2.5 RESULTS OF GEOPHYSICAL EXPLORATION OF LEVEL-2

2.5.1 NZEGA DISTRICT

(1) Isanga Village

The survey location map shown in Figure2.5.1,and the interpreted sections of the geophysical exploration are shown Figure 2.5.2 - 4.

The exploration was carried out around the unclear lineament in the E-W direction and around the clear lineament in the N-S direction.

1) Isanaga No.1

2 low resistivity zones that fall into the west direction were detected by 2D electrical sounding. The low resistivity zones are congruent in the clear lineament. Moreover, it is possible to confirm it in other resistivity sections. Therefore, the low resistivity zone is considered as the two fracture zones in the N-S direction.

The resistivity value decreases where the section between two presumptions fractures estimated in the crush zone.

The above-mentioned structure can be expected to have a potential of groundwater storage therefore, 2 drill sites were chosen. (NZ-046BH1, 2)

2) Isanga No.2

The results of geophysical exportation suggesting a fault or fracture was not recognized.

The resistivity shows low value overall. Therefore, it is considered that the thickness of the weathered zone or sediment is rather thick.

2.5.2 SIKONGE DISTRICT

(1) Usunga village

The survey location maps are shown in Figure 2.5.5 - 2.5.6, and the interpreted sections of the geophysical exploration are shown in Figure 2.5.7 – 2.5.10

An exploration was carried out around the intersection of the clear lineament and the unclear lineament. And an exploration was carried out around major fault south west of the village that was suggested by the regional satellite map (1:200,000)

1) Usunga No.1

The anomalies of the radon concentration and apparent conductivity were not recognized. And the resistivity section did not detect any structure that has the possibility of water storage. Therefore, the possibility is low that groundwater can be developed in this area.

2) Usunga No.2

A clear anomaly of the radon concentration was not recognized.

The results of the EM method detected an increase in apparent conductivity moving toward the valley. Moreover, the resistivity section detected a clear structure where resistivity fell. These results suggest that a fracture is there, but it is not compatible with the radon method results.

The possibility of groundwater development is higher than UsungaNo1, 1 drill site was chosen (SK-028BH1).

3) The South-West of the village

The west zone of the estimated major fault has low resistivity(<300Ω-m),and the east side has higher resistivity than the west side(max 800Ω-m) therefore a clear contrast was detected. The low resistivity in the west side suggested the different stratum from the east side or the thickness of the weathered zone is rather large. The high resistivity zone at the east side suggested fresh bedrock. Thus, the possibility is high that there is a major fault in the center of survey line.

This major fault was interpreted as a normal fault. Therefore, these is high possibility that groundwater can be developed at the west side. 1 drill site was chosen (SK-028BH2).

(2) Mpombwe village

The survey location maps shown in Figure 2.5.11 - 2.5.12, and the interpreted sections of geophysical exploration are shown in Figure 2.5.13 - 2.5.18.

An exploration was carried out around an intersection of the estimated major fault and unclear lineament.

1) Mpombwe No.1

The anomalies of the radon concentration and apparent conductivity were recognized, but it is not compatible with results of other survey. Therefore these anomalies suggest small fractures were recognized.

The resistivity section can detect the structure where resistance deteriorates locally.

A similar structure can be detected in a near by survey line. These results suggest a fracture that crosses 2 sections. And the presumed fracture has low resistivity(<150Ω-m),therefore this zone can be expected to have the potential of groundwater storage,1 drill site was chosen (SK-037BH1).

2) Mpombwe No.2

The anomaly of the radon concentration was recognized, and the apparent conductivity a decreases outside the main fault. Moreover, the resistivity section can be detected in a structure where resistance deteriorates locally.

Each result has an interrelation that was congruent in the lineament. Therefore, those results detected a fracture. But, these fractures cannot be expected to groundwater storage potential. Because these fractures have high resistivity(>1000Ω-m excluding the south zone)

A structure resistivity fall was detected in the south zone that has relatively low resistivity(400Ω-m). And, this corresponds to the anomaly of the radon concentration. This structure can be expected to have the potential of groundwater storage at around this area Therefore, 1 drill site was chosen (SK-037BH2).

2.5.3 TABORA RURAL DISTRICT

(1) Mpumbuli village

The survey location map is shown in Figure 2.5.19, and the interpreted sections of the geophysical exploration shown in Figure 2.5.20.

Exploration was carried out around the major fault zone.

1) Mpumbuli No.1

The anomaly of the radon concentration was recognized, but it is not compatible with results of other surveys. Therefore these anomalies suggest small fractures were recognized.

The apparent conductivity decreases toward the end of the line from 450m suggest the discrepancy of the stratum. At the resistivity section, the low resistivity zone of 80m in width was detected at the center. Moreover the resistivity is distributed like a stair at the center. It is very likely that a big fault is located there. And, the presumed fault has low resistivity; therefore, this point can be expected to have the potential of groundwater storage.2 drill sites ware chosen (TR-054BH1, 2).

(2) Mabama village

The survey location map shown in Figure 2.5.21, and the interpreted sections of the geophysical exploration are shown Figure 2.5.22 - 2.5.26.

Exploration was carried out inside and outside the major fault zone. Each survey point is along the interpreted dyke that was estimated by an “airborne magnetic”.

1) MabamaNo.1

Though anomalies of the radon concentration were detected in several places the structure of resistivity suggesting a fault or fracture was not recognized.

It is thought that anomaly detected a small scale fracture. Therefore, sufficient storage of groundwater cannot be expected.

2) MabamaNo.2

The results of the geophysical exploration suggest a dyke is not recognized.

The structure where resistivity fell was detected in 2 points. Of these, the western site structure is shown clearly and accords with the anomaly of the radon concentration. It is very likely that the fracture is there. And, the presumed fracture has low resistivity, therefore, the western site can be expected to have the potential of groundwater storage Therefore, 1 drill site was chosen (TR-069BH1).

3) Mabama No.3

The results of the geophysical exploration suggest a dyke was not recognized.

The structure where the resistivity fell was detected at 2 points. This structure is shown clearly and accords with the anomaly of the radon concentration. It is very likely that the fracture is there. And, the presumed fracture has low resistivity, therefore, the structures can be expected to have the potential of groundwater storage Therefore, 2 drill sites were chosen (TR-069BH2, 3).

4) Mabama No.4

This area is outside a major fault, and the results of geophysical exportation suggesting fault or fractures was not recognized.

This place cannot be expected to have the potential of groundwater storage.

(3) Ufuluma village

The survey location map is shown in Figure 2.5.27, and the interpreted sections of the geophysical exploration are shown in Figure 2.5.28.

An exploration was carried out around the major fault that was suggested by the regional satellite map (1:200,000).

The Ufuluma village did not have sufficient survey time. Because this village was add as a Level-2 at the end of the exploration. Therefore, exploration was carried out only with 2D electric sounding and no outline survey.

The resistivity section can detect relatively fall on structures. The position of this structure

roughly corresponds to the presumed fault in the regional satellite image. Therefore, it is very likely that some kind of a fracture is located there.

Though resistivity is high(300-600Ω-m), water storage can be presumed as these is a possibility that resistivity fell by the influence of the water.

This point can be expected to have the potential of groundwater storage.1 drill site was chosen (TR-098BH1).

2.5.4 TABORA MUNICIPALITY

(1) Kakola village

The survey location map shown in Figure 2.5.29, and the interpreted sections of geophysical exploration are shown Figure 2.5.30 – 2.5.35.

An exploration was carried out around 2 clear lineaments of the NE-SW / NW-SE direction （Kakola No.2,No.3）.And an exploration was carried out around the major fault located on the east side of the village (Kakola No.1).

1) Kakola No.1

The plural fractures are presumed from resistivity sections and the anomaly of the radon concentration. But the possibility that there is groundwater is small because presumed fractures have high resistivity.

2) Kakola No.2

The indistinct resistivity structure that changes in a vertical direction was detected in the point where the lineament intersected. And, this is corresponding to the anomaly of the radon concentration. Therefore, though resistivity structure is unclear, a fracture can be presumed. In addition, the presumed fracture has low resistivity

The above-mentioned structure can be expected to have the potential of groundwater storage Therefore, 1 drill site was chosen (TU-008BH1).

3) Kakola No.3

Low resistivity structures that fall into the west were detected by 2D electrical sounding. And, this is corresponding to the anomaly of radon concentration.

But the possibility that there is groundwater is few because presumed fractures have high resistivity (400-800 Ω-m).

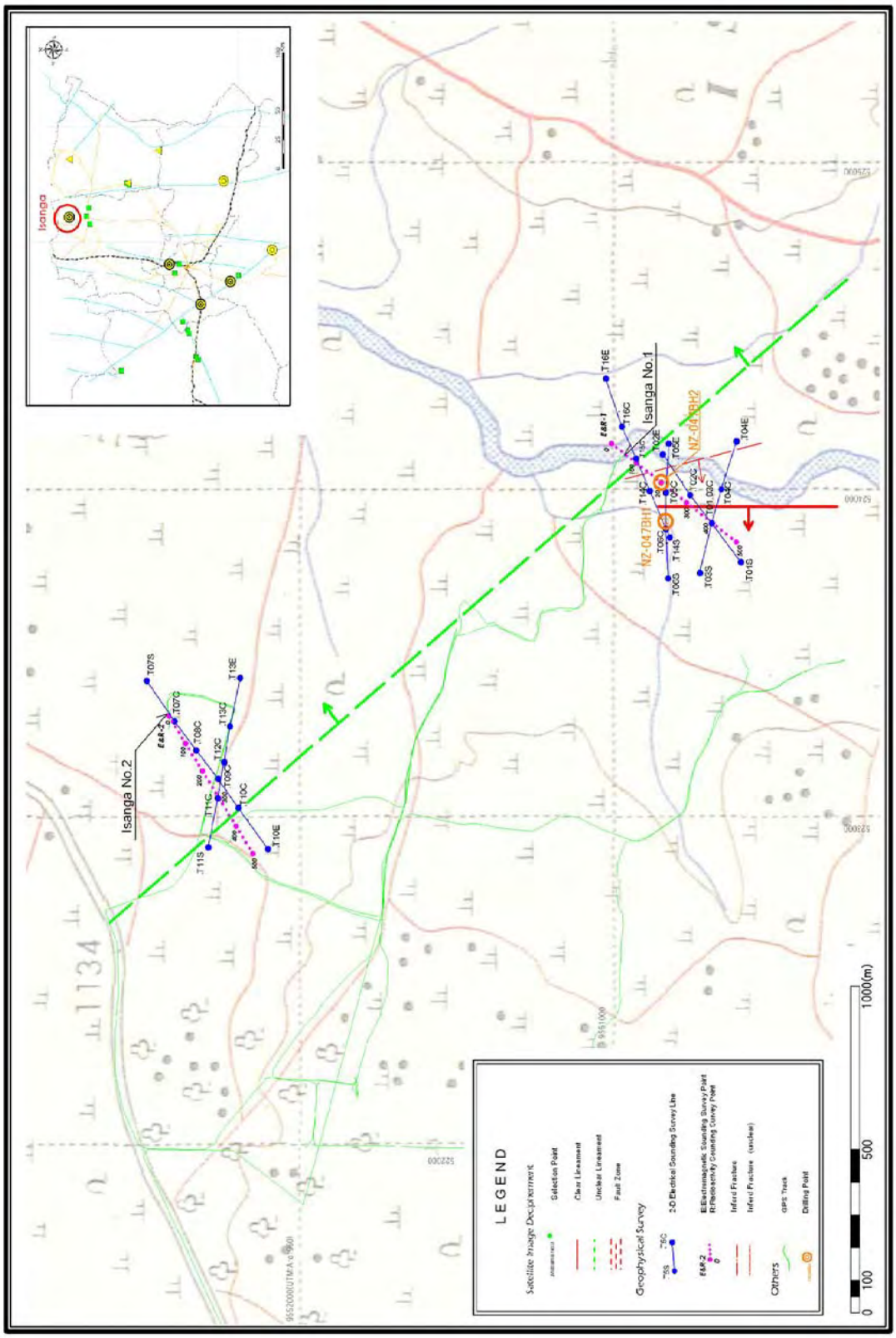

Figure 2.5.1 Layout of Geophysical Exploration（Level-2:Isanga village）

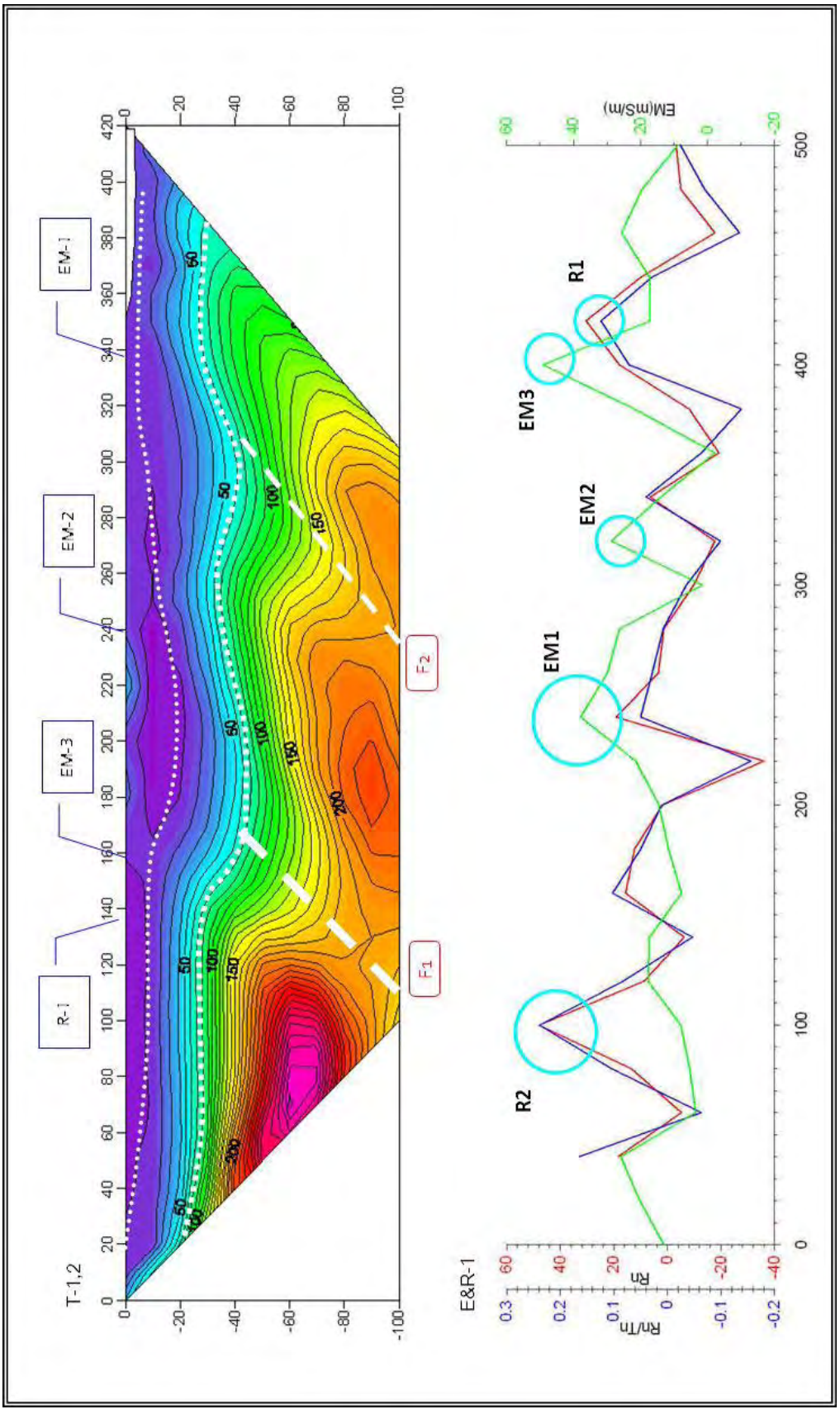

Figure 2.5.2 Results of Geophysical Exploration (Level-2 :Isanaga Village Isanaga No.1 1/2)

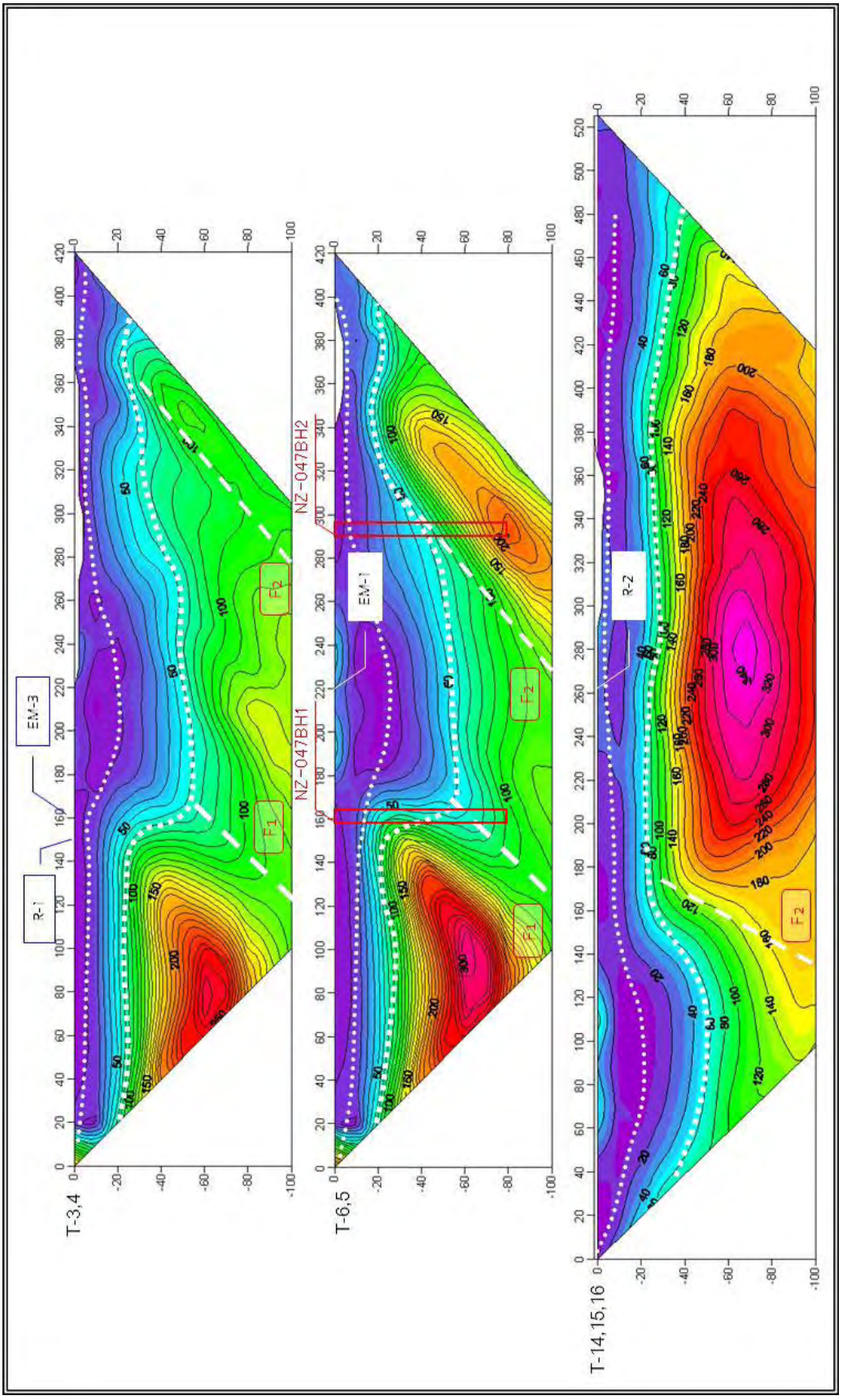

Figure 2.5.3 Results of Geophysical Exploration (Level-2 :Isanaga Village Isanaga No.1 2/2)

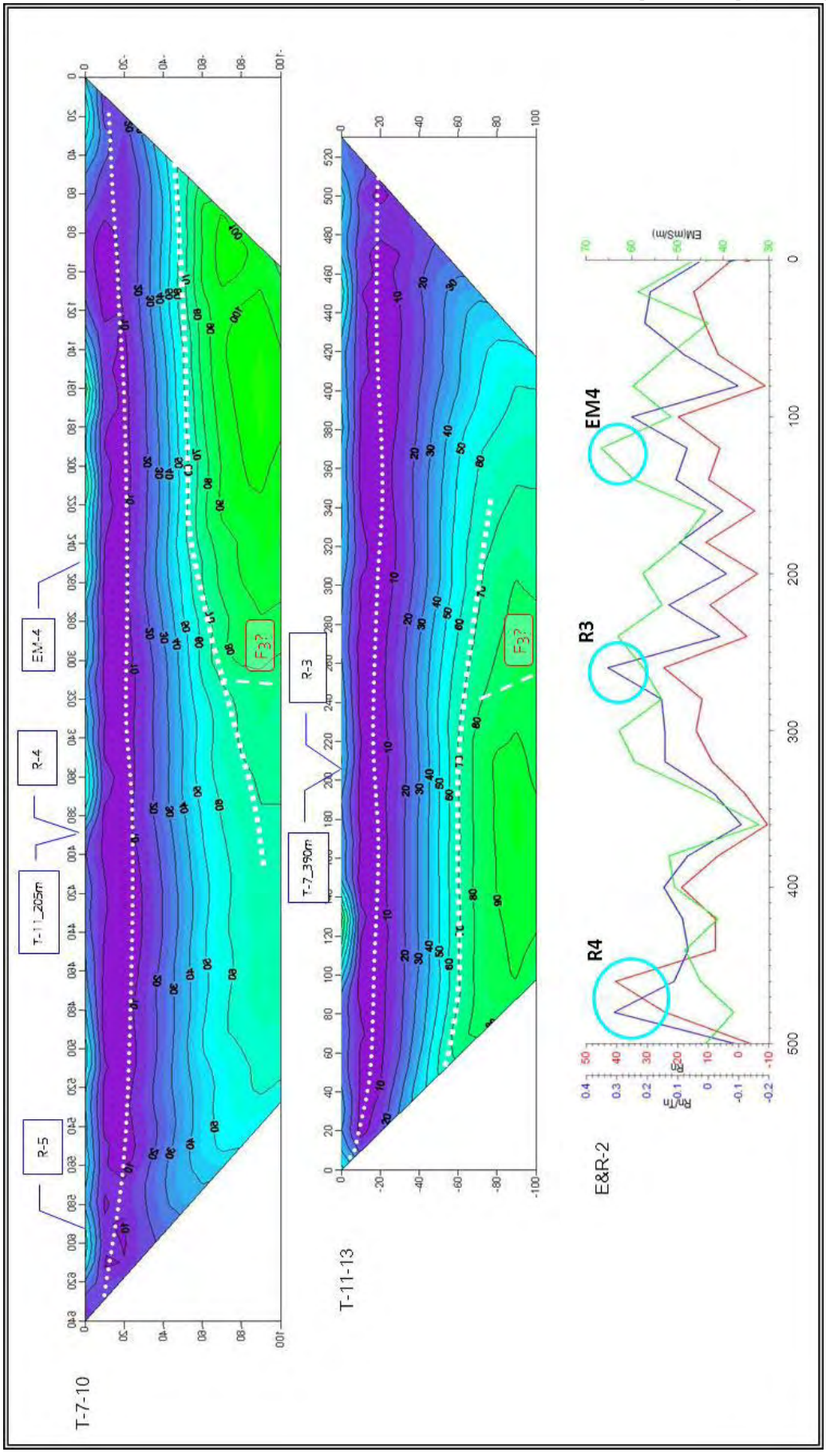

Figure 2.5.4 Results of Geophysical Exploration (Level-2 :Isanaga Village Isanaga No.2)

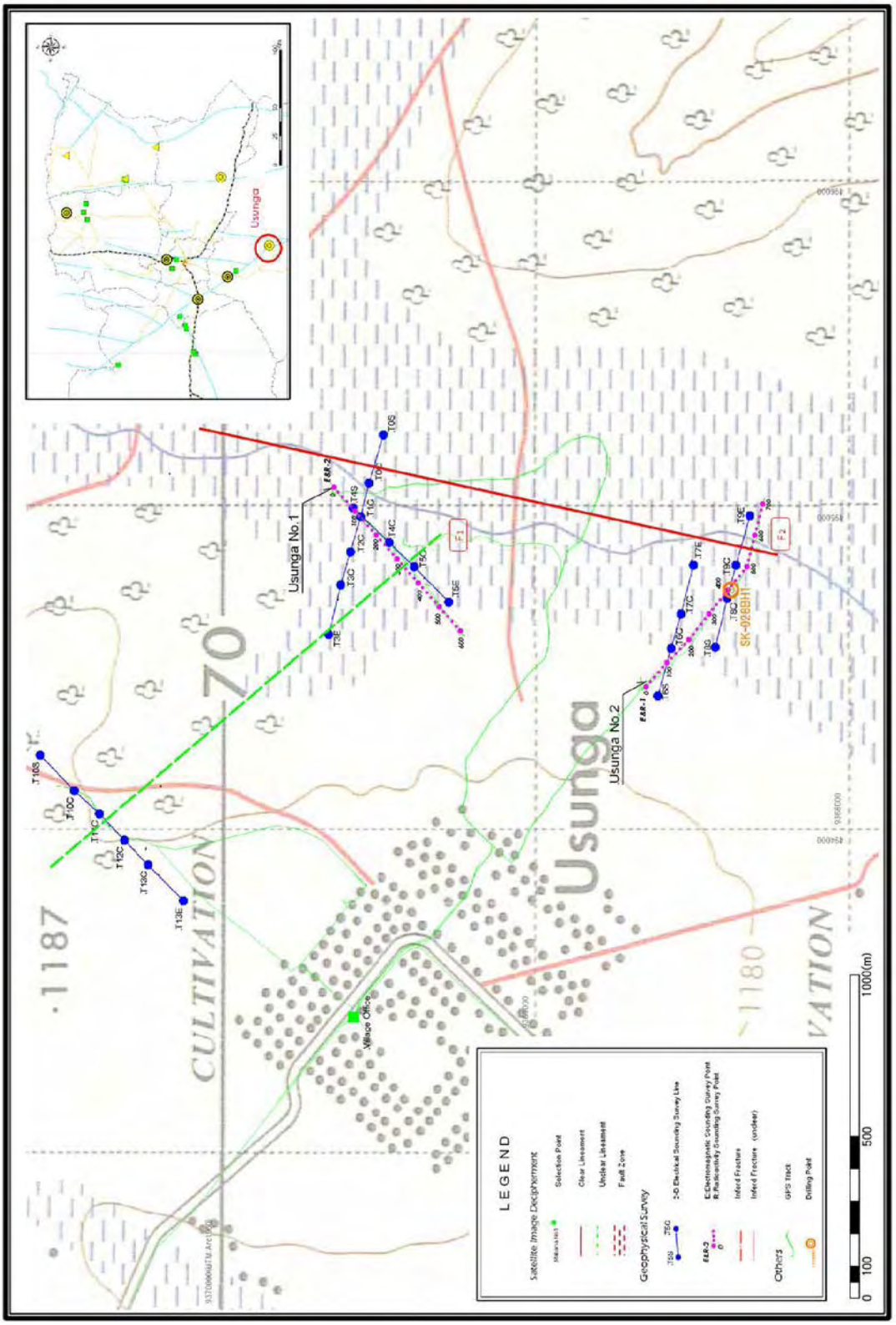

Figure 2.5.5 Layout of Geophysical Exploration (Level-2:Usunga Village1/2)

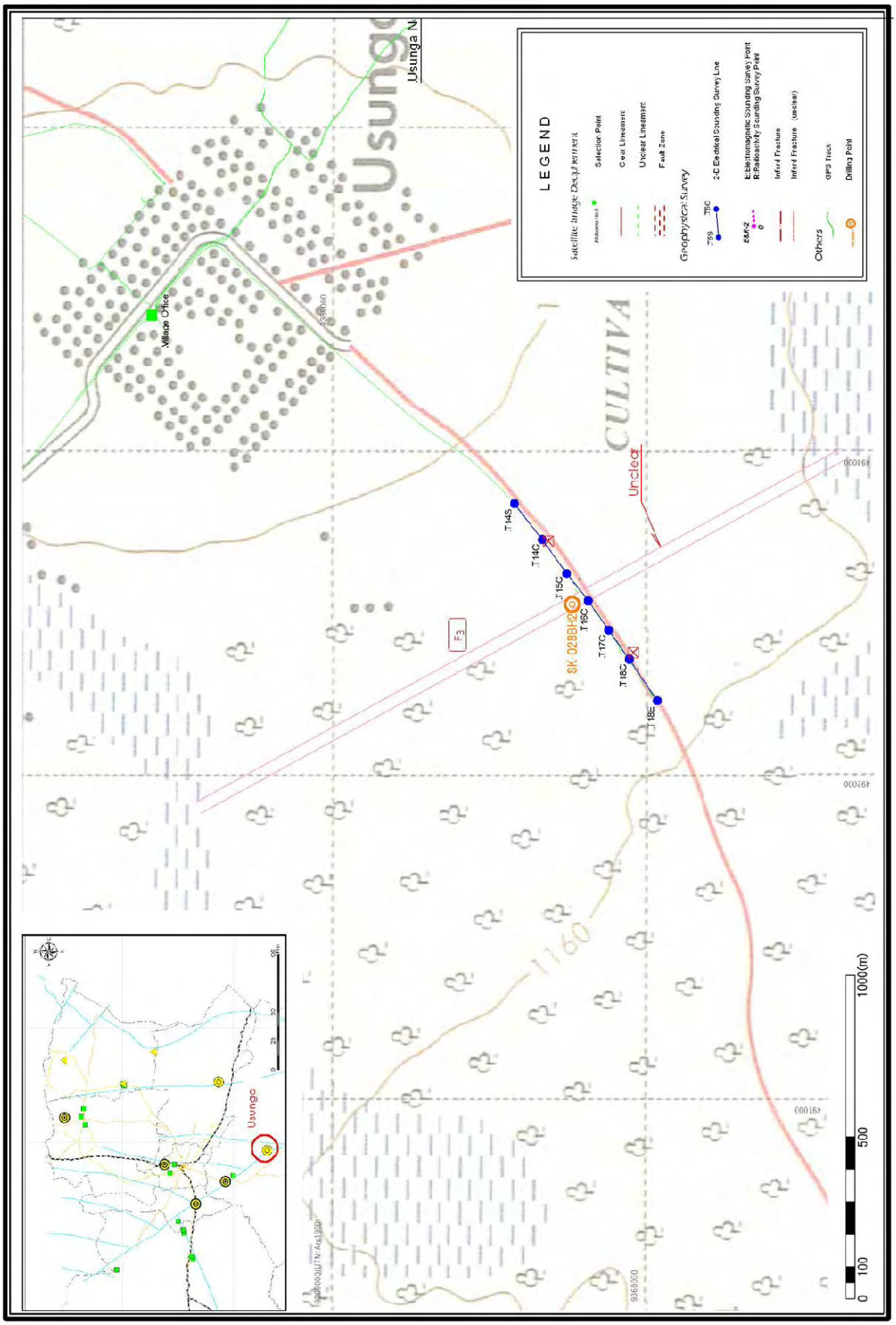

Figure 2.5.6 Layout of Geophysical Exploration (Level-2:Usunga Village 2/2)

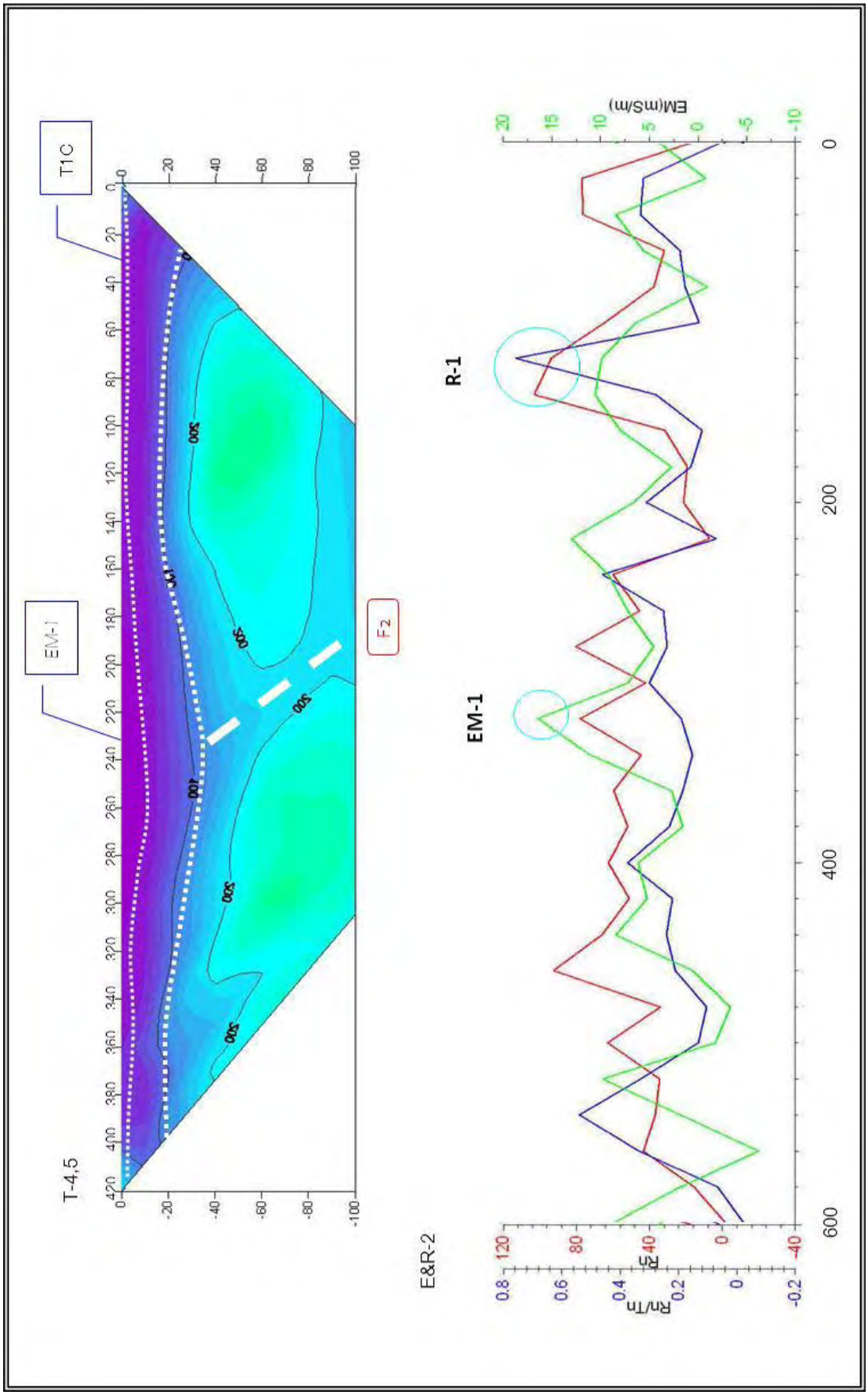

Figure 2.5.7 Results of Geophysical Exploration (Level-2:Usunga village Usunga No.1 1/2)

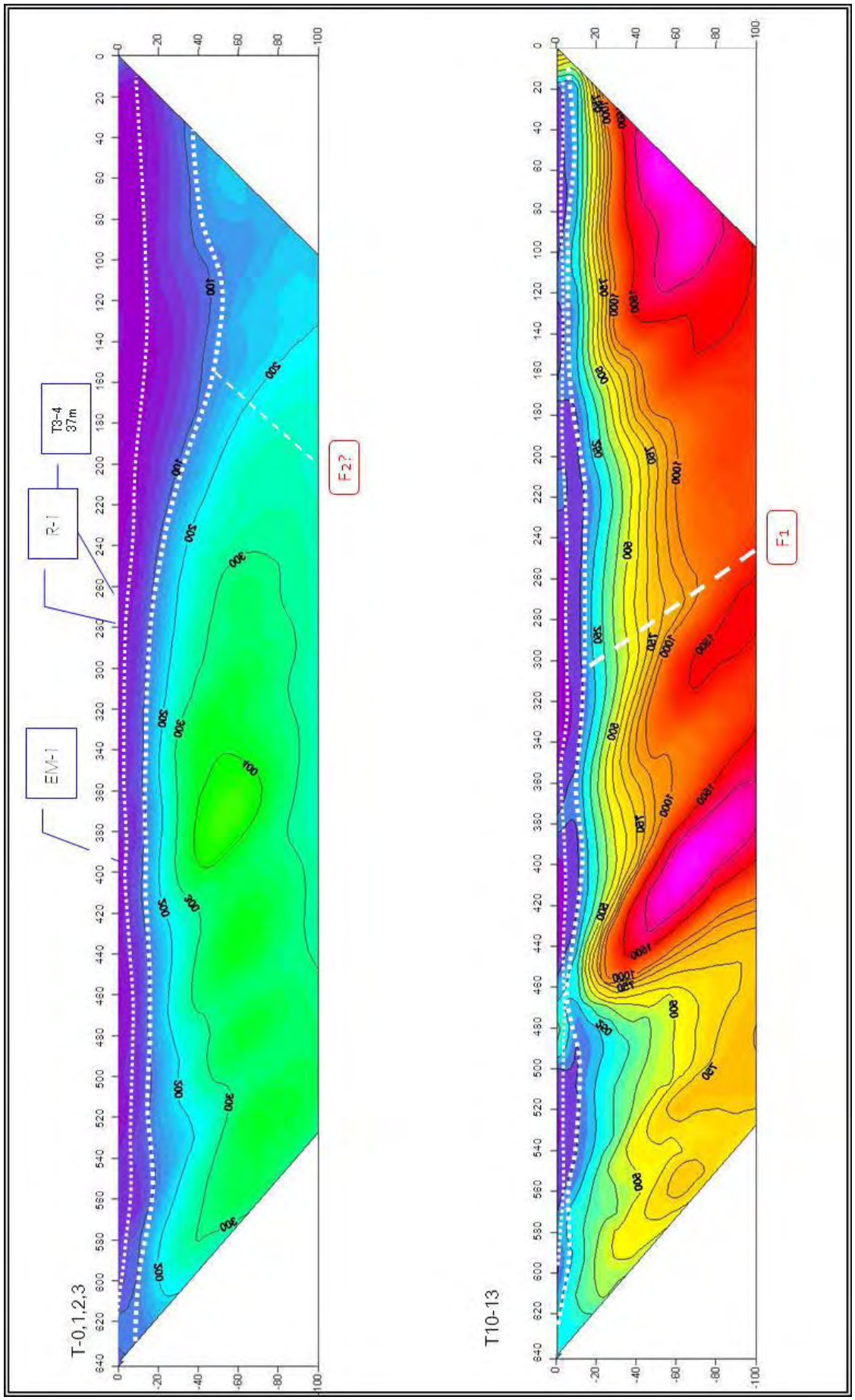

Figure 2.5.8 Results of Geophysical Exploration（Level-2:Usunga village Usunga No.1 2/2）

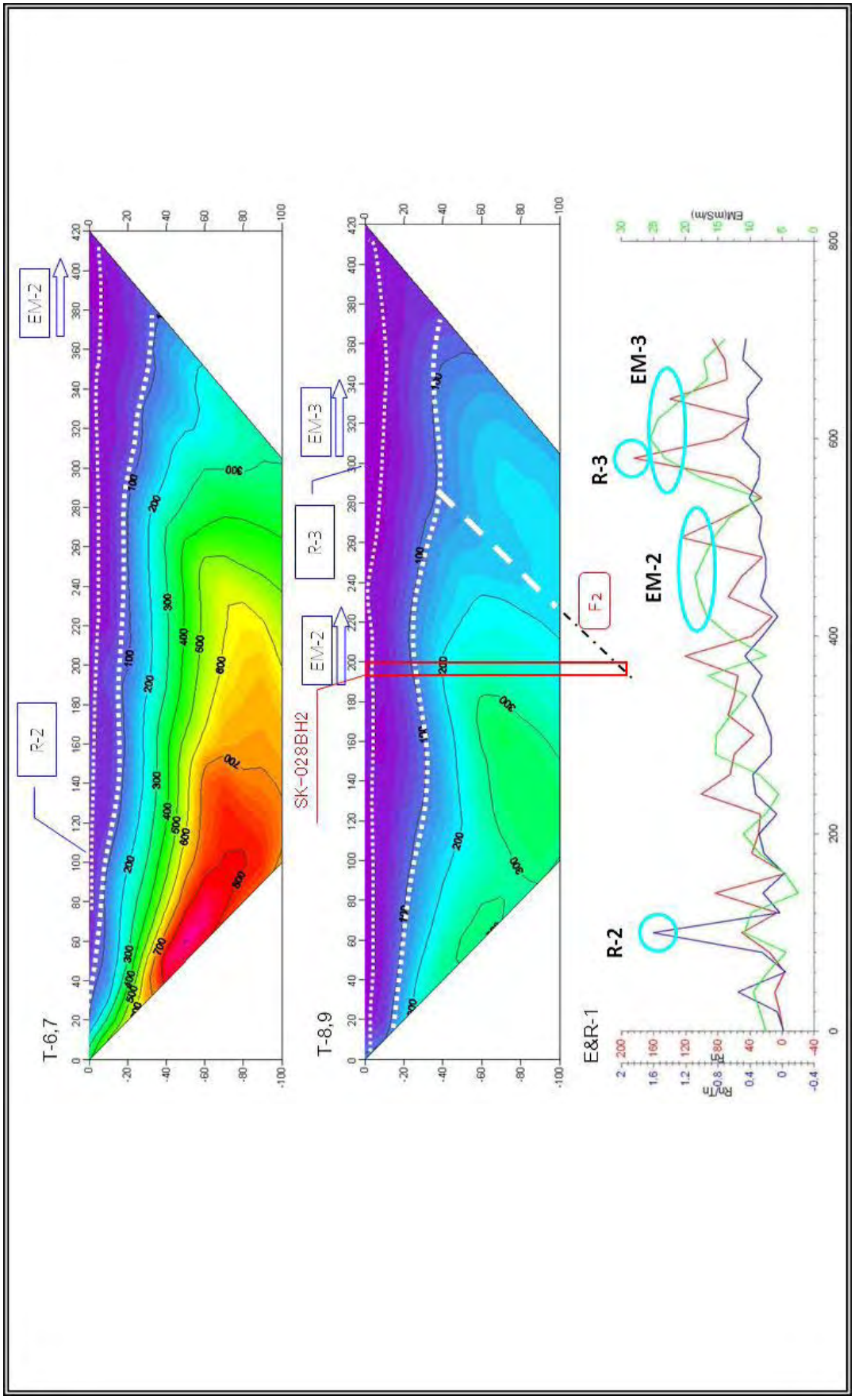

Figure 2.5.9 Results of Geophysical Exploration（Level-2:Usunga village Usunga No.2）

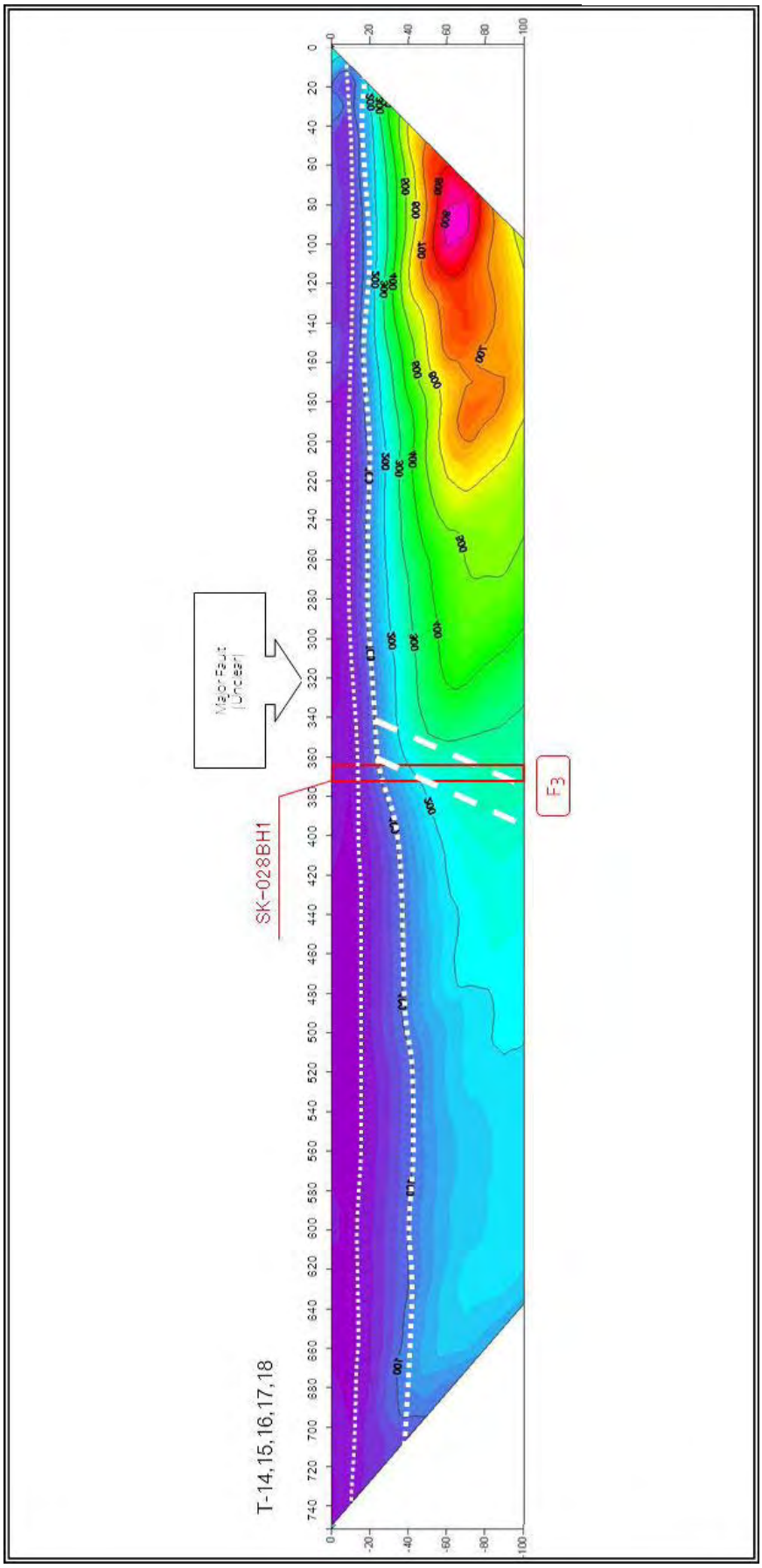

Figure2.5.10 Results of Geophysical Exploration（Level-2:Usunga village The South-West of the village）

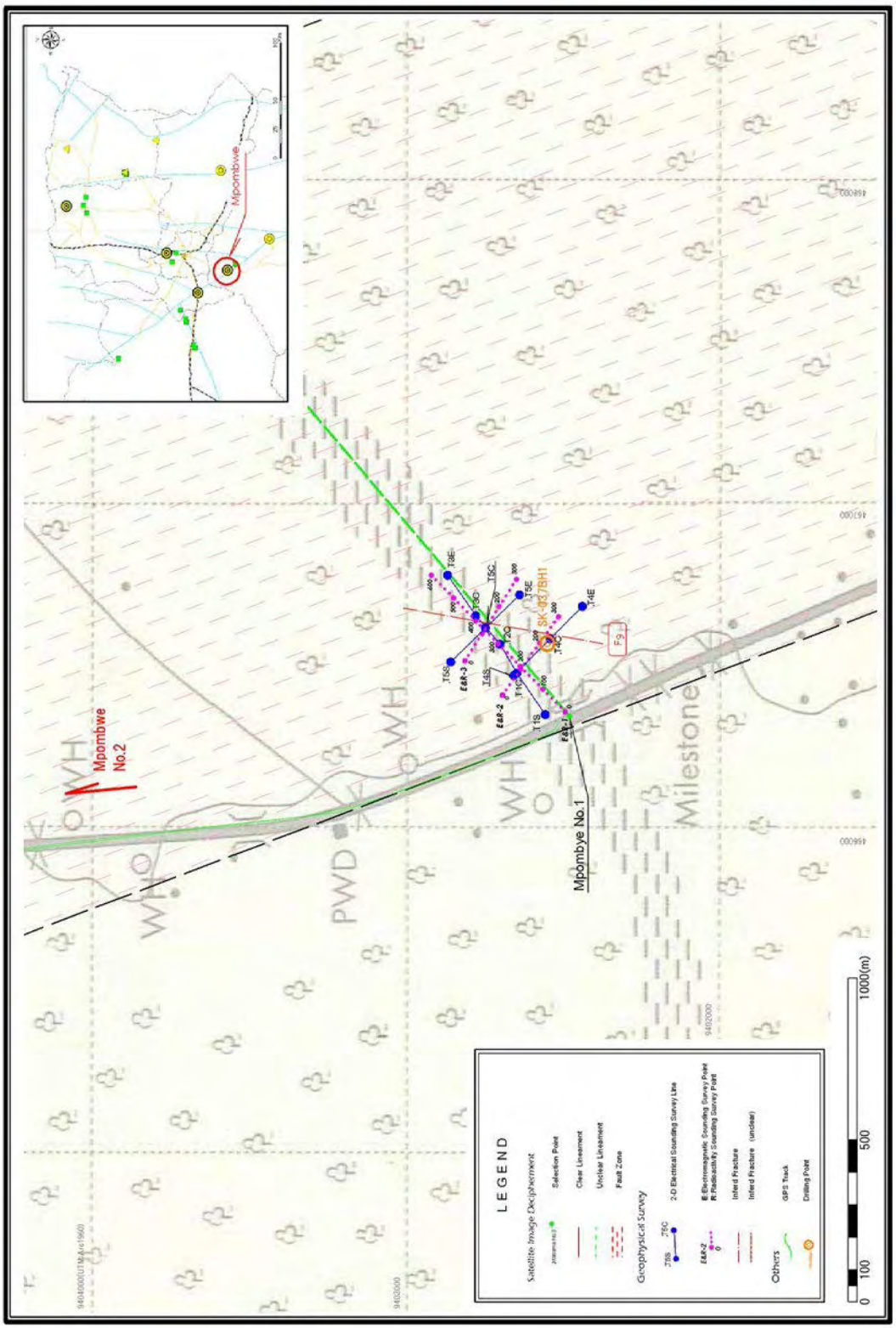

Figure 2.5.11 Layout of Geophysical Exploration（Level-2: Mpombwe village 1/2）

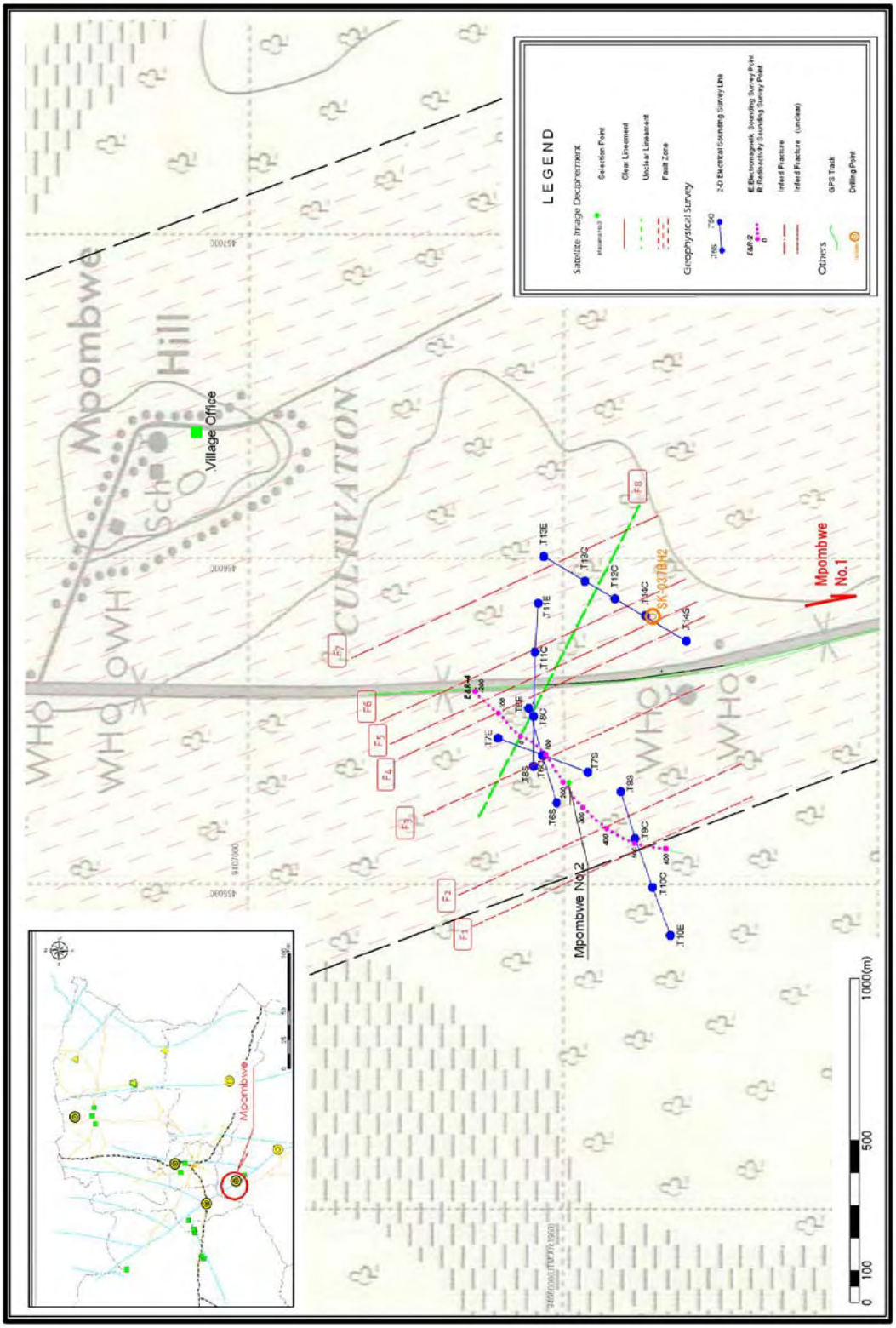

Figure 2.5.12 Layout of Geophysical Exploration (Level-2: Mpombwe village 2/2)

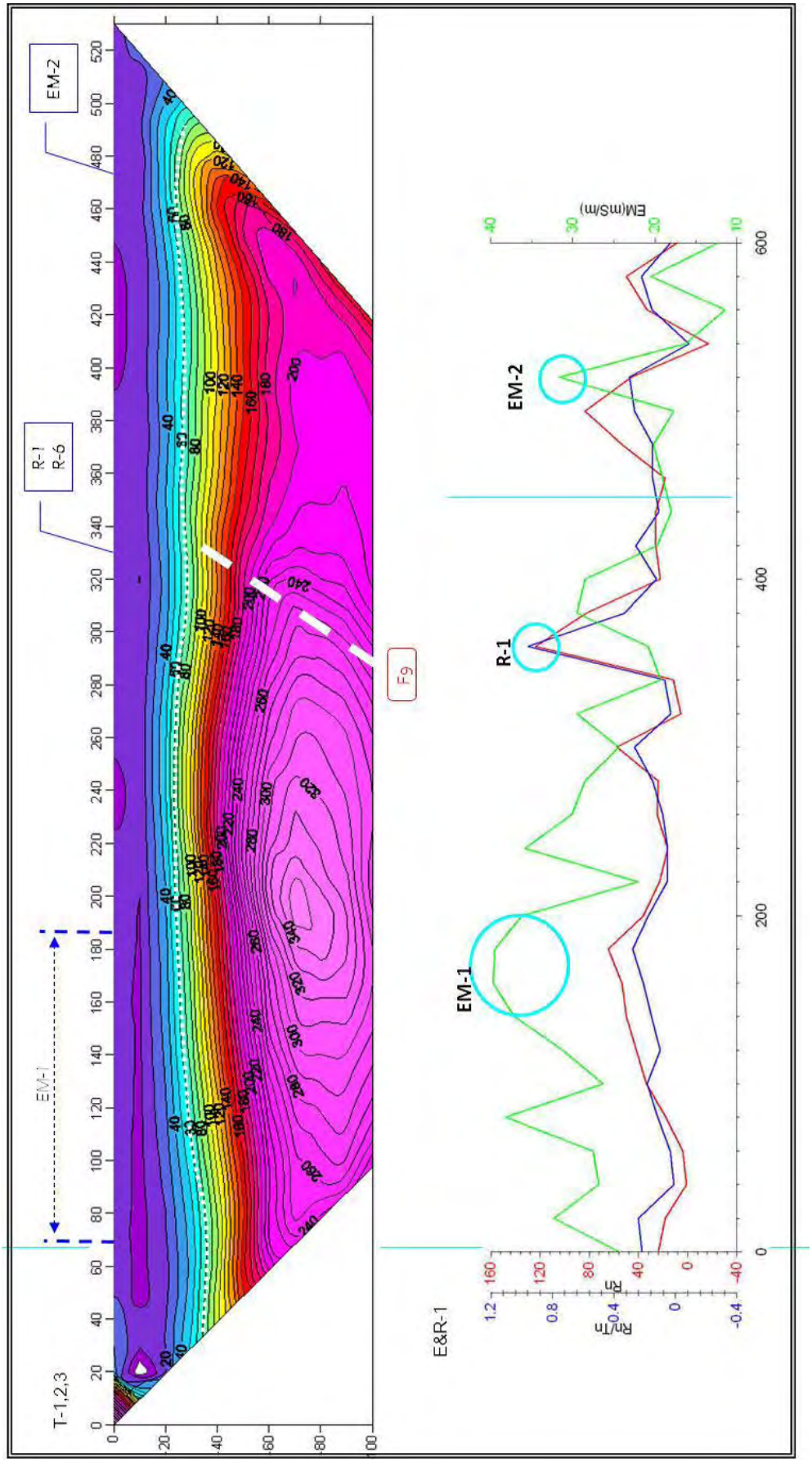

Figure 2.5.13 Results of Geophysical Exploration（Level-2:Mpombwe village Mpombwe No.1 1/3）

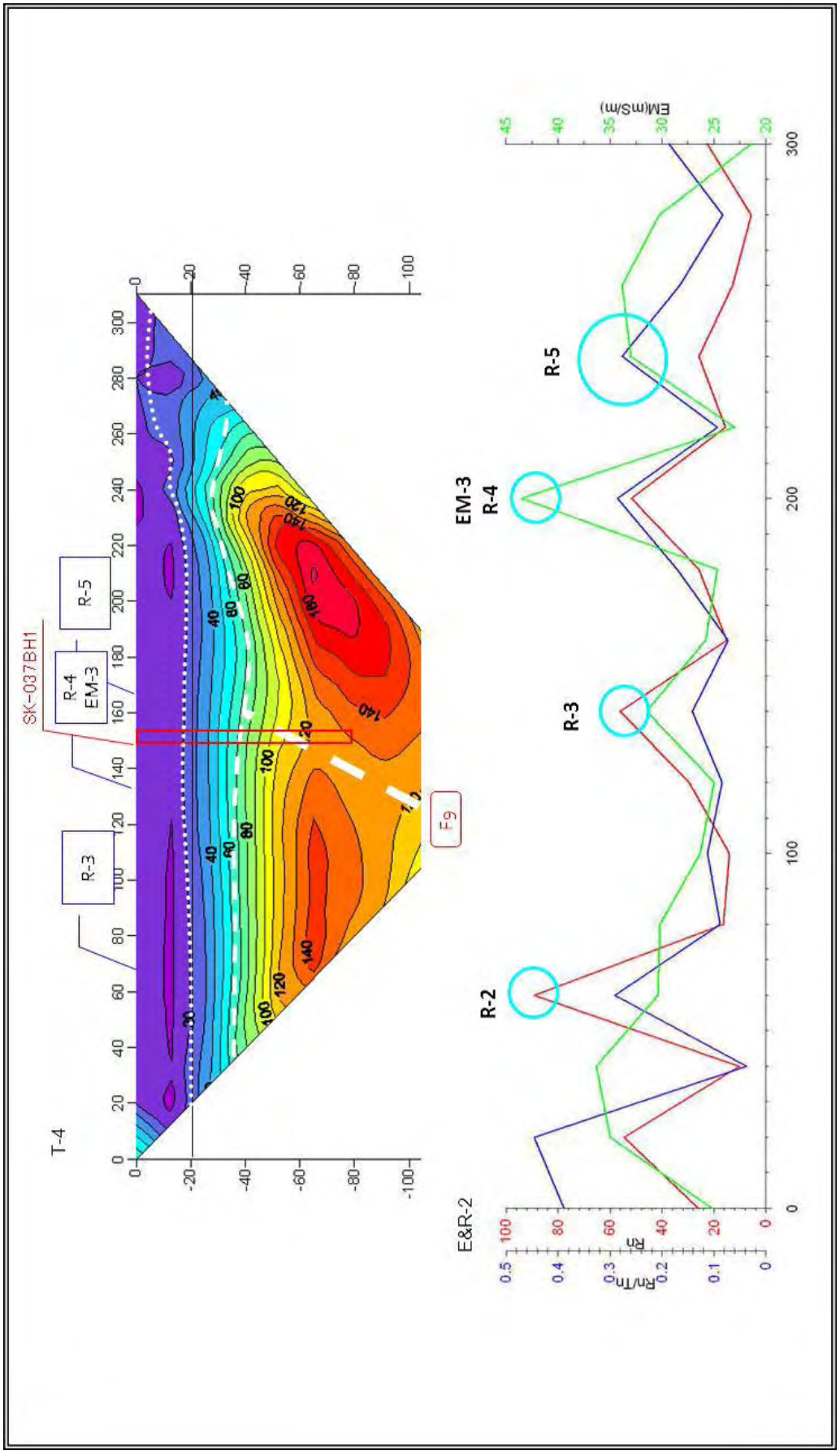

Figure 2.5.14 Results of Geophysical Exploration (Level-2:Mpombwe village Mpombwe No. 1 2/3)

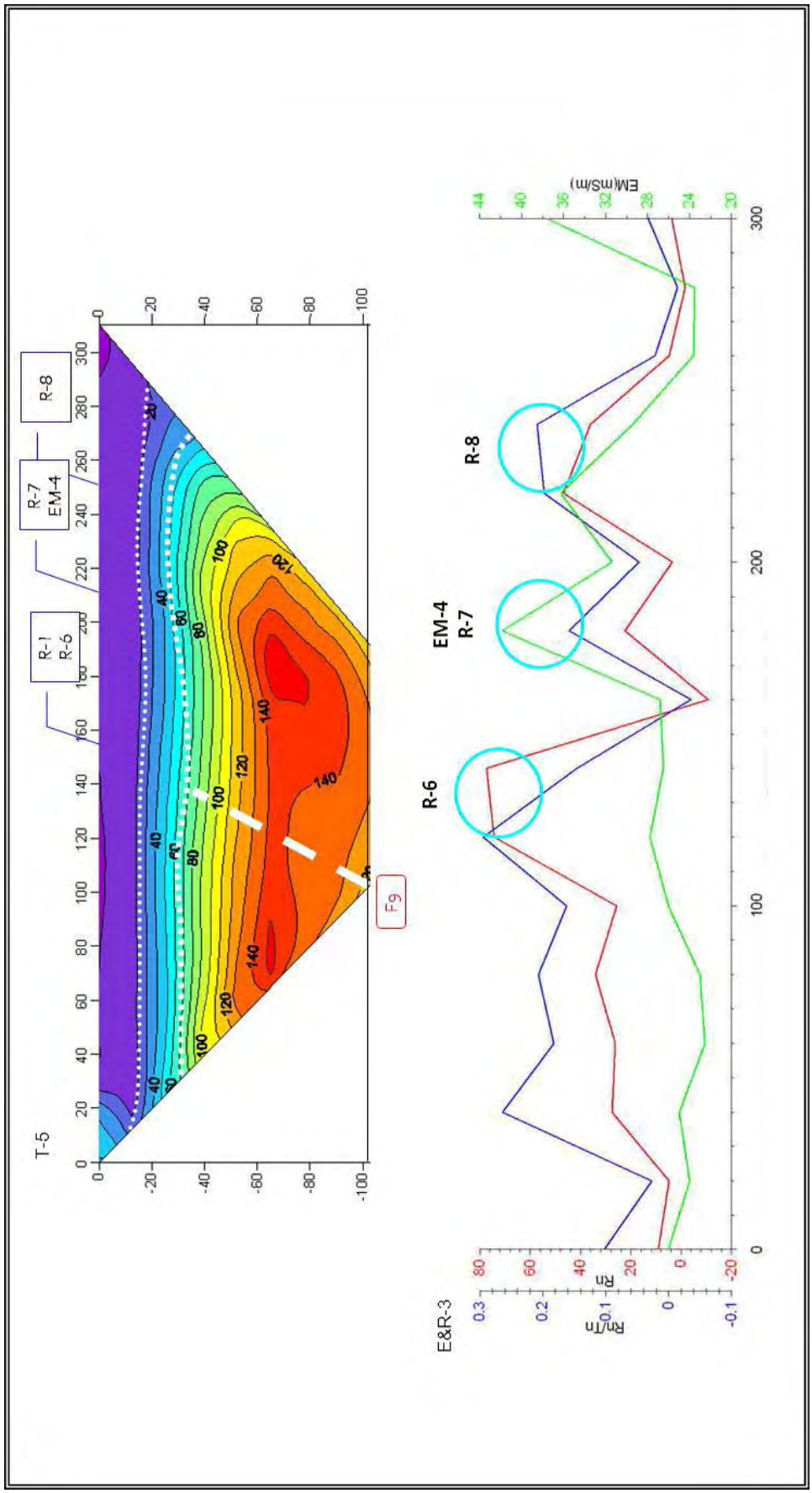

Figure 2.5.15 Results of Geophysical Exploration（Level-2:Mpombwe village Mpombwe No.1 3/3）

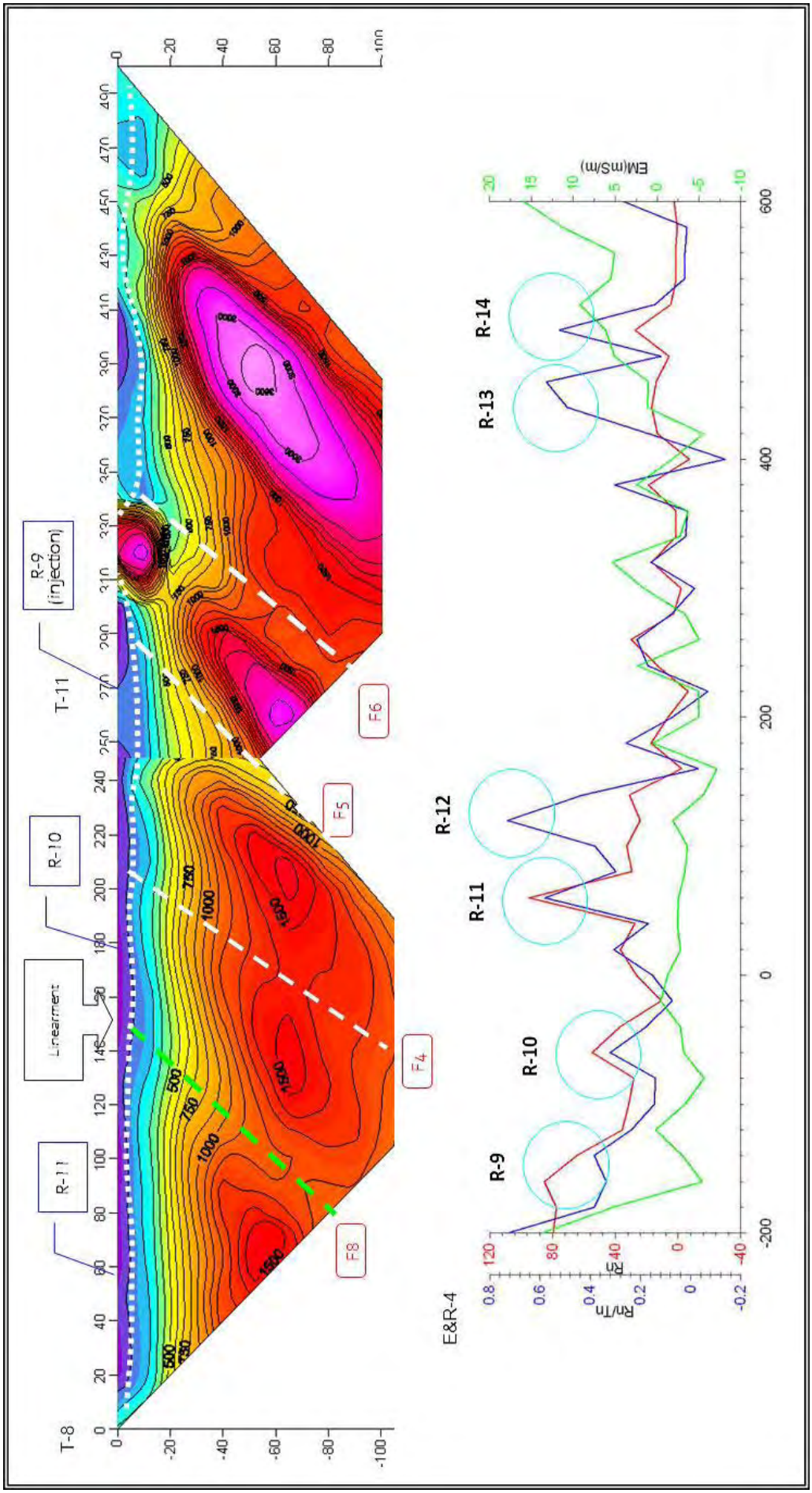

Figure2.5.16 Results of Geophysical Exploration（Level-2:Mpombwe village MpombweNo.2 1/3）

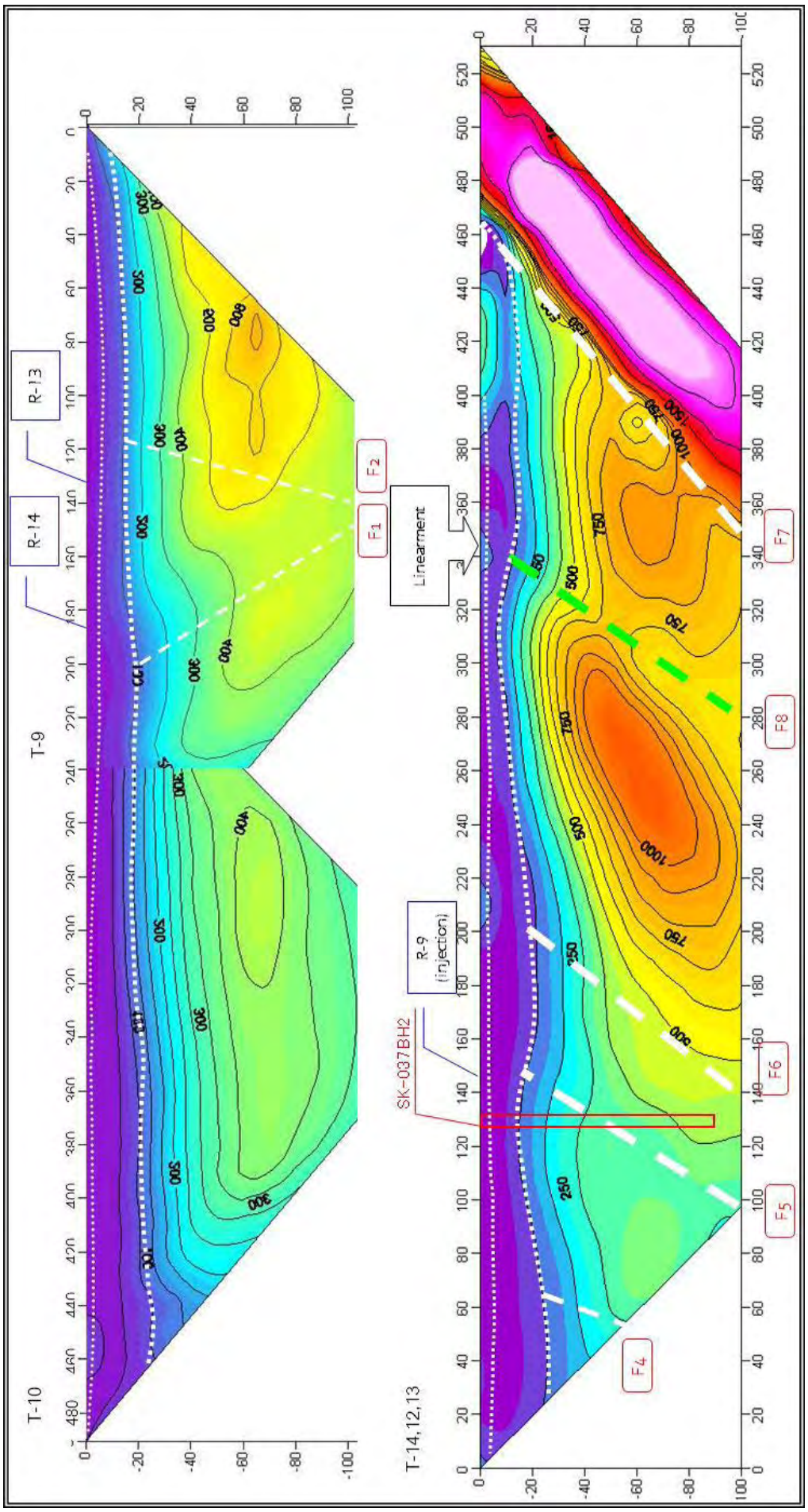

Figure2.5.17 Results of Geophysical Exploration（Level-2:Mpombwe village MpombweNo.2 2/3）

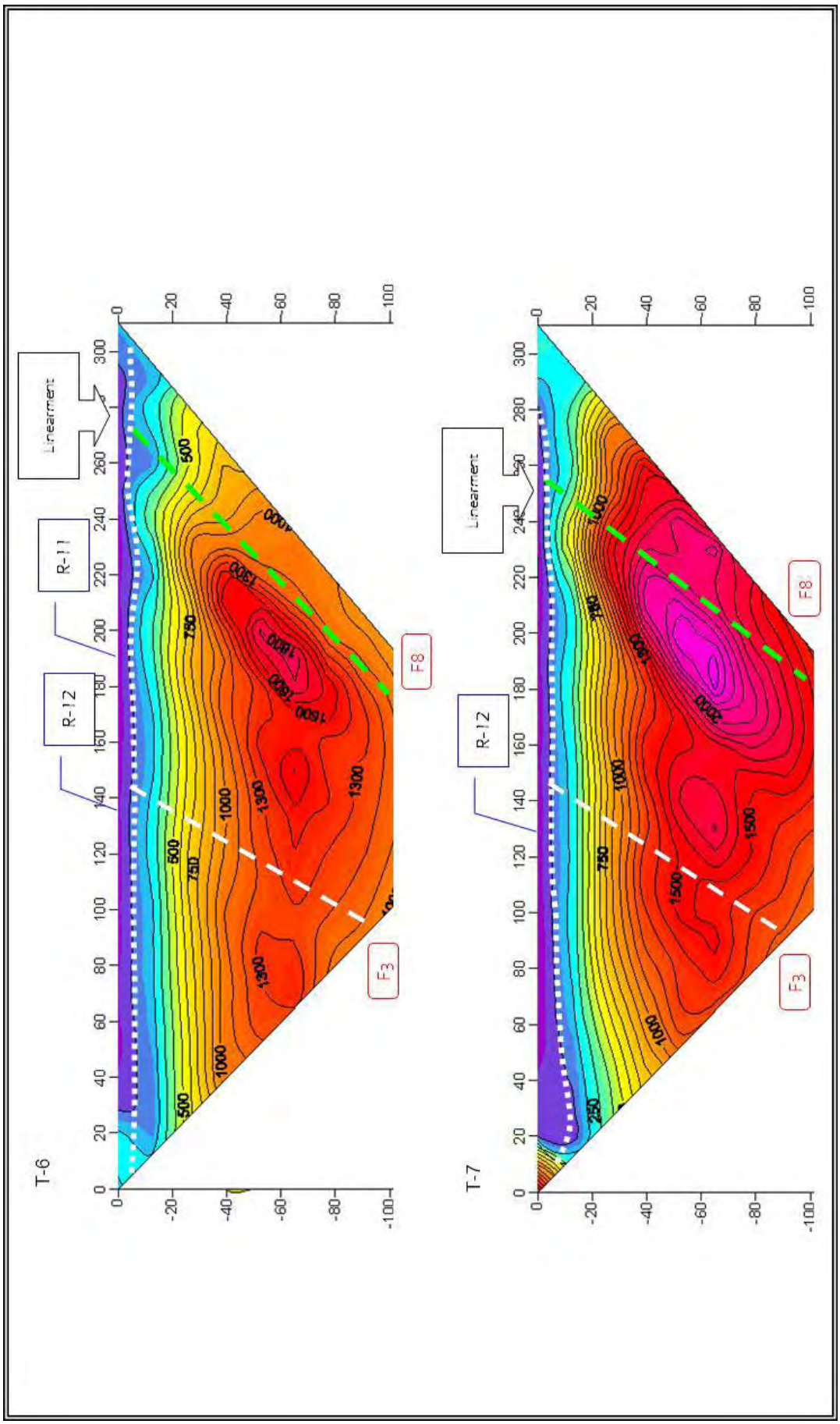

Figure2.5.18 Results of Geophysical Exploration（Level-2:Mpombwe village MpombweNo.2 3/3）

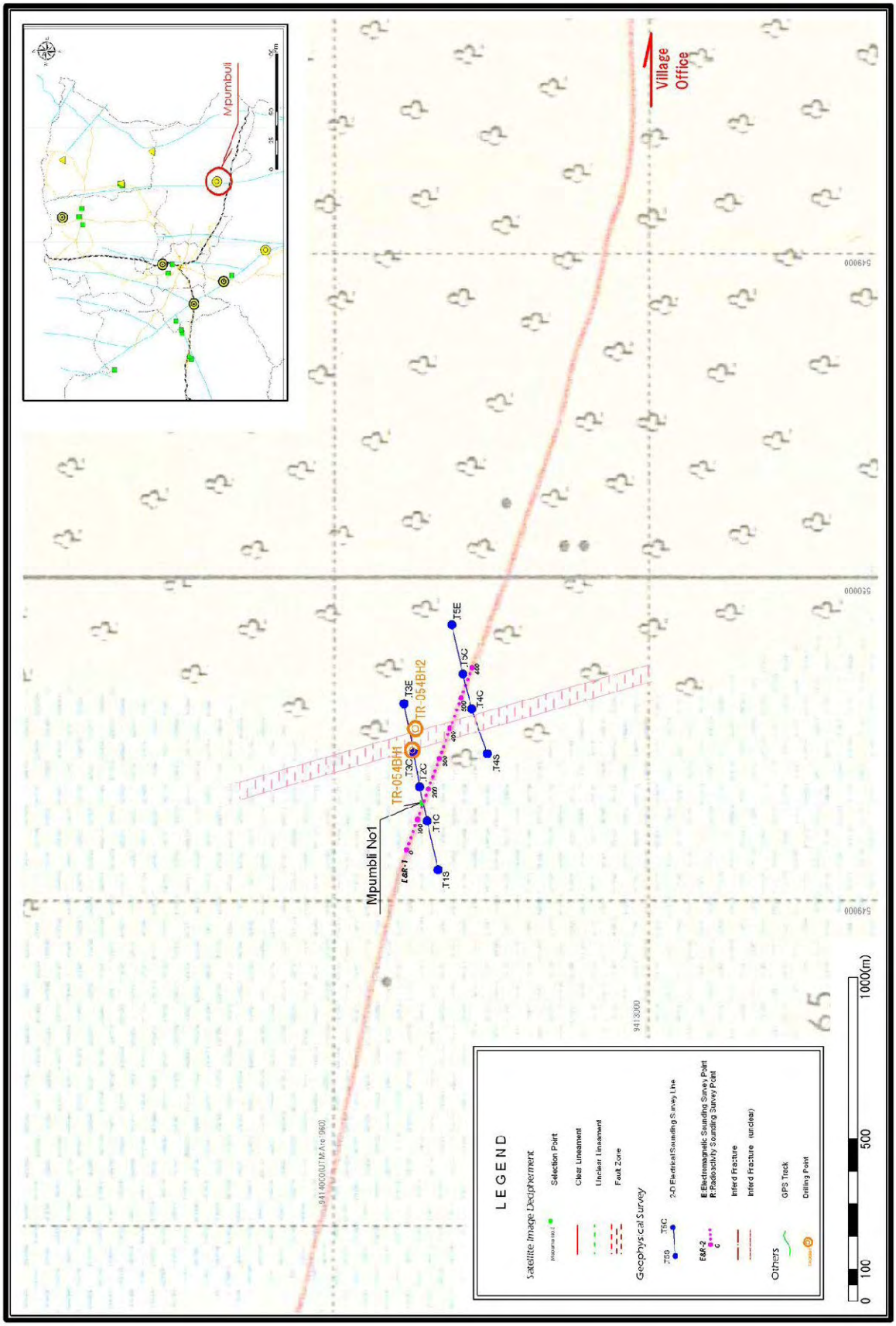

Figure 2.5.19 Layout of Geophysical Exploration (Level-2:Mpumbuli village)

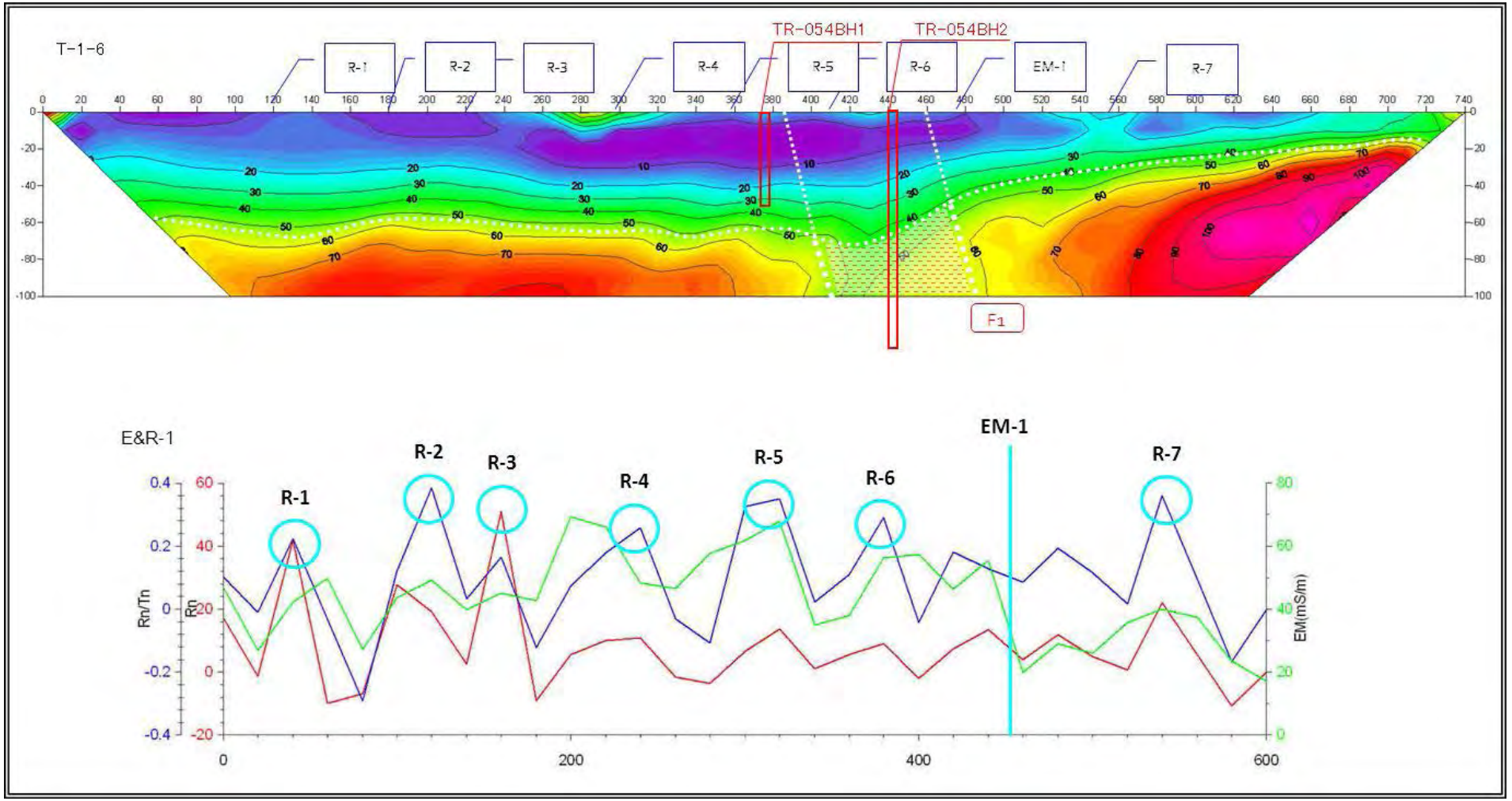

Figure 2.5.20 Results of Geophysical Exploration（Level-2:Mpumbuli village　Mpumbuli No.1）

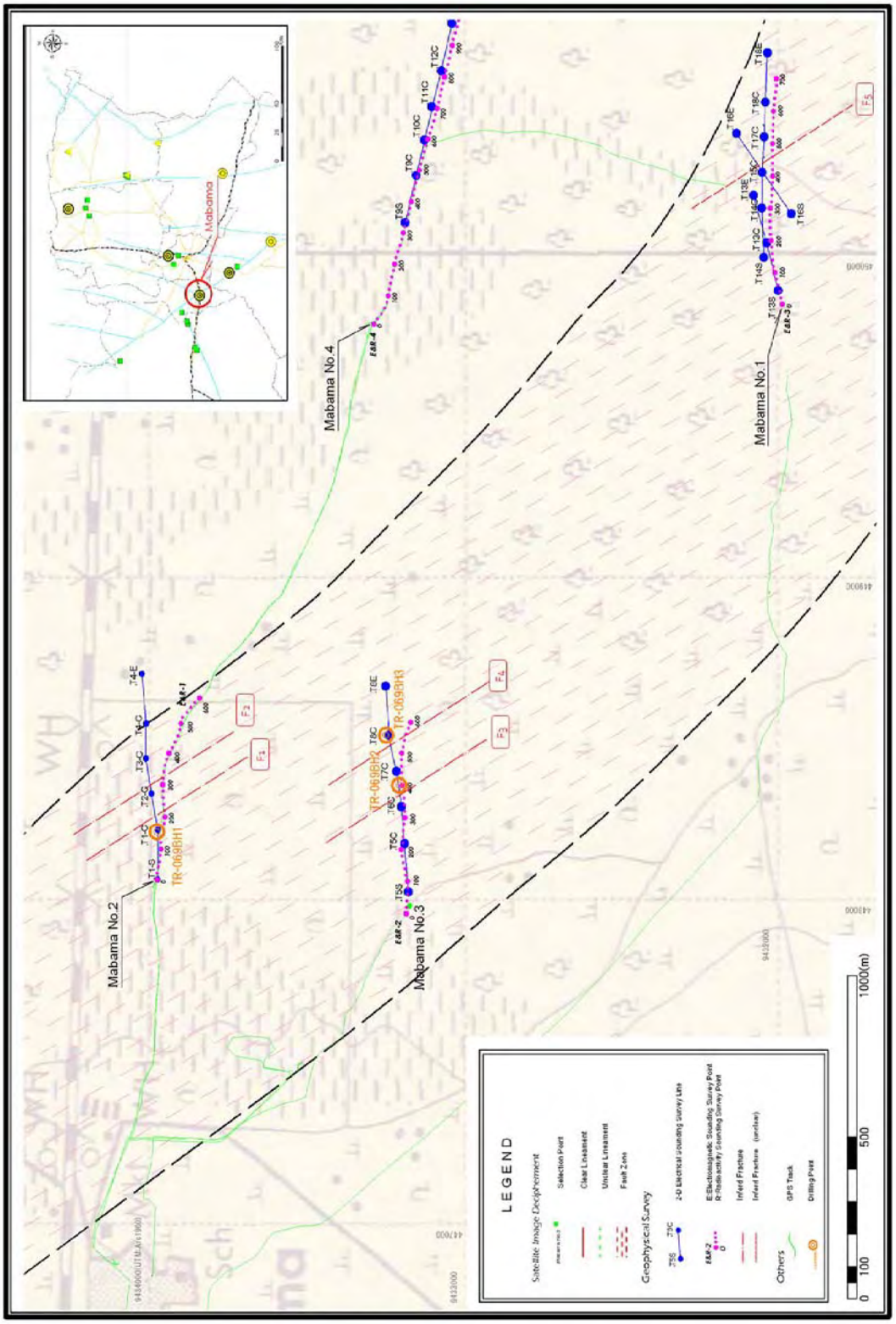

Figure 2.5.21 Layout of Geophysical Exploration（Level-2:Mabama village）

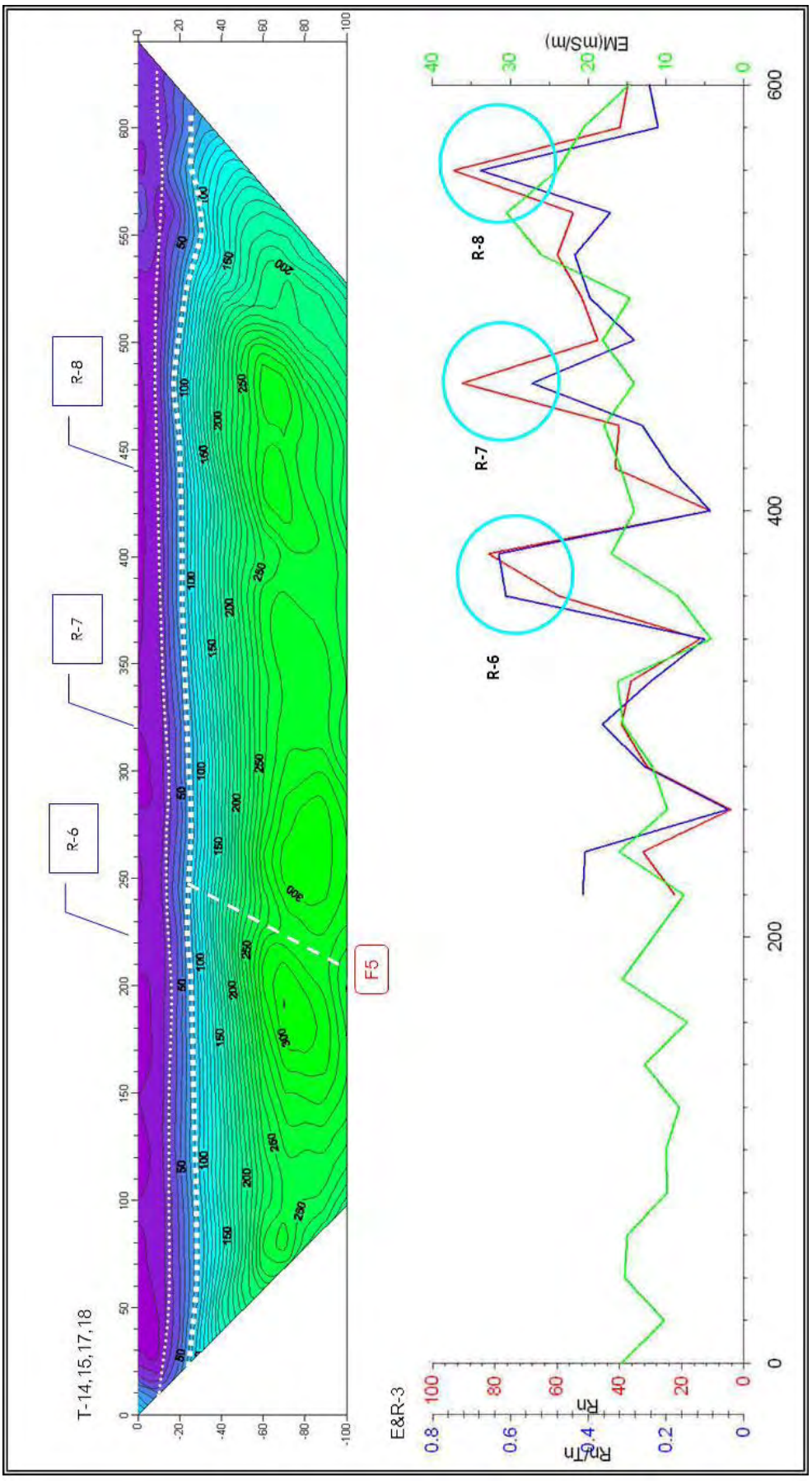

Figure 2.5.22 Results of Geophysical Exploration（Level-2:Mabama village Mabama No.1 1/2)

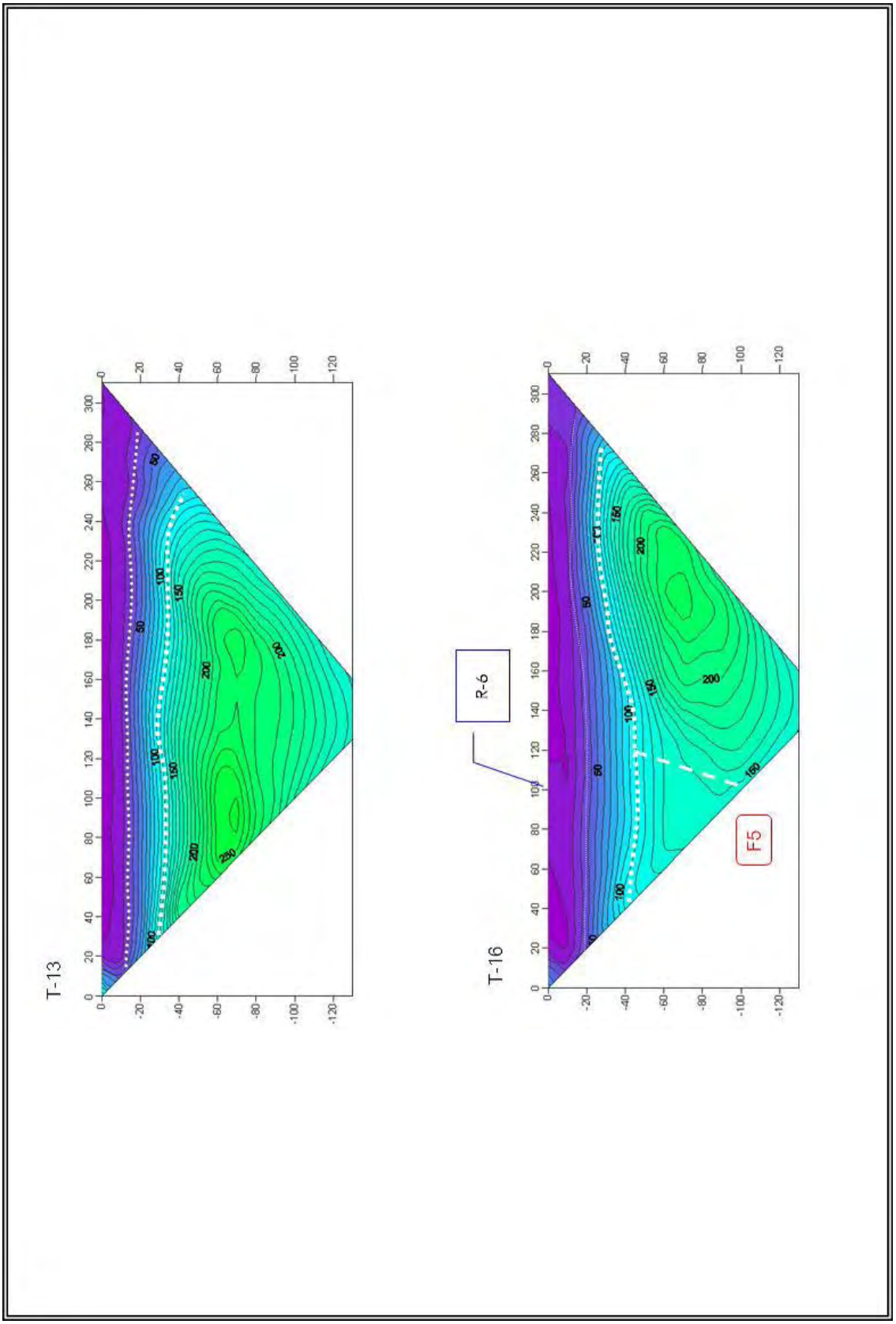

Figure2.5.23 Results of Geophysical Exploration（Level-2:Mabama village Mabama No.1 2/2）

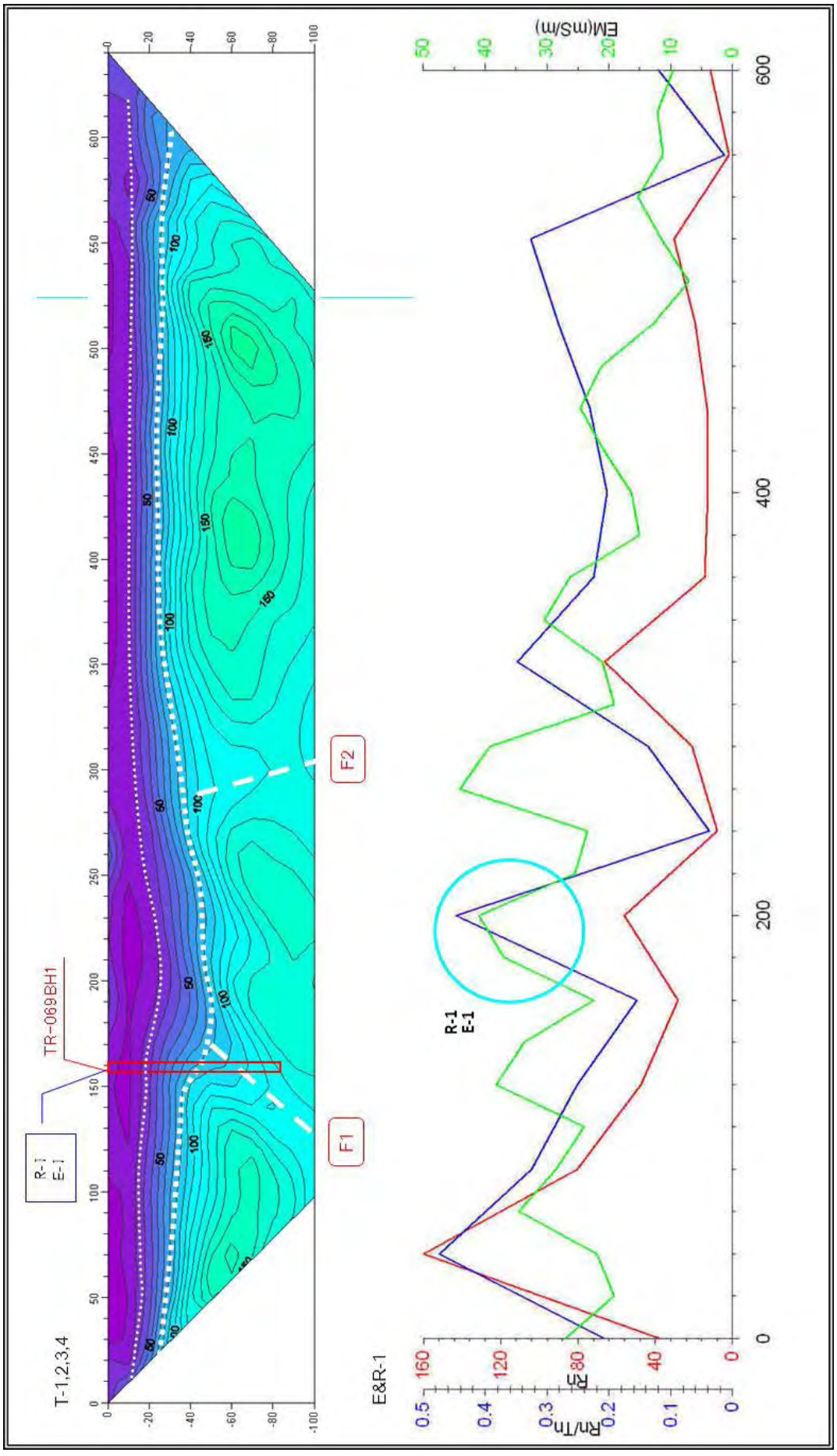

Figure 2.5.24 Results of Geophysical Exploration（Level-2:Mabama village Mabama No.2 ）

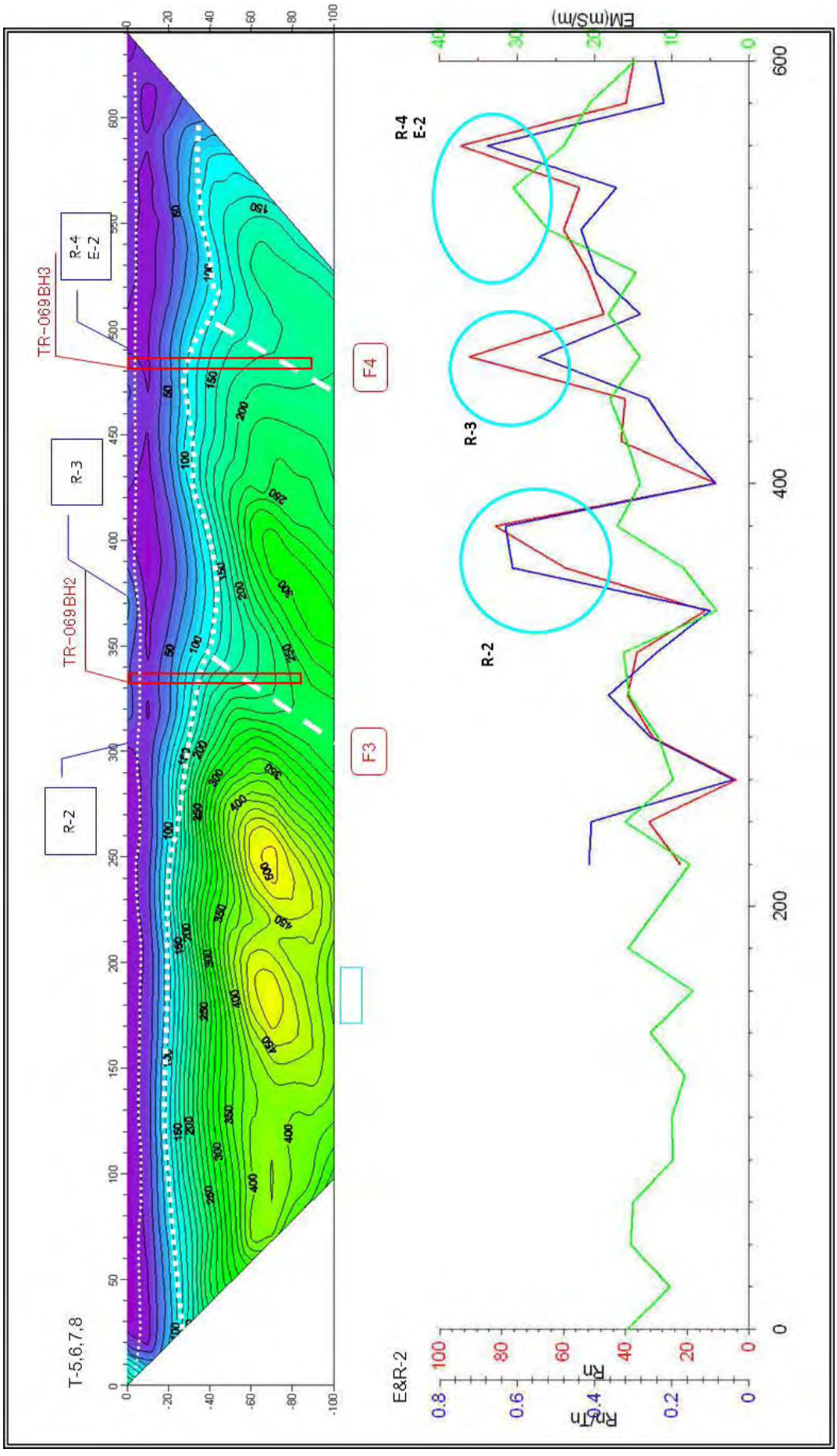

Figure 2.5.25 Results of Geophysical Exploration（Level-2:Mabama village Mabama No.3）

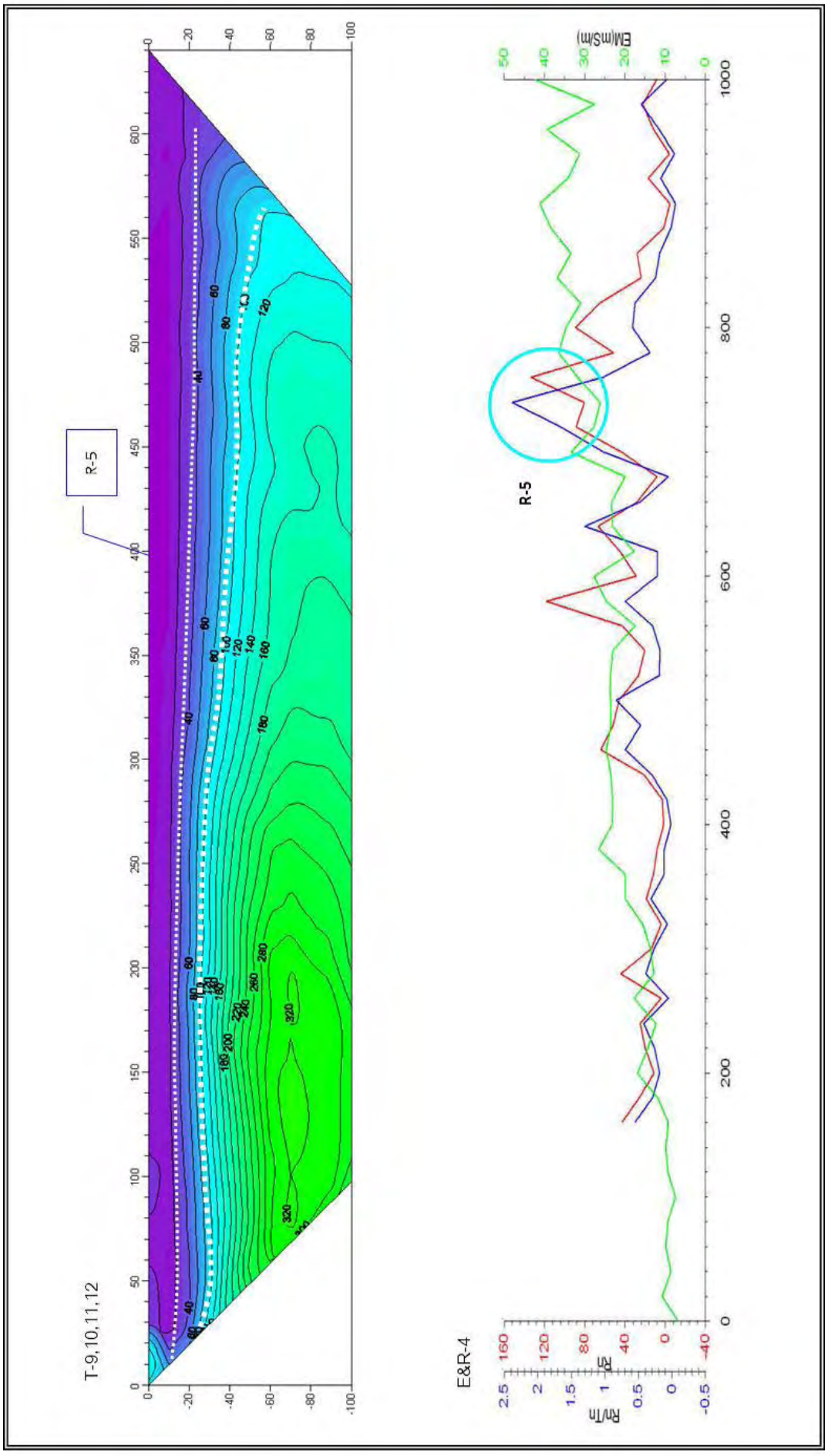

Figure 2.5.26 Results of Geophysical Exploration（Level-2:Mabama village Mabama No.4）

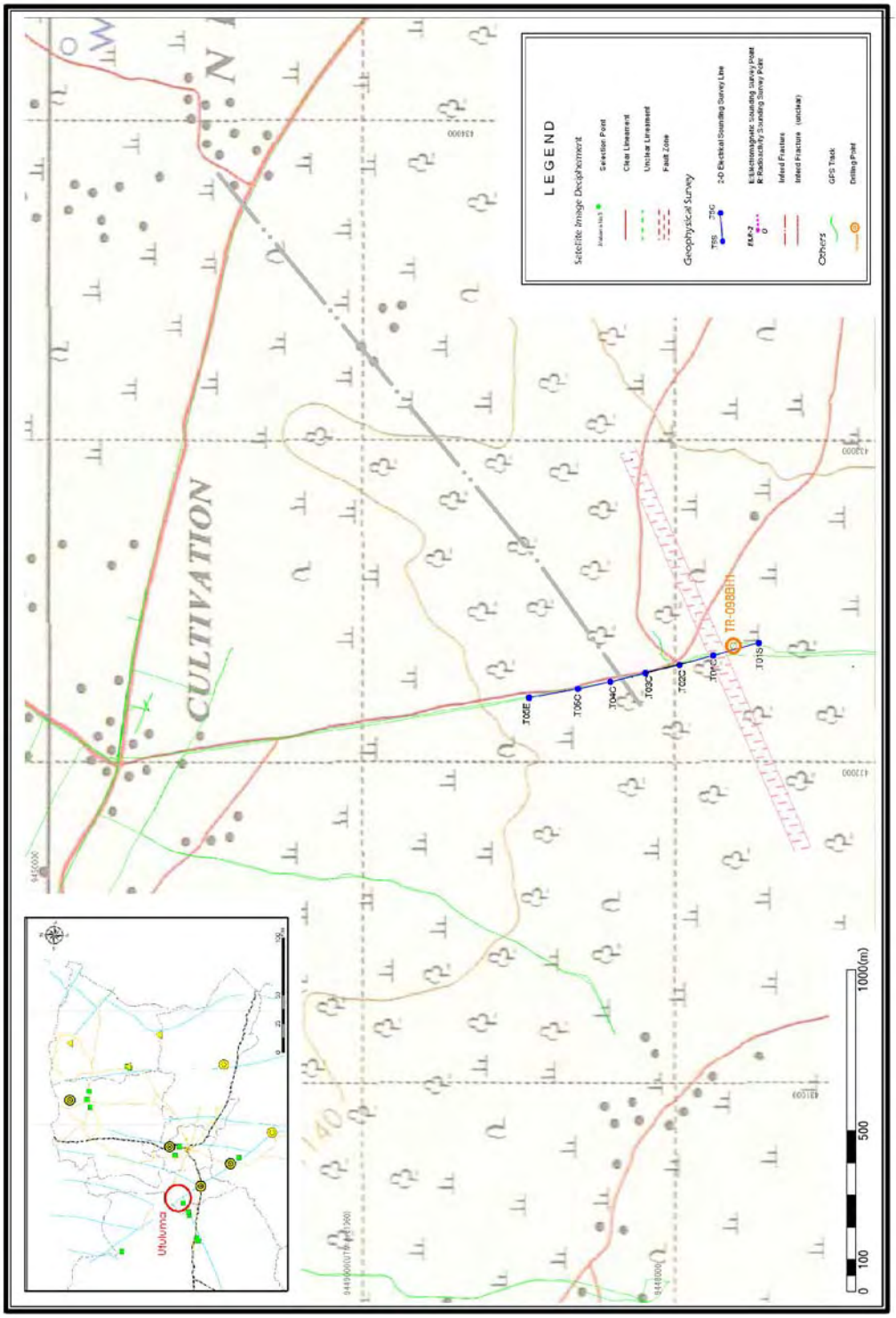

Figure 2.5.27 Layout of Geophysical Exploration（Level-2:Ufulumai village）

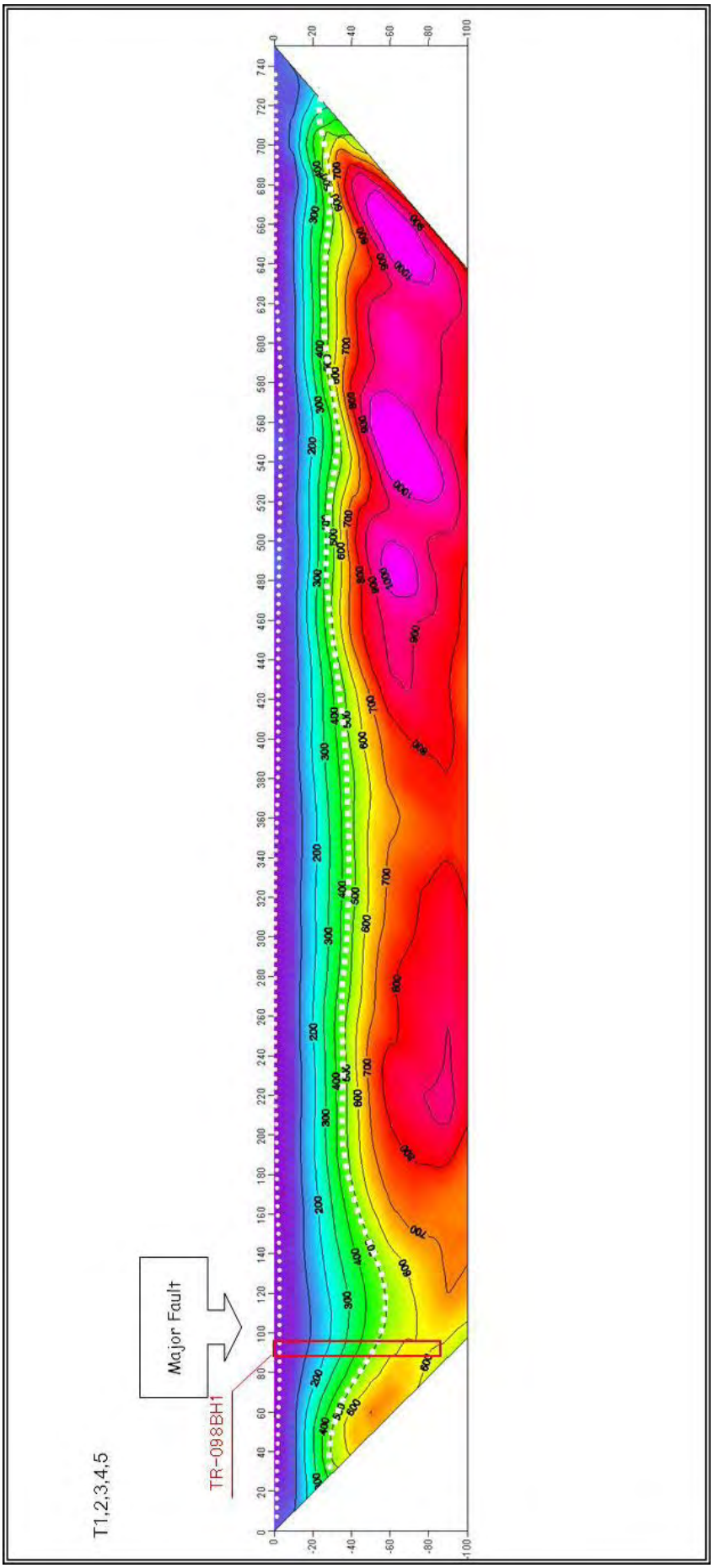

Figure 2.5.28 Results of Geophysical Exploration（Level-2:Ufuluma village）

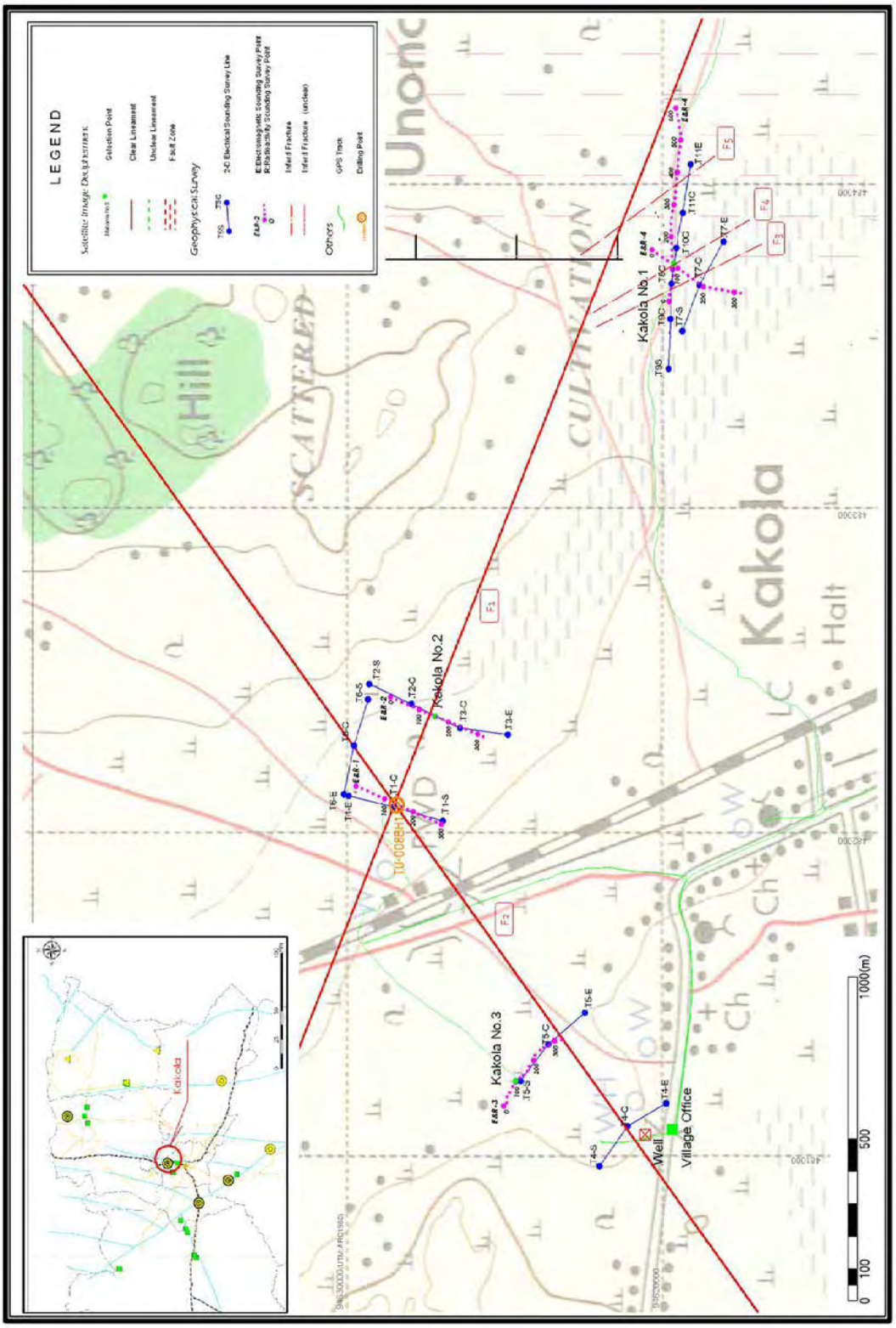

Figure 2.5.29 Layout of Geophysical Exploration（Level-2:Kakola village）

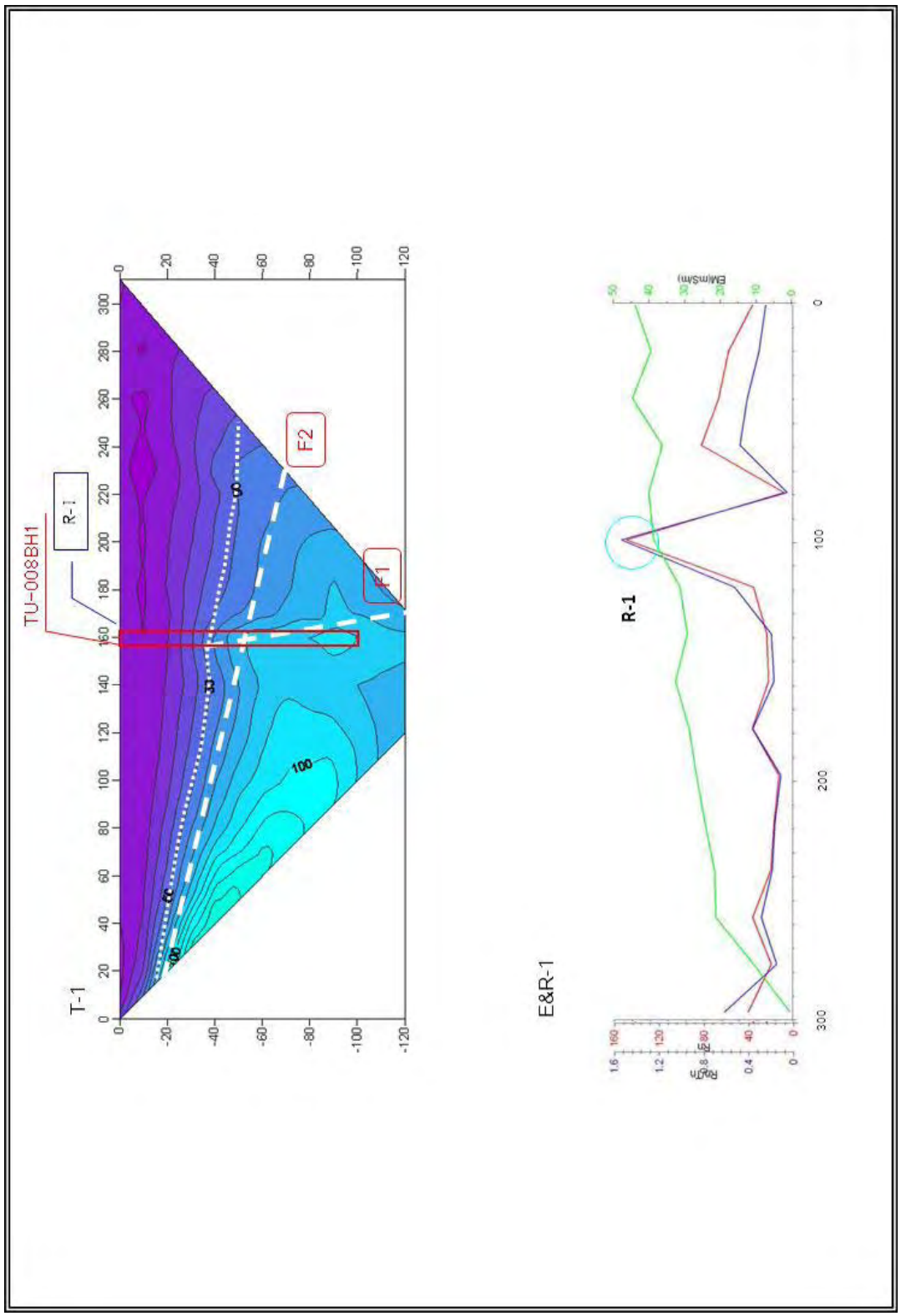

Figure 2.5.30 Results of Geophysical Exploration (Level-2 :Kakola Village Kakola No.2 1/2)

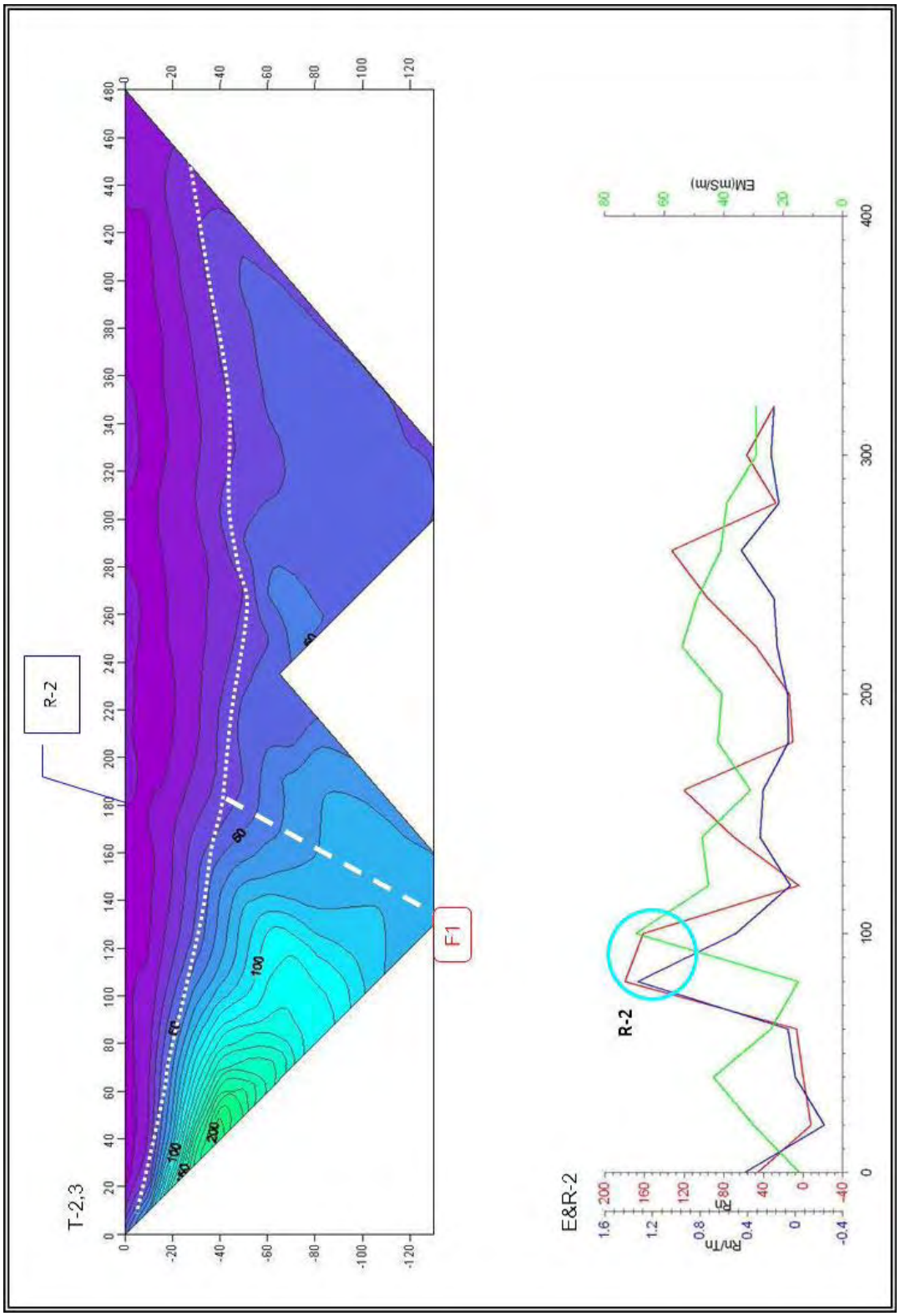

Figure 2.5.31 Results of Geophysical Exploration (Level-2 :Kakola Village Kakola No.2 2/2)

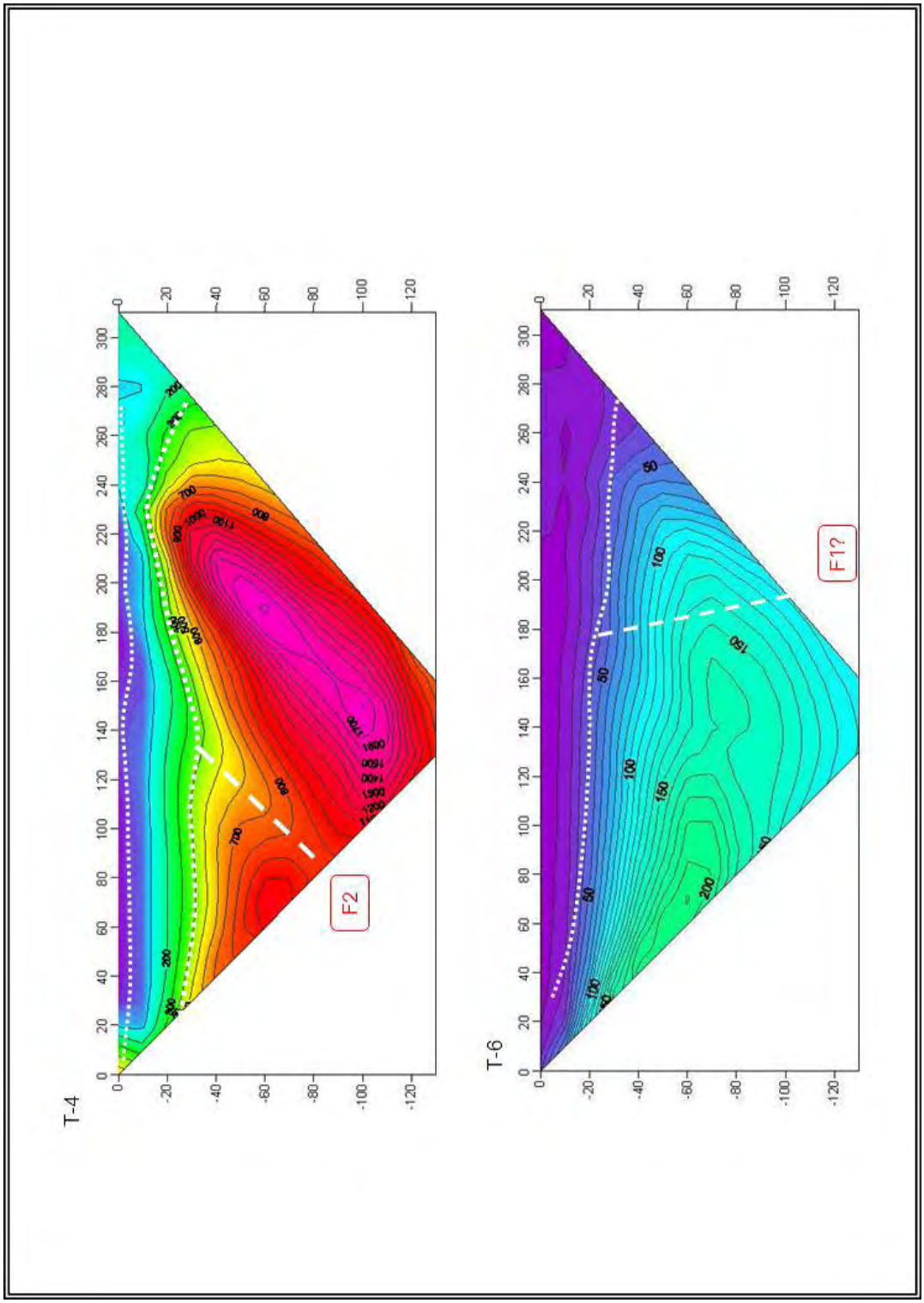

Figure 2.5.32 Results of Geophysical Exploration (Level-2 :Kakola Village Kakola No.2,3 1/2)

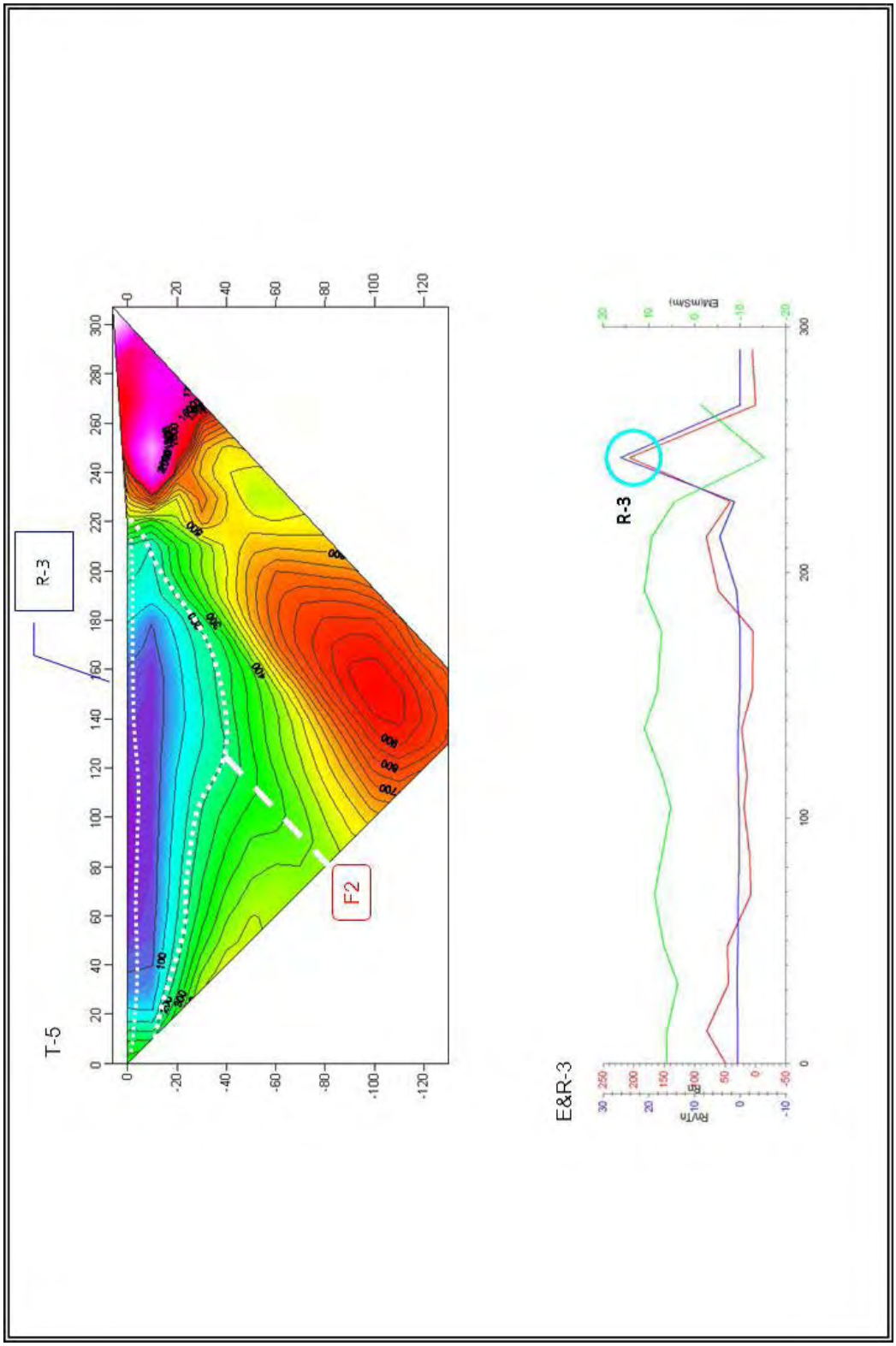

Figure 2.5.33 Results of Geophysical Exploration (Level-2 :Kakola Village Kakola No.3 2/2)

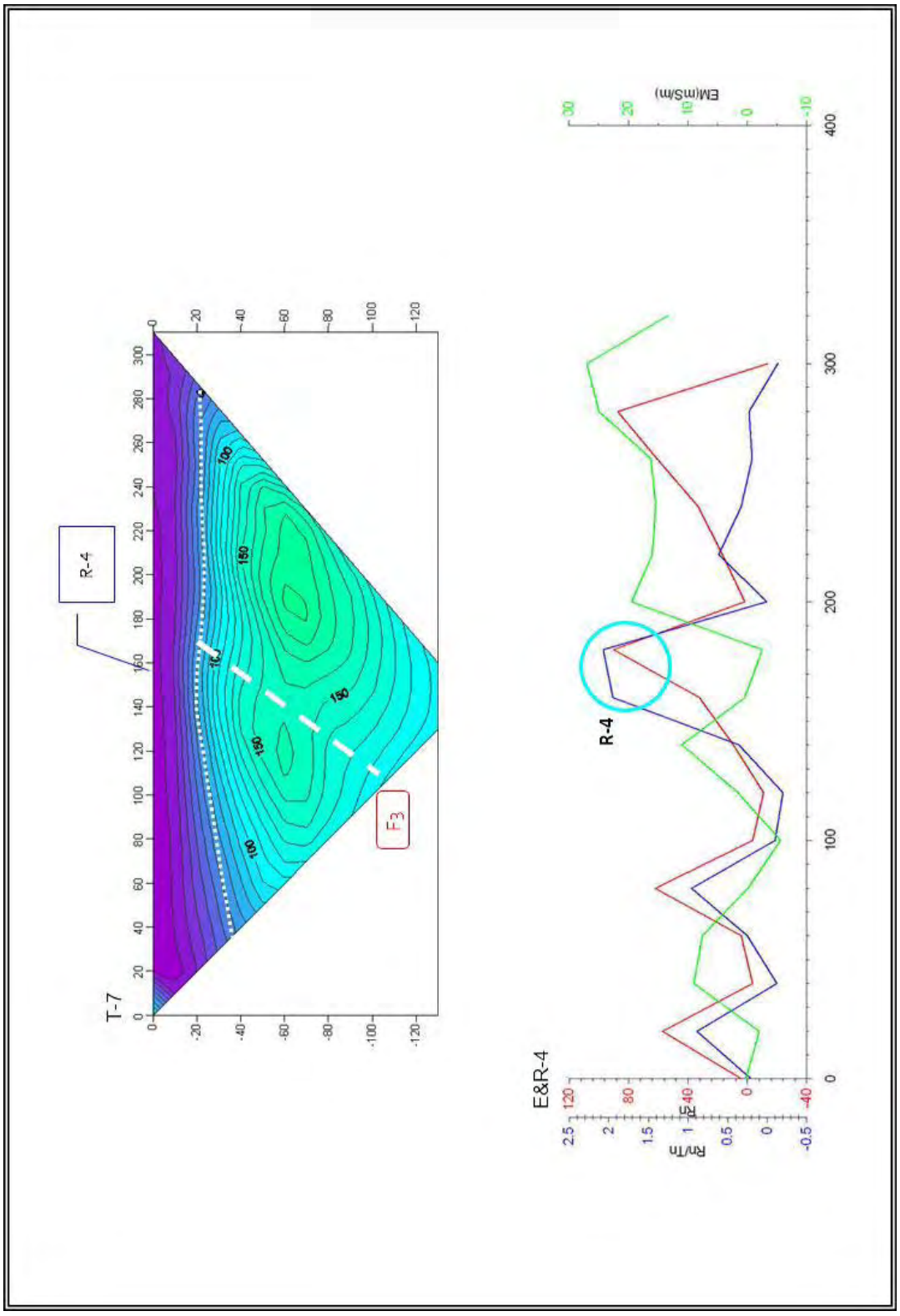

Figure 2.5.34　Results of Geophysical Exploration　(Level-2 :Kakola Village　Kakola No.1　1/2)

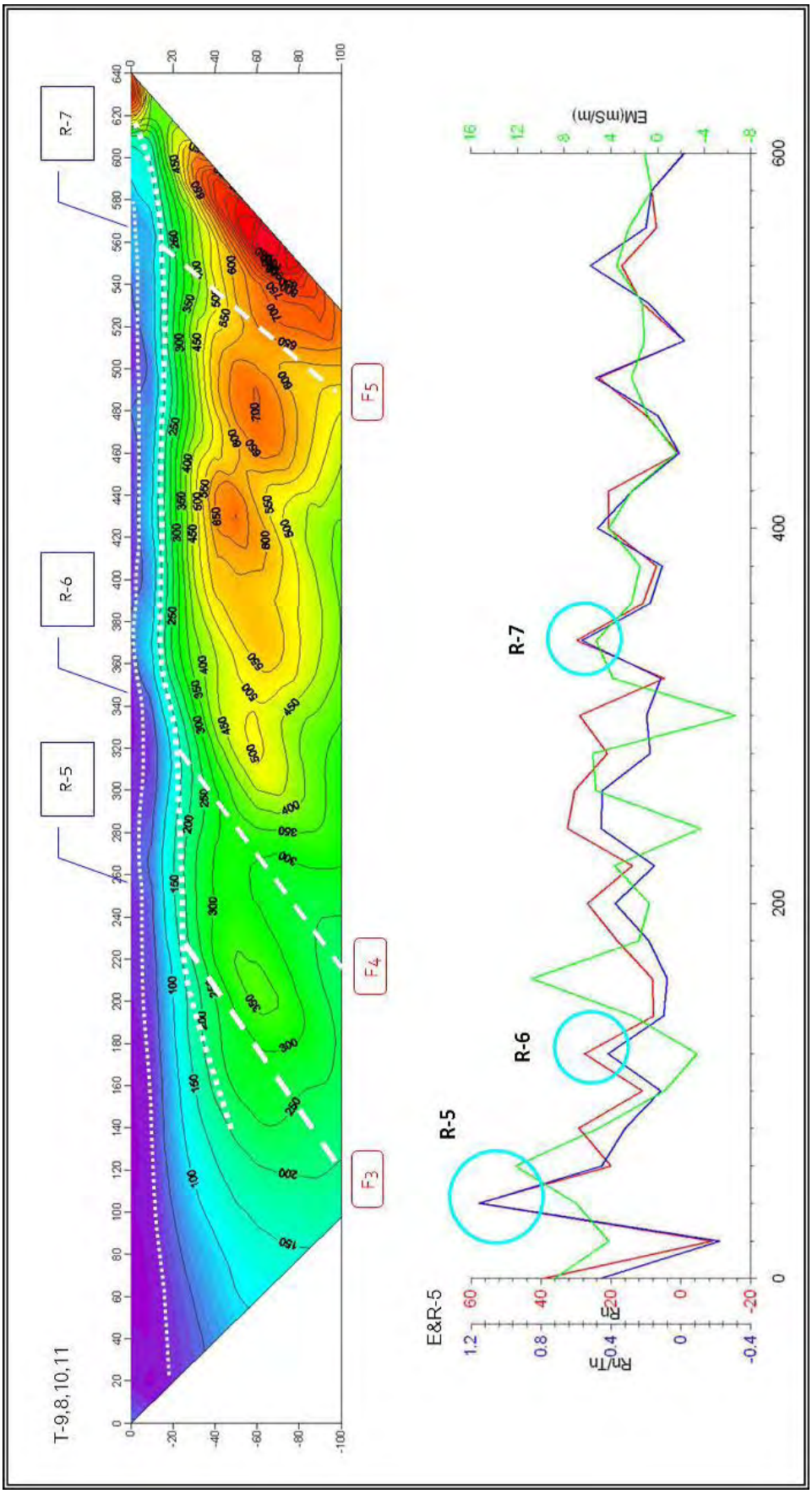

Figure 2.5.35 Results of Geophysical Exploration (Level-2 :Kakola Village Kakola No.1 2/2)