• Fieldtrip 1
  
  Details: This fieldtrip was sponsored by Steward R Wallace Fund
  Time: The fieldtrip was held on Sunday, 10\(^{th}\) February 2018.
  Location: Kali Adem, Sleman, Special Region of Yogyakarta
  Participants: All member of SEG UGM-SC 2018
  Transportation and Logistic: Students went to the location by motorcycles because the pathway couldn't be reached by bus or car. The road headed to location is narrow and rocky path, and it took about 20 minutes from main road to the fieldtrip location.

Detailed report:
This fieldtrip took place at Kali Adem, near Mt. Merapi, Yogyakarta. The location approximately 25 kilometers from Universitas Gadjah Mada. In this location, students learn about volcanic deposits near Mount Merapi and its economic potentials as industrial minerals. This fieldtrip was led by our SEG UGM SC’s former, Iza Zulfana Fikri as speaker of Merapi’s volcanic deposits. Based on regional geology, this location was included in Young Volcanic Deposits of Merapi Volcano. At this location, we can find volcanic materials such as tuff, ash, breccias, and agglomerate. This volcanic deposits were formed by Merapi's eruption in 2010. This materials are well exposed in cliff and river near the location. The rock unit that found in this location can be divided in to 2 units, igneous rocks and pyroclastic rocks.

The igneous rocks that found in this location have andesitic-basaltic compositions. The structure of the rock shows massive structure and some of them shows vesicular on the surface. Meanwhile, the pyroclastic rocks that exposed in west and east cliffs show massive and layered bed. The massive layered rocks show poorly sorted with matrix supported textures. This deposit was interpreted as pyroclastic flow deposits. And the layered pyroclastic deposit was interpreted as pyroclastic surge deposits.

Near this location, students can see mining activities of the volcanic materials. This volcanic materials were excavated by excavator machine and then it was carried by large trucks. This materials can be used as building material and have high economic values.
Figure 1. Explanation about volcanic deposits at Kali Adem by SEG UGM SC's former.

- Fieldtrip 2
  Details: This fieldtrip was sponsored by Steward R Wallace Fund
  Time: The fieldtrip was held on Sunday, 13<sup>th</sup> May 2018
  Location: Gunung Gupit, Magelang, Central Java
  Transportation and Logistic: Students were delivered to fieldtrip location by bus for a day trip.
  Participants: All member of SEG-UGM SC
  Detailed Report:
  This fieldtrip took place in Gunung Gupit, Magelang Central Java. This location approximately 45 kilometers to the Northwest of Yogyakarta. In this location, students learned about hydrothermal alteration. Based on regional geology, this location is part of Menoreh Hills, located at northside of Kulonprogo Mountain. Students was divided into 2 groups. Each groups were requested to do observation around this area and focused on the occurrence of alteration rocks, its intensity and determine the key minerals of each alteration type that can be found in this area.
The alterations that found around this area included silicification, advanced argillic, and argillic alteration. The occurrence of silicification was marked by the presence of vuggy silica and massive silica. Advanced argillic alteration was marked by the occurrence of silica and clay minerals. This alteration shows brownish grey color, with stockwork veins. Argillic alteration shows brownish white color, with soft textured clay minerals. The white colored minerals was identified as kaolinite.

After doing some detailed observation, students were given some explanation about alteration zone and characteristics and mineralization of this filedtrip area by SEG UGM SC’s formers, Yessy Fatimah and I Gusti Ngurah Kusuma. They explained that type of mineral deposits in Gunung Gupit was classified as epithermal high sulphidation with very acidic fluids. Mineralization of gold in this area was controlled by presence of geological structure, such as dextral fault and sinistral fault. These faults interpreted as channelway of hydrothermal fluid which brings economic deposits in this area.

Figure 1. Photo of student and speakers of 2nd fieldtrip at Gunung Gupit.
Figure 2. Students observed an outcrop and made detailed observation about alteration minerals and its host rocks.

Figure 3. Students discussed about characteristic of mineralization in Gunung Gupit.
- **Fieldtrip 3**

**Details:** This fieldtrip was collaborated with Universitas Padjadjaran SEG student chapter. All the fieldtrip and accommodation costs was shared with these student chapters.

**Time:** The fieldtrip was held on Sunday, 19th August 2018.

**Location:** Sangon and Glagah Beach, Kulonprogo, Special Region of Yogyakarta

**Transportation and Logistic:** Students were delivered to fieldtrip location by two buses for a day trip.

**Participants:** All member of SEG UGM SC featuring SEG Unpad SC

**Detailed Report:**

This fieldtrip was a part of Universitas Padjajaran SEG student chapter's visit to Yogyakarta. This trip was held on 19th August 2018 and took place at Kulonprogo, Special Region of Yogyakarta. There are 2 stopsites on this fieldtrip. The first trip is headed to Sangon, Kulonprogo, Special Region of Yogyakarta and the 2nd stopsite is Glagah Becah.

- At 1st stopsites, students from Universitas Gadjah Mada and Universitas Padjadjaran observed outcrops related to gold mineralization in Kulon Progo. They observed the characteristics of its host rocks, mineralization type, and alteration zone. During this fieldtrip, students found many hydrothermal veins with different textures such as massive texture, crustiform texture, comb texture, and drussy texture. Beside the hydrothermal veins, students also made a detailed observation about its host rocks. The hostrock of this area is mainly composed of andesitic rocks and breccias. The speakers of this fieldtrip, Mr. Fahmi Hakim give some explanation about hydrothermal low sulphidation and gold mineralization in this area. He also give detailed explanation about its host rocks, especially about diatreme breccias that found in this area and its importance in ore exploration. Further explanation about breccias also given by Mr. Faisal Sangaji. He explained the classification of breccias, its characteristic, its genesis, and its importance as guide to ore. After doing observation in field, all students took a rest in nearest mosque for doing zuhur prayer and have a lunch. After take a rest, trip was continued to Glagah Beach.
Figure 1. Student observed an altered outcrop at Sangon,

Figure 2. A close up view of altered breccias with sulfide veins.

Figure 3. Explanation about hydrothermal low sulphidation deposits and diatreme breccias was delivered by Mr. Fahmi Hakim
At 2nd stopsite, students observed placer deposits at Glagah Beach. The deposits show black color, with fine-coarsed sand size particles, and composed of magnetite, iron oxides, olivine, pyroxene, and quartz minerals. This deposits is iron placer deposits that accumulated in southern shore of Yogyakarta. The provenance of this deposits interpreted from mechanical weathering of andesitic intrusion at Kulonprogo Mountains. The materials were transported through the river and deposited in southern shore. Mr. Faisal Sangaji give explanation about REE contents in this placer deposits. He explained that this deposits have potential as source of titanium and vanadium that can be used in many aspect of modern technology. He also give a challenge to students to make a new research about its REE contents and how to extract it to add more economic values to this deposits.
**Company Visit**

**Details:** This fieldtrip was sponsored by Steward R Wallace Fund  
**Time:** The fieldtrip was held on August 25\textsuperscript{th} 2018  
**Location:** Alexis Perdana Mineral (APM), Selogiri, Central Java, Indonesia  
**Transportation and Logistic:** Students were delivered to fieldtrip location by a bus for a day trip.

**Trip Leader:**  
- Lucas D. Setijadji (Lecturer at Dept. Geological Engineering, UGM)  
- Fahmi Hakim ((Former of SEG UGM-SC)  
- Aditya Pratama (Exploration Geologist PT. Jresources)  
- Sapto Putranto (PT Alexis Perdana Mineral)

**Participants:** 25 members of SEG UGM SC

**Detailed Report:**  
Company visit was held on Saturday, August 25\textsuperscript{th} 2018 at Alexis Perdana Mineral (APM), Selogiri, Wonogiri, Central Java, Indonesia.

In order to achieve the aim of having an excellent understanding about gold and copper deposit, SEG UGM-SC 2018 visited Randukuning Porphyry Cu-Au Prospect of Alexis Perdana Mineral (APM) Company on Saturday, August 25\textsuperscript{th} 2018 in Selogiri, Wonogiri, Central Java, Indonesia. The participants to this visit was 25 active student chapter members and was guided by Dr. Lucas Dony Setijadji, S.T., M.sc. (faculty advisor and also lecture of mineral resources Universitas Gadjah Mada), Fahmi Hakim, S.T., M.T. (Former of SEG UGM-SC), Aditya Pratama, S.T. (Exploration Geologist PT. Jresources) and Mr. Sapto Putranto (PT Alexis Perdana Mineral).

At 08.00 a.m, we arrived at PT. Alexis Perdana Mineral after 3 hours journey by bus from Yogyakarta. We were having explanation about Randukuning prospect by Mr. Sapto Putranto and followed by observation to core samples in coresite (figure 1). We learned how to decribe a core sample correctly and what parameters should we describe. After having a great lesson from the coresite, we continued to the Randukuning Prospect.

We had 3 stopsite to observe. At the first stopsite, we found the rock samples from surface which had many iron oxide and we have the rock samples got from the traditional miners to observe the alteration and mineralization below the surface.
We found that the rock samples were mineralized by galena (PbS), pyrite (FeS2) and sphalerite (ZnS) and altered by kaolin and silica. At the second stopsite, we went to the top of the hill and we found malachite mineral that indicates supergene enrichment of Cu (figure 2). At the third stopsite, we found advanced argillic alteration known by the secondary mineral association which dominated by kaolin and alunite and ensure by the presence of vuggy silicates.

There are many lessons and experiences we got from this company visit. We hope, in the future we could visit the company again or another company to make our understanding about mineral resources better and best. (figure 3).
**Minnovation Fieldwork 2019**

**Details:** This fieldtrip was the following event after having a workshop about spectral analysis and exploration in lithocap environment on February 16th 2019. This fieldtrip was sponsored by Steward R Wallace Funding batch 1 and several mining companies (PT. Aneka Tambang, Micromine Ltd, Sumacorp, and PT. J Resources) and supported by PT. Bumi Suksesindo (BSI).

**Time** : The fieldtrip was held in 4 days (February 17-20th, 2019)

**Location** : Tumpangpitu mining area of BSI, Pulau Merah Beach and Ijen Crater, East Java, Indonesia

**Transportation and Logistic:** Participants were delivered to fieldtrip location by one bus for 4 day trip and stay at villa near the location.

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<tr>
<td>1</td>
<td>Fahmi A. Makkaratte</td>
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<td>Faiza R. Hakim</td>
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**Trip Leader:**
- Adi Maryono (VP Exploration of J Resources Nusantara)
- Lucas D. Setijadji (Lecturer at Dept. Geological Engineering, UGM)
- Geologist from PT. Bumi Suksesindo

**Detailed Report:**

The trip was designed for practising the workshop materials about spectral analysis in lithocap environment which have been given by Mrs. Rachel Harrison (Indenpendent Consultant Geologist) and Mr. Adi Maryono (VP Exploration of J Resources Nusantara). The trip was started on Sunday, February 17th 2019.
At the first day, we travelled to Tumpangpitu, East Java from Department of Geological Engineering UGM (figure 4) by bus for about 15 hours. After arrived at the villa, all the participants got some rest and prepared for the trip in the next day to Tumpangpitu area.

![Participants ready for Minnovation Fieldtrip to Tumpangpitu and Kawah Ijen (SEG UGM-SC Documentation, 2019)](image)

### _Tumpangpitu Mining Area PT Bumi Suksesindo_ (February, 18th 2019)

At 7.00 pm we arrived at the PT Bumi Suksesindo. We have 2 sessions at PT Bumi Suksesindo. In first session, we had explanations about geological condition of Tumpangpitu, several gold and copper prospects near the Tumpangpitu and successful exploration history by using Analytical Spectral Devices (ASD) by Mr. Irwanto and Mr. Rizfan Hasnur from PT. BSI. Tumpangpitu is an area with porphyry Cu-Au deposit and overprinted by high sulfidation epithermal. The mineralization of the porphyry system was hosted by tonalite intrusion and structurally controlled by N-S and NE-SW trending strike-slip fault. In this session we also trained how to use the terraspec tool and interpret the spectral data by Mr. Rizfan Hasnur and team (figure 5).
In second session, we went to the B-West Pit and had an explanation about the types of the alteration and mineralization in the field lead by Mr. Adi Maryono and Mr. Rizfan Haznur (Figure 6). From figure 6, the high grade Au is located among the structural fault and mostly the rock with the high grade is rich in hematite so the colour becomes red. On the other hand, the grey one with argilic alteration is no grade. Mr. Adi also give explanation about important aspects for doing an exploration in lithocap environment (Figure 7). Mostly rocks in the lithocap environment has been weathered, so we may found iron oxide minerals in the outcrop. These iron oxide is one of the important aspect. The iron oxide, practically divide into 3 minerals, they are hematite with the characteristic is red in colour and so does the streak, jarosite with brownish yellow in colour and has yellow streak, and the last is goethite with brown colour and streak. The hematite is believed to be the product of weathered complex sulfide for example enargite and luzonite. The jarosite is believed to be the weathered simple sulfide so the previous rock may be rich in pyrite mineral. It is also important to make a note containing the streak colour of the iron oxide so we has a consistency when determining the type of iron oxide minerals.

The next agenda, we went to the coresite of Tumpangpitu lead by Mr. Irwanto. He explained several drilling methods that was used in tumpangpitu area such as navi-drilling or directional drilling (figure 8). This method was used to know the horizontal variation of the alteration and mineralization in the subsurface. After that, we moved to Pulau Merah beach but due to the high tide condition, we could not reach the Pulau Merah island so we just observe a floatation rock which has a stockwork vein structure.
Figure 6: Pit B-West of Tumpangpitu copper and gold mining (SEG UGM-SC Documentation, 2019)

Figure 7: Mr. Adi Maryono explains about exploration in lithocap environment (SEG UGM-SC Documentation, 2019)

Figure 8: Participants were listening to Mr. Irwanto explanation about navi-drilling (SEG UGM-SC Documentation, 2019)
- **Ijen Crater, Banyuwangi, East Java** (February, 19th 2019)

After leaving Tumpangpitu area, we went to Kawah Ijen and have a rest before hiking to the crater. At 01.00 pm, we were ready to hiking Ijen Crater. We arrived at the Ijen Crater at 04.00 pm and enjoy blue fire phenomenon (**figure 9a**). After the sun rise, we started to have discussion about the crater lead by Mr. Lucas. Ijen Crater is an active hydrothermal system which interpreted to be an example of process that may cause the epithermal high sulphidation at the future. Kaolinite alteration and a few alunite alteration largely found in the crater with the vulcanic breccia as the host rock. Massive sulphur mostly found as the precipitation from hydrothermal fluid. This massive sulphur is being mined by locals residents. Caudron (2015) told that the acidity of the fluid in Ijen crater is hyperacidic with pH around 0–0,3.

The others object that we can learnt from Ijen Crater is the pyroclastic material that we can found. We found an outcrop of scoria rock which believed has genetically form by pyroclastic fall process (**figure 9b**). The scoria is the latest product of ijen crater as we can see all of the materials covering the others vulcanic rock beneath. The characteristic of the scoria, is following the paleomorphology at the center of Ijen crater and the thickness is almost the same in the valley and the crest of the morphology.

![Figure 9: a) fumaroles at the ijen crater; b) pyroclastic fall deposit at the center of the crater (SEG UGM-SC Documentation, 2019)](image-url)
SEG UGM-SC received $500 by Steward R Wallace Fund in the first application round of 2018. The funds were spent to sponsor our field activities especially for accommodation and transportation.

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*will be held on February 2019

In order to cover all the cost of the total balanced, we are also supported by several mining companies.

They are:
1. PT Aneka Tambang
2. Sumacorp
3. Micromine Ltd
4. PT Jresources Nusantara
5. PT Alexis Perdana Mineral