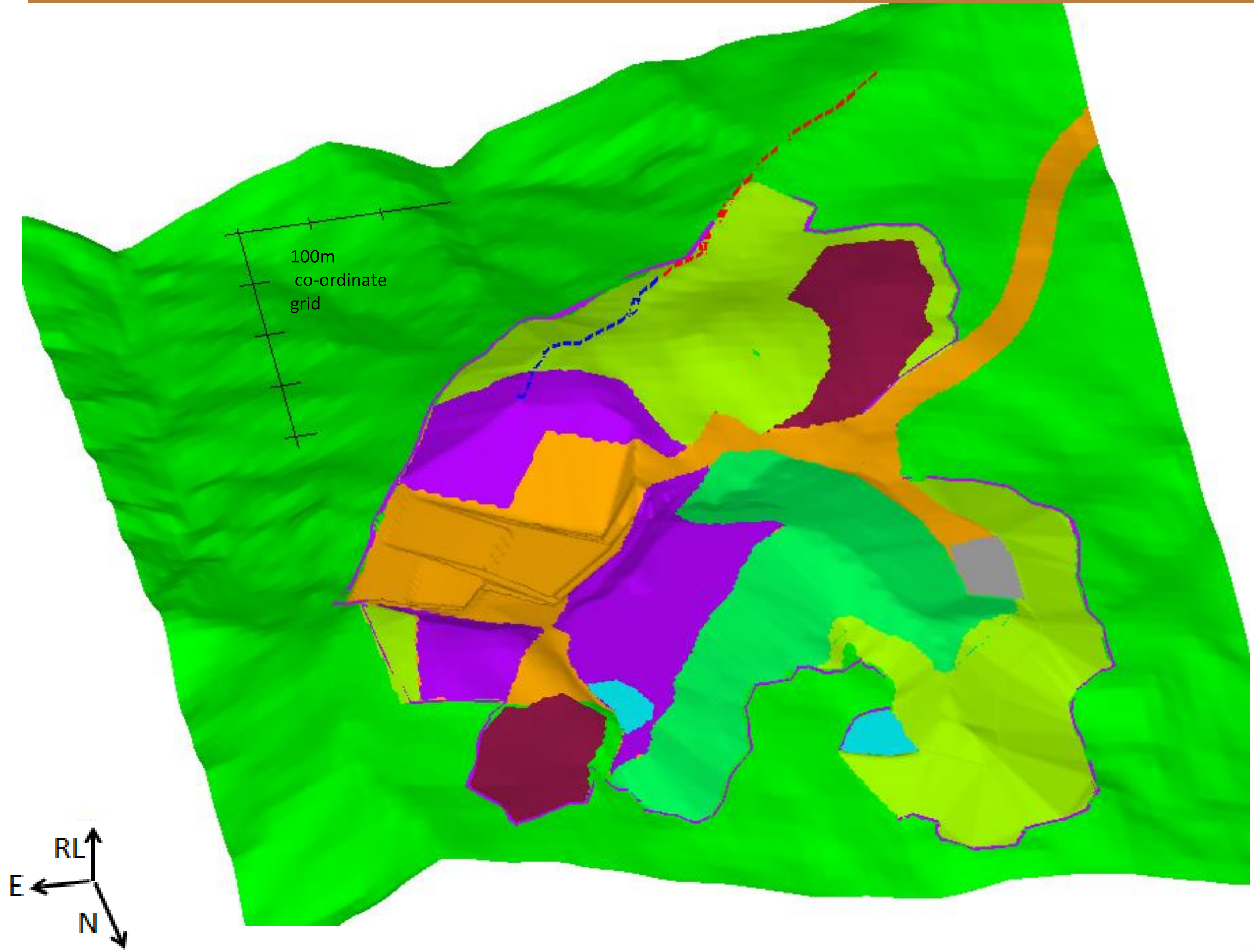


SCHEDULE – LOOKING SOUTH

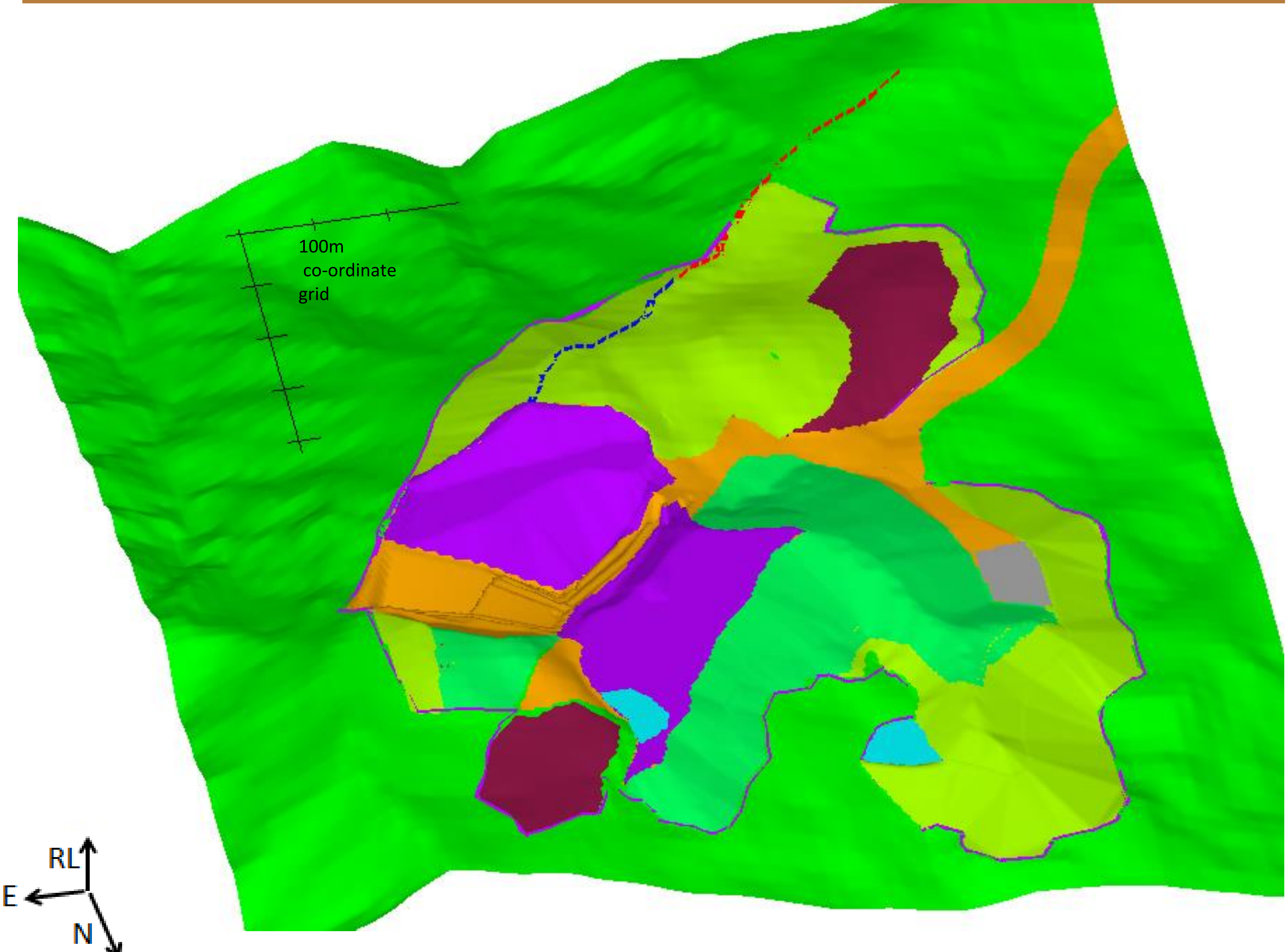
SCHEDULE – YEAR 12



SCHEDULE – YEAR 13

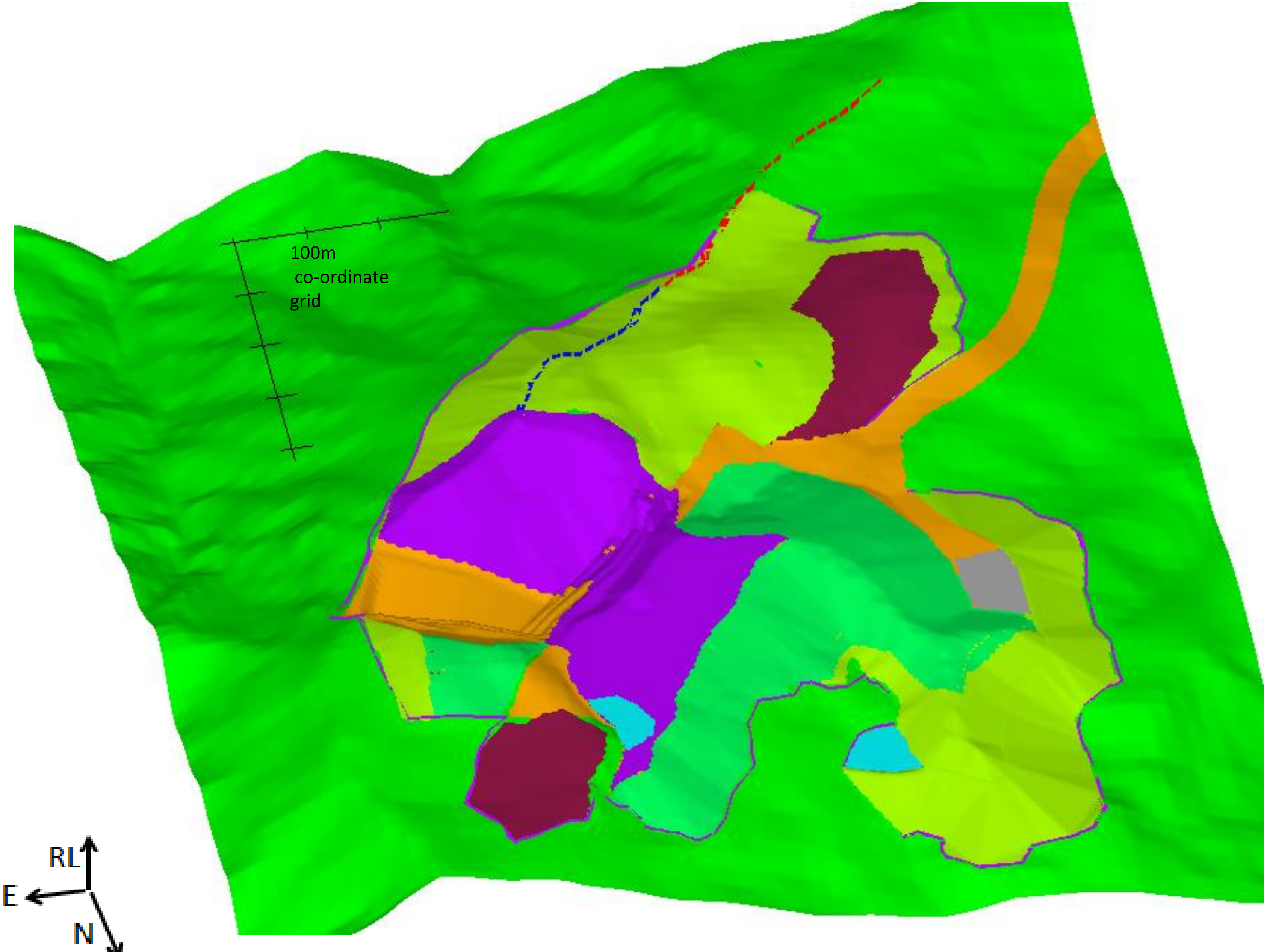


SCHEDULE – YEAR 14

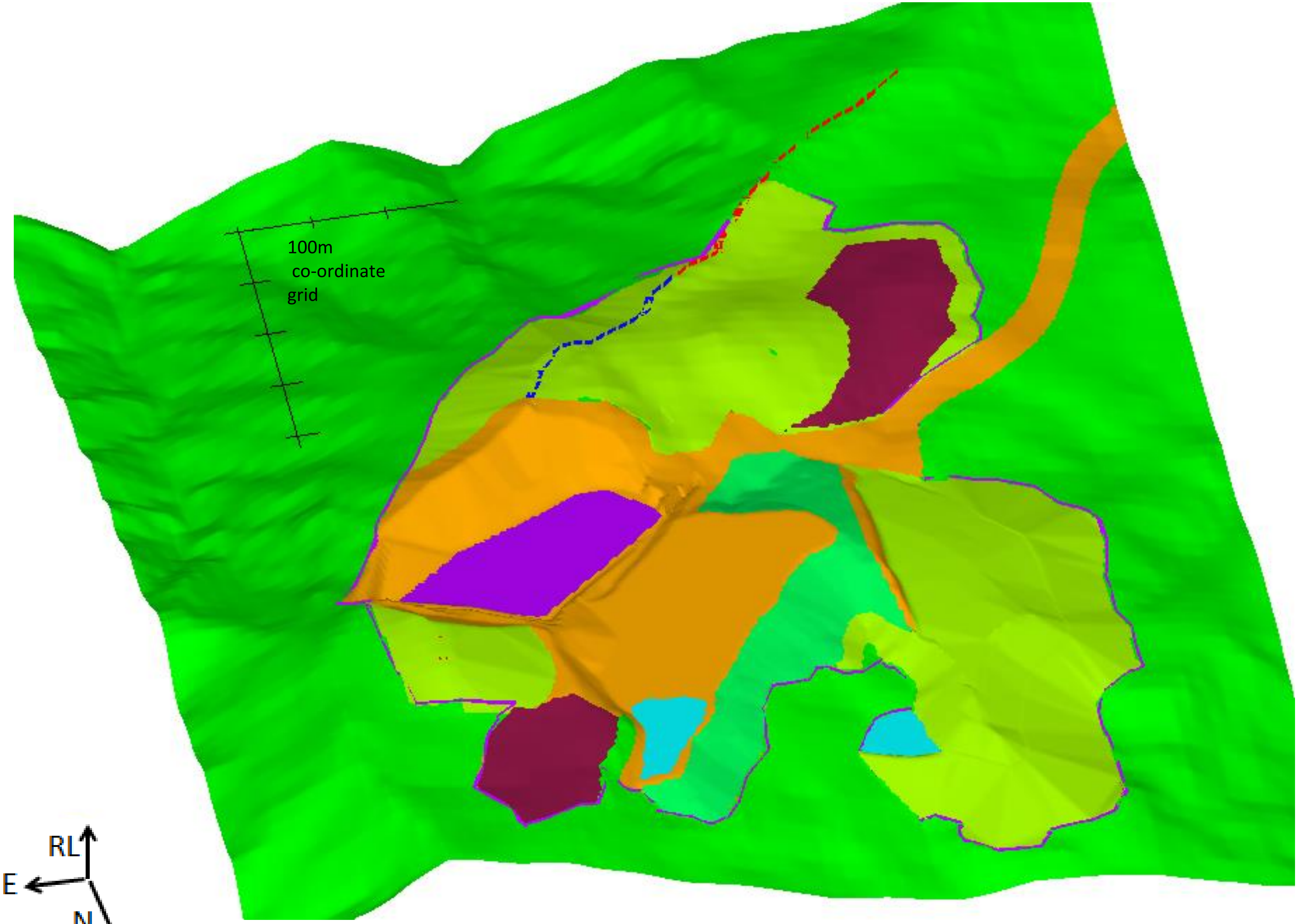


SCHEDULE – LOOKING SOUTH

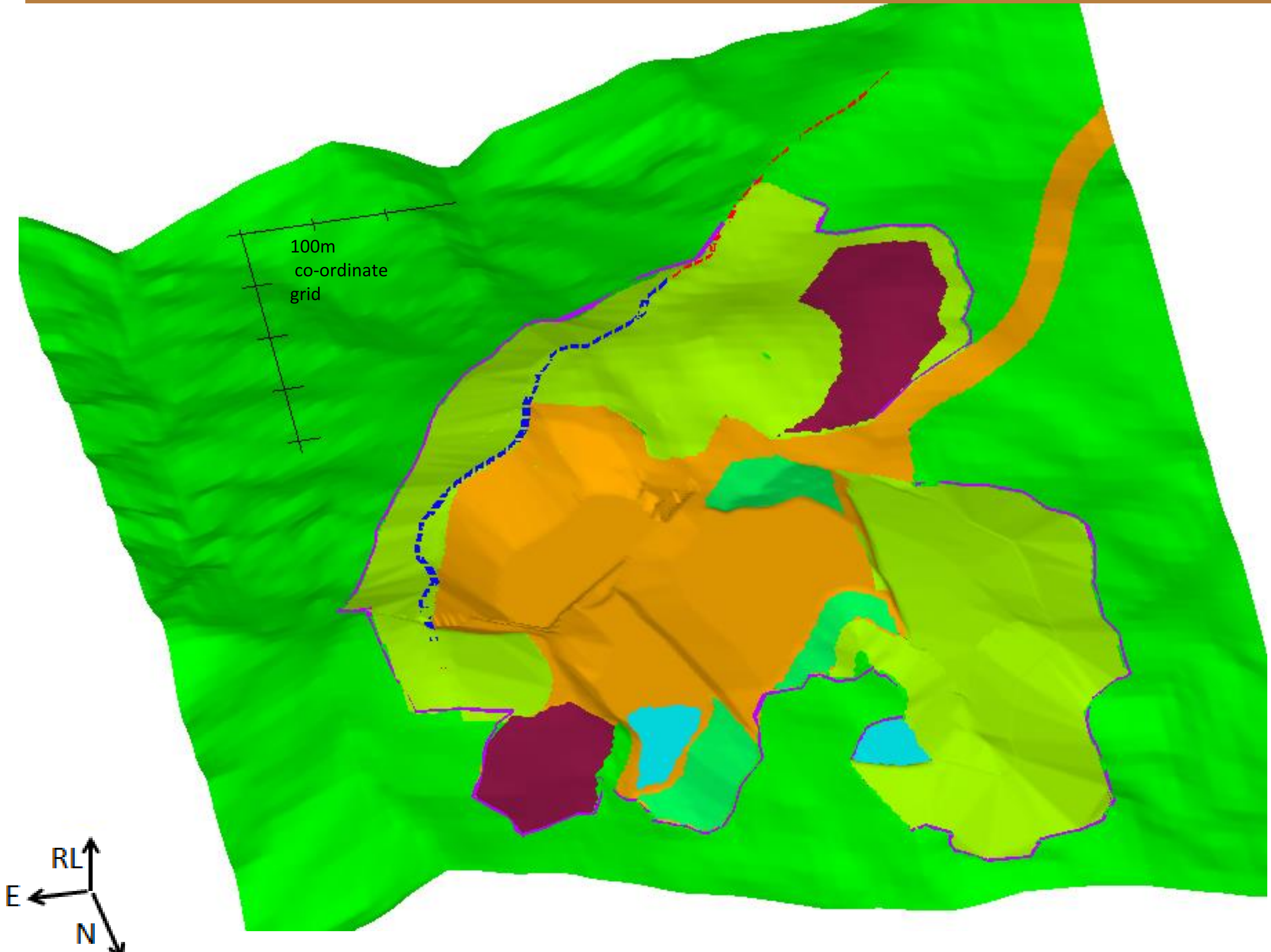
SCHEDULE – YEAR 15



SCHEDULE – YEAR 16

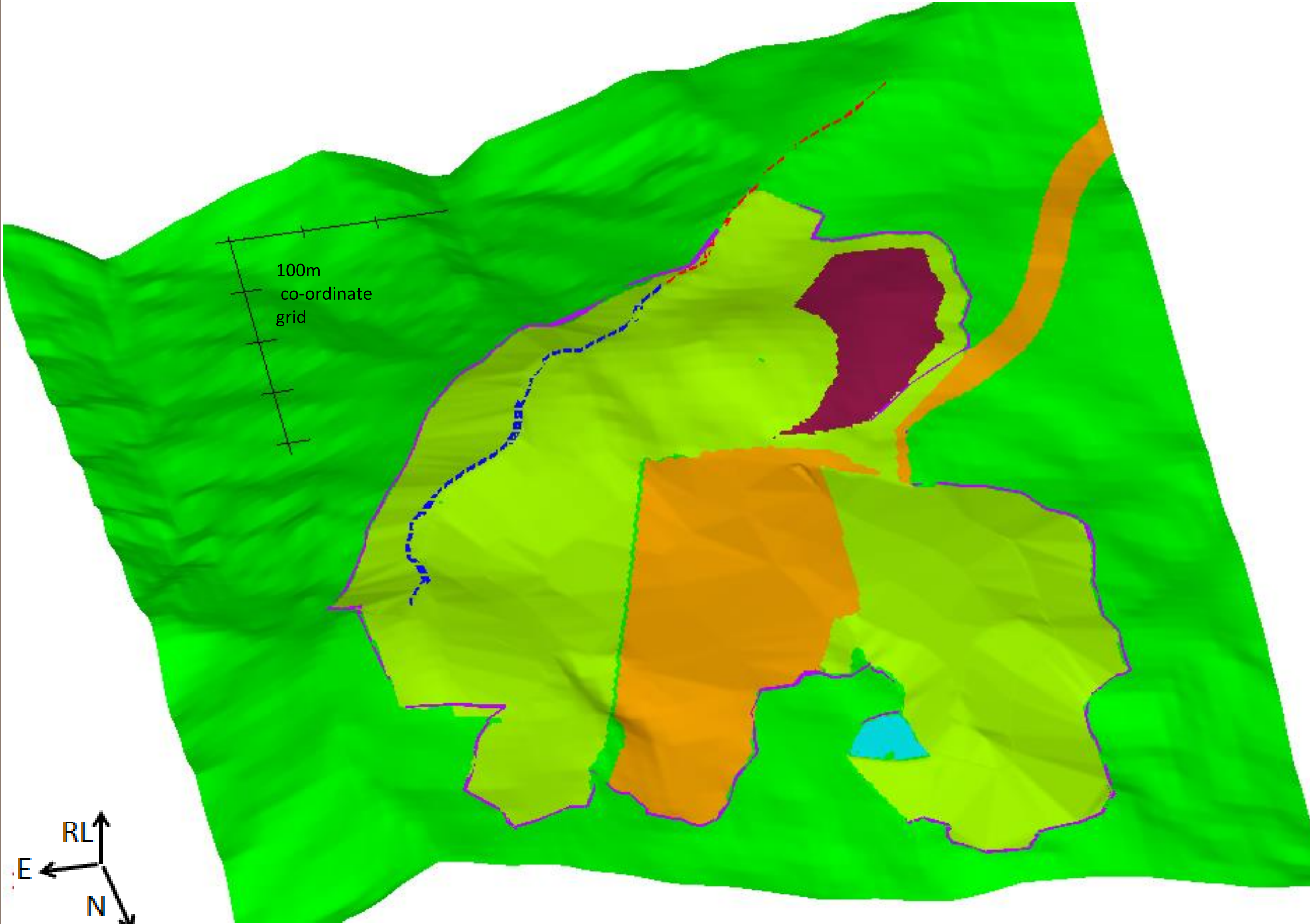


SCHEDULE – YEAR 17

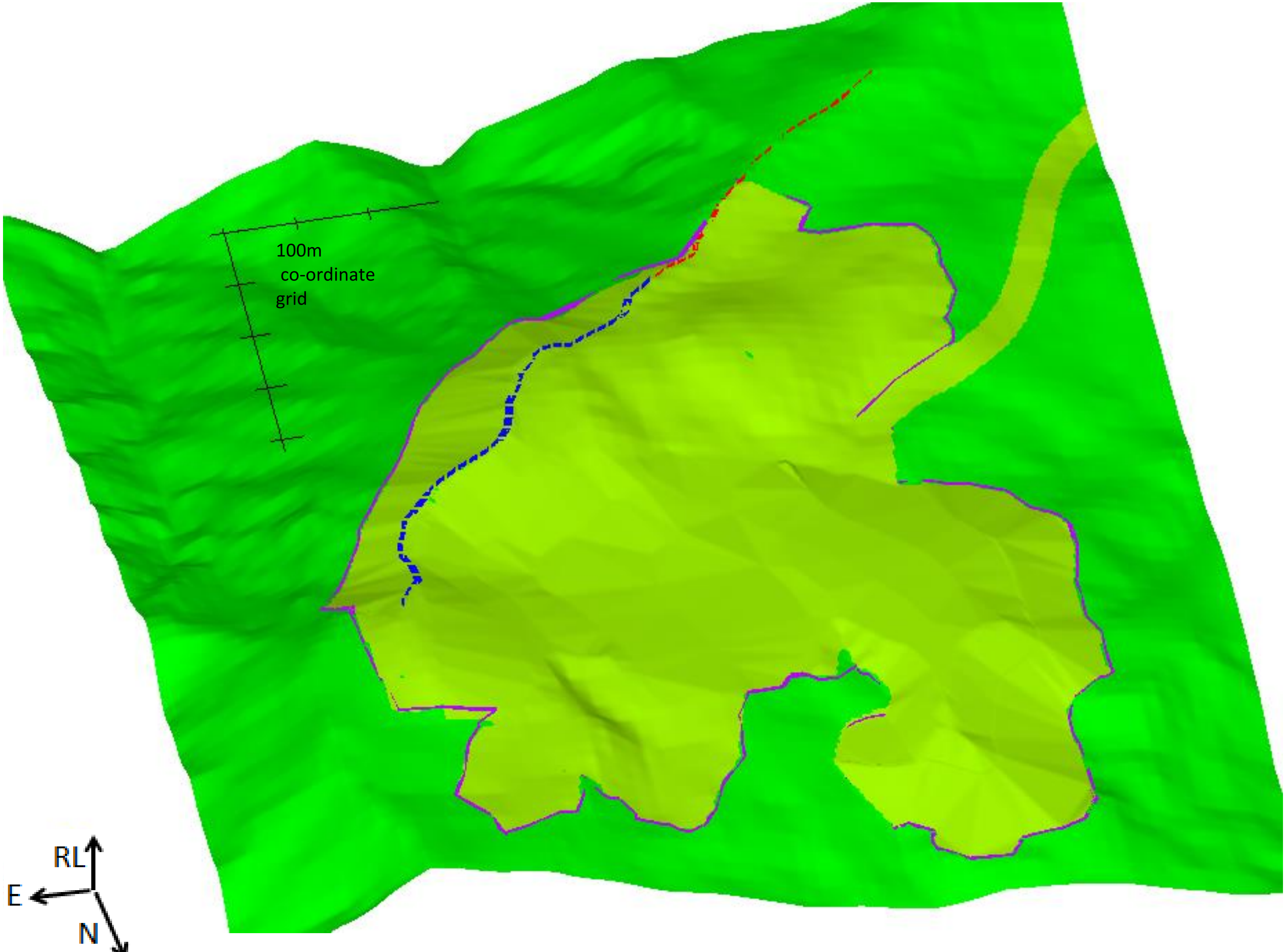


SCHEDULE – LOOKING SOUTH

SCHEDULE – YEAR 18



SCHEDULE – FINAL LANDFORM



SCHEDULE – LOOKING SOUTH

RECOMMENDATIONS

- It should be noted that this is a conceptual design as it is based on a relatively low level of exploration data and further work is strongly recommended to refine and optimise this conceptual design in order to produce a bankable mine design and schedule
- There are 3 areas recommended for further work and these include:
  - More exploration drilling is recommended in order to:
    - Assist in delineating the fault locations and allow them to be modelled accurately
    - Determine the extent of all target seams (for example the Brunner may extend further south
    - Improve knowledge of coal quality and washability and allow the development of a coal quality grid model
    - Improve the JORC status of the resource
  - More geotechnical sampling and analysis is strongly recommended to improve the confidence of the design slope angles for dumps and pit wall
  - Following upgrade of the geological model to incorporate this additional information collected from drilling, coal quality analyses and geotechnical analysis optimisation of the mine design and mine sequence should be performed and a feasibility study completed