JABATAN MINERAL DAN GEOSAINS MALAYSIA
DEPARTMENT OF MINERAL AND GEOSCIENCE MALAYSIA

LAPORAN TAHUNAN 2017 ANNUAL REPORT

KEMENTERIAN SUMBER ASLI DAN ALAM SEKITAR MALAYSIA
MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT MALAYSIA

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Perutusan Ketua Pengarah
Message From The Director General

Tahun 2017 merupakan tahun yang begitu signifikan bagi JMG, bukan sahaja dari segi kecemerlangan pencapaian projek pembangunan, malah juga dalam bidang R&D&C dan kerjasama luar negara. Melalui projek dan kajian yang dilaksanakan di bawah aktiviti utama jabatan, JMG telah berjaya mengumpul dan memetakan maklumat untuk membolehkan pengurusan yang lebih baik ke atas penggunaan tanah dan perancangan pembangunan negara. Maklumat asas ini adalah amat penting bagi membantu kerajaan dalam menangani masalah berkaitan di samping menguruskan sumber asli negara secara mampan.

Geopelancongan merupakan suatu bidang ekonomi baru yang semakin berkembang. Ia bukan sahaja boleh menjana pendapatan negara malah ia boleh memelihara alam sekitar sesuatu kawasan. Salah satu aspek penting

The year 2017 was a significant year for JMG, not only in terms of project achievements, but also with regards to our achievements in R&D&C and our working relationship with our counterparts at home and abroad. From the projects carried out, JMG has successfully mapped and collected information to enable better management of land use and national development planning. These base information is crucial in assisting the Government to address related issues while managing the country's natural resources sustainably.

Geotourism is a new, sustainable and growing economy. It not only helps to generate the country's revenue but at the same time conserves the environment of the area. One of the most important features of geotourism

dalam geopelancongan adalah geowarisan. Di bawah Projek Geologi Warisan, JMG telah mengambil inisiatif untuk mengenalpasti tapak-tapak yang terdapat di seluruh negara serta menjalankan pemetaan dan pencirian ke atas fitur-fitur geologi yang unik, menarik dan bernilai estetik. Tapak-tapak yang berpotensi kemudian diketengahkan kepada Kerajaan Negeri untuk diterima dan dibangunkan sama ada sebagai geotapak atau geopark. Hasil daripada kajian yang dijalankan, JMG telah berjaya mengenalpasti beberapa geopark di seluruh negara seperti Geopark Jerai, Geopark Lembah Kinta, Geopark Delta Sarawak, Geopark Kinabalu dan Geopark Mersing.

is geoheritage. Under the Geological Heritage Project, JMG has taken the initiative to identify sites across the country and carry out mapping and characterization of geological features which are unique and of high aesthetic value. Potential sites are then highlighted to the State Government for approval to be developed as geosites or geoparks. To date, JMG has identified several aspiring Geoparks across the country such as Jerai Geopark, Kinta Valley Geopark, Delta Sarawak Geopark, Kinabalu Geopark and Mersing Geopark.

Sebagai sebuah agensi yang menerajui pembangunan sumber air bawah tanah, JMG sentiasa komited untuk membantu kerajaan dalam menyediakan bekalan air bersih kepada penduduk di kawasan yang sering menghadapi masalah bekalan air. JMG telah membina telaga-telaga tiub di seluruh negara dan juga Sistem Penapisan Air Tanah Ringkas (SPATR) di Perak, Selangor dan Terengganu. Selain itu, JMG juga telah membina telaga bagi mengawal kebakaran kawasan tanah gambut di negeri Sabah, Selangor, Pahang, Johor, Kelantan dan Terengganu. JMG telah berjaya menyalurkan air bersih untuk penduduk di kawasan rumah panjang di Sarawak dengan menggunakan sumber air graviti. Jabatan ini sentiasa melakukan pemantauan air bawah tanah dan penyelenggaraan telaga tiub dan SPATR bagi memastikan bekalan air tidak terputus dan selamat digunakan.

As a government agency leading the development of ground water resources, JMG is committed to assist the Government in providing clean water to residents in areas where water supply is not readily available. JMG has constructed production wells nationwide as well as the “Sistem Penapisan Air Tanah Ringkas” (SPATR) in Perak, Selangor and Terengganu. In addition, JMG has also built wells to control the peat fires in Sabah, Selangor, Pahang, Johor, Kelantan and Terengganu. JMG has successfully supplied clean water to residents in longhouses in Sarawak using gravity water resources. The Department constantly conducts groundwater monitoring and maintenance on SPATR to ensure the water supply is uninterrupted and safe to consume.

Di bawah projek pembangunan RMKe-11, JMG telah berjaya mengenalpasti kawasan sumber bauksit, unsur nadir bumi berat (HREE) dan *coal-bed methane* (CBM) serta menjalankan Projek sambungan Survei Geofizik Awangan di Wilayah Ekonomi Pantai Timur (ECER). Kajian penilaian sumber logam berat seperti emas dan timah primer telah dilaksanakan di Kedah, Selangor dan Sabah.

Under the RMKe-11 development project, JMG has successfully identified new area for bauxite, heavy rare earth elements (HREE) and coal-bed methane (CBM) sources and conducts the Airborne Geophysical Survey Project in East Coast Economic Region (ECER). Assessment studies on gold and lead were also conducted in Kedah, Selangor and Sabah.

JMG juga menerbitkan laporan status dan sumbangan sektor mineral kepada pembangunan negara. Di samping itu, JMG juga membekalkan statistik perlombongan, pengkuarian dan industri berasaskan mineral kepada agensi-agensi kerajaan. Secara khusus bermula tahun 2017, Jabatan Perangkaan Malaysia telah mewujudkan Penunjuk Ekonomi Hijau/Pembangunan Hijau dan Inventori Gas Rumah Hijau. Dengan pewujudan penunjuk dan inventori tersebut, JMG telah diberi kepercayaan membekalkan data rizab mineral, pengeluaran mineral dan pengeluaran terperinci arang batu, dolomit dan batu kapur. JMG terus melaksanakan

JMG also published reports on status and contribution of the mineral sector to the development of the country. Apart from that, JMG also provided statistic on mining, quarrying and mineral-based industry to government agencies. In particular, starting from 2017 the Department of Statistic Malaysia has to set up the Green Economy / Green Growth Indicators and Greenhouse Gas (GHG) Inventory. With those setting up of indicator and inventory, JMG has been entrusted to supply data on mineral resources, mineral productions, and detailed production of coal, dolomite and limestone. JMG continued to carry out law enforcement, issuance of

tugas penguatkuasaan undang-undang, pengeluaran lesen, permit dan surat kebenaran operasi, di samping memantau operasi perlombongan, pengkuarian dan urusniaga mineral ke atas 144 lombong, 399 kuari dan 36 peniaga mineral termasuk loji pemprosesan mineral bersendirian. JMG bertanggungjawab memastikan aktiviti perlombongan mineral negara dijalankan secara selamat, cekap, mampan dan memenuhi standard alam sekitar dan amalan kejuruteraan terbaik.

licences, permits and operational approval letters apart from monitoring mining, quarrying and mineral dealings on 144 mines, 399 quarries and 36 mineral traders including stand-alone mineral processing plants. JMG is responsible for ensuring that the country's mineral mining activities are carried out safely, efficiently and conforming to the environmental standards and best engineering practices.

JMG melalui Pusat Penyelidikan Mineral (PPM), sentiasa mempertingkatkan kemajuan dalam bidang Penyelidikan dan Pembangunan (R&D) terutama dalam bidang teknologi berasaskan lempung, silika, batuan dan bahan termaju. R&D berkaitan teknologi pemprosesan mineral, perlombongan, pengkuarian dan pemulihan lombong dan kuari juga dijalankan selaras dengan kehendak kerajaan untuk menggalak dan mempelbagai penggunaan sumber mineral tempatan bagi menyumbang kepada pembangunan sektor perindustrian negara. Hasil R&D PPM telah mendapat pengiktirafan antarabangsa dan berjaya memenangi pelbagai hadiah dalam pertandingan berkaitan. Kejayaan yang amat membanggakan telah diperolehi dalam *Invention, Innovation & Design Exposition* (IIDEX) 2017, dimana rekacipta JMG bertajuk "An Innovative Engineered Marble for Building Materials" telah merangkul pingat emas. Dalam *28th International Invention and Innovation Exhibition* (ITEX) 2017, JMG telah memenangi hadiah pingat perak dalam dua rekacipta yang dipertandingkan. Selain itu, satu projek penyelidikan telah dianugerahkan perbaharuan utiliti dan tiga projek penyelidikan telah didaftarkan untuk permohonan paten manakala dua produk telah terpilih dalam pencalonan produk bagi Tahun Pengkomersialan Malaysia 2017 (MCY 2017).

JMG through our Mineral Research Centre (PPM) has progressed tremendously in Research and Development (R&D) especially in the fields of clay, silica, rock and advanced materials based technology. The R&D programs are in line with the government's desire to promote and diversify local mineral resources to contribute to the development of the industrial sector. Our R&D products are internationally recognized and have won various prizes in the relevant competitions. In the Invention, Innovation & Design Exposition (IIDEX) 2017, JMG's invention titled "An Innovative Engineered Marble for Building Materials" won a gold medal. In the 28th International Invention and Innovation Exhibition (ITEX) 2017, JMG submitted 2 inventions which won 2 silver medals. In addition, 1 research project was awarded utility innovation and 3 research projects were registered for patent while 2 products were selected in product nomination for Malaysia Commercialization Year 2017 (MCY 2017).

Di peringkat antarabangsa, JMG meneruskan amalan dasar menjalin kerjasama saintifik serta perkongsian kepakaran dalam bidang geosains dan mineral ekonomi dengan negara Thailand dan Indonesia. JMG juga bekerjasama mengendalikan program saintifik dengan agensi kerajaan dan pertubuhan luar negara seperti *Coordinating Committee for Geoscience Programmes in East and Southeast Asia* (CCOP), *Japan International Cooperation Agency* (JICA) dan juga institusi pengajian seperti *Korea Institute of Geoscience and Mineral Resources* (KIGAM) dan lain-lain lagi. Sebagai penghargaan ke atas sumbangan dan kerjasama yang diberikan, Ketua Pengarah JMG yang merupakan wakil tetap Malaysia ke CCOP telah dilantik sebagai Pengerusi *Steering Committee* CCOP. JMG juga terus memberikan

Internationally, JMG continues its policy for scientific and expertise collaboration in the fields of geosciences and economic minerals with countries such as Thailand and Indonesia. In addition, JMG also works together in coordinating scientific programs with government bodies and foreign organizations such as the Coordinating Committee for Geoscience Programs in East and Southeast Asia (CCOP), the Japan International Cooperation Agency (JICA) and other institutions such as Korea Institute of Geoscience and Mineral Resources (KIGAM) and many other related organizations. In recognition of our contribution and cooperation, the Director General of JMG, who is also Malaysia's permanent representative to CCOP, was appointed the Chairman for CCOP Steering Committee. JMG also

komitmen bagi meningkatkan kerjasama dalam sektor mineral di kalangan negara-negara ASEAN menerusi Mesyuarat Kumpulan Kerja ASOMM (ASEAN Senior Officials Meeting on Minerals), ASOMM, ASOMM+3 (China, Jepun dan Republik Korea) dan AMMin (ASEAN Ministerial Meeting on Minerals) yang telah diadakan di Nay Pyi Taw, Myanmar pada tahun 2017.

Semua pencapaian ini tidak boleh dilakukan tanpa kerjasama dan komitmen daripada semua pihak yang terlibat. Saya ingin mengambil kesempatan ini untuk merakamkan setinggi-tinggi penghargaan kepada Kementerian Sumber Asli dan Alam Sekitar (NRE) atas segala sokongan dan kepercayaan yang telah diberikan kepada JMG. Saya juga ingin mengucapkan terima kasih kepada semua agensi kerajaan, pihak swasta, institusi pengajian tinggi serta badan-badan NGO yang telah bekerjasama dengan JMG untuk menjayakan program-program sepanjang tahun 2017. Ucapan penghargaan tidak terhingga saya tujukan khas kepada semua kakitangan JMG yang telah memberi komitmen serta profesionalisme yang tinggi dalam menyampaikan perkhidmatan yang terbaik untuk rakyat. Semua projek-projek yang dilaksanakan oleh jabatan ini bertujuan untuk memberi kemudahan dan manfaat kepada rakyat. Saya berharap semangat kerjasama antara semua pihak ini dapat dikekalkan. Semoga JMG terus menyumbang ke arah pembangunan dan kemakmuran negara.

DATUK SHAHAR EFFENDI ABDULLAH AZIZI
Ketua Pengarah/ Director General
Jabatan Mineral dan Geosains Malaysia
Department of Mineral and Geoscience Malaysia

continued its commitment to increase cooperation in the mineral sector among ASEAN countries through ASOMM (ASEAN Senior Officials Meeting on Minerals) Working Group Meetings, ASOMM, ASOMM+3 (China, Japan and Republic of Korea) and AMMin (ASEAN Ministerial Meeting on Minerals) which were held at Nay Pyi Taw, Myanmar in 2017.

All of these cannot be achieved without the cooperation from all concerned parties. Hence, I would like to take this opportunity to express my sincere appreciation to the Ministry of Natural Resources and Environment (NRE) for all the support and trust given to JMG. I wish to thank all Government agencies, private sectors, institutions of higher learning and NGOs who have collaborated with JMG for the successful implementation of the 2017 programs. My utmost appreciation is due to all JMG staff who has given their commitment and professionalism in delivering the best service for the people. All projects undertaken by the department are intended to facilitate and benefit the people in line with the aspirations and goals of the Malaysian Government. JMG hopes the spirit of cooperation amongst us will remain strong and continue to flourish. Together we can move forward and bring development and prosperity to our country.

Geotapak Mersing Johor

Profil Korporat
Corporate Profile

Profil Korporat
Corporate Profile

Visi

Peneraju pembangunan mineral dan geosains menjelang 2020

Misi

Menyumbang kepada peningkatan daya saing ekonomi negara dan kualiti hidup melalui penggunaan maklumat, perkhidmatan berkepakaran tinggi serta penyelidikan berkaitan mineral dan geosains yang efektif

Objektif Strategik

1. Memperkasa pengurusan modal insan dan kapasiti organisasi ke arah meningkatkan kecekapan penyampaian perkhidmatan

2. Memperkukuh keupayaan aktiviti mineral dalam eksplorasi, pembangunan dan promosi untuk memacu ekonomi negara

3. Memantap pelaksanaan perkhidmatan geosains berkepakaran tinggi ke arah pembangunan mampan yang menyumbang kepada kesejahteraan hidup dan pemeliharaan alam sekitar

4. Memperkukuh penyelidikan dan pembangunan (R&D) mineral untuk memajukan industri mineral negara

Vision

Leader in mineral and geoscience development by 2020

Mission

To contribute towards enhancement of the nation's economic competitiveness and quality of life through effective usage of mineral and geoscience information, specialised expert services and related research

Strategic Objectives

1. To strengthen the management of human capital and organisational capacity towards improving the efficiency of service delivery

2. To intensify the capability of mineral exploration, development and promotion activities to spearhead the national economy

3. To strengthen the implementation of specialised geoscience services towards sustainable development that contributes to the well-being of mankind and conservation of environment

4. To intensify research and development (R&D) on minerals for increased growth and advancement in the nation's mineral industry

Objektif

- Menyediakan maklumat komoditi mineral bagi meningkatkan pertumbuhan industri berasaskan mineral
- Menggalakkan penggunaan optimum maklumat dan perkhidmatan geosains bagi pembangunan negara yang mapan
- Memastikan perusahaan sumber mineral berkembang secara teratur, selamat, cekap dan mesra alam serta mendatangkan pulangan yang maksimum kepada negara
- Menggalak dan mempelbagai penggunaan sumber mineral tempatan bagi menyumbang kepada pembangunan sektor perindustrian negara melalui aktiviti-aktiviti penyelidikan dan pembangunan (R&D)
- Menyediakan perkhidmatan kepakaran dalam bidang mineral, geosains dan perlombongan di peringkat nasional dan antarabangsa bagi menggalakkan pelaburan dalam sektor mineral dan perancangan pembangunan negara

Objectives

- To provide mineral commodity information to enhance the growth of mineral-based industries
- To encourage the optimal use of geoscience information and services for the sustainable development of the country
- To ensure that mineral resources are exploited in a systematic, safe, efficient and environmentally friendly manner as well as to secure their maximum returns to the country
- To encourage and diversify the use of local mineral resources so as to contribute towards the development of the country's industrialisation through research and development (R&D) activities
- To provide expert services in the fields of mineral, geoscience and mining at national and international levels so as to promote investments in the mineral sector and for national development planning

Fungsi

- Mengendali eksplorasi mineral secara sistematik
- Mengendali penyiasatan pelbagai bidang geosains seperti pemetaan geologi, sumber air bawah tanah, geologi kejuruteraan, bencana geologi, geologi alam sekitar, geologi marin, geofizik, dan bidang-bidang geosains lain secara sistematik
- Menyedia perkhidmatan analisis geokimia dan ujian fizikal bahan batuan dan mineral
- Bertindak sebagai bank data nasional bagi semua maklumat berkaitan dengan geosains dan sumber mineral negara
- Mengumpul, menganalisis dan menyebarkan data dan maklumat berkaitan eksplorasi mineral, perlombongan dan aktiviti yang berkaitan
- Menyedia perkhidmatan nasihat teknikal dan kepakaran dalam bidang mineral, geosains, perlombongan dan pengkuarian
- Membantu dan bekerjasama dengan pihak swasta dan industri dalam usaha pembangunan sektor mineral
- Menentukan supaya aktiviti perlombongan mineral serta aktiviti lain yang berkaitan dengannya dijalankan dengan cara yang selamat, cekap dan sistematik
- Melaksana dasar dan arahan Kerajaan berhubung dengan industri mineral dan geosains, disamping mentadbir dan menguatkuasakan undang-undang yang berkaitan
- Menjalankan penyelidikan dan pembangunan (R&D), pemindahan teknologi, pembangunan sumber mineral serta mempromosi hasil penyelidikan supaya digunapakai oleh pihak industri

Functions

- To undertake systematic mineral exploration
- To undertake systematic investigations in various geoscience disciplines such as geological mapping, groundwater resources, engineering geology, geological hazards, environmental geology, marine geology, geophysics, and others
- To provide geochemical analyses and physical tests on rock materials and minerals
- To act as the national depository for all information related to geoscience and mineral resources of the country
- To collect, analyse and disseminate data and information pertaining to mineral exploration, mining and related activities
- To provide technical advisory and expertise services in the fields of mineral, geoscience, mining and quarrying
- To assist and co-operate with the private sector and industry to develop further the mineral sector
- To ensure that mining of minerals and related activities are carried out safely, efficiently and systematically
- To implement government policies and directives with regards to the mineral industry and geoscience, besides administration and enforcement of regulations
- To carry out research and development (R&D), technology transfer, mineral resources development and promotion of research products so that they are acceptable to the industry

Piagam Pelanggan

Maklumat Mineral dan Geosains

- Membekalkan laporan geologi (termasuk peta), mineral dan bidang-bidang geosains lain yang telah diterbitkan dan sedia ada, dalam masa 1 hari selepas permohonan diterima
- Membekalkan laporan dan peta geologi, mineral dan bidang-bidang geosains lain yang belum diterbitkan dan sedia ada, dalam masa 1 minggu selepas permohonan diterima
- Membekalkan maklumat berdigit sedia ada dalam masa 3 hari selepas permohonan diterima

Perkhidmatan Kepakaran

- Menyediakan perkhidmatan kepakaran apabila diminta dalam rangka masa yang ditetapkan atau dipersetujui bersama dengan pelanggan, terutamanya bagi bidang-bidang:
  - Pemetaan geologi
  - Siasatan mineral
  - Siasatan air bawah tanah
  - Siasatan geofizik
  - Geologi Marin
  - Siasatan geologi kejuruteraan
  - Siasatan geologi alam sekitar

Perkhidmatan Makmal

- Menyediakan perkhidmatan makmal apabila diminta bagi bidang berikut:
  - Analisis mineralogi dan petrologi
  - Analisis sampel bijih, mineral, aloi, batuan, kelodak, konsentrat, tanih dan air
  - Ujian mineral perindustrian
  - Ujian sedimentologi
  - Ujian geologi kejuruteraan

  dalam tempoh yang dipersetujui, sekiranya mandatori, atau jika rutin, dalam tempoh 2 minggu selepas sampel diterima

Clients Charter

Mineral and Geoscience Information

- To supply available and published geological (including maps), mineral and other geoscience reports within 1 day upon receipt of request
- To supply available but unpublished geological maps, mineral and other geoscience reports within 1 week upon receipt of request
- To supply available digital information within 3 days upon receipt of request

Expert Services

- To provide expert services upon request, within the time frame stipulated or mutually agreed upon with the client, especially in the fields of:
  - Geological mapping
  - Mineral investigation
  - Groundwater investigation
  - Geophysical investigation
  - Marine Geology
  - Engineering geology investigation
  - Environmental geology investigation

Laboratory Services

- To provide laboratory services upon request for
  - Mineralogical and petrological analyses
  - Analyses of ores, minerals, alloys, rocks, silts, concentrates, rocks and water samples
  - Industrial mineral tests
  - Sedimentological tests
  - Engineering geology tests

  within the time frame stipulated or mutually agreed upon with the client if it is mandatory, or within 2 weeks if it is routine, upon receipt of samples

Perkhidmatan Perlombongan dan Pengkuarian

- Mengeluarkan Lesen Melombong atau Lesen Kuari dalam tempoh 30 hari dari tarikh penerimaan permohonan yang lengkap
- Menyediakan laporan-laporan teknikal yang tepat dan lengkap berkaitan dengan kepentingan perlombongan, dalam tempoh 30 hari dari tarikh penerimaan permohonan yang disertakan dengan dokumen-dokumen yang lengkap

Perkhidmatan Dagangan Mineral

- Memberi ulasan ke atas permohonan untuk mengeksport mineral dalam tempoh 5 hari dari tarikh penerimaan permohonan yang disertakan dengan dokumen-dokumen yang lengkap
- Mengeluarkan Lesen Bijih Mineral dalam tempoh 30 hari dari tarikh penerimaan permohonan yang lengkap
- Mengeluarkan dan membaharukan permit pengangkutan konsentrat timah dalam tempoh 1 jam

Mining and Quarrying Services

- To issue Mining Licences or Quarrying Licences within 30 days upon receipt of duly completed application forms
- To prepare comprehensive technical reports relating to mining interest within 30 days upon receipt of application supported by duly completed documents

Mineral Commerce Services

- To provide comments on mineral export applications within 5 days upon receipt of applications accompanied by duly completed documents
- To issue Mineral Ore Licences within 30 days upon receipt of duly completed application forms
- To issue and renew permits for transportation of tin concentrates within 1 hour

Dasar Kualiti

Jabatan Mineral dan Geosains Malaysia komited untuk memastikan produk dan perkhidmatannya sentiasa memenuhi keperluan pelanggan. Untuk mencapai matlamat ini, pengurusan jabatan serta seluruh warga JMG adalah komited untuk:

- Melaksanakan sistem kualiti berdasarkan kepada keperluan MS ISO 9002;
- Memastikan bahawa produk dan perkhidmatan tepat pada masanya;
- Memastikan bahawa peningkatan kualiti dilaksanakan secara berterusan;
- Membina pasukan kerja yang kuat, responsif dan mempunyai etika kerja yang positif, dan
- Meningkatkan pengetahuan dan kemahiran melalui latihan.

Quality Policy

The Minerals and Geoscience Department Malaysia is committed to ensuring customer satisfaction in its products and services. To achieve this goal, the JMG management as well as the constituents are committed to:

- Implementing a quality system based on MS ISO 9002 qualifications;
- Ensuring that datelines are met in both products and services;
- Continuance of quality improvement is implemented;
- Building of a strong and responsive work force with positive work ethics, and
- Development of knowledge and skills through training.

Pengurusan Tertinggi
Top Management

1. **Datuk Shahar Effendi Abdullah Azizi**
   (Ketua Pengarah)
   (Director General)

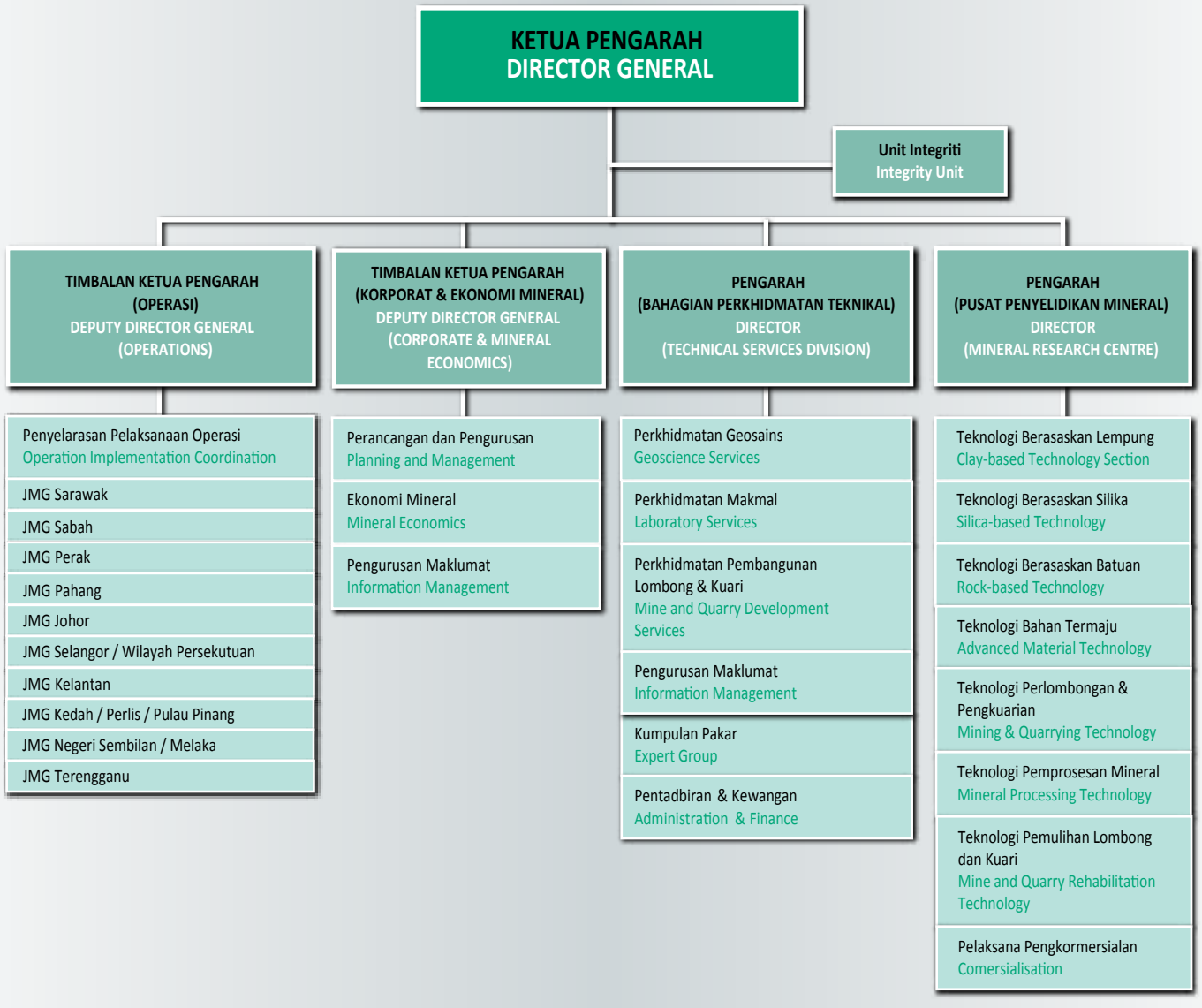
2. **Mohd Zukeri Ab Ghani**
   (Timbalan Ketua Pengarah - Operasi)
   (Deputy Director General - Operations)

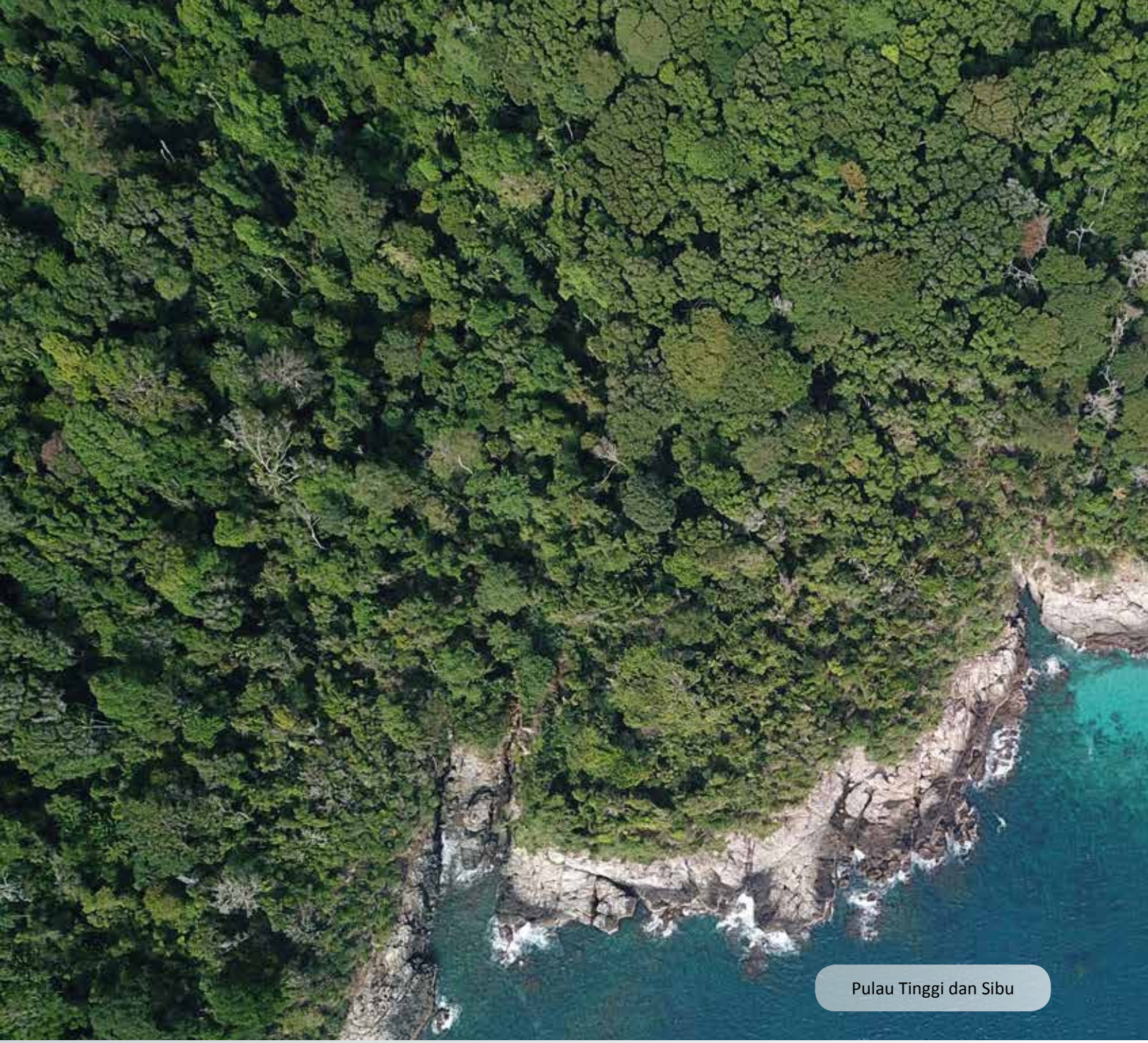
3. **Kamal Daril**
   (Timbalan Ketua Pengarah - Korporat dan Ekonomi Mineral)
   (Deputy Director General - Corporate and Mineral Economics)

4. **Md Muzayin Alimon**
   (Pengarah - Pusat Penyelidikan Mineral)
   (Director - Mineral Research Centre)

5. **Dato' Mohd Zaim Abdul Wahab**
   (Pengarah - Bahagian Perkhidmatan Teknikal)
   (Director - Technical Services Division)

Carta Organisasi
Organisation Chart





Pulau Tinggi dan Sibu

Hal Ehwal Korporat
Corporate Affairs

Hal Ehwal Korporat
Corporate Affairs

Kewangan

Financial

Perbandingan Peruntukan dan Perbelanjaan Mengurus 2013-2017
Comparison of Recurrent Allocation and Expenditure 2013-2017

Tahun Year	Peruntukan Allocation (RM)	Perbelanjaan Expenditure (RM)	%
2013	63,390,568.00	63,387,855.00	99.99
2014	68,555,484.40	68,529,659.17	99.96
2015	66,931,910.00	64,911,225.24	96.98
2016	62,429,920.00	61,836,644.03	99.05
2017	60,860,400.00	59,147,690.62	97.19

Perbandingan Peruntukan dan Perbelanjaan Pembangunan 2013-2017
Comparison of Development Allocation and Expenditure for 2013-2017

Tahun Year	Peruntukan Allocation (RM)	Perbelanjaan Expenditure (RM)	%
2013	8,765,700.00	8,761,881.00	99.95
2014	32,774,728.00	30,499,351.23	93.06
2015	31,519,300.00	31,513,496.01	99.98
2016	39,530,070.00	39,467,561.22	99.84
2017	40,100,000.00	39,932,038.97	99.58

Sumber Manusia

Human Resource

Status Perjawatan Tahun 2017
Staffing Status 2017

Kumpulan perkhidmatan Service Group	Bil. jawatan diisi No. of filled posts	Bil. jawatan belum diisi No. of vacant posts	Jumlah Total
Pengurusan Tertinggi Top Management	5	0	5
Pengurusan & Profesional (Gred 41-54) Management & Professional (Grade 41-54)	283	38	321
Kumpulan Sokongan I (Gred 19-40) Supporting Group I (Grade 19-40)	468	89	557
Kumpulan Sokongan II (Gred 11-18) Supporting Group II (Grade 11-18)	153	29	182
Jumlah Keseluruhan **Grand Total**	**909**	**156**	**1065**

Pembangunan Sumber Manusia Human Resource Development

Program Latihan Training programme	Dalam Jabatan In-house	Luar Jabatan External	Luar Negara Overseas	Jumlah Total
Sumber Mineral Mineral Resources	23	15	3	41
Geosains Geoscience	69	66	11	146
Lombong & Kuari Mine & Quarry	9	20	2	31
Kimiabumi Geochemistry	14	3	2	19
Penyelidikan Research	12	21	1	34
Pengurusan Maklumat Information Management	9	30	0	39
Pengurusan Sumber Manusia Human Resource Management	14	21	0	35
Pengurusan Kewangan Financial Management	6	60	0	66
Pembangunan Kendiri Self Development	22	42	1	65
Kualiti & Produktiviti Quality & Productivity	10	11	0	21
Kursus Wajib Compulsory Course	6	13	2	21
Bahasa & Komunikasi Language & Communication	34	28	1	63
Lain - lain Others	1	2	0	3
Jumlah Total	**0**	**0**	**0**	**0**
	71	**135**	**3**	**209**
	300	**467**	**26**	**793**

Program Latihan Dalam Jabatan

Sebanyak 300 program latihan dalam Jabatan termasuk kursus, bengkel, taklimat, seminar, persidangan, ceramah dan perhimpunan bulanan telah dilaksanakan oleh Unit Pembangunan Sumber Manusia (PSM) dan semua bahagian / pusat / pejabat JMG Negeri pada sepanjang tahun 2017. Sejumlah 6,015 penyertaan pegawai / kakitangan Jabatan terlibat dalam program-program tersebut. Sebahagian besar daripada program telah dijadualkan dalam takwim latihan dirancang.

In-House Training Programme

A total of 300 in-house training programmes involving courses, workshops, briefings, seminars, conferences, talks and monthly assembly were implemented by Human Resources Development Unit and JMG offices during the year 2017. A total of 6,015 participants were involved in these programmes. Most of these programmes are scheduled in the planned training calendar.

Program Latihan Luar Jabatan (Tempatan)

Sebanyak 467 kursus, bengkel, seminar dan persidangan telah dianjurkan yang melibatkan 1,538 penyertaan untuk tempoh tahun 2017. Program ini melibatkan agensi penganjur seperti INSTUN, NRE, SIRIM, INTIM, JPM, JANM, INSPIN, JPA, UMS, USM, INTAN, IGM, JAKIM, IQM, IEM, IKM, SUK, NAHRIM, SIDC, UNISEL, JPM, JAKIM, Nuklear Malaysia, JUPEM, Persatuan Geologi Malaysia dan lain-lain.

External Training Programme (Local)

A total of 467 courses, workshops, seminars and conferences were organised involving a total of 1,538 participants in the year 2017. These programmes involved other organizing agencies such as INSTUN, NRE, SIRIM, INTIM, JPM, JANM, INSPIN, JPA, UMS, USM, INTAN, IGM, JAKIM, IQM, IEM, IKM, SUK, NAHRIM, SIDC, UNISEL, JPM, JAKIM, Nuklear Malaysia, JUPEM, Persatuan Geologi Malaysia and others.

Program Latihan Luar Negara

Sebanyak 44 program latihan, mesyuarat dan lawatan ke luar negara telah dihadiri oleh beberapa pegawai JMG bagi tahun 2017. Lawatan ini meliputi negara Indonesia, India, Thailand, Filipina, Myanmar, UAE, Jepun, Australia, China, Vietnam, Korea, Taiwan, Jerman dan Laos telah dianjurkan oleh ASOMM, CCOP, DMR, COTI, JPA, KIGAM, CGS, GEOSEA, IGF, AIST, IAEA, GAI, UNEP dan pelbagai agensi luar negara. Seramai 60 anggota jabatan telah mengikuti program ini.

Overseas Training Programme

A total of 44 training programmes, meetings and overseas visit in the year 2017. The visiting includes Indonesia, India, Thailand, Phillippines, Myanmar, UAE, Japan, Australia, China, Vietnam, Korea, Taiwan, Germany and Laos organised by ASOMM, CCOP, DMR, COTI, JPA, KIGAM, CGS, GEOSEA, IGF, AIST, IAEA, GAI, UNEP and other overseas agencies. A total of 60 of staff of the department attended these programmes.

25.04.2017 – 26.04.2017
Kursus Penyediaan Keratan Nipis, Analisis Petrografi dan Pengkelasan Batuan di Universiti Malaysia Kelantan, Jeli, Kelantan
Course on Thin Section Preparation Method, Petrographic Analysis and Rock Classification was held in Universiti Malaysia Kelantan, Jeli, Kelantan.

Peserta kursus mendengar taklimat penyediaan keratan nipis.
Participants paying attention to the lecture on the preparation of thin section.

Demonstrasi penyediaan sampel oleh kakitangan JMG Kelantan
Sample preparation demonstration by JMG Kelantans staff

01.08.2017 – 31.08.2017
Kursus keenam China-ASEAN Mining Personnel Exchange and Training Center (CAMPETC) – Mining Environmental Protection di Wilayah Guangxi, China
6th Training Course of China-ASEAN Mining Personnel Exchange and Training Center (CAMPETC) - Mining Environmental Protection

Peserta-peserta daripada negara-negara ASEAN
Participants from ASEAN countries

17.10.2017 – 20.10.2017

"Workshop on Trenching for Active Fault 2017" di Dungun, Terengganu

Workshop on Trenching for Active Fault 2017 in Dungun, Terengganu

26.10.2017

"Workshop on Dinosaur Footprint" di Bukit Panau, Tanah Merah, Kelantan

Workshop on Dinosaur Footprint Study, Bukit Panau, Tanah Merah, Kelantan.

Peserta kursus didedahkan dengan kaedah lapangan pengenalan tapak kaki dinosaur.

Participants were briefed on dinosaur footprint identification method.

Pengajian Ijazah Lanjutan Sesi 2017/ 2018

Post-Graduate for Session 2017/ 2018

Bil. No.	Nama pegawai Name of officer	Universiti University	Bidang pengajian Field of study
1	Balachandar a/l Subramaniyan	Luar Negara	Sains Bumi
2	Silvia Joseph	Dalam Negara	Social Computing
3	Fakhruddin Afif bin Fauzi	Dalam Negara	Sains Alam Sekitar
4	Mohd Anuar bin Ishak	Dalam Negara	Kejuteraaan Awam

Pengurniaan dan Kepujian

Awards and Accolades

Penerima Pingat Darjah Kebesaran
Recipients of Honorary Titles and Awards

Bil No	Nama Pegawai Name of Officer	Jawatan Position	Pejabat Office	Pingat Darjah Kebesaran Medal Decoration
1.	Dato'Ir. Azman Ab Majid	Pegawai Geosains C54	JMG Pahang	Darjah Indera Mahkota Pahang (D.I.M.P)
2.	Mohd Nazan Awang	Pegawai Geosains C54	JMG Ibu Pejabat	Darjah Kebesaran Setia Mahkota Kelantan yang Amat Terbilang (P.S.K)
3.	Jontih Enggihon @ Jontih Inggihon	Pegawai Geosains C52	JMG Sabah	Bintang Setia Kinabalu (B.S.K)
4.	Henry Litong Among	Pegawai Geosains C54	JMG Selangor/WP	Pingat Perkhidmatan Setia
5.	Dr. Richard Mani Banda	Pegawai Geosains C54	JMG Sarawak	Pingat Perkhidmatan Setia
6.	Richard Batoi @ Lipai	Pegawai Geosains C52	JMG Sarawak	Pingat Perkhidmatan Setia
7.	Hatta Jerawi	Pembantu Geosains C26	JMG Ibu Pejabat	Pingat Perkhidmatan Setia
8.	Ahmad Fathi Hamdan	Pembantu Geosains C22	Bahagian Perkhidmatan Teknikal	Pingat Jasa Kebaktian (P.J.K)
9.	Lim Yong Hui	Pembantu Geosains C22	JMG Sarawak	Pingat Perkhidmatan Setia
10.	Maling anak Kanyan	Pembantu Geosains C22	JMG Sarawak	Pingat Perkhidmatan Setia
11.	Ti Morni Sedik	Pembantu Geosains C22	JMG Sarawak	Pingat Perkhidmatan Setia
12.	Phui Jin Miaw	Pembantu Geosains C22	JMG Sarawak	Pingat Perkhidmatan Setia
13.	Amin Taha	Pembantu Awam, H11	JMG Sarawak	Pingat Perkhidmatan Setia
14.	Sidi Kuteh	Pembantu Awam, H11	JMG Sarawak	Pingat Perkhidmatan Setia
15.	Abdul Pani @Abdilloh Brudi	Pembantu Awam, H11	JMG Sarawak	Pingat Perkhidmatan Setia
16.	Ismail Abdullah @ Chan Kheng Hui	Pemandu Kenderaan, H11	JMG Sarawak	Pingat Perkhidmatan Setia
17.	Mohamad Sabri Ismail	Pemandu Kenderaan H11	JMG Sarawak	Pingat Perkhidmatan Setia
18.	Lee On Talu @ Anthony Lee	Pemandu Kenderaan, H11	JMG Sabah	Pingat Perkhidmatan Terpuji

Penerima Anugerah Perkhidmatan Cemerlang Tahun 2017 (Tahun Penilaian: 2016)
Recipients of Excellent Service Award 2017 (Year of Assessment: 2016)

Bil No	Nama Pegawai Name of Officer	Jawatan/Gred Position	Pejabat Office
1.	Nurzaidi Abdullah	Pegawai Geosains Gred C48	Ibu Pejabat / Headquarters
2.	Abd. Rahim Harun	Pegawai Geosains Gred C48	Ibu Pejabat / Headquarters
3.	Khairul Zaman Ibrahim	Pegawai Geosains Gred C44	Ibu Pejabat / Headquarters
4.	Mohd Anuar Ishak	Pegawai Geosains Gred C44	Ibu Pejabat / Headquarters
5.	Saidaruza Shamsuddin	Pembantu Tadbir (P/O) Gred N22	Ibu Pejabat / Headquarters
6.	Siti Rahmah Maamor	Pembantu Tadbir (P/O) Gred N19	Ibu Pejabat / Headquarters
7.	Marina Mansor	Pembantu Tadbir (Kew) Gred W19	Ibu Pejabat / Headquarters
8.	Muzzammil Kamal	Pemandu Kenderaan Gred H11	Ibu Pejabat / Headquarters
9.	Mohd Fauzi Muhammad Said	Pegawai Geosains Gred C48	Bahagian Perkhidmatan Teknikal / Technical Services Division
10.	Mohd Anuar Md. Razali	Pegawai Geosains Gred C44	Bahagian Perkhidmatan Teknikal / Technical Services Division
11.	Noor Akhmar Kamarudin	Pegawai Geosains Gred C44	Bahagian Perkhidmatan Teknikal / Technical Services Division
12.	Amin Noorasid Abdul Jalil	Pegawai Geosains Gred C44	Bahagian Perkhidmatan Teknikal / Technical Services Division
13.	Rosiah Che Me	Penolong Pegawai Geosains Gred C29	Bahagian Perkhidmatan Teknikal / Technical Services Division
14.	Nordin Abdullah	Penolong Jurutera Gred J29	Bahagian Perkhidmatan Teknikal / Technical Services Division
15.	Ismail Abdullah	Pembantu Geosains Gred C26	Bahagian Perkhidmatan Teknikal / Technical Services Division
16.	Mohd Haiqal Hakimi Arania Abdullah	Pembantu Geosains Gred C19	Bahagian Perkhidmatan Teknikal / Technical Services Division
17.	Khairul Afendi Mohamed	Pembantu Geosains Gred C19	Bahagian Perkhidmatan Teknikal / Technical Services Division
18.	Noor Hartini Aznan	Pembantu Tadbir (Kew) Gred W19	Bahagian Perkhidmatan Teknikal / Technical Services Division
19.	Nur Azlin Yaacob	Pembantu Tadbir (P/O) Gred N19	Bahagian Perkhidmatan Teknikal / Technical Services Division
20.	Mohamad Yusoff Abu Hasan	Pembantu Penerbitan Gred N19	Bahagian Perkhidmatan Teknikal / Technical Services Division
21.	Azri Othman	Pembantu Operasi Gred N11	Bahagian Perkhidmatan Teknikal / Technical Services Division
22.	Fazli Zohari	Pembantu Awam Gred H11	Bahagian Perkhidmatan Teknikal / Technical Services Division
23.	Mohd Syahrir Mohd Rozi	Pegawai Penyelidik Gred Q44	Pusat Penyelidikan Mineral / Mineral Research Centre
24.	Mohd Idham Mustaffar	Pegawai Penyelidik Gred Q44	Pusat Penyelidikan Mineral / Mineral Research Centre
25.	Ali Ismail	Pembantu Penyelidik Gred Q26	Pusat Penyelidikan Mineral / Mineral Research Centre

26.	Yeoh Ah Heong	Pembantu Penyelidik Gred Q22	Pusat Penyelidikan Mineral / Mineral Research Centre
27.	Samsiah Yaacob	Pembantu Tadbir Gred N22	Pusat Penyelidikan Mineral / Mineral Research Centre
28.	Asrul Affendi Amran	Pembantu Operasi Gred N11	Pusat Penyelidikan Mineral / Mineral Research Centre
29.	Ahmad Azlan Abdullah	Pembantu Operasi Gred N11	Pusat Penyelidikan Mineral / Mineral Research Centre
30.	Asmawi Shahruddin	Pembantu Operasi Gred N11	Pusat Penyelidikan Mineral / Mineral Research Centre
31.	Nur Susila Md Saaid	Pegawai Geosains Gred C44	JMG Kedah / Perlis / Pulau Pinang
32.	Fakhruddin Afif Fauzi	Pegawai Geosains Gred C41	JMG Kedah / Perlis / Pulau Pinang
33.	Wan Bennyamin Rosli	Pembantu Geosains C19	JMG Kedah / Perlis / Pulau Pinang
34.	Zulfadhli Zakaria	Pembantu Awam H11	JMG Kedah / Perlis / Pulau Pinang
35.	Azmi Abu Bakar	Pegawai Geosains Gred C44	JMG Perak
36.	Saiful Abdullah	Pegawai Geosains Gred C41	JMG Perak
37.	Tan Pang Teck	Pembantu Geosains Gred C26	JMG Perak
38.	Faeros Akhbar Zaharudin	Penolong Pegawai Geosains Gred C29	JMG Perak
39.	Norfazura Abidin	Pembantu Tadbir (Kew) Gred W22	JMG Perak
40.	Faizal Arshad	Pegawai Geosains Gred C48	JMG Selangor / Wilayah Persekutuan
41.	Marina Mansor	Penolong Pegawai Tadbir Gred N29	JMG Selangor / Wilayah Persekutuan
42.	Khairul Nizam Ahmad Rauf	Penolong Pegawai Geosains Gred C29	JMG Selangor / Wilayah Persekutuan
43.	Muhammad Helmi Che Zilan	Pembantu Tadbir (Kew) Gred W19	JMG Selangor / Wilayah Persekutuan
44.	Hairul Mohamed Shaharudin	Pegawai Geosains Gred C44	JMG Negeri Sembilan / Melaka
45.	Hashimah Ismail	Pembantu Tadbir Gred N22	JMG Negeri Sembilan / Melaka
46.	Arif Minang	Pembantu Operasi Gred N11	JMG Negeri Sembilan / Melaka
47.	Mohammed Syahrizal Zakaria	Pegawai Geosains C44	JMG Johor
48.	Abd Manaf Hanapiah	Pembantu Geosains C26	JMG Johor
49.	Masni Ismail	Pembantu Awam H11	JMG Johor
50.	Mazlan Mohamad Zain	Pegawai Geosains Gred C44	JMG Pahang
51.	Hassan Saru	Pembantu Geosains Gred C26	JMG Pahang
52.	Normaiziera Abdul Rahim	Penolong Pegawai Tadbir Gred N29	JMG Pahang
53.	Norkamisah Mazlan	Pembantu Tadbir (Kew) Gred W19	JMG Pahang
54.	Kamarudin Mat Lela	Pembantu Awam Gred H11	JMG Pahang
55.	Muhammad Fadzli Deraman	Pegawai Geosains Gred C44	JMG Terengganu
56.	Nailah @ Nazirah Abdullah	Penolong Pegawai Tadbir N29	JMG Terengganu
57.	Sivalingam A/L Krishnan	Pembantu Geosains Gred C19	JMG Terengganu

58.	Mohd Ridhuan A Manan	Pemandu Kenderaan H11	JMG Terengganu
59.	Mohd Nazan Awang	Pegawai Geosains Gred C54	JMG Kelantan
60.	Mohd Yuzlan Yusoff	Pegawai Geosains Gred C44	JMG Kelantan
61.	Nik Mohamad Zulkifly Nik Yusoff	Pemandu Kenderaan Gred H11	JMG Kelantan
62.	Mohd Zamri Abdullah	Pengawal Keselamatan Gred KP11	JMG Kelantan
63.	Setebin @ Roslan Rajali	Pegawai Geosains Gred C48	JMG Sarawak
64.	Ledyhernando Taniou	Pegawai Geosains Gred C41	JMG Sarawak
65.	Shahrul Ridzuan Zainal Rashid	Pegawai Geosains Gred C41	JMG Sarawak
66.	Tracy Anak Upong	Penolong Pegawai Tadbir N29	JMG Sarawak
67.	Halmi Jaraiee	Penolong Pegawai Geosains C29	JMG Sarawak
68.	Rosmah Usup	Penolong Juruukur JA29	JMG Sarawak
69.	Wan Dobil Wan Sulaiman	Penolong Juruukur JA29	JMG Sarawak
70.	Helda Jane Anak Edward	Setiausaha Pejabat N29	JMG Sarawak
71.	Phui Jin Miaw	Pembantu Geosains C26	JMG Sarawak
72.	Peter Anak Buking	Pembantu Geosains C19	JMG Sarawak
73.	Anderson Ronnie Anak Anthony	Pemandu Kenderaan H11	JMG Sarawak
74.	Paulius Godwin @ Paulus	Pegawai Geosains Gred C52	JMG Sabah
75.	Faye Donna Edmund	Pegawai Geosains Gred C44	JMG Sabah
76.	Redzuan Ahmad Banjar	Pegawai Geosains Gred C41	JMG Sabah
77.	Besty Jenny Adim	Penolong Juruukur JA29	JMG Sabah
78.	Levy @ Azhar Mosungkai	Pembantu Geosains Gred C22	JMG Sabah
79.	Mejah Birud	Pegawai Khidmat Pelanggan N19	JMG Sabah
80.	Rosman Erang	Pemandu Kenderaan Gred H11	JMG Sabah

Air Terjun Puteri Mandi, Yan, Kedah

Kerjasama dan Perkongsian
Cooperation and Partnership

Kerjasama Antarabangsa

Penyiasatan Geologi Bersama Sempadan Malaysia-Thailand (MT-JGS)

Kerjasama teknikal dalam bidang geosains dan mineral di antara Malaysia dan Thailand telah dijalankan sejak tahun 2000. Pada peringkat awal kerjasama lebih tertumpu kepada pemetaan geologi dan sumber mineral. Walau bagaimanapun, kini kerjasama teknikal juga dijalankan dalam bidang stratigrafi, geologi warisan dan geologi bencana. Kerjasama juga dijalankan dalam bina upaya dan perkongsian kepakaran dalam bidang geologi warisan dan geologi bencana di antara kedua-dua negara.

International Cooperation

Malaysia-Thailand Border Joint Geological Survey (MT-JGS)

Technical cooperation in the field of geosciences and mineral between Malaysia and Thailand has been carried out since the year 2000. Initially the cooperation was focused on geological mapping and mineral resources. Presently, technical cooperation is also carried out in the field of stratigraphy, geological heritage as well as geological hazard. Cooperation is also carried out in capacity building and sharing of expertise in the fields of geological heritage and geological hazard between the two countries.

14-26.2.2017
Kursus 'Paleoseismic Training' di Chiang Rai, Thailand
Paleoseismic Training Course in Chiang Rai, Thailand

Latihan paleoseismik di Chiang Rai, Thailand.
Paleosismic training in Chiang Rai, Thailand.

Kaedah perparitan bagi pemetaan sesar aktif
Trenching method for active fault mapping

2-7.5.2017
Mesyuarat Kumpulan Kerja Penyiasatan Geologi Bersama Sempadan Malaysia-Thailand Bil. 1/2017 dan Mesyuarat Penyuntingan, Satun, Thailand
Malaysia-Thailand Border Joint Geological Survey Working Group Meeting No. 1/2017 and Joint Report Editing, Satun, Thailand

Mesyuarat Kumpulan Kerja / Working Group Meeting

Delegasi Malaysia / Malaysian Delegates

Kerja penyuntingan laporan dan peta / Editing the geological report and map

8-12.5.2017
Kursus Serantau Rangkaian Geopark Asia Pasifik Geopark Global UNESCO 2017, Langkawi
Asia Pacific Geopark Network (APGN) Regional Course on UNESCO Global Geopark 2017, Langkawi

Latihan dalam kumpulan semasa kursus / Team training during the course

Kerja lapangan semasa kursus
Fieldwork during the course

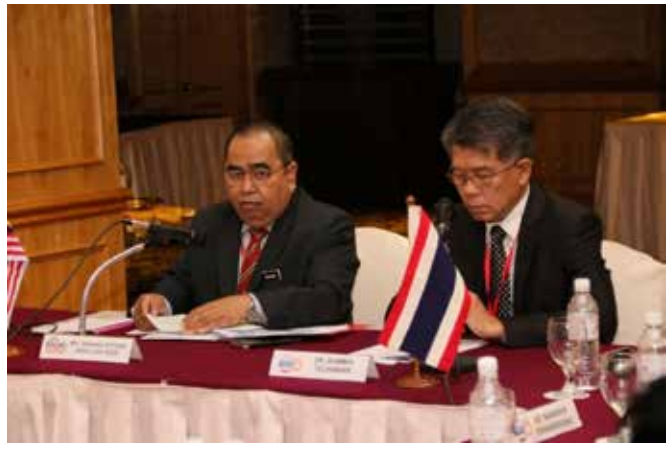
Peserta kursus semasa kerja lapangan
Participants during the fieldwork

15.8.2017
Mesyuarat Kumpulan Kerja Penyiasatan Geologi Bersama Sempadan Malaysia-Thailand Bil. 2/2017, Pulau Pinang, Malaysia
Malaysia-Thailand Border Joint Geological Survey Working Group Meeting No. 2/2017, Penang, Malaysia

Peserta Mesyuarat Kumpulan Kerja Penyiasatan Geologi Bersama Sempadan Malaysia-Thailand
Participants of the Malaysia-Thailand Border Joint Geological Survey Working Group Meeting

16.8.2017
Mesyuarat Jawatankuasa Penyiasatan Geologi Bersama Sempadan Malaysia-Thailand (MT-JGSC) Ke-14, Pulau Pinang, Malaysia
The 14th Malaysia-Thailand Border Joint Geological Survey Committee (MT-JGSC) Meeting, Penang, Malaysia

Ketua Pengarah JMG, semasa majlis perasmian
The Director General of JMG during the opening ceremony



Pengerusi dan Pengerusi Bersama Mesyuarat
Chairman and Co-Chairman of the meeting

17-18.8.2017
Kerja lapangan di sekitar Pulau Pinang dan Geopark Jerai
Field excursion in Penang and Jerai Geopark areas

Kerja lapangan selepas mesyuarat di Geotapak Puncak Gunung Jerai, Geopark Jerai, Kedah
Post-meeting field excursion at Jerai Mountain Peak Geosite, Jerai Geopark, Kedah

Lawatan ke Tapak Arkeologi Sungai Batu, Lembah Bujang
Visit to Sungai Batu Archeological Site

13-14.7.2017
DMR-CCOP-THCU Technical Seminar on Biostratigraphy and Karst Morphology of Satun Aspiring Geopark, Hotel Berkeley, Pratunam, Bangkok, Thailand
DMR-CCOP-THCU Technical Seminar on Biostratigraphy and Karst Morphology of Satun Aspiring Geopark, Berkeley Hotel Pratunam, Bangkok, Thailand

Pembentangan kertas teknikal
Presenting technical paper

Peserta Seminar
Seminar participants

01.09.2017
Seminar Teknikal mengenai Sempadan Jura – Kapur Asia Tenggara di Bangkok, Thailand
Technical Seminar on Jurassic – Cretaceous Boundary of Southeast Asia, Bangkok, Thailand

Peserta Malaysia membentangkan kertas teknikal.
Malaysian participant presenting the technical paper

Urus setia dan peserta seminar
Secretariat and participants of the seminar

16-18.11.2017
Persidangan Antarabangsa Gondwana Ke-16 Bangkok, Thailand
16th International Conference on Gondwana, Bangkok, Thailand

Urus setia dan semua peserta Persidangan Antarabangsa Gondwana Ke-16
Secretariat and all participants of the 16th International Conference on Gondwana

Kerjasama Teknikal dan Saintifik Malaysia-Indonesia

Kerjasama antara (JMG) dan Geological Agency Indonesia (GAI) bermula hasil daripada cadangan awal kerjasama dalam bidang eksplorasi mineral di sempadan Malaysia-Indonesia yang akhirnya turut dipersetujui penubuhan Kumpulan Kerja Teknikal (TWG) dalam bidang lain juga seperti Kumpulan Kerja Korelasi Geologi, Kumpulan Kerja Geobencana dan Kumpulan Kerja Air Tanah, Geologi Alam Sekitar dan Geowarisan, dan Kumpulan Kerja Sumber Mineral dan Tenaga.

Malaysia-Indonesia Scientific and Technical Cooperation (MALINDO)

Cooperation between Department of Mineral and Geoscience Malaysia (JMG) and Geological Agency Indonesia (GAI) was initiated by the proposal of a joint cooperation in mineral exploration along the Malaysia-Indonesia border, which later developed to the formation of technical working groups on other fields such as Working Group on Geological Correlation, Geohazard, Groundwater, Enviromental Geology and Geoheritage and Mineral and Energy Resources.

22-23.11.2017
Mesyuarat Kumpulan Kerja Teknikal JMG di Hotel Ming Garden, Kota Kinabalu, Sabah.
JMG Technical Working Group meeting held at Ming Garden Hotel, Kota Kinabalu, Sabah.

Kumpulan Kerja Korelasi Geologi

Kumpulan Kerja Teknikal telah mengadakan satu mesyuarat di Kuching, Sarawak pada 30 Oktober 2017 hingga 4 November 2017. Pada tahun 2017 ini, kawasan kerjasama untuk kerja korelasi geologi ini bertumpu di Transek Silantek –Sintang, Pulau Sebatik, Serudong dan Sebuku.

Working Group On Geological Correlation

Technical working group meeting between JMG and GAI was held in Kuching, Sarawak from 30th October 2017 to 4th November 2017. In 2017, the area for this working group was focused in Silantek – Sintang Transect, Pulau Sebatik, Serudong and Sebuku.

Kumpulan Kerja Sumber Mineral dan Tenaga

Eksplorasi Arang Batu di Sarawak dan Sabah

Pasukan kerja Eksplorasi Arang Batu di Sarawak tidak dapat dijalankan disebabkan kesukaran akses di kawasan sempadan. Di Sabah pula, kerja tertumpu di kawasan Nunukan Timur untuk mendapat maklumat sumber dan kualiti arang batu. Korelasi dengan Indonesia masih diteruskan. Laporan berikut juga telah berjaya disiapkan:

i) Report on the Coal Resources of the Sintang Kalimantan) – Silantek (Sarawak) Block
ii) Report on the Coal Resources of the Nunukan (Kalimantan) – Serudung (Sabah) Block

Eksplorasi Mineral Berlogam Sarawak

Pada tahun 2017, JMG telah melaksanakan kajian terperinci Penilaian Sumber Emas Gunung Merachi di mana kerja-kerja geokimia dan geofizik telah selesai. Satu laporan bertajuk 'Mineral Resources (Gold) of the Sanggau (Kalimantan) – Kedup (Sarawak)' juga telah disiapkan.

Working Group On Mineral And Energy Resources

Coal Exploration in Sarawak and Sabah

Coal explorationin Sarawak could not be carried out due to difficulty assessing border area. In Sabah, information gathering on mineral resources and quality of coal is focused on the East Nunukan. Maps and reports on the Malaysian side have been published. Corelation with Indonesia will be continued. The working group has also completed the following reports:

i) Report on the Coal Resources of the Sintang (Kalimantan) – Silantek (Sarawak) Block
ii) Report on the Coal Resources of the Nunukan (Kalimantan) – Serudung (Sabah) Block

Sarawak Metallic Mineral Exploration

In 2017, JMG has completed the geochemical and geophysical work for the study on Gunung Merachi Gold Resources. A report entitled ' Mineral Resources (Gold) of the Sanggau (Kalimantan) – Kedup (Sarawak)' was also completed.

Singkapan arang batu di Blok Silantek Timur
Coal outcrop in East Silantek Block

Trabas sungai di kawasan Empili, Blok Silantek Timur
River traversing in Empili area, East Silantek Block

Mengambil bacaan perlapisan batuan Formasi Silantek
Measuring rock beddings on Silantek Formation

Singkapan arang batu di Blok Silantek Timur
Coal outcrop at East Silantek Block

Kumpulan Kerja Geobencana

Antara program di bawah kumpulan kerja ini adalah kompilasi dokumen / kertas teknikal program Capacity Building on Landslide and Earthquake. Pihak Malaysia sudah berjaya menyiapkan satu dokumen berkenaan perkara ini iaitu Compilation Report 2016: Capacity Building on Landslide / Earthquake Hazards and Risk Management.

Kumpulan Kerja Air Tanah, Alam Sekitar dan Geowarisan

Kajian hidrogeologi dilaksanakan di Pulau Sebatik. Beberapa laporan hasil kerjasama JMG dan GAI sudah disiapkan seperti senarai berikut:

i) The Geology of the Silantek (Sarawak) – Sintang (Kalimantan) Block
ii) Hydrogeological Study in Sebatik Island

Working Group On Geohazard

Among programmes under this working group was compilation of documents / technical papers for Capacity Building on Landslide and Earthquake. On the Malaysian side, a report, Compilation Report 2016: Capacity Building on Landslide / Earthquake Hazards and Risk Management has been succesfully produced.

Working Group On Groundwater, Environmental Geology And Geoheritage

Hydrogeological study was conducted in Sebatik Island. List of reports completed by the cooperation between JMG and GAI are as follows:

i. The Geology of the Silantek (Sarawak) – Sintang (Kalimantan) Block
ii. Hydrogeological Study in Sebatik Island

Kumpulan Kerja ASOMM

ASOMM Working Group

Delegasi ASEAN di 14th ASOMM Working Group Meetings, Nay Pyi Taw, Myanmar
ASEAN delegations for the 14th ASOMM Working Group Meetings, Nay Pyi Taw, Myanmar

Kerja lapangan di bahagian utara Laos semasa latihan program ASEAN Web Based Mineral Resources Database.
Field excursion to Northern Laos during the ASEAN Web Based Mineral Resources Database training.

Peserta ASEAN dari Lao PDR danThailand yang menghadiri 8th Mineral Symposium 2017
ASEAN participants from Lao PDR and Thailand during the 8th Mineral Symposium 2017

Simposium Mineral ke 8 (SIMPOMIN) 2017, Casuarina@Meru Hotel, Ipoh, Perak
The 8th Mineral Symposium (SIMPOMIN) 2017, Casuarina@Meru Hotel, Ipoh, Perak

Pelawat Luar Negara

Overseas Visitors

11.09.2017
Lawatan daripada *Department Of Mineral Resources Thailand*
Visit from Department of MIneral Resources Thailand

30.11.2017
Lawatan daripada Saudi Geological Survey
Visit from Saudi Geological Survey

Kerjasama Dalam Negara

Kerjasama Dengan Agensi Nuklear Malaysia (ANM)

Kerjasama dengan ANM untuk Projek *Thorium Flagship* telah bermula pada tahun 2010 dan berakhir pada tahun 2017. Terdapat dua (2) sub-projek di bawah *Thorium Flagship* iaitu;-

i) *Thorium Resource and Supply, dan*
ii) *Production of Nuclear Grade Thorium and Uranium from Local Sources for Fuel Reactor*

Thorium Resource Supply
JMG telah menerima sejumlah RM1 juta peruntukan daripada ANM bagi kerja eksplorasi penilaian sumber Thorium negara. Pada tahun 2017, JMG telah mensasarkan lapan kawasan iaitu Ayer Lanas-Gual (Tanah Merah), Manik Urai-Peria (Kuala Krai), Gambang-Bekelah (Kuantan), Selendang (Rompin), Lawin-Lenggong (Lenggong), Kg. Pahit-Sg Pong (Gerik), Mahang-Karangan (Kulim) dan Titi-Kuala Kelawang (Jelebu). Skop kajian JMG terbahagi kepada kajian tinjauan dan kajian terperinci. Kajian terperinci merangkumi kerja pemetaan geologi dan geokimia, survei radiometrik, persampelan geokimia, lelubang, penggerudian dan analisa geokimia. Laporan bersepadu akhir telah diserahkan kepada ANM semasa mesyuarat Jawatankuasa Pemandu Bil1/2018 yang dibuat di Palm Seremban Hotel pada 28 November 2017.

Production of Nuclear Grade Thorium and Uranium from Local Sources for Fuel Reactor
JMG telah menerima peruntukan sebanyak RM 150 ribu daripada ANM untuk keseluruhan projek. Pada tahun 2017, sebanyak RM45 ribu telah diterima untuk ujian pencirian dan pemprosesan amang bagi mendapatkan monazite dan xenotime. Kesemua sampel daripada pihak ANM telah dianalisis dan laporan keputusan ujian tersebut telah diserahkan kepada pihak ANM.

National Cooperation

Cooperation with Malaysian Nuclear Agency

Cooperation with Malaysian Nuclear Agency (ANM) for the Thorium Flagship Programme had begun since 2010 and ended in 2017. There are two (2) sub-projects under Thorium Flagship, namely;

i) Thorium Resource and Supply, and
ii) Production of Nuclear Grade Thorium and Uranium from Local Sources for Fuel Reactor

Thorium Resource Supply
JMG was funded RM1million by ANM for thorium resource supply exploration works. In 2017, JMG had targetted eight (8) study areas namely Ayer Lanas-Gual (Tanah Merah), Manik Urai-Peria (Kuala Krai), Gambang-Bekelah (kuantan), Selendang (Rompin), Lawin-Lenggong (Lenggong), Kg. Pahit-Sg. Pong (Gerik), mahang-Karangan (Kulim) and Titu-Kuala Kelawang (Jelebu). Detailed study covers on geological and geochemical mapping, radiometric survey, geochemical sampling, pitting, drilling, and geochemical analysis. Final report had been submitted to ANM during the 1st Steering Committee Meeting in which was held in Seremban on 28th November 2017.

Production of Nuclear Grade Thorium and Uranium from Local Sources for Fuel Reactor
JMG had received RM150k from ANM for the project. In 2017, RM45k had been received for characteristic analysis and processing monazite and xenotime from tin tailing. All the samples had been analysed and the results had been submitted to ANM.

Kerjasama Dengan Merc Resources

Perjanjian persefahaman (MoU) hak pengkomersialan eksklusif teknologi penghasilan kertas secara in-situ telah ditandatangani oleh Ketua Pengarah JMG dan CEO Merc Resources Sdn Bhd di Ibu Pejabat JMG, Menara Tabung Haji, Kuala Lumpur pada 26 Januari 2017. Pada tahun 2017, kerjasama ini masih dalam peringkat perbincangan pemindahan teknologi dan pembelian hak harta intelek (IP).

Cooperation with Merc Resources

Memorandum of Understanding (MoU) for the exclusive commercialization right on in-situ paper making technology had been signed by JMG DG and Merc Resource's CEO at the JMG Headquarters, Menara Tanung Haji, Kuala Lumpur on 26th January 2017. In 2017, the cooperation was focused on the discussion on technology transfer and intellectual property rights.

Kerjasama Dengan Petronas Research Sdn Bhd (PRSB)

Kerjasama di dalam projek *"Concept Validation and Prototype Testing for CO_2 Mineralization Technology"* di antara JMG dan PRSB telah ditandatangani oleh Ketua Pengarah JMG dan Ketua Technology Research & CEO PRSB pada 10 Mac 2017 di Bangi, Selangor.

Projek selama sembilan (9) bulan ini dijangkakan bermula pada Februari 2017 dan berakhir pada Oktober 2017, bagaimanapun bermula agak lewat iaitu pada Ogos 2017 dan dijangka berakhir pada April 2018 oleh sebab-sebab yang tidak dapat dielakkan.

Melalui perjanjian persefahaman ini, JMG akan menerima sejumlah RM 150 ribu peruntukan secara berfasa daripada pihak PRSB bagi mengkaji beberapa parameter untuk menghasilkan *pcc* yang menggunakan bahan mula *quick lime, carbide lime* dan *hydrated lime*. Antara parameter yang dikaji adalah kadar aliran gas CO_2, ketulenan campuran gas CO_2 dan metana serta kadar adukan.

Pada tahun 2017, sebanyak 180 sampel telah dihasilkan di makmal PPM, dan ujian pencirian juga telah dijalankan ke atas sampel-sampel tersebut.

Cooperation with Petronas Research Sdn Bhd (PRSB)

Cooperation through the Concept Validation and Prototype Testing for CO2 Mineralization Technology was signed by JMG DG and PRSB CEO at Bangi, Selangor on 10th March 2017.

This Nine (9) months project was expected to start in February 2017 and ended in October 2017, however due to unforeseen circumstances, it was delayed to August 2017 and expected to be completed by April 2018.

It was agreed that JMG will received RM150k fund from PRSB to study few parameters to produce pcc using quick lime, carbide lime and hydrated lime as precursors. Among the parameters are CO2 flow rate, CO2 and methane mixture purity, as well as the mixture rate.

In 2017, a total of 180 samples had been produced and analyzed in PPM's laboratory.

Kerjasama Dengan Universiti Teknologi PETRONAS (UTP)

JMG telah menandatangani perjanjian persefahaman (MoU) bagi kerjasama dalam bidang mineral dan geosains dengan pihak UTP pada 28 September 2017 dan disaksikan oleh Timbalan Menteri NRE di Hotel Casuarina@Meru, Ipoh.

Cooperation with Universiti Teknologi PETRONAS

The Memorandum of Understanding (MoU) between JMG and UTP in the field of mineral and geoscience was signed on 4th Dec 2017 at Casuarina@Meru Hotel, Ipoh, witnessed by Deputy Minister of NRE.

Kerjasama Dengan Universiti Malaysia Pahang (UMP)

JMG telah menandatangani perjanjian kesefahaman (MoU) bagi kerjasama dalam bidang mineral dan geosains dengan pihak UMP pada 04 Disember 2017 dan disaksikan oleh Menteri Besar Pahang serta Timbalan Menteri NRE di Hotel Casuarina@Meru, Ipoh.

Cooperation with Universiti Malaysia Pahang

Witnessed by Menteri Besar Pahang and Deputy Minister of NRE, the Memorandum of Understanding (MoU) between JMG and UMP in the field of mineral and geoscience was signed on 4th Dec 2017 at Casuarina@Meru Hotel, Ipoh.

Geotapak Mersing Johor

Aktiviti Mineral
Mineral Activities

Aktiviti Mineral

Permintaan mineral dunia semakin meningkat selaras dengan pertumbuhan ketara bilangan penduduk dunia, yang mana mineral digunakan secara meluas dalam pelbagai aplikasi. (JMG), sebagai sebuah agensi yang bertanggungjawab ke atas pengurusan sumber mineral negara, berperanan menyediakan, mengumpul serta menganalisis data dan maklumat berkaitan eksplorasi mineral, perlombongan, pengkuarian, pengeluaran mineral, pelaburan komersial, dagangan mineral dan juga pengeluaran industri berasaskan mineral.

Aktiviti mineral yang dijalankan oleh JMG melibatkan penilaian sumber mineral berlogam, mineral perindustrian dan mineral tenaga. JMG juga berperanan membekalkan maklumat komoditi mineral bagi membantu meningkatkan perkembangan industri mineral negara, dan memberi khidmat nasihat guna tanah serta pembebasan mineral kepada pihak berkuasa negeri dan swasta.

Mineral Activities

The world's demand for minerals is constantly increasing in tandem with the world's population and the wider usage of minerals in various applications. As an agency responsible for the management of the nation's mineral resources, the (JMG), has to provide, collect and analyse data and information pertaining to mineral exploration, mining, quarrying, production, commercial investment, mineral trade and the development of mineral-based industries.

Mineral activities carried out by JMG involves resource evaluation for metallic, industrial, and energy minerals. JMG also plays a role in providing mineral commodity information to support the development of the nation's mineral industry, as well as advisory services pertaining to land use and mineral clearance to the state authorities and the private sector.

Penilaian Sumber Mineral

JMG melaksanakan penilaian sumber mineral di bawah projek pembangunan RMKe-11 pada mana sumber baharu bauksit, unsur nadir bumi berat (HREE) dan coal-bed methane (CBM) telah dikenal pasti. Projek sambungan survei geofizik awangan yang dijalankan di Wilayah Ekonomi Pantai Timur (ECER) menfokus kepada pemprosesan data, interpretasi data dan penulisan laporan akhir untuk kawasan berpotensi mineral berlogam.

Mineral Resource Evaluation

JMG conducted mineral resources evaluation under RMKe-11 development project where new deposits of bauxite, heavy rare earth element (HREE) and coal-bed methane (CBM) have been identified. Airborne geophysical survey was carried out in the East Coast Economic Region (ECER) focusing on data processing, data interpretation and final report writing for potential metallic mineral deposits.

Mineral Berlogam

Penilaian Sumber Mineral Berlogam

Kajian susulan terperinci penilaian timah primer Kedah dijalankan di Hutan Simpan Gunung Bongsu di Karangan, Kedah meliputi keluasan 6 km^2. Ia melibatkan kerja persampelan geokimia sungai di lokasi terpilih dan persampelan tanih di permatang dan rabung. Kerja pemetaan geologi permukaan terperinci turut dilaksanakan.

Kajian penilaian sumber timah primer dilaksanakan di Hulu Selangor meliputi keluasan 20 km^2. Kajian melibatkan pemetaan geologi, persampelan sedimen sungai terperinci sampel kelodak, konsentrat mineral berat dan batuan.

Di Terengganu, pensampelan geokimia terperinci dijalankan di Sg. Tapah, Setiu meliputi kawasan seluas 20 km^2. Kajian melibatkan pensampelan sedimen dan konsentrat sungai, pensampelan tanih bergrid, peparit dan kajian geofizik.

Metallic Minerals

Metallic Mineral Resource Evaluation

Follow-up studies on primary tin in Kedah was conducted in Gunung Bongsu Forest Reserve in Karangan, Kedah covering an area of 6 km^2. The study includes geochemical sampling on stream sediments and geochemical sampling of soil at ridges and spurs. Detailed surface geological mapping was also carried out.

Primary tin evaluation source study was carried out over a coverage of 20 km^2 in Hulu Selangor. The study involved geological mapping and detailed sediment sampling of silt, heavy mineral concentrates and rock samples.

In Terengganu, systematic detail geochemical sampling was conducted in Sg. Tapah, Setiu, covering a 20 km^2 area. The study involved sampling of stream sediments and concentrates, soil grid sampling, trenching and geophysical

Objektif kajian adalah untuk menyempadankan zon berpotensi emas berdasarkan laporan terdahulu dan untuk penambahan data geokimia jabatan.

Dua projek kajian penilaian sumber mineral berlogam dilaksanakan di Sabah iaitu kajian susulan emas Sungai Mentalitip, Semenanjung Semporna dan kajian geofizik untuk pemineralan mangan di Taritipan, Kota Marudu.

survey. The objectives of the study were to delineate gold potential zones based on previous reports and also to enhance the department's geochemical database.

Two metallic mineral evaluation studies were conducted in Sabah. The first study is on gold follow-up study in Sungai Mentalitip, Semporna while the second is the geophysical study for manganese mineralization in Taritipan, Kota Marudu.

Penilaian sumber mineral berlogam (tinjauan)
Metallic mineral resources assessment (reconnaissance)

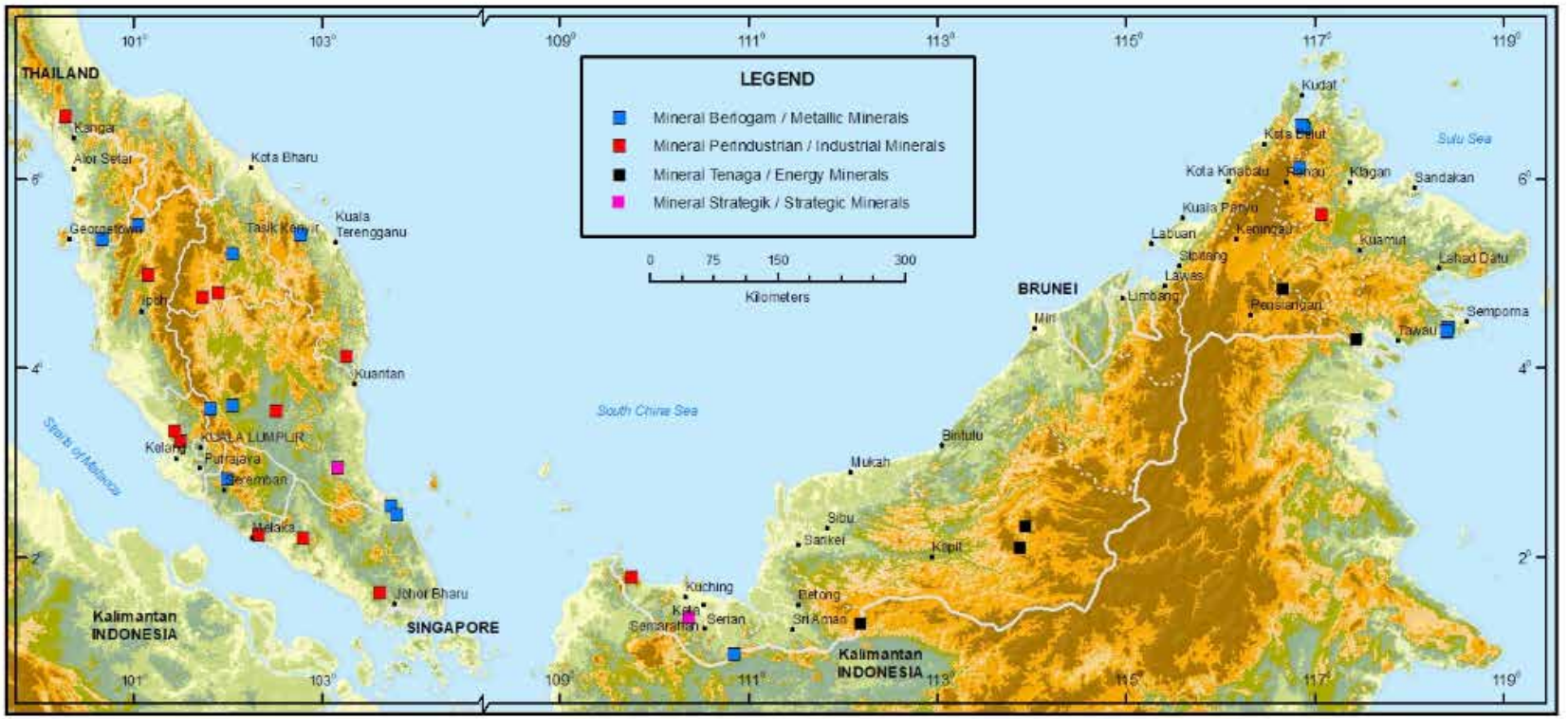
Komoditi Commodity	**Negeri** State	**Kawasan** Area	**Liputan** Coverage (km^2)	**Penemuan** Findings
Emas Gold	Johor	Sg. Arong	10.0	Pemineralan emas kawasan ini berasosiasi dengan mineral sulfida pirit dan arsenopirit. Persampelan konsentrat sungai menunjukkan kewujudan emas aluvial. Gold mineralization in the area is associated with pyrite and arsenopyrite sulphide minerals. River concentrate sampling shows the presence of alluvial gold.
	Jumlah Liputan: **Total Coverage:**		**10**	

Penilaian sumber mineral berlogam (susulan / terperinci)
Metallic mineral resources assessment (follow-up / detailed)

Komoditi Commodity	Negeri State	Lokasi Location	Liputan Coverage (km^2)	**Penemuan** Findings
Timah Tin	Kedah	Hutan Simpan Gunung Bongsu Gunung Bongsu Forest Reserve	6.0	Pemineralan timah jenis greisen yang menganjur arah timur laut-barat daya dalam jasad granit-pegmatit dikenalpasti berdasarkan analisis geokimia sampel tanih in-situ dan batuan terubah yang tersingkap pada potongan jalan. Greisen type of tin mineralization cutting pegmatite granite bodies in northeast-southwest direction was determined through in-situ soil geochemical analysis and altered rocks exposed in road cuttings.

Timah Tin	Perak	Hulu Perak	17.0	Hasil keputusan analisis geokimia sampel tanih yang dikutip melalui kaedah permatang dan susuh telah menggariskan tiga kawasan anomali pelbagai unsur berkeluasan 1.5 km^2 dengan nilai unsur Sn berjulat 0.5 – 546 ppm. Analisis QME sampel konsentrat di kawasan anomali berkenaan juga menunjukkan kehadiran mineral kasiterit dengan tenor berjulat 116.3 – 1,560 g/m^3. Based on the result of geochemical analysis on soil samples conducted by ridge and spur method, a total of three multi-element anomalies within an area of 1.5 km^2 were identified with Sn value ranging from 0.5 – 546 ppm. QME analysis on stream concentrate samples taken within the anomaly areas show cassiterite with tenor ranging from 116.3 – 1,560 g/m^3.
Timah Tin	Selangor	Hulu Selangor	20.0	Kawasan anomali pelbagai unsur berkeutamaan 1 dikenalpasti seluas 4 km^2. Unsur-unsur yang menunjukkan nilai anomali adalah Sn, W, Pb, Zn dan Mn. Kawasan ini berpotensi dijalankan kajian lanjut dengan penekanan kepada unsur Sn. A first priority multi elements anomalous area is identified with an area of 4 km^2. Elements with anomalous value include Sn, Pb, Zn and Mn. The area has high potential and should be further study with focus on Sn.
Emas Gold	Johor	Sg. Jamari, Mersing	20.0	Pemineralan emas adalah dari deposit hidrotermal yang mengalami proses aktivasi semula semasa penerobosan lampofir ke dalam batuan jujukan Mersing. Emas didapati berasosiasi dengan mineral sulfida pirit dan arsenopirit. Gold mineralization is from hydrothermal deposit which undergoes reactivation process during lampophyre intrusion into Mersing rock sequence. Gold is found to be associated with pyrite sulfide minerals and arsenopyrite.
Emas Gold	Pahang	Lanchang	30.0	Dua kawasan beranomali yang berpotensi sebagai kawasan dengan sumber pemineralan emas dikenalpasti. Two anomalous area with potential as resource area for gold mineralization were determined.

Emas Gold	Terengganu	Sg. Tapah, Setiu	5.0	Keputusan analisis bagi unsur emas berjulat dari 0.003 - 0.44 ppm untuk sampel kelodak manakala untuk sampel konsentrat berjulat dari 0.003 - 814.31 ppm. Keputusan analisis sampel tanih kaedah persampelan tanih bergrid berjulat 0.003 - 0.433 ppm, manakala keputusan analisis sampel tanih bagi kaedah peparit berjulat 0.003 - 0.304 ppm. Keputusan analisis bagi sampel batuan berjulat 0.003 - 20.09 ppm Analysis results for the element gold range from 0.003 - 0.44 ppm for silt samples while for concentrate samples range from 0.003 - 814.31 ppm. The result of soil samples analysis for the soil grid sampling was 0.003 - 0.433 ppm. The result of soil samples analysis for trenching was 0.003 - 0.304 ppm. Results of the analysis for rock samples range from 0.003 - 20.09 ppm
Emas Gold	Kelantan	Teleming Gua Musang	26.0	Potensi pemineralan berada di permatang filit teralterasi oleh pensilikaan yang berarah utara-selatan. Kawasan beranomali ini terletak di zon sentuhan batuan filit – riolitik tuf yang telah mengalami sesar dan dipotong oleh korok kuarza bersaiz 30 m lebar dan 2 km panjang. Mineral potential area was found on a north-south trending phyllite ridge (altered by silification) The anomally area is located on a sheared phyllite– rhyollitic tuff contact zone which is cut by a (30 m width) 2 km long.
Emas Gold	Sarawak	Serian	2.5	Anomali Au, Cu, Co, Fe, Sb, (Ni dan Mo ditemui) dalam sampel tanih. Survei geofizik resistiviti menunjukkan terdapat zon rekahan pada batuan igneus. Soil sample showed anomalous Au, Cu, Co, Fe, Sb, Ni and Mo. Geophysical survey resistivity in the study area indicated fractured zones in the igneous rocks.
Emas Gold	Sabah	Sg. Mentalitip	1	Keputusan analisis bagi unsur emas berjulat dari 0.003-0.027 ppm untuk sampel kelodak manakala untuk sampel konsetrat berjulat dari 0.989-8.935 ppm. Keputusan analisis sampel tanih bagi kaedah berjulat 0.003-0.167 ppm. Analysis results for the element gold range from 0.003-0.027 ppm for silt samples while for cocentrate samples range from 0.989-8.935 ppm. The result of soil samples analysis for the soil good sampling was 0.003-0.167 ppm. Results of the analysis for rock samples range from 0.003-0.167 ppm
Mangan Manganese	Sabah	Taritipan, Kota Marudu	8	Interpretasi data geofizik sedang dilaksanakan. Geohysics data interpretation is in progress.
	Jumlah liputan **Total coverage**		**135.5**	



Aktiviti Penilaian Sumber Mineral 2017
Mineral Resources Evaluation Activities 2017

Singkapan granit tergreisen dengan kehadiran kasiterit bersaiz sederhana hingga kasar di Hutan Simpan Gunung Bongsu, Kedah
Greisenized granite outcrop with occurences of medium to coarse grained cassiterite in Gunung Bongsu Forest Reserve, Kedah

Pirofilit terluluhawa pada singkapan greisen yang mengandungi butiran kasiterit di Gunung Bongsu, Kedah
Weathered pyrophyllite on greisen outcrop containing cassiterrite nodules in Gunung Bongsu, Kedah

Kuarza menggerutu atau kuarza baki akibat sulfidasi tinggi dalam greisen ditemui di zon terubah di Gunung Bongsu, Kedah
Vuggy quartz or residue quartz from high sulfidation alteration of greisen found in altered zone in Gunung Bongsu, Kedah

Pemetaan singkapan batuan bagi penilaian sumber timah di Sg. Pahit, Hulu Perak, Perak
Outcrop mapping for tin resource assessment at Sg. Pahit, Hulu Perak, Perak

Persampelan konsentrat mineral berat di Sg. Pahit, Hulu Perak, Perak
Sampling of heavy mineral concentrate at Sg. Pahit, Hulu Perak, Perak

Persampelan tanih bagi penilaian sumber timah di Sg. Pahit, Hulu Perak, Perak
Soil sampling for tin resource assessment at Sg. Pahit, Hulu Perak, Perak

Pengkodan warna tanih menggunakan Munsell Chart
Soil colour coding using Munsell Chart

Bijih timah yang ditemui di Sg. Pahit, Hulu Perak, Perak
Tin ore found in Sg. Pahit, Hulu Perak, Perak

Kerja pendulangan emas semasa pemetaan dijalankan di Sg. Jamari, Mersing, Johor
Gold panning during the mapping of Sg. Jamari area in Mersing, Johor

Persampelan kelodak dan konsentrat bagi kajian sumber pemineralan emas di Sg. Jenalik, Lanchang, Pahang
Sampling of silt and concentrates for gold mineralization resource study at Sg. Jenalik, Lanchang, Pahang

Telerang kuarza yang dijumpai semasa pemetaan dijalankan di Sg. Jamari, Mersing, Johor
Quartz vein found during mapping in Sg. Jamari, Mersing, Johor

Mineral Perindustrian

Perindustrian Penilaian Sumber Mineral

Pelan Induk Perindustrian menyatakan keperluan inventori sumber mineral perindustrian kebangsaan untuk membolehkan perancangan program perindustrian negara yang sistematik. Oleh itu adalah mustahak kajian bagi mengenal pasti sumber-sumber mineral perindustrian tempatan diteruskan. Projek Penilaian Sumber Mineral Perindustrian merupakan komponen kepada Projek Penilaian Potensi dan Pembangunan Sumber Mineral Negara yang telah dilaksanakan dalam Rancangan Malaysia Ke-11 bermula tahun 2016. Ianya merupakan sambungan kepada Projek Mineral Perindustrian yang dijalankan dalam Rancangan Malaysia sebelumnya. Kesemua projek telah dilaksanakan secara tinjauan dan susulan bagi kawasan yang telah dikenal pasti.

Pada tahun 2017 penilaian telah dijalankan ke atas beberapa jenis mineral perindustrian iaitu bauksit, batuan silika, batu kapur dan agregat batuan dengan jumlah kawasan liputan 73 km^2. Kajian yang dijalankan telah mengenal pasti rizab anggaran 401,800 tan metrik bauksit, 271 juta tan metrik batuan silika dan 294 juta tan metrik batuan agregat.

Industrial Minerals

Industrial Mineral Resources Evaluation

The Industrial Master Plan requires an inventory of national industrial mineral resources to enable systematic planning of the country's industrialization program. It is therefore important to continue the study to identify local industrial mineral resources. The Industrial Mineral Resource Assessment Project is a component of the National Mineral Resources Potential and Development Assessment Project which has been implemented in the 11th Malaysia Plan from 2016. The project is the continuation to the Peninsular Industrial Mineral Project, carried out in the previous Malaysia Plan. The reconnaissance and follow-up surveys were carried out in all the identified areas.

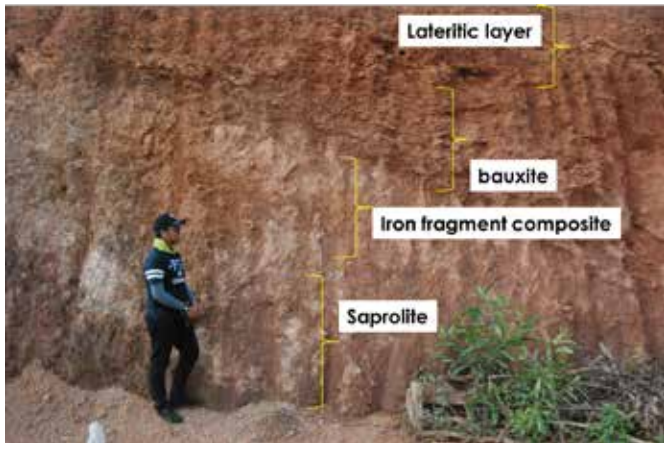
In the year 2017, evaluations on several types of industrial minerals such as bauxite, silica rock, limestone and rock aggregates were carried out, with a total coverage area of 73 km^2. The study has identified an estimated reserve of 401,800 tonnes of bauxite, 271 million tonnes of silica rock and 294 million tonnes of rocks aggregate.

Bauksit / Bauxite

Negeri State	Kawasan Area	Liputan Coverage (km^2)	Penemuan Findings
Sarawak	Gunung Angus, Lundu	4.0	Anggaran sumber adalah sebanyak 400,000 tan metrik. Purata gred bauksit adalah Al_2O_3 (45.62%), SiO_2 (10.41%), Fe_2O_3 (17.87%), TiO_2 (1.02%) dan LOI (27.65%). The estimated resource is 400,000 tonnes. The average chemical composition of bauxite is Al_2O_3 (45.62%), SiO_2 (10.41%), Fe_2O_3 (17.87%), TiO_2 (1.02%) and LOI (27.65%).
Sabah	Sg Tapaang, Telupid	10.0	Sebanyak 550 sampel sedang dianalisis. A total of 550 samples are being analyzed.
Selangor	Sg Buloh	4.0	Deposit bauksit menunjukkan kandungan mineral gibbsit antara 62 - 95% dan kandungan Al_2O_3 (41 - 52%). Ketebalan purata deposit adalah 1.3 m dijumpai dalam kawasan seluas 0.2 km^2. Bauxite deposit shows gibbsite mineral content between 62 - 95% and Al_2O_3 content 41 - 52%. The average thickness of the deposit in an area of 0.2 km^2 is 1.3 m.
	Bukit Badong dan Sg Tengi	10.0	Kajian awal menunjukkan kandungan mineral gibbsit antara 70-95% dengan kandungan Al_2O_3 lebih dari 30%. Preliminary studies show gibbsite mineral content between 70 - 95% with Al_2O_3 content more than 30%.

Melaka	Telok Mas, Merlimau	3.0	Penemuan sumber bauksit dengan kandungan Al_2O_3 (>40%), Fe_2O_3 (3 - 20%), LOI (>20%). Bauxite resources with the content of Al_2O_3 (> 40%), Fe_2O_3 (3 - 20%), LOI (> 20%).
Johor	Muar	5.0	Kawasan potensi bauksit telah ditemui dengan kandungan alumina (Al_2O_3) sebanyak 47.4 - 53.6%. Bauxite potential area was found with alumina (Al_2O_3) content of 47.4 - 53.6%.
	Kulai	5.0	Kawasan berpotensi bauksit dengan kandungan alumina (Al_2O_3) 47.6 - 51.4%. Potential area for bauxite with alumina (Al_2O_3) content of 47.6 -51.4%.
Pahang	Felcra Bukit Segumpal dan Felda Sungai Nerek, Maran	1.0	Potensi sumber bauksit bergred rendah di Felda Bukit Segumpal dengan kandungan Al_2O_3 (20.2 - 42.2%), Fe_2O_3 (11.2 - 43.6%) dan SiO_2 (12.4 - 39.6%). Manakala kandungan Al_2O_3 (10.0% - 33.1%), Fe_2O_3 (4.6 - 62.2%) dan SiO_2 (14.4% - 74.8%) di Felda Sungai Nerek. Anggaran rizab sumber bauksit adalah 1,800 tan metrik di Felcra Bukit Segumpal dan tiada sumber berekonomi di Felda Sungai Nerek. The potential of low grade bauxite resources in Felda Bukit Segumpal with Al_2O_3 (20.2 - 42.2%), Fe_2O_3 (11.2 - 43.6%) and SiO_2 (12.4 - 39.6%). Al_2O_3 content (10.0% - 33.1%), Fe_2O_3 (4.6% -62.2%) and SiO_2 (14.4% - 74.8%) in Felda Sungai Nerek. The bauxite reserves were estimated at 1,800 tonnes in Felcra Bukit Segumpal.
Jumlah liputan **Total coverage**		**42.0**	

Sampel nodul bauksit dari Sg. Tapaang, Telupid, Sabah
Bauxite nodule samples from Sg. Tapaang, Telupid, Sabah



Singkapan profil teres bukit yang ditemui di Bukit Lintang, Telok Mas, Merlimau, Melaka
Terrace profile outcrop in Bukit Lintang, Telok Mas, Merlimau, Melaka

Nodul bauksit yang ditemui di Muar, Johor
Bauxite nodules found in Muar, Johor

Persampelan bauksit dalam lelubang di Maran, Pahang
Bauxite sampling in pithole at Maran, Pahang

Batuan silika
Silica rocks

Negeri State	Kawasan Area	Jenis batuan Rock type	Liputan Coverage (km^2)	Penemuan Findings
Perak	Bukit Berekeh, Sungai Siput Utara.	Kuarzit Quartzite	10.0	Kandungan silika (SiO_2) berjulat dari 94.1 - 98.4% dengan ketulenan purata 97.5%. Ianya bersesuaian digunakan dalam penghasilan ferosilikon. SiO_2 content ranged from 94.1 - 98.4% with average value of 97.5%. The quartzite can be used for making ferrosilicone alloy.
Terengganu	Tanah kerajaan Bandar Ceneh Baru, Kemaman.	Batuan kuarza masif yang terbentuk daripada penyejukan bendalir hidroterma. Massive silica quartz ridge that built from the cooling of hydrothermal fluid.	3.0	Anggaran rezab sebanyak 1.11 juta tan metrik dijumpai dalam kawasan seluas 29,049.95 m^2. Kandungan SiO_2 adalah sebanyak 98.8%. Reserve estimates of 1.11 million tonnes were found in an area of 29,049.95 m^2. SiO_2 content was 98.8%.
Kelantan	Sungai Berok, Gua Musang.	Batuan silika masif. Massive silica rock.	18.0	Anggaran rezab melebihi 100 juta m^3 (270 juta tan metrik). Kandungan SiO_2 di antara 94.3 - 97.6%. Estimated reserve exceeds 100 million m^3 (270 tonnes). SiO_2 contents range 94.3 - 97.6%.
	Jumlah liputan **Total coverage**		**31.0**	

Singkapan batuan kuarza di Bandar Cheneh Baru, Kemaman, Terengganu
Quartz outcrop in Bandar Cheneh Baru, Kemaman, Terengganu

Singkapan batuan kuarzit, di Bukit Berekeh, Sungai Siput Utara, Perak
Quartzite outcrop of Bukit Berekeh, Sungai Siput Utara, Perak

Persampelan batuan silika di Sungai Berok, Gua Musang, Kelantan
Silica rock sampling in Sungai Berok, Gua Musang, Kelantan

Sampel kuarzit Bukit Berekeh, Sungai Siput Utara, Perak
Quartzite samples of Bukit Berekeh, Sungai Siput Utara, Perak

Batu Kapur / Limestone

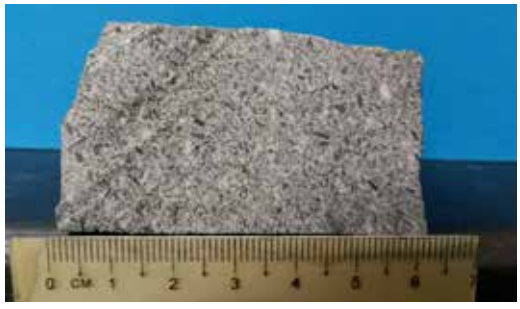
Negeri State	Kawasan Area	Liputan Coverage (km^2)	Penemuan Findings
Perlis	Kok Mak, Bukit Mata Ayer, Padang Besar.	5.0	Survei geofizik dan pemodelan graviti 2D menunjukkan ketebalan batu kapur / dolomit melebihi 160 m dan mencecah sehingga 300 m. Penggerudian intan mendapati ketebalan lapisan batu kapur / dolomit melebihi 90 m. Geophysical survey and 2D gravity modelling indicates a limestone / dolomite thickness of 160 m to 300 m. Diamond drilling also indicates that thickness of the limestone / dolomite exceeds 90 m.
Jumlah liputan Total coverage		**5.0**	

Penggerudian intan batu kapur/ dolomit di Padang Besar, Perlis
Diamond drilling of limestone/ dolomite in Padang Besar, Perlis

Kajian survei graviti di Padang Besar, Perlis
Gravity survey study in Padang Besar, Perlis

Agregat batuan / Rock agregates

Negeri State	Kawasan Area	Jenis batuan Rock type	Liputan Coverage (km^2)	Penemuan Findings
Sabah	Tarawas, Daerah Ranau. Bukit Pinosuduan.	Mikrodiorit	5.0	Kawasan seluas 1.02 km^2 didapati berpotensi dengan anggaran kasar simpanan batuan 293.6 juta tan metrik. Total rock reserve in 1.02 km^2 area is estimated at 293.6 million tonnes.
Jumlah liputan Total coverage			**5.0**	



Sampel mikrodiorit Bukit Pinosuduan, Ranau, Sabah.
Microdiorite sample from Bukit Pinosuduan, Ranau, Sabah

Mineral Tenaga

Penilaian Sumber Arang Batu

Di Sarawak, Penilaian Sumber Arang Batu telah dijalankan di dua blok iaitu Sarawak Utara dan Sarawak Barat dengan jumlah keluasan melitupi 130 km^2. Di Blok Betalong, telah dijumpai sekurang-kurangnya satu lipit arang batu. Sementara di Blok Silantek Timur, singkapan arang batu agak kurang dijumpai.

Sabah telah menjalankan dua komponen kajian iaitu Penilaian Sumber Arang Batu (SAB) di kawasan Blok Sinobang - Lambunan, Sandakan dan Penilaian Pembangunan Coal Bed Methane (CBM) di Silimpopon dan Tawau, Sabah dengan keluasan masing-masing 30 km^2 dan 40 km^2.

Kajian susulan Penilaian SAB Sabah di kawasan Blok Sinobang-Lambunan dilakukan untuk menyiasat taburan serta kesinambungan unjuran lipit yang ditemui di antara Blok Sinobang dan Blok Lambunan sebelum ini, manakala kajian pembangunan Coal Bed Methane (CBM) yang merupakan komponen baru dalam kajian jabatan ditumpukan untuk meningkatkan kefahaman teknologi dalam bidang ini. Kajian pembangunan CBM di Silimpopon dilakukan melalui pemetaan lapangan untuk melihat ciri-ciri kesesuaian arang batu untuk pembentukan gas metana.

Energy Mineral

Coal Resources Assessment

In Sarawak, Coal Resources Assessment Project was conducted in two blocks, namely North Sarawak and West Sarawak with a total area of 130 km^2. In Betalong Block, one coal seam has been found. In East Silantek Block, few coal outcrops are found.

Sabah has conducted two investigations namely coal resources assessment in Sinobang-Lambunan Block (SLB) in Sandakan and the development of Coal Bed Methane (CBM) in Silimpopon, Tawau Block of 30 km^2 and 40 km^2 respectively.

The follow-up survey for coal resources in SLB is to investigate the coal distribution between Sinobang and Lambunan Block found from the previous investigation and to delineate the seam extension, while the CBM investigation is focussed on related exploration technologies as it was a new development project for the department. The investigation is confined on surface mapping to identify the coal characteristic for CBM potential.

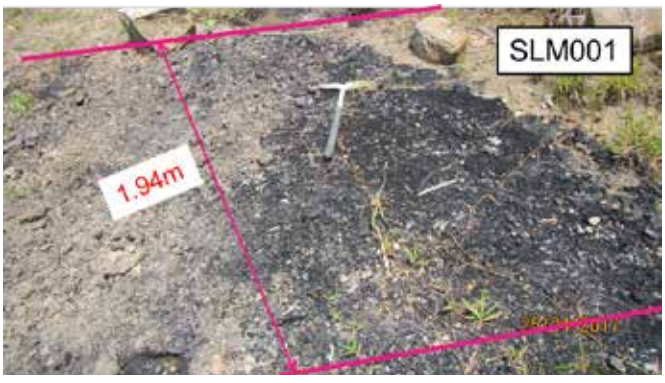
Mineral tenaga – batu arang
Energy mineral – coal

Negeri State	Kawasan Area	Liputan Coverage (km^2)	Darjat Rank	Penemuan Findings
Sarawak	Blok Betalong, Horst Mountains, Kapit	55	bitumen bituminous	Bil. Singkapan: 20 (BHM019-BHM038) Sudut kemiringan: 3^0-50^0 berarah SW-NW Ketebalan: 0.06 m - 1.50 m Lipit: 1 Simpanan:- Singkapan arang batu dijumpai di dalam Formasi Nyalau yang berusia Miocene. Number of Outcrop: 20 (BHM019-BHM038) Tilt angle: 3^o - 50^o SW-NW direction. Thickness: 0.06 - 1.50 m Seam: 1 Reserve: - Coal outcrops are found in the Nyalau Formation of Miocene age
Sarawak	Blok Silantek East, Silantek coal field, Sri Aman	75	bitumen bituminous	Bilangan singkapan: 1 (SE006) Sudut kemiringan: 15^o berarah SE Ketebalan: 0.15 m Simpanan: - Singkapan arang batu dijumpai di dalam Formasi Silantek yang berumur Awal Eocene sehingga Awal Miocene. Number of outcrop: 1 (SE006) Tilt angle: 15^o direction SE Thickness: 0.15 m Reserve: - Coal outcrops are found in the Silantek Formation of Early Eocene to the Early Miocene age.
Sabah	Sinobang – Lambunan, Sandakan, Sabah	$30km^2$	HvC-Ab (High volatile C – A arang batu bitumen) HvC-Ab (High volatile C – A Bituminous coal)	Kawasan kajian dilitupi oleh Formasi Tanjong, berusia Miosen Awal hingga Miosen Tengah Sebanyak 13 singkapan arang batu telah ditemui dengan julat ketebalan 0.23 - 2.50 m Tiga lipit arang batu ditemui. Sumber arang batu mempunyai simpanan sebanyak 10.5 juta tan metrik Hasil analisis kimia menunjukkan ia tergolong dalam gred “high volatile A to C bituminous” (hvAb ke hvCb). The study area underlained by the Tanjong Formation of Early to Middle Miocene age A total of 13 coal outcrops were discovered with thickness ranging from 0.23 - 2.50 m Three coal seams were delineated with an indicated coal reserves of 10.5 million tonnes Eight coal samples were sent for chemical analyses shows the coal is ranked as high volatile A to C bituminous Coal (hvAb to hvCb)

Sabah	Silimpopon	40km^2	Coal	Kawasan kajian dilitupi Formasi Tanjong berusia Miosen Awal hingga Miosen Tengah Empat singkapan arang batu ditemui dengan ketebalan dari 0.5 - 2.0 meter Singkapan arang batu mempunyai ciri-ciri cleat pada permukaan dan lapisan arang batu menunjukkan potensi baik untuk pembentukan gas metana Dua sampel dihantar untuk analisa kimia menunjukkan nilai kalori yang tinggi dengan keputusan 7,720 dan 7,989 kcal/kg The study area underlained by the Tanjong Formation of Early to Middle Miocene age Four coal outcrops were detected with thickness ranges from 0.5 - 2.0 m The coal outcrops shown a cleat system on the surface and within the coal layers indicating good potential for CBM formation Two coal samples sent for chemical analyses showed very high gross calorific value of 7,720 and 7,989 kcal/kg respectively
Jumlah liputan **Total coverage**		**200**		

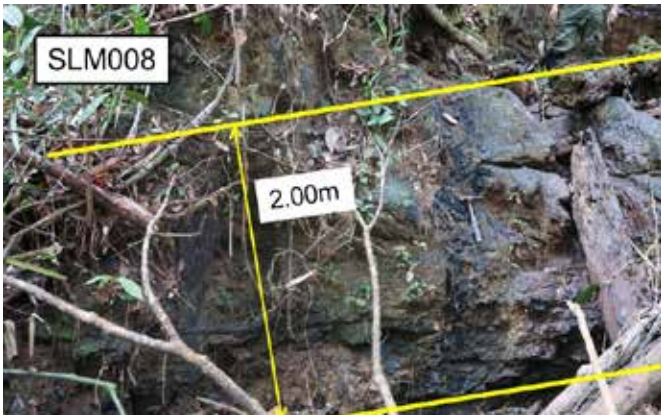
Singkapan arang batu di Blok Silantek Timur
Coal outcrop at Silantek East Block

Mengambil bacaan perlapisan batuan
Measuring rock beddings



Singkapan arang batu dengan ketebalan 1.94 m di Silimpopon
Coal outcrop with thickness of 1.94 m at Silimpopon

Singkapan arang batu dengan ketebalan 0.85 m di Silimpopon
Coal outcrop with 0.85 m thickness at Silimpopon



Singkapan arang batu dengan ketebalan 2.0 m di Silimpopon
Coal outcrop with 2.00 m thickness at Silimpopon

Singkapan arang batu dengan ketebalan 2.50 m di Silimpopon
Coal outcrop with 2.50 m thickness at Silimpopon

Survei Geofizik Awangan

JMG secara berterusan membantu dan bekerjasama dengan NRE dalam urusan berkaitan pembangunan mineral, terutamanya dalam pelan pembangunan potensi mineral di Wilayah Ekonomi Pantai Timur (ECER) yang merangkumi selatan Kelantan, Terengganu, Pahang dan utara Johor (Mersing). Majlis Pembangunan ECER, pada mesyuarat yang dipengerusikan oleh YAB Perdana Menteri pada 9 April 2015, telah meluluskan peruntukan sebanyak RM19 juta untuk survei geofizik awangan di kawasan ECER. Survei ini bertujuan untuk mengenal pasti longgokan mineral berlogam yang berpotensi melalui penawanan, pemprosesan dan interpretasi data radiometrik dan magnetik. Fokus utama projek ini adalah untuk mengenal pasti potensi longgokan bagi enam jenis sumber mineral yang penting untuk pembangunan industri hiliran di kawasan ECER, iaitu bijih besi, batu kapur, pasir silika, tanah liat, feldspar, dan granit.

Penerbangan untuk survei geofizik awangan telah dilaksanakan melintasi 62,937 km dan meliputi jumlah keluasan 27,921 km^2. Peta daripada data yang dikumpul akan memberikan maklumat mengenai kandungan uranium (U), torium (Th), kalium (K), ternari plot, magnetik rantau plot, struktur geologi dan anomali. Pemprosesan data dilakukan antara Disember 2016 hingga Mac 2017 manakala interpretasi data dilakukan antara April hingga Ogos 2017.

Airborne Geophysical Survey

JMG continue to assist and cooperate with NRE in the development of the minerals sector, especially the mineral potential development plan of the Economic Corridor of East Region (ECER) which includes southern Kelantan, Terengganu, Pahang and northern Johor (Mersing). The ECER Development Council, at a meeting chaired by The Honorable Prime Minister on 9 April 2015, approved an allocation of RM19 million for the airborne geophysical survey in the ECER area. The survey was aimed at identifying potential metallic mineral deposits through the acquisition, processing, and interpretation of airborne geophysical radiometric and magnetic data. The main focus of the project was to identify potential deposits of six mineral resources in the area which are essential for the downstream industrial development of ECER, namely iron ore, limestone, silica sand, clay, feldspar and granite.

The airborne geophysical survey covered an area of traversing 62,937 km and covering a total area of 27,921 km^2. Maps from the collected data would provide information on uranium (U), thorium (Th), potassium (K), ternary plots, regional magnetic plots, structural geology and anomalies. Data processing was done between December 2016 to March 2017 while data interpretation was done between April to August 2017.

Mineral Strategik

Penilaian Sumber Mineral Strategik

Skop kajian tertumpu kepada taburan batuan ultrabes yang luas di Sarawak dan Sabah. Unsur nadir bumi berat (REE), terutama skandium terbentuk daripada luluhawa dan penguraian batuan ultrabes yang kaya dengan mineral ultramafik.

Di Sarawak, kawasan terlibat untuk penilaian sumber REE ialah di Wilayah Sarawak Barat. Kawasan berkenaan berpotensi untuk kajian susulan kerana sampel yang dianalisis menunjukkan jumlah REE yang tinggi (> 300 ppm).

Persampelan telah dibuat pada singkapan batuan ultrabes di sepanjang Jalur Tengah Sabah bermula dari Pulau Banggi di utara Sabah hingga ke Tawau dan Semporna. Analisis geokimia sampel sedang dijalankan dengan kaedah Laser *Abbration* dan ICP-MS.

Strategic Minerals

Strategic Mineral Resources Evaluation

The scope of study is targeted to the widely distributed ultrabasic rock in Sarawak and Sabah. Rare earth elements (REE) especially scandium is primarily formed from weathering and breakdown of the ultramafic minerals rich of ultrabasic rocks.

In Sarawak, REE resource potential assessment study was conducted in West Sarawak region. These areas have potential for follow-up study due to analyzed samples showing high content of REE (> 300 ppm).

Ultrabasic outcrop sites along the Sabah Central Belt beginning from Pulau Banggi in the northern of Sabah to Tawau and Semporna were sampled. Geochemical analysis of the sample were currently conducted using Laser Abbration and ICP-MS

Penilaian sumber unsur nadir bumi berat
Heavy rare earth element resources assessment

Negeri State	Lokasi Location	Komoditi Commodity	Liputan (meter-garis) Coverage (line meter)	Penemuan Findings
Sarawak	Wilayah Sarawak Barat	REE	100	Kajian tinjauan potensi REE meliputi Wilayah Sarawak Barat. Kawasan yang terlibat iaitu Munggu Belian Lundu, Kg. Sorak Melayu Serian, Kg. Riih Serian dan Kg. Jagoi Bau berpotensi untuk kajian susulan kerana sampel yang dianalisis menunjukkan jumlah REE yang tinggi (> 300 ppm). REE resource potential assessment study covered West Sarawak. The involved area were Munggu Belian Lundu, Kg Sorak Melayu Serian, Kg Riih Serian and Kg Jagoi Bau that are highly potential for follow-up study due to analysed samples showed high content of REE (> 300 ppm).
Sabah	Seluruh Sabah Whole Sabah	REE, Thorium Skandium. REE, Thorium Scandium.		Kajian dilaksanakan di singkapan batuan ultrabes di Sabah. Batuan ultrabes di sepanjang Jalur Tengah Sabah bermula dari Pulau Banggi di utara Sabah hingga ke Tawau dan Semporna telah dibuat persampelan. Analisis geokimia sedang dilaksanakan. Study was conducted on ultrabasic rocks outcrop in Sabah. Ultrabasic rocks along the Sabah Central Belt beginning from Pulau Banggi in the northern of Sabah to Tawau and Semporna were sampled. Currently on geochemical analysis stage.
	Jumlah liputan Total coverage		100	

Ekonomi Mineral

Dalam usaha untuk menyebarkan informasi mineral dalam Negara, sebanyak lima laporan telah diterbitkan:

1. *Malaysian Minerals Yearbook,*
2. *Industrial Mineral Production Statistics and Directory of Producers in Malaysia,*
3. *Malaysian Mining Industry,*
4. *Malaysian Mineral Trade Statistics* dan
5. *Directory of Mineral-Based Industries in Malaysia.*

Selain daripada menerbitkan laporan tahunan, JMG terus memberi input berkala mengenai status sektor mineral kepada NRE dan agensi-agensi kerajaan yang lain. Segala input ini bertujuan untuk pengiraan sumbangan sektor perlombongan kepada ekonomi negara oleh Bank Negara. Informasi ini juga digunakan untuk membuat formulasi imbangan tenaga negara, serta mengemaskini data inventori greenhouse gas (GHG) oleh *Malaysian Green Technology Corporation.* Laporan dan maklumat data yang dibekalkan adalah:

1. Laporan industri perlombongan kepada Bank Negara dan Jabatan Perangkaan,
2. Laporan pengeluaran bijih timah kepada Lembaga Timah,
3. Laporan pelaburan swasta kepada MIDA,
4. Laporan data pengeluaran batu arang, batu kapur serta serbuk kapur kepada *Malaysian Green Technology Corporation* (dahulu dikenali sebagai Pusat Tenaga Malaysia),
5. Input mengenai pelaksanaan keputusan 16th ASOMM, 9th ASOMM+3, persediaan 17th ASOMM, persediaan *14th ASOMM Working Group Meetings,*
6. Input bagi persediaan *3rd Coordination Meeting and WTO Secretariat Visit* pada September 2017,
7. Input untuk kertas kedudukan "Senario Industri Bauksit di Malaysia" (BMG),
8. Input untuk penyediaan kertas teknikal oleh Sekretariat ASEAN di mana Malaysia merupakan Pengerusi bagi WGTIM *(Working Group on Trade and Investment in Minerals) iaitu; Identification of Minerals Sector-Related Economic Activities Using the International Standards Industrial Classification of All Economic Activities (Isic Rev. 4) System dan Identification of Minerals Sector Products Using the Harmonised System (HS 2017) Nomenclature (6-Digits),*
9. Input untuk penyediaan *Chapter Report on" Constraints, Gaps and Needs" for Third National Communication (NC3)"* dan
10. Input untuk penyediaan Review Finding and Workshop for Energy and Industrial Processes and Product Use Sector (IPPU).

Peranan JMG dalam menyalurkan input berkaitan industri mineral meliputi peringkat antarabangsa di mana input-input

Mineral Economics

In order to disseminate the country's information on minerals, a total of five reports were published:

1. Malaysian Minerals Yearbook,
2. Industrial Mineral Production Statistics and Directory of Producers in Malaysia,
3. Malaysian Mining Industry,
4. Malaysian Mineral Trade Statistics and
5. Directory of Mineral-Based Industries in Malaysia.

Besides the publication of the annual reports, JMG continued to provide periodical inputs on the status of the minerals sector to the NRE, as well as to other related government agencies. These inputs were necessary for the calculation of the contribution of the mineral sector to the country's economy by the Central Bank. The information was also needed in the formulation of the national energy balance and in the updating of greenhouse gas (GHG) inventory data by Malaysian Green Technology Corporation. Report and data supplied were:

1. Mining industry reports to Central Bank and Statistics Department,
2. Tin ore production reports to the Tin Board,
3. Private investment reports to MIDA,
4. Coal, limestone and lime production reports to the Malaysian Green Technology Corporation (formerly known as Pusat Tenaga Malaysia),
5. Input of the outcome of the 16th ASOMM and 9th ASOMM+3, preparation for the 17th ASOMM, preparation for the 14th ASOMM Working Group,
6. Input for the 3rd Coordination Meeting and WTO Secretariat Visit on September 2017,
7. Input for the position paper "Senario Industri Bauksit di Malaysia" (by BMG),
8. Input for the technical paper by ASEAN Secretariat where is Malaysia was the Chairman for the WGTIM (Working Group on Trade and Investment in Minerals) i.e.; Identification of Minerals Sector-Related Economic Activities Using the International Standards Industrial Classification of All Economic Activities (Isic Rev. 4) System and Identification of Minerals Sector Products Using the Harmonised System (HS 2017) Nomenclature (6-Digits),
9. Input for the Financial Support, Technical / Technology and Capacity Building Needs for Chapter Report on "Constraints, Gaps and Needs" for Third National Communication (NC3)" and
10. Input for Review Finding and Workshop for Energy and Industrial Processes and Product Use Sector (IPPU).

JMG's input on minerals was also necessary in the formulation of bilateral trade agreements and in international cooperation. In this context, a total of twelve country briefs namely on Nigeria, Bahrain, Tajikistan, Indonesia, United States, South

telah disediakan bagi membantu kerajaan dalam pelbagai mesyuarat, perjanjian dan misi pelaburan seperti dalam forum Perjanjian Dagangan Bebas, Pertubuhan Dagangan Dunia, dagangan dua hala, hubungan antarabangsa dan kajian semula polisi perdagangan. Sehubungan dengan itu, sebanyak 12 ikhtisar negara (country brief) dalam mineral sektor iaitu Nigeria, Bahrain, Tajikistan, Indonesia, Amerika Syarikat, Afrika Selatan, Vietnam, New Zealand, Australia, Maghribi, Algeria dan Iran telah disediakan untuk kegunaan stake holder dan pihak-pihak yang berkepentingan.

Di peringkat ASEAN, peranan JMG adalah:

1. APEC Mine Closure Workshop, Hanoi, Vietnam pada 9 Mei 2017,
2. Menyertai Mesyuarat Ke-14 Kumpulan Kerja ASOMM (ASEAN Senior Officials Meeting on Minerals) di Hotel Royal Ace, Nay Pyi Taw, Myanmar pada 25 - 27 Julai 2017,
3. Menyertai latihan program *ASEAN Web Based Mineral Mineral Resources Database* pada 3 - 23 September 2017 di Tsukuba, Jepun dan Vientiane, Laos pada 23 September – 7 Oktober 2017 dan
4. Menyertai Mesyuarat ke-6 AMMin *(ASEAN Ministers Meeting on Minerals)* di M Gallery Hotel, Nay Pyi Taw, Myanmar pada 30 November 2017.

Bagi mengekalkan hubungan jabatan dengan pihak industri, JMG telah melakukan beberapa lawatan kerja ke lombong-lombong (9), kuari-kuari (9) dan juga industri berasaskan mineral (12) dalam negara. Selain daripada itu, tujuan lawatan itu juga untuk mengumpul maklumat berkaitan dengan pembangunan dan penggunaan bahan mineral serta produk-produk hiliran berasaskan mineral yang dihasilkan.

Lawatan industri di Malaysia Smelting Corporation Berhad, Pulau Pinang
Industry visit to Malaysia Smelting Corporation Berhad, Pulau Pinang

Africa, Vietnam, New Zealand, Australia, Morocco, Algeria and Iran were prepared in the year.

Malaysia also took part in the following meetings and workshops:

1. The APEC Mine Closure Workshop, Hanoi, Vietnam on 9th May 2017,
2. The 14th ASOMM (ASEAN Senior Officials Meeting in Minerals) Working Group Meeting which was held from 25-27th July 2017 in Royal Ace Hotel, Nay Pyi Taw, Myanmar,
3. The training program on ASEAN Web Based Mineral Resources Database in Tsukuba, Japan which was held from 3-23rd September 2017 and from 23rd September-7th October 2017 in Vientiane, Laos and
4. The 6th AMMin (ASEAN Ministers Meeting on Minerals) on 30th November 2017 in M Gallery Hotel, Nay Pyi Taw, Myanmar.

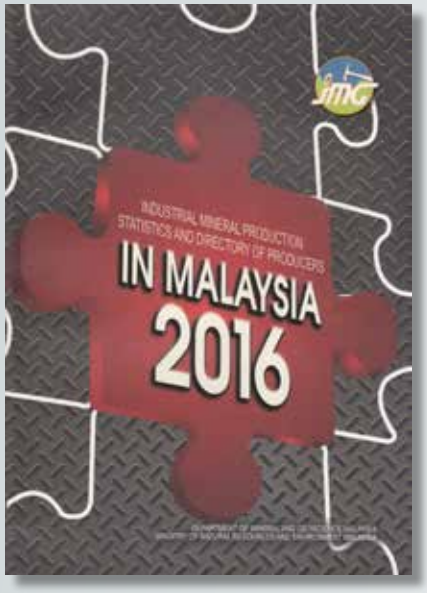
To maintain good rapport with the mineral industry, JMG organised several working visits to various mines (9), quarries (9) and mineral-based industries (12) in the country. The visits were also to collect information related to the development and utilization of minerals, as well as the production of value added downstream mineral products.

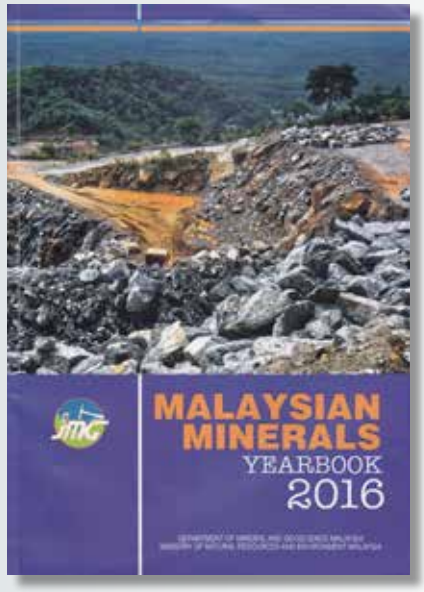
Lawatan kerja ke lombong bijih besi, Chaah Baru, Johor
Site visit to iron ore mine, Chaah Baru, Johor

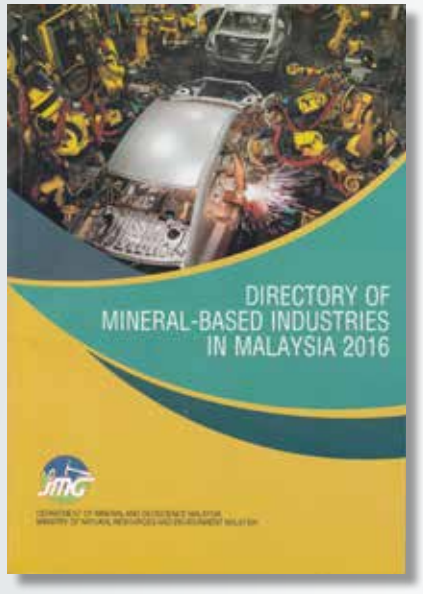
Proses pemunggahan '*armor rock*' di jeti Kuari Kemaman untuk dieksport ke Negara Brunei Darussalam
Armour rock unloading process in Kemaman Quarry jetty for export to Brunei Darussalam

Penerbitan Berkaitan Mineral

Mineral-Related Publications







Laporan yang diterbitkan oleh JMG pada tahun 2017
Report published by JMG in 2017

Khidmat Nasihat Mineral

Mineral Advisory Services

JMG telah memberikan khidmat nasihat mineral bagi ulasan guna tanah dan pembangunan mineral seperti jadual di bawah:-

Khidmat nasihat mineral
Mineral advisory services

Pejabat JMG JMG Office	Jenis khidmat nasihat Type of advisory services		
	Ulasan guna tanah Landuse review (bil. / no.)	Ulasan pembebasan mineral Mineral clearance review (bil. / no.)	Pertanyaan Enquiries (bil. / no.)
Ibu Pejabat / Headquaters	-	-	59
Johor	48	264	2
Melaka	6	-	2
Negeri Sembilan	53	-	15
Selangor	34	-	5
Perak	149	115	24
Kedah	76	1	8
Pulau Pinang	8	-	2
Perlis	2	2	2
Kelantan	47	15	20
Terengganu	89	19	18
Pahang	67	86	53
Sarawak	15	-	125
Sabah	99	1	5
Jumlah / Total:	**693**	**503**	**281**

Pulau Dayang, Johor

Geosains
Geoscience

Geosains

Aktiviti Geosains

Aktiviti geosains dilaksanakan oleh jabatan untuk menyediakan maklumat geologi yang berguna dalam bidang seperti pemetaan geologi, geologi warisan, hidrogeologi, geologi kejuruteraan, geologi alam sekitar dan geologi marin. Maklumat geosains yang berkualiti serta memenuhi kehendak pemegang saham dan pelanggan adalah input penting yang diperlukan dalam perancangan guna tanah bagi mencapai pembangunan mampan, mengurangkan risiko bencana dan memelihara alam sekitar.

Pemetaan geologi dijalankan bagi mengumpul maklumat asas geologi yang amat diperlukan dalam kerja-kerja carigali sumber mineral, perancangan guna tanah dan juga untuk menentukan kesesuaian tapak untuk pembangunan. Pemetaan warisan geologi pula dapat menilai dan memulihara tapak geologi yang berpotensi sebagai tapak warisan negara untuk dipromosikan sebagai kawasan geopelancongan serta kelestarian alam sekitar.

Maklumat hidrogeologi adalah penting dalam pengurusan sumber air bawah tanah bagi memastikan ia dapat terus digunakan sebagai bekalan air negara, manakala maklumat pemetaan geobencana dan penilaian risiko bencana, terutamanya di kawasan perbandaran dan penempatan, amat berguna kepada pihak berkuasa tempatan dalam merancang pembangunan yang lebih sistematik.

Geoscience

Geoscience Activities

Geoscience activities are carried out to gather useful geological information in the field of geological mapping, geological heritage, hydrogeology, engineering geology, environmental geology and marine geology. Quality geosciences information, which meets the needs of stakeholders and clients, provides vital input needed in land use planning for sustainable development, reducing the risks of disaster and protects the environment.

Geological mapping is carried out to collect basic geological information that is very much needed in the exploration of mineral resources and land use planning, as well as to determine whether a land is suitability for site development. Geological heritage mapping is carried out to assess and conserve potential geological sites as national heritage while promoting geotourism and environmental sustainability.

Hydrogeological information is important in the management of groundwater resources to ensure groundwater resource remains available for the nation's water supplies, while information from geohazard mapping and disaster risk assessment, especially in the urban and settlement areas, assists the local authorities in systematic development planning.

Pemetaan Geologi

Pemetaan Sesar Aktif dan Kawasan Risiko Gempa Bumi

Kejadian gempa bumi yang mula dikesan di Malaysia seawal tahun 1970-an, telah menunjukkan ianya berlaku semakin kerap dan dengan skala yang lebih tinggi. Kewujudan sesar aktif di beberapa lokasi di negara ini menunjukkan Malaysia berkemungkinan mengalami gempa bumi pada skala sederhana pada masa hadapan walaupun terletak di luar Lingkaran Api Pasifik. Beberapa lokasi tertentu dikenalpasti sebagai berisiko mengalami gempa bumi pada skala yang lebih besar pada masa hadapan. Keprihatinan tentang aktiviti seismik dan kesan kerosakan olehnya telah mendorong JMG menjalankan projek Pemetaan Sesar Aktif dan Risiko Gempa Bumi di Sabah, Sarawak, dan beberapa negeri di Semenanjung. Seluas 11,187 km^2 kawasan telah pun dipetakan sepanjang tahun 2017 dengan objektif mengenalpasti kawasan sesar aktif yang terdedah kepada gempa bumi, membuat pencirian sesar aktif dan memetakan fitur geomorfologi yang berkait dengan pergerakan sesar. Maklumat dari pemetaan ini sangat berguna dan membantu jabatan ini serta pihak berkuasa tempatan dalam melaksanakan dan merancang pembangunan yang lebih selamat sekaligus dapat mengurangkan kerosakan harta benda dan kehilangan nyawa.

Geological Mapping

Active Fault and Earthquake Risk Area Mapping

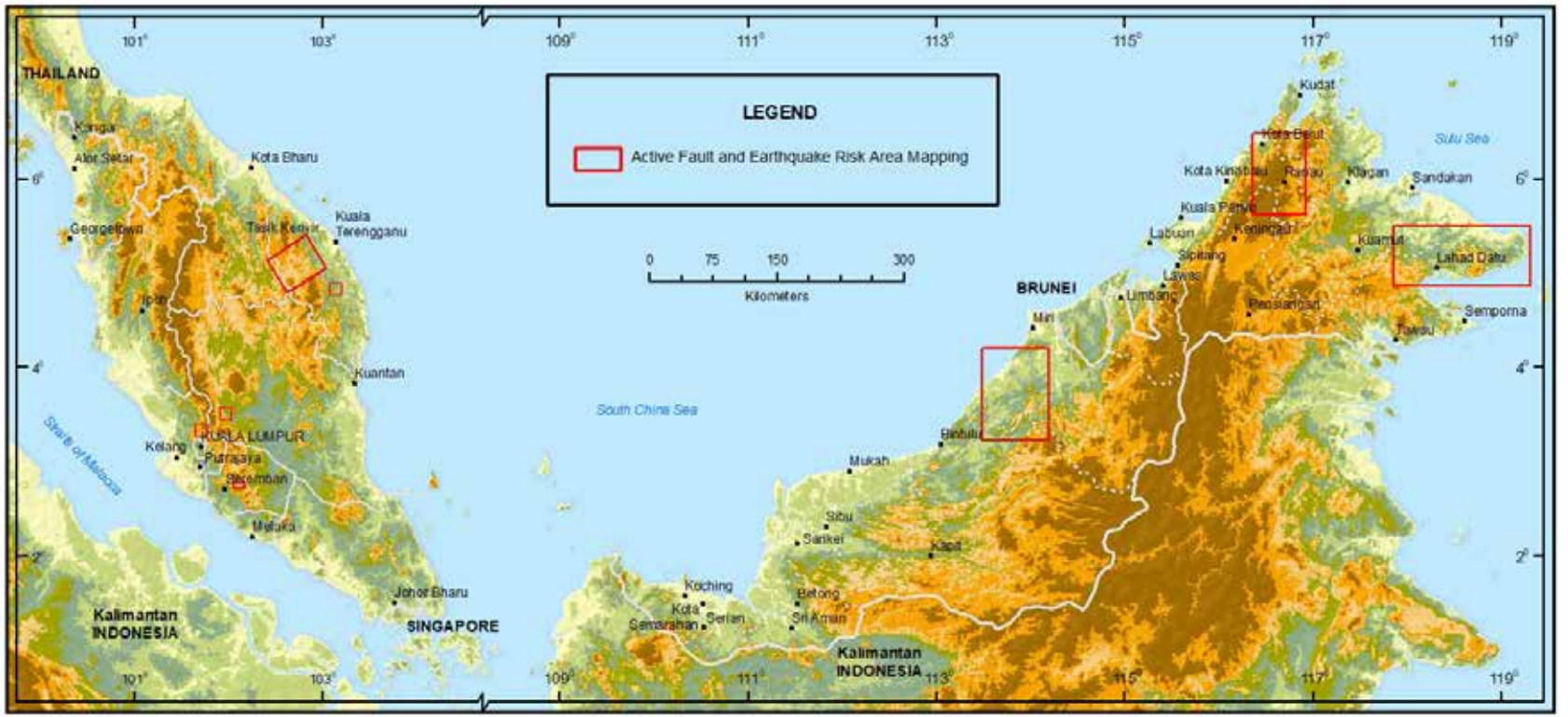
Records of earthquakes event in Malaysia has started since 1970-an, and lately the record shows that it is occurring more often and on a higher scale. The existence of active faults in several locations in the country indicates that Malaysia is likely to experience a medium scale earthquake in the future even though it is located outside the Pacific Ring of Fire. Certain locations are identified as being at risk of experiencing an earthquake at a larger scale in the future. Concerns about seismic activity and its damaging consequences in Malaysia have prompted JMG to conduct the Active Fault and Earthquake Risk Mapping projects in Sabah, Sarawak, and several states in the Peninsular. In 2017, JMG has conducted active fault mapping in 11,187 km^2 areas all over the country. The objectives of this mapping are to identify active fault area that prone to earthquake, to characterize the active fault and to map the geomorphology feature connected to fault movements. Information from this mapping activity was useful for JMG and other local authorities in implementing and planning a safer development while reducing property damage and loss of life.

Pemetaan Sesar Aktif dan Kawasan Risiko Gempa Bumi
Active Fault and Earthquake Risk Area Mapping

Negeri State	Kawasan Area	Liputan Coverage (km^2)	Tujuan Purpose	Penemuan / Catatan Findings / Remarks
Sarawak	Niah, Miri	7,503	Mengenalpasti kawasan sesar aktif yang terdedah kepada gempa bumi. Identifying active fault area that prone to earthquake	Sejumlah 15 lokasi penting sesar utama telah dikenal pasti bagi kajian geofizik. Dua sesar utama iaitu Tubau dan Tinjar telah dikenalpasti dan dipetakan termasuk 3 sesar kecil iaitu Tusan, Ngebol dan Kejapil. Sejumlah 15 garisan kajian geofizik telah dijalankan di lokasi sesar merangkumi kawasan Sesar Tubau, Sesar Kejapil, Sesar Ngebol dan Sesar Tusan. Identifying 15 important locations of main fault for geophysical study. Two main faults which is Tubau and Tinjar have been identified and mapped including 3 other small faults Tusan, Ngebol and Kejapil. A total of 15 line of geophysical survey have been carried out at the fault location areas include Tubau Fault, Kejapil Fault, Ngebol Fault and Tusan Fault
Sabah	Lobou-Lobou	40	Pencirian sesar aktif Active fault characterisation	Morfologi *triangular facet*, sungai teralih, rabung teralih dan batuan hancur Triangular facet morphology, displaced river, displaced ridge and shattered rock
	Kadamaian	90	Pencirian sesar aktif Active fault characterisation	Morfologi *triangular facet*, sungai teralih, sungai lurus dan batuan hancur Triangular facet morphology, displaced river, straight river and shattered rock
	Mensaban	40	Pencirian sesar aktif Active fault characterisation	Morfologi *triangular facet* dan batuan hancur Triangular facet morphology and shattered rock
	Mesilau	35	Pencirian sesar aktif Active fault characterization	Morfologi *triangular facet* dan batuan hancur Triangular facet morphology, and shattered rock
	Mamut	114	Pencirian sesar aktif Active fault characterisation	Morfologi *triangular facet* dan batuan hancur Triangular facet morphology, and shattered rock
	Paranchangan	68	Pencirian sesar aktif Active fault characterisation	Morfologi *triangular facet*, wine glass dan batuan hancur Triangular facet morphology, wine glass and shattered rock
	Nalapak	25	Pencirian sesar aktif Active fault characterisation	Morfologi *triangular facet*, jalan teralih dan batuan hancur Triangular facet morphology, displaced road and shattered rock.
	Lahad Datu	194	Pencirian sesar aktif Active fault characterisation	Morfologi *triangular facet*, volkano lumpur, pokok kelapa terbelah dua, dan batuan hancur Triangular facet morphology, mud volcano, split of coconut tree and shattered rock.

Negeri State	Kawasan Area	Liputan Coverage (km^2)	Tujuan Purpose	Penemuan / Catatan Findings / Remarks
	Danum	91	Pencirian sesar aktif Active fault characterisation	Morfologi *triangular facet* dan batuan hancur. Triangular facet morphology and shattered rock.
	Tabin	145	Pencirian sesar aktif Active fault characterisation	Morfologi *triangular facet*, rabung hancur dan batuan hancur Triangular facet morphology, shattered ridge and shattered rock
	Tomanggong	124	Pencirian sesar aktif Active fault characterisation	Morfologi *triangular facet*, rabung hancur, kesan slikensid dan batuan hancur Triangular facet morphology, shattered ridge, slickensided mark and shattered rock
	Tanduo	160	Pencirian sesar aktif Active fault characterisation	Morfologi *triangular facet*, shattered ridge, kesan slikensid dan batuan hancur Triangular facet morphology, shattered ridge, slickensided mark and shattered rock
Selangor	Hutan Simpan Ulu Gombak dan Ulu Yam	20	Memetakan garisan sesar aktif yang berkait dengan kehadiran epicenter di kawasan kajian. Map the active fault lines associated with the presence of epicenter in the study area.	Penemuan fitur yang berkait dengan sesar aktif seperti sungai teralih, segitiga faset, kesan canggaan pada batuan di lapangan serta garisan sesar yang jelas ditentukan melalui survei geofizik. The discovery of features associated with active faults such as transient rivers, triangular facet, effect from rock deformation at the field and clear fault line can be determined through geophysical surveys.
Negeri Sembilan	Mukim Terachi Daerah Kuala Pilah	30	Menjalankan kajian terhadap kejadian punca gempa bumi kecil di sekitar Terachi Kuala Pilah dan memetakan kehadiran sesar aktif dikaitkan dengan epicenter yang direkodkan. Carried out study of small earthquake at Terachi Kuala Pilah area and map the occurrence of active fault that associated to recorded epicenter	‘”Garis Sesar Kuala Pilah” merupakan sesar major yang boleh dikaitkan dengan aktiviti mikro gempabumi di Terachi Kuala Pilah. “Kuala Pilah Fault Line” is a major fault that can be attributed to the micro earthquake activity in Terachi Kuala Pilah.

Negeri State	Kawasan Area	Liputan Coverage (km^2)	Tujuan Purpose	Penemuan / Catatan Findings / Remarks
Pahang	Bukit Tinggi dan Janda Baik	100	Pemetaan fitur geomorfologi yang berkait dengan pergerakan sesar dan geologi struktur bagi mengetahui arah canggaan kawasan. Geomorphology feature mapping connected to fault movements and structural geology to determine deformation direction of the area.	Sejumlah 50 lokasi dicerap. Beberapa fitur dikenalpasti sebagai kesan daripada anjakan sesar dan disokong oleh hasil siasatan geofizik.Umumnya geologi struktur kawasan tersebut dipengaruhi oleh daya mampatan pada jurus Timur laut – Barat daya, dan kebanyakan sesar yang ditemui merupakan sesar gelinciran jurus yang bermiring hampir tegak. A total of 50 locations were observed. Some features were identified as effect from fault displacement and the findings supported by geophysics result. Generally structural geology of that area influenced by compression force of SW-NE direction and most of faults are strike-slip fault with nearly vertical dipping.
Terengganu	Tasik Kenyir	2408	Cerapan lapangan projek Pemetaan Sesar Aktif	Kajian melibatkan survei geofizik di dua kawasan terpilih yang dijangkakan kemungkinan terdapat sesar aktif. Kedua-dua kawasan tersebut adalah di Kuala Pueh/ Kg Pauh dan Jalan Gawi Aring. Sebanyak empat garis survei geofizik kaedah keberintangan dilakukan. The study involves geophysical surveys in two selected areas which are likely to have active faults. Both areas are in Kuala Pueh/ Kg Pauh and Jalan Gawi Aring. Four geophysical surveys of resistivity methods were conducted
	Kg Tepus, Jerangau		Kajian Paleoseismik Kaedah Perparitan Paleoseismism study of trenching method	Kajian paleoseismik kaedah perparitan turut dilakukan di Kg Tepus, Jerangau, Dungun, Terengganu, kira-kira 100 km ke Tenggara Tasik Kenyir. Sejumlah tujuh sampel tanah dan 20 sampel arang kayu dikutip untuk analisis pentarikhan karbon. Paleoseismic studies of trenching methods were also conducted in Kg Tepus, Dungun, Terengganu, about 100km to the Southeast of Tasik kenyir. A total of seven soil samples and 20 samples of charcoal were collected in this study for the purpose of carbon dating.
Jumlah Liputan / Total Coverage:		**11,187**		



Pemetaan Kawasan Risiko Sesar Aktif and Gempabumi 2017
Active Fault and Earthquake Risk Area Mapping 2017

Sesar songsang di bawah Low's Peak berdekatan laluan ke Gurkha Hut

Reverse fault below Low's peak nearby trail to Gurkha Hut

Penemuan fitur sungai teralih di Hutan Simpan Ulu Gombak dan Ulu Yam

The discovery of the displaced river features in the Ulu Gombak and Ulu Yam Forest Reserve

Kerja-kerja pengukuran dan pemprofilan dinding parit sedang dijalankan, di dalam kajian paleoseismik kaedah perparitan di Kg Tepus, Jerangau, Dungun.

Measuring and profiling of drainage wall are underway in trenching method paleoseism studies in Kg Tepus, Jerangau, Dungun

Geologi Warisan

Kajian geologi warisan telah dijalankan bagi memastikan khazanah alam semula jadi yang sangat berharga dapat dipulihara bagi tatapan generasi akan datang. Menerusi kajian ini konsep tapak terpelihara monumen geologi taman geologi dan landskap berpemandangan indah dapat diperkenalkan kepada orang awam. Kajian kebolehlaksanaan bagi tapak geologi warisan telah dijalankan di tapak-tapak terpilih bagi cadangan penarafan sama ada sebagai geotapak, tapak warisan geologi kebangsaan atau geopark.

Geological Heritage

Geological heritage studies were carried out to ensure that the conservation of natural heritages for its future generations. Through these studies, the concept of preserved sites, geological monuments, geological parks and beautiful landscapes could be promoted and made known to the public. Feasibility studies for geological heritahe were carried out at selected sites with the view to propose the various locations as possible geosites, national geological heritage or geoparks.

Pemetaan warisan geologi
Geological heritage mapping

Negeri State	Kawasan Area	Status Status	Catatan Remarks
Sarawak	**Kuching dan Bau**		
	Ketakselarasan Tg Tgok, Santubong	Geotapak rujukan penyelidikan dan pendidikan Research geosite and education	Bukti saintifik sempadan ketakselarasan Formasi Pedawan (Jura-Kapur) dan formasi Batupasir Kayan (Kapur Akhir-Eosen). Pantai berteluk (pocket beach) bersaiz kecil-sederhana dibentuk oleh enapan pasir pantai putih. Scientific evidence of unconformity of the Pedawan Formation (Jura-Cretaceous) and the Kayan Sandstone Formation (Late Eocene). Small-medium-sized beach beaches are formed by white sands of sand beaches.
	Hornfels Tg Batu - Pasir Panjang	Geotapak rujukan penyelidikan dan pendidikan Research geosite and education	Bukti saintifik pemanasan semula (terpanggang) batuan Formasi Pedawan disebabkan rejahan magma muda (Tertier). Membentuk beberapa morfologi tanjung serta menghasilkan pantai bersaiz sederhana hingga luas yang terbentuk daripada enapan pasir putih. Scientific evidence of reheating of the Pedawan Formation caused by the young magma (Tertiary). Forming several cape morphology and medium-sized beaches to vast areas of white sands.
	Batu Kitang Ancient Volcanic	Geotapak rujukan penyelidikan dan pendidikan Research geosite and education	Bukti saintifik ledakan gunung berapi yang terenap di dasar lautan terawal semasa fasa pertama aktiviti igneus Paleozoik (pra-Trias) di Sarawak. Scientific evidence of volcanic of deep water origins during the first phase of Paleozoic igneous activity (pre-Triassic) in Sarawak.
	Terobosan Sill Buan-Buso	Geotapak rujukan penyelidikan dan pendidikan Research geosite and education	Bukti rejahan magma lewat (post-orogeni) mengisi ruang perlapisan batuan atau rekahan yang selari dengan perlapisan batuan yang jauh lebih tua Formasi Pedawan (pra-orogeni). Proof of post-orogene magma infillings the rock layers or fractures that that are much older than the Pedawan Formation (pre-orogene).

Negeri State	Kawasan Area	Status Status	Catatan Remarks
	Gunung Santubong	Geotapak rujukan penyelidikan dan pendidikan Research geosite and education	Tapak pemandangan telah dikenal pasti di Kpg Santubong untuk pembangunan intepretasi. Paparan evolusi landskap geologi pesisir pantai. Viewing platform location have been identified at Kpg Santubong for the interpretative development. Evolutionary view of coastal geological landscape.
	Tuang Schist Country Hill	Geotapak rujukan penyelidikan dan pendidikan Research geosite and education	Batuan tertua sebagai bukti evolusi pengenapan & pemanasan serantau terawal di Bahagian Kuching. The oldest rocks in the Kuching Division.
	Batu Boya	Geotapak rujukan penyelidikan dan pendidikan Research geosite and education	Evolusi geologi dan budaya setempat. Local geological and cultural evolution.
	Antiklin Miri, Miri Airport Road	Geotapak Geosite	Tinjauan semula selesai dan pencirian terperinci sudah pernah dijalankan untuk dibangunkan sebagai geotapak. Completed surveys and detailed features have been carried out to be developed as geosite.
	Tanjong Lobang, Miri	Geotapak Geosite	Tinjauan potensi geotapak untuk pencirian dan pemetaan selesai. Potential geosite for characterization and mapping have been completed.
	Pantai Tusan, Miri	Geotapak Geosite	Tinjauan potensi geotapak untuk pencirian dan pemetaan selesai. Potential geosite for characterization and mapping have been completed.
	Lumpur Volkano Bekenu	Geotapak Geosite	Tinjauan semula selesai dan pencirian terperinci sudah pernah dijalankan untuk dibangunkan sebagai geotapak. Potential geosite for characterization and mapping have been completed.
	Gua Niah, Miri	Geotapak Geosite	Tinjauan semula selesai dan pencirian terperinci sudah pernah dijalankan untuk dibangunkan sebagai geotapak. Potential geosite for characterization and mapping have been completed.

Negeri State	Kawasan Area	Status Status	Catatan Remarks
Sabah	Taman Kinabalu (sepanjang Denai Puncak dariTimpohon Gate ke Puncak Low), Penara Mesilou, Pekan Ranau dan Lembah Kadamaian. Kinabalu Park (along the summit trail from Timpohon Gate tp Low's Peak).	Diperingkat tinjauan dan pemetaan geotapak Reconnaisance and geosite mapping	Beberapa lokasi di sekitar Gunung Kinabalu dan di sebahagian kaki gunung telah dikenalpasti dan berpotensi untuk dibangunkan sebagai geotapak. A few locations at the Mount Kinabalu and the surrounding areas have been identified and have the potential to be developed as geosite.
Kedah		Jerai Geopark	Penilaian Jerai Geopark oleh delegasi Jawatankuasa Penilai Geopark Kebangsaan telah berlansung selama 3 hari iaitu bermula 5 Julai sehingga 7 Julai 2017. Jerai Geopark validation was held for 3 days from 5th – 7th July, 2017 by the National Geopark Committee
	Sg. Batu Pahat, Kuala Muda	Geotapak Geosite	Pemetaan terperinci untuk geotapak Detailed mapping for geosite
	Padang Tok Sheikh, Kuala Muda	Geotapak Geosite	Geotapak Pegmatit Pegmatite geosite
	Batu Kapal, Kuala Muda	Geotapak Geosite	Geotapak Dataran Kuarzit dan Fosil Kesan Planar Quartzite Geosite and trace fossils
	Sg. Teroi, Yan	Geotapak Geosite	Geotapak Box work dan kuartza porfiri Box work geosite and phorphyry quartz.
	Singkir Laut, Yan	Geotapak Geosite	GeotapakTelerang Kuartza Quartz veins geosite
	Tg. Jaga, Yan	Geotapak Geosite	Geotapak Garis Pantai Kuno Pelbagai Jenis Cengkerang 5,600 tahun Ancient coastline of various shells about 5600yrs
	Bukit Penjara, Kuala Muda	Geotapak Geosite	Geotapak kepelbagaian mineral dan batuan. Geosite with a variety of minerals and rocks.
	Pulau Sayak, Yan	Geotapak Geosite	Geotapak Pantai Batu Lumpur Merah - Formasi Mahang Red mudstone beach geosite – Mahang Formation
Perak	Lembah Kinta	Geopark Kebangsaan Lembah Kinta Kinta Valley National Geopark	Lembah Kinta telah diiktiraf sebagai geopark kebangsaan pada 18 Julai 2017. Badan pengurusan Geopark Lembah Kinta adalah di bawah Perbadanan Taman Negeri Perak Darul Ridzuan. Lembah Kinta has officially being recognized as a national geopark on July 18, 2017 and it is managed under the Perak State Parks Corporation

Negeri State	Kawasan Area	Status Status	Catatan Remarks
Selangor	Selayang	Geotapak	Kolam Air Panas Selayang dipilih bagi tahun 2017 ini dan telah dibuat pencirian geotapak. Pihak Jabatan juga terus komited untuk mengangkat Permatang Kuarza Gombak (PKGS) sebagai tapak warisan dunia UNESCO
		Geosite	The Selayang Hotspring have been selected for 2017 geosite and its characterisation have been completed. JMG is also committed to lifting the Gombak Quartz Ridge (PKGS) as an UNESCO world heritage site
Negeri Sembilan	Gua Pelangi, Felda Pasoh 4	Geotapak	Siap diciri dan dipetakan serta papan Tanda telah dipasang. Keunikan Gua Batu kapur berusia 314 juta tahun (Karbon Akhir) dalam batuan Granit berfitur menarik dan ada artifak berstatus kebangsaan dan dunia
		Geosite	Characterisation have been mapped and Signboards have been erected. The uniqueness of limestone caves which is about 314 million years old (Late Carbonecaous) in granitic rock and also have and interesting artifact of national and world status.
Johor	Pantai Tanjung Musoh, Pulau Sibu, Mersing	Geotapak Geosite	Pulau Sibu, Mersing mempunyai variasi fitur geologi: Pulau Sibu, Mersing has various of geological feature: i) Kepelbagaian batuan volkanik daripada tuf hinggalah aglomerat. Bahan piroklasnya juga pelbagai saiz dari debu hingga bom Diversity of volcanic rocks from tuff to agglomerate. Variuos size of pyroclastic material, from dust to bomb ii) Penemuan fosil tumbuhan Discovery of plant fossil iii) Morfologi hakisan pantai Coastal erosion morphology
	Tanjung Semanggar, Pulau Sibu, Mersing	Geotapak Geosite	i) Batuan volkanik berusia Perm yang terdiri daripada riolit dan piroklas. Permian volcanic rocks which consist of rhyollite and pyroclastic rock ii) Fosil batang kayu lepidodendron Lepidodhendron fossil
	Pantai Berkembar, Pulau Sibu, Mersing	Geotapak Geosite	Morfologi tombolo dan pentas abrasi Morphology of tombolo and abrassion platform
	Tanjung Keramat, Pulau Sibu, Mersing	Geotapak Geosite	Morfologi gua, gerbang lautan dan turus laut Morphology of cave, sea arch and sea stack.

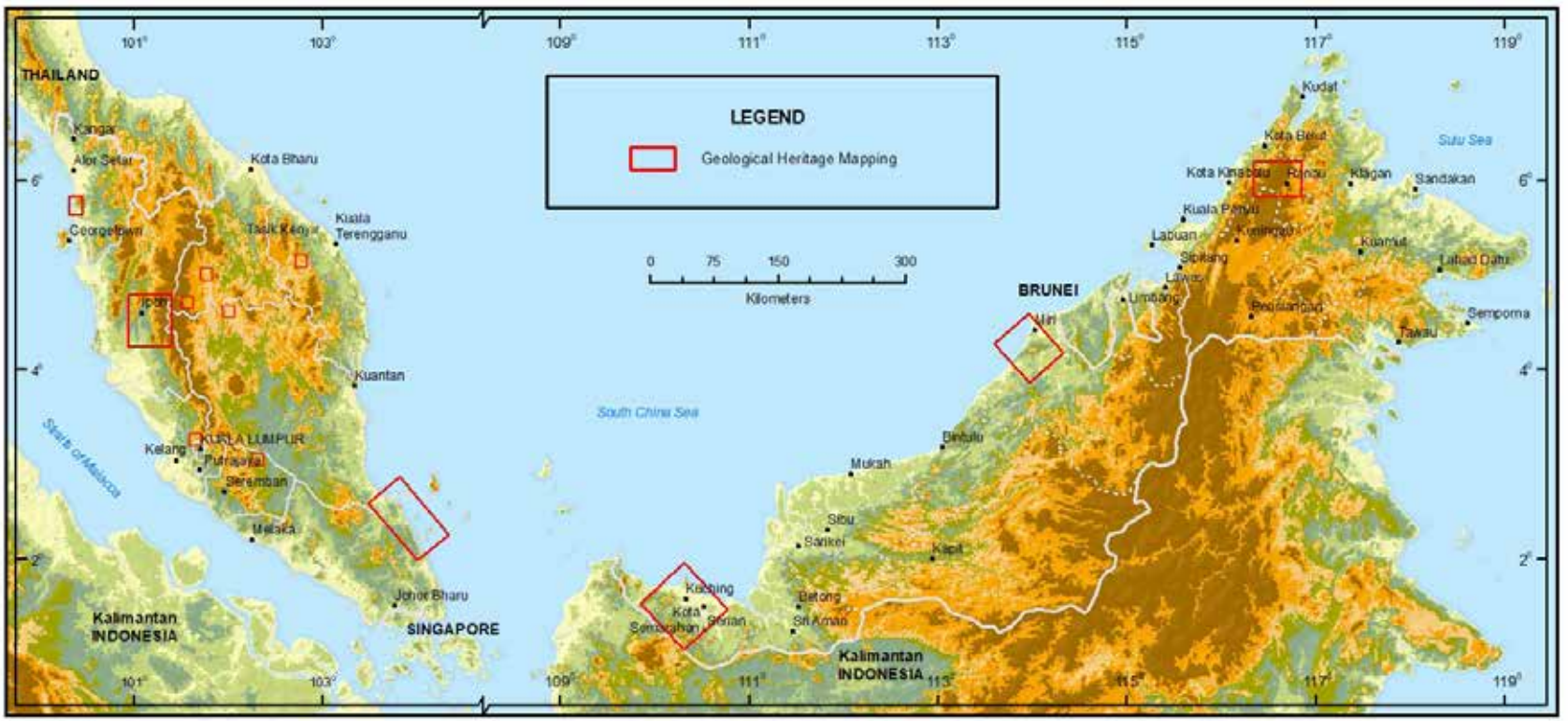
Negeri State	Kawasan Area	Status Status	Catatan Remarks
	Pulau Besar, Mersing	Geotapak	Granit dengan peratus kandungan silika paling tinggi dan wujud dalam jasad yang besar. Menghasilkan pantai pasir paling putih dan luas di Johor
		Geosite	Granite with the highest percent of silica content in big mass body. As a result produce a 4 km beautiful white sandy beach
	Pulau Tinggi, Mersing	Geotapak	Bukit yang unik seperti puncak gunung berapi. Keseluruhan pulau ini (termasuk pulau-pulau kecil sekitar) merupakan tinggalan gunung berapi berusia 100 juta tahun
		Geosite	Unique hill look like volcanic peaks. The entire island (including the surrounding small islands) is the remains of a volcano 100 million years old
	Pulau Batu Gajah, Mersing	Geotapak	Morfologi hakisan pantai seperti gua, gerbang lautan dan turus lautan. Gerbang lautan menyerupai bentuk gajah
		Geosite	Morphology of coastal erosion such as caves, sea arch and sea stack. Sea arch resembles the shape of an elephant
	Tanjung Penyabong, Mersing	Geotapak	Batuan volkanik berusia Perm yang terdiri daripada lapisan riolit dan piroklas. Kandungan piroklasnya pelbagai menjulat daripada abu, kerikil hinggalah bom, pumis dan scoria. Terdapat juga batuan andesit yang menunjukkan kawasan ini berhampiran dengan kawah gunung berapi
		Geosite	Permian volcanic rocks consisting of rhyolite and pyroclastic layers. Its pyroclasite content ranges from ash, gravel to bomb, pumice and scoria.There are also andesite rocks that indicate this area is in the volcanic crater
	Tanjung Mawar, Mersing	Geotapak	i) Morfologi pengendapan pantai iaitu tombolo yang menghubungkan antara Tg Mawar dan Pulau Mawar
		Geosite	Morphology of the coastal deposition such as tombolo that connects between Tanjung Mawar and Pulau Mawar ii) Dataran pantai yang luas dan terlindung oleh Pulau Mawar Coastal plain are protected by Pulau Mawar iii) Boleh mencerap fenomena pasang surut dengan jelas Tidal phenomena can be observe clearly iv) Kesan riak pada pantai yang pelbagai akibat aliran pasang surut yang berbeza Various type of ripple marks on the beach due to various tidal flows

Negeri State	Kawasan Area	Status Status	Catatan Remarks
Pahang	Merapoh, Lipis	Geotapak	Tinjauan dan pemetaan geotapak gua batu kapur seperti Gua Seribu Cerita, Gua Hantu Menari, Gua Tahi Bintang, Gua Harimau, Gua Kambing, Gua Kalong dan Gua Sisik Naga.
		Geosite	Reconnaissance and geosite mapping of limestone caves such as Seribu Cerita Cave, Hantu Menari Cave, Tahi Bintang Cave, Harimau Cave, Kambing Cave, Kalong Cave and Sisik Naga Cave.
Terengganu	Air Terjun Lata Buweh	Geotapak	Air terjun bertingkat merupakan antara ciri-ciri menarik yang dapat menggamit kehadiran pengunjung sebagai destinasi pelancongan.
		Geosite	Multi-Leveled waterfalls are amongst the interesting features that appeals as a tourist destination.
	Panchur Merah, Setiu	Geotapak	Kajian lapangan di Panchur Merah didapati terdapat tiga lokasi kolam air panas dimana ketiga-tiga kola mini mempunyai suhu air pada bacaan yang hamper sama iaitu 37-39 ºC.
		Geosite	Field studies at Panchur Merah found three hotspring locations where the temperatures of the water are about the same which are 37-39ºC.
Kelantan	Sungai Ber, Lojing, Gua Musang	Geotapak	Mata air panas terpanas di Kelantan. Berpotensi untuk dijadikan tumpuan pelancong untuk datang.
		Geosite	It is the hot springs with the hottest water in Kelantan so far. Potential to be a tourist destination.
	Gus Cha, Kuala Betis, Gua Musang	Geotapak	Terdapat struktur stalaktit dan stalagmit yang menarik. Gua Cha juga merupakan tapak arkeologi yang dijumpai rangka tulang manusia pada zaman Neolitik.
		Geosite	Gua Cha shows an interesting features of stalactite and stalagmite structures. It is also an archaeological site whereby human bones of the Neolithic period were found.

Aktiviti Pemetaan Warisan Geologi 2017

Geological Heritage Mapping Activities 2017

Pemandangan Permatang Kuarza Gombak Selangor
View of the Gombak Quartz Ridge, Selangor



Aktiviti Pemetaan Warisan Geologi 2017
Geological Heritage Mapping Activities 2017

Pemandangan Permatang Kuarza Gombak Selangor
View of the Gombak Quartz Ridge, Selangor

Fosil lepidodendron (fosil batang kayu) di Tanjung Semanggar, Pulau Sibu
Lepidodendron fossil (wooden stick fossil) in Tanjung Semanggar, Sibu Island

Ketakselarasan bersudut antara Formasi Pedawan dan Formasi Kayan Sandstone,
Tg. Tgok, Santubong
Uncomformity contact between Pedawan Formation and Kayan Sandstone Formation, Tg. Tgok, Santubong

Pembentukan Gua Harimau, Lipis terhasil daripada tindakbalas pelarutan batu kapur dengan air tanah.
The formation of Harimau Cave, Lipis is formed by limestone dissolution with groundwater

Keindahan morfologi kars yang terdapat di Gua Kambing, Lipis
The beauty of the karst morphology of Kambing Cave, Lipis

Ciri perlapisan batu kapur yang jelas di Gua Kalong, Lipis
Limestone bedding that can be observed in the Kalong Cave, Lipis

Hidrogeologi

Aktiviti hidrogeologi telah dijalankan bagi mendapatkan maklumat air bawah tanah yang bertujuan untuk menilai potensi sumber air bawah tanah dan membekalkan air bersih kepada penduduk di kawasan yang sering menghadapi masalah bekalan air. Pada tahun 2017, sebanyak 94 buah telaga digerudi di mana 14 adalah telaga eksplorasi, 28 telaga pemantauan dan 52 adalah telaga pengeluaran. Projek pembinaan Sistem Penapisan Air Tanah Ringkas (SPATR) juga telah berjaya disiapkan iaitu tiga di Perak, empat di Selangor dan dua di Terengganu. Jabatan juga telah membina sembilan buah telaga bagi mengawal kebakaran kawasan tanah gambut di negeri Sabah, Selangor, Pahang, Johor dan Terengganu. Di bawah Projek Bekalan Air Luar Bandar Sistem Alternatif pula, Sarawak telah berjaya menyalurkan air di empat buah kampung. Sumber air yang digunakan adalah air graviti bukit yang disalurkan terus kepada penghuni rumah panjang. Pemantauan air bawah tanah juga dijalankan sebagai sebahagian daripada usaha Jabatan untuk memastikan sumber air bebas daripada pencemaran dan digunakan secara mampan. Ini melibatkan kerja-kerja pengukuran paras air bawah tanah, pengumpulan sampel air bawah tanah dan penyenggaraan SPATR. Hasil pemantauan ke atas 587 buah telaga mendapati tiada perubahan yang ketara pada paras air bawah tanah dan kualiti air yang diuji.

Hydrogeology

Hydrogeological activities have been carried out to acquire data for the assessment of groundwater potential and to provide treated water supply in water-constrained areas. In 2017, a total of 94 wells were produced which is 14 of them are exploration wells, 28 monitoring wells and 52 production wells. Three numbers of SPATR has succesfully built at Perak, four at Selangor and two SPATR at Terengganu. The department has developed nine wells at Sabah, Selangor, Pahang, Johor and Terengganu to be used during peat fire. Under the Rural Water Supply Project – Alternative System, Sarawak has successfully implemented gravity fed water to four villages. Groundwater monitoring was carried throughout the year as part of the department's effort to ensure that water resources were free from pollution and were sustainably utilised. Monitoring programmes included the measurement of groundwater levels, collection of samples and maintenance of SPATR. Results of monitoring on 587 wells indicated that there were no significant changes pertainng to the water level and water quality.

Pembangunan Air bawah tanah

Groundwater Development

Penggerudian dan pembinaan telaga
Drilling and well construction

Negeri State	Lokasi Location	TE* EW*	TP* PW*	TM* MW*	Catatan Remarks
Sarawak	SMK Senibong, Lundu		1		Kedalaman telaga adalah 71 m dengan kadar luahan sebanyak 1.5 m^3/jam. Telaga ini telah dibangunkan bagi membekalkan air untuk kegunaan domestik Depth of well is at 71 m and with an estimated discharge rate of 1.5 m^3/hour. The well has been developed to supply water for domestic consumption.
	Kg Semada Tengah, Serian		1		Kedalaman telaga adalah 34 m dengan kadar luahan sebanyak 3.5 m^3/jam. Telaga ini telah dibangunkan bagi membekalkan air untuk kegunaan domestik. Depth of well is at 34 m and with an estimated discharge rate of 3.5 m^3/hour. The well has been developed to supply water for domestic consumption.
	Rh Salwan, Miri	1			Telaga ini tidak berpotensi dibangunkan bagi membekalkan air untuk kegunaan domestik. The well had no potential as a source of water for domestic consumption.

Negeri State	Lokasi Location	TE* EW*	TP* PW*	TM* MW*	Catatan Remarks
Sabah	Kg. Bintuka, Beaufort		1		Kedalaman telaga adalah 20 m dengan kadar luahan sebanyak 2 m^3/jam. Telaga ini telah dibangunkan bagi membekalkan air untuk kegunaan 200 orang penduduk. Depth of well is 20 m and with an estimated discharge rate of 2 m^3/hour. The well has been developed to supply water for the use of approximately 200 residents.
	Kg. Taburan Damang, Kota Belud.		1		Kedalaman telaga adalah 49 m dengan kadar luahan sebanyak 5 m^3/jam. Telaga ini telah dibangunkan bagi membekalkan air untuk kegunaan 300 orang penduduk. Depth of well is at 49 m and with an estimated discharge rate of 5 m^3/hour. The well has been developed to supply water for the use of approximately 300 residents.
	Kg. Timbang Dayang, Kota Belud		1		Kedalaman 20 m dengan luahan 5 m^3/jam dan bermanfaat untuk 400 orang. Well depth of 20 m with discharge rate of 5 m^3/hour beneficial to 400 residents.
	Kg. Marabau, Kota Belud			1	Telaga ini digunakan sebagai telaga pemantauan dengan kedalaman 26 m untuk Kajian Lembangan Kadamaian – Tempasuk. The well was used as a monitoring well with 26 m depth for Kadamaian - Tempasuk Basin Study.
	Kg Sembirai, Kota Belud			1	Telaga ini digunakan sebagai telaga pemantauan dengan kedalaman 18 m untuk Kajian Lembangan Kadamaian - Tempasuk The well was used as a monitoring well with 18 m depth for Kadamaian- Tempasuk Basin Study
	Kg. Lilud, Kota Belud			1	Telaga ini digunakan sebagai telaga pemantauan dengan kedalaman 25.5 m untuk Kajian Lembangan Kadamaian – Tempasuk. The well was used as a monitoring well with 25.5 m depth for Kadamaian - Tempasuk Basin Study.
	Kg. Linkodon, Kota Belud			1	Telaga ini digunakan sebagai telaga pemantauan dengan kedalaman 21.5 m untuk Kajian Lembangan Kadamaian - Tempasuk The well was used as a monitoring well with 21.5 m depth for Kadamaian - Tempasuk Basin Study.
	Kg. Tangkol, Kota Marudu		1		Kedalaman 17 m dengan luahan 10 m^3/jam dan bermanfaat untuk 700 orang. Well depth of 17 m with discharge rate of 10 m^3/hour beneficial to 700 residents.

Negeri State	Lokasi Location	TE* EW*	TP* PW*	TM* MW*	Catatan Remarks
Kedah	Kg. Budi, Pokok Sena		1	1	Kedalaman 100 m dengan luahan 15.9 m^3/jam. Telaga telah dibangunkan bagi membekalkan air untuk kegunaan domestik. Well depth of 17 m with discharge rate of 10 m^3/hour. The well has been developed to supply water for domestic consumption.
	Kg. Lincan, Pendang		1	1	Kedalaman 100 m dengan luahan 6.5 m^3/jam. Telaga telah dibangunkan bagi membekalkan air untuk kegunaan domestik. Well depth of 100 m with discharge rate of 6.5 m^3/hour. The well has been developed to supply water for domestic consumption.
	SMK Kubor Panjang, Pendang		1	1	Kedalaman 100 m dengan luahan 8.9 m^3/jam. Telaga telah dibangunkan bagi membekalkan air untuk kegunaan domestik. Well depth of 100 m with discharge rate of 8.9 m^3/hour. The well has been developed to supply water for domestic consumption.
	SMA Al-Khairiah, Kuala Nerang		1	1	Kedalaman 100 m dengan luahan 9.1 m^3/jam. Telaga telah dibangunkan bagi membekalkan air untuk kegunaan domestik. Well depth of 100 m with discharge rate of 9.1 m^3/hour. The well has been developed to supply water for domestic consumption.
	Masjid Bukit Hijau, Kupang, Baling	1			Telaga ini adalah telaga eksplorasi dengan kedalaman 150 m untuk Kajian Lembangan Sungai Muda. This well is an exploration well with 150 m depth for Sungai Muda Basin Study. The discharge rate was 4.5 m^3/hour.

Negeri State	Lokasi Location	TE* EW*	TP* PW*	TM* MW*	Catatan Remarks
Perak	Rancangan Perumahan Tersusun (RPT) Kampung Bukit Bertam, Selama.		1		Kedalaman telaga 100 m dengan kadar luahan 3 m^3/jam. SPATR telah dibina untuk kegunaan kira-kira 100 orang. Depth of well is 100 m with 3 m^3/hour discharge rate. SPATR has been built to supply water for approximately 100 people.
	Rancangan Perumahan Tersusun (RPT) Kampung Teras, Selama.			1	Kedalaman telaga 80 m dengan kadar luahan kurang daripada 1 m^3/jam. Depth of well is 80 m with less than 1 m^3/hour discharge rate.
	Surau Kampung Simpang Empat, Anak Kurau.		1		Kedalaman telaga 60 m dengan kadar luahan 1 m^3/jam. SPATR telah dibina untuk kegunaan kira-kira 100 orang. Depth of well is 60 m with 1 m^3/hour discharge rate. SPATR has been built to supply water for approximately 100 people.
	Masjid Jamek Chemor, Chemor.		1		Kedalaman telaga 12 m dengan kadar luahan 4.5 m^3/jam. SPATR telah dibina untuk kegunaan kira-kira 200 orang. Depth of well is 12 m with 4.5 m^3/hour discharge rate. SPATR has been built to supply water for approximately 200 people.
	Padang Ragut Ulu Gerik 'A', Gerik.		1		Kedalaman telaga 52m dengan kadar luahan 9.2m^3/jam. SPATR telah dibina untuk pertanian. Depth of well is 52 m with 9.2 m^3/hour discharge rate. SPATR has been built for agriculture.
Selangor/ Wilayah Persekutuan	Klinik Kesihatan Beranang		1		Kedalaman telaga ialah 93 m. Luahan adalah sebanyak 4.5 m3/jam. Telaga telah dibangunkan untuk kegunaan domestik. Well depth of 93 m and discharge rate of 4.5 m^3/hour. Production well has been built for domestic use.
	Kg.Nadsyabandiah, Kajang.	1			Kedalaman telaga 5 m dan luahan adalah sebanyak 3 m^3/jam. Well depth is 5 m and discharge rate of 3 m^3/hour.
	Masjid Al-Hasanah Bangi	1	1		Kedalaman telaga ialah 73 m. Luahan adalah sebanyak 4.5 m^3/jam. Telaga telah dibangunkan untuk kegunaan domestik. Well depth is 73 m and discharge rate 4.5 m^3/hour. Production well has been built for domestic use.
	Kolej Mara Banting		1		Kedalaman telaga ialah 60 m. Luahan adalah sebanyak 4.5 m^3/jam. Well depth of 60 m with discharge rate of 4.5 m^3/hour.

Negeri State	Lokasi Location	TE* EW*	TP* PW*	TM* MW*	Catatan Remarks
Negeri Sembilan	Gua Pelangi, Felda Pasoh 4, Daerah Jelebu.	1			Projek ini adalah untuk membekalkan air bersih kepada pelawat yang berkunjung ke gua pelangi ini dan juga kepada penduduk orang asli yang tinggal berdekatan. Kedalaman telaga adalah 3 m dan luahan telaga adalah 9 m³/jam. Bekalan air mampu memberi manfaat kepada 908 orang dalam masa sehari. This project is to supply water for tourist and aborigin inhabitant nearby. Depth of well is 3 m and discharge rate 9 m^3/hour. This amount of water can be consumed approximately by 908 people.
	Kg. Parit Buluh, Air Kuning Selatan, Gemencheh, Daerah Tampin		1		Projek ini bertujuan untuk membekalkan air bersih kepada penduduk kampung di Air Kuning Selatan. Kedalaman telaga adalah 109 m. Luahan telaga pula adalah 2.82 m³/jam. Bekalan air mampu memberi manafaat kepada 337 orang sehari. This project is to supply water for Air Kuning Selatan residents. Well depth is 109 m and discharge rate 2.82 m^3/hour. This amount of water can be consumed approximately 337 people.
	Felda Bukit Rokan Utara, Gemencheh, Daerah Tampin		1		Projek ini bertujuan untuk membekalkan air bersih kepada penduduk kampung di Felda Bukit Rokan Utara. Kedalaman telaga adalah 66 m. Luahan telaga adalah 20 m³/jam. Bekalan air mampu memberi manfaat kepada 2428 orang sehari. This project is to supply water for Felda Bukit Rotan Utara residents. Well depth is 66 m and discharge rate 20 m^3/hour. This amount of water can be consumed approximately 2428 people.

Negeri State	Lokasi Location	TE* EW*	TP* PW*	TM* MW*	Catatan Remarks
Johor	Kompleks Islam Ibnu Masud, Segamat.	1			Telaga ini tidak berpotensi dibangunkan bagi membekalkan air untuk kegunaan domestik. The well had no potential as a source of water for domestic. Consumption.
	Kg. Buau, Pulau Pemanggil, Mersing.		1		Telaga telah dibangunkan dan berupaya membekalkan air kepada 40 orang penduduk pulau. Production well has been built to supply clean water for approximately 40 people.
	Kg. Felcra Kg. Pauh, Segamat.	1			Telaga ini tidak berpotensi dibangunkan bagi membekalkan air untuk kegunaan domestik. The well had no potential as a source of water for domestic consumption.
	Wisma Anak Yatim, Batu Pahat		1		Telaga telah dibangunkan untuk kegunaan 120 orang penghuni berkenaan. Production well has been built to supply water for approximately 120 occupants and visitor.
	Surau Annur, Kg. Sawah Laku, Bukit Kepong, Muar		1		Telaga telah dibangunkan untuk membekalkan air kepada 700 orang pengguna. Production well has been built to supply water for approximately 700 people.
	Masjid Sri Jaya, Bukit Serampang, Muar			1	Telaga digunakan sebagai telaga pemantauan. The well was used as a monitoring well
Pahang	Pusat Pendidikan Al-Quran Al Muqarrabin, Kg. Lamir, Pekan.	1	1	1	Kedalaman telaga 34 m dengan kadar luahan 35 m^3/jam. Telaga telah dibangunkan untuk kegunaan domestik. Well depth of 34 m with discharge rate of 35 m^3/hour. The well has been developed to supply water for domestic consumption.
	Institut Kemahiran Belia Negara (IKBN) Pekan	1	1	1	Kedalaman telaga 78 m dengan kadar luahan 18m^3/jam. Telaga telah dibangunkan untuk kegunaan domestik. Well depth of 78 m with discharge rate of 18 m^3/hour. The well has been developed to supply water for domestic consumption.
	Sekolah Kebangsaan Denai, Rompin	1	1	1	Kedalaman telaga 100 m dengan kadar luahan 25 m^3/jam. Telaga telah dibangunkan untuk kegunaan domestik. Well depth of 100 m with discharge rate of 25 m^3/hour. The well has been developed to supply water for domestic consumption.

Negeri State	Lokasi Location	TE* EW*	TP* PW*	TM* MW*	Catatan Remarks
Terengganu	Madrasah Darul Ansor, Marang		1		Telaga telah dibina dengan luahan air 25.1 m^3/jam. SPATR telah dibina untuk kegunaan 210 orang pengguna. Production well was constructed with discharge rate is 25.1 m^3/hour. SPATR has been built to supply water for approximately 210 people.
	Pusat Pengajian Pondok Al-Madini, Kuala Nerus		1		Telaga dibina dengan luahan air ialah 3.6 m^3/jam. SPATR telah dibina untuk kegunaan 60 orang pengguna. The well was constructed with discharge rate of 3.6 m^3/hour. A SPATR has been built to supply water for approximately 60 people.
	Kg. Jongok Batu, Dungun		1		Telaga dibina untuk bekalan air bersih. Luahan air ialah 33.9 m^3/jam. The well was constructed to supply water. Rate of discharge was 33.9 m^3/hour.
	SM Islam Darul Bayan, Dungun dan Madrasah Darul Bayan		3		Tiga telaga pengeluaran dengan jumlah kedalaman 50.3 m telah dibina. Purata anggaran luahan sebanyak 24 m^3/jam untuk kegunaan 600 pelajar dan kakitangan. Three production wells with a total depth of 50.3 m were constructed. Average rate of discharge was 24 m^3/hour can supply water to 600 students and staffs.
	Kg. Jebok Puyuh, Besut	1	1		Pembinaan telaga pengeluaran berdiameter 100 mm dengan kaedah pengejetan bagi kegunaan domestik. Telaga ini telah dibangunkan untuk kegunaan 82 orang pengguna. Producton well was constructed for water supply purposes. This well can supply water to approximately 82 people.
	Kg. Batu Balai, Jabi, Besut		1		Telaga berkedalaman 10 m dengan anggaran luahan sebanyak 6.5 m^3/jam untuk kegunaan domestik. Depth of well is 10 m and with an estimated discharge rate of 6.5 m^3/hour. The well has been developed to supply water for domestic consumption.
	SK Pondok Madrasah Ta'alim Wattarbiah, Besut	1	1		Telaga dengan kedalaman 10 m dengan anggaran kadar luahan 2.9 m^3/jam untuk dimanfaatkan oleh 85 orang pengguna. Depth of well is 10 m and with an estimated discharge rate of 2.9 m^3/hour. The well has been developed to supply water for approximately 85 people.

Negeri State	Lokasi Location	TE* EW*	TP* PW*	TM* MW*	Catatan Remarks
	Madrasatul Quran, Bukit Kenak, Besut		1		Pembinaan telaga pengeluaran berdiameter 100 mm dengan kaedah pengejetan bagi kegunaan domestik. Kadar luahan adalah 7.9 m^3/jam. Construction of producton well of 100 mm by jetting method diameter for domestic consumption. The yield was 7.9 m^3/hour
	SMKA Nurul Ittifaq, Besut		1		Pembinaan telaga untuk 270 orang penghuni asrama. Kadar luahan adalah 3.6 m^3/jam. A well was built to benefit 270 hostel users. Discharge rate was 3.6 m^3/hour.
	Madrasah Haji Ghazali, Besut		1		Telaga berkedalaman 7.7 m dengan anggaran kadar luahan sebanyak 2.8 m^3/jam untuk kegunaan lebih 100 orang pengguna. Well with a depth of 7.7 m with an estimated discharge rate of 2.8 m^3/hour. The well has been developed to supply water for approximately 100 people.
	Maahad Tahfiz Ar-Rahmah, Manir, Kuala Terengganu		1		Telaga berkedalaman 10.8 m dan kadar luahan 13.4 m^3/jam untuk manfaat 66 pengguna. Well with a depth of 10.8 m and an estimated discharge rate of 13.4 m^3/hour that benefitted 66 user.

Negeri State	Lokasi Location	TE* EW*	TP* PW*	TM* MW*	Catatan Remarks
Kelantan	Pondok Lepan Bola, Tanah Merah.		1		Telaga berkedalaman 100 m dengan anggaran kadar luahan 7 m^3/jam. Telaga dibangunkan untuk 60 orang terdiri daripada pengajar dan penghuni pondok. Well with a depth of 100 m with an estimated discharge rate of 7 m^3/hour. The well has been developed to supply water for approximately 60 people.
	Pusat Pengembangan Akuakultur dan Komuniti, Labok, Machang		1		Telaga berkedalaman 100 m dengan anggaran kadar luahan 7 m^3/jam. Telaga dibangunkan untuk kegunaan pembenihan ikan dan 30 orang kakitangan. Well with a depth of 100 m with an estimated discharge rate of 7 m^3/hour. The well has been developed to supply water for approximately 30 people and aquaculture.
	Kilang Padi Pertubuhan Peladang, Kangkong, Pasir Mas		1		Telaga berkedalaman 70 m dengan anggaran kadar luahan 5 m^3/jam. Telaga dibangunkan untuk kegunaan pemprosesan padi dan 20 orang kakitangan. Well with a depth of 70 m with an estimated discharge rate of 5 m^3/hour. The well has been developed to supply water for approximately 20 people and agriculture.
	Tapak Cadangan Pejabat JMG Kelantan, Tunjong, Kota Bharu		1		Telaga berkedalaman 60 m dengan anggaran kadar luahan 156 m^3/jam. Telaga dibangunkan untuk kegunaan 67 orang kakitangan dan sistem penyejukan penyaman udara Wisma Audit. Well with a depth of 60 m with an estimated discharge rate of 156 m^3/hour. The well has been developed to supply water for 67 people and industrial.
	Pejabat Pertubuhan Peladang Negeri Kelantan, Panji, Kota Bharu		1		Telaga berkedalaman 5.3 m dengan anggaran kadar luahan 6 m^3/jam. Telaga dibangunkan untuk kegunaan 200 orang kakitangan. Well with a depth of 5.3 m with an estimated discharge rate of 6 m^3/hour. The well has been developed to supply water for 200 people.
	PERKIM, Pengkalan Chepa		1		Telaga berkedalaman 5.5 m dengan anggaran kadar luahan 10.3 m^3/jam. Telaga dibangunkan untuk kegunaan 120 orang kakitangan. Well with a depth of 5.5 m with an estimated discharge rate of 10.3 m^3/hour. The well has been developed to supply water for 120 people.
	Pejabat JUPEM, Kota Bharu		1		Telaga berkedalaman 40 m dengan anggaran kadar luahan 1 m^3/jam. Telaga dibangunkan untuk kegunaan 114 orang. Well with a depth of 40 m with an estimated discharge rate of 1 m^3/hour. The well has been developed to supply water for 114 people.

Negeri State	Lokasi Location	TE* EW*	TP* PW*	TM* MW*	Catatan Remarks
	Sekolah Menengah Kebangsaan Kutan		1		Telaga berkedalaman 15.5 m dengan anggaran kadar luahan 5.14 m^3/jam. Telaga dibangunkan untuk kegunaan 408 orang. Well with a depth of 15.5 m with an estimated discharge rate of 5.14 m^3/hour. The well has been developed to supply water for 408 people.
	Cawangan (stor) JMG Kelantan	1			Eksplorasi Air bawah tanah. Groundwater exploration.
	SK Keling, Kota Bharu	1			Eksplorasi Air Bawah Tanah. Groundwater exploration.
	Kg. Baung, Pengkalan Chepa			1	Telaga digunakan sebagai telaga pemantauan. The well was used as a monitoring well.
	Masjid An-Nur Panji		1		Telaga berkedalaman 9 m dengan anggaran kadar luahan 4.8 m^3/jam. Telaga dibangunkan untuk kegunaan 100 orang jemaah masjid. Well with a depth of 9 m with an estimated discharge rate of 4.8 m^3/hour. The well has been developed to supply water for 408 people.
	Tanah Mara, Gong Kulim			1	Telaga digunakan sebagai telaga pemantauan. The well was used as a monitoring well.
	SMK Tendong, Pasir Mas			1	Kedalaman telaga 63 m dan anggaran luahan air 47.7 m^3/jam. Test well with depth of 63 m, and an estimated discharge of 47.7 m^3/hour.
	SMK Panglima Raja, Pasir Mas			1	Kedalaman telaga ujian 54 m dan anggaran luahan air 101.8 m^3/jam. Test well with depth of 54 m, and an estimated discharge of 101.8 m^3/hour.
	SK Kedai Piah, Ketereh			1	Kedalaman telaga ujian 52 m dan anggaran luahan 114.4 m^3/jam Test well with depth of 52 m, and an estimated discharge of 114.4 m^3/hour.
	SK Mata Ayer, Pulai Chondong			1	Telaga berkedalaman 100 m. Depth of 100 m.
	SK Chuchoh Puteri, Kuala Krai			1	Kedalaman telaga 100 m dan anggaran luahan 14.1 m^3/jam. Test well with depth of 100 m, and an estimated discharge of 14.1 m^3/hour.
	SMK Pangkal Meleret, Machang			1	Telaga berkedalaman 105 m dengan anggaran kadar luahan 16.0 m^3/jam Depth of well 105 m, and an estimated discharge of 16.0 m^3/hour.

Negeri State	Lokasi Location	TE* EW*	TP* PW*	TM* MW*	Catatan Remarks
	SMK Belimbing, Tanah Merah			1	Telaga berkedalaman 100 m dengan anggaran kadar luahan 25.1 m^3/jam Depth of well 100 m, and an estimated discharge of 25.1 m^3/hour.
	SK Sri Suria 1, Tanah Merah			1	Telaga berkedalaman 103 m dengan anggaran kadar luahan 16.0 m^3/jam Depth of well 103 m, and an estimated discharge of 16.0 m^3/hour.
	Masjid Sokor, Tanah Merah			1	Kedalaman 105 m dengan anggaran kadar luahan 1.6 m^3/jam. Depth of well 105 m, and an estimated discharge of 1.6 m^3/hour.
	SK Biak, Dabong			1	Telaga berkedalaman 100 m dengan anggaran kadar luahan 0.8 m^3/jam. Depth of well 100 m, and an estimated discharge of 0.8 m^3/hour.
	JPS Gua Musang			1	Telaga berkedalaman 54 m. Test well with depth of 54 m.
	Stesen Hujan dan Aras Air Sg. Belatop, Lojing			1	Telaga berkedalaman 100 m dengan anggaran kadar luahan 1.6 m^3/jam. Depth of well 100 m, and an estimated discharge of 1.6 m^3/hour.
	Stesen Hujan dan Aras Air Sg. Belatop, Lojing			1	Telaga berkedalaman 100 m dengan anggaran kadar luahan 1.6 m^3/jam. Depth of well 100 m, and an estimated discharge of 1.6 m^3/hour.
Jumlah / Total:		14	47	28	

TE* / EW* = Telaga Eksplorasi / Exploration Well
TP* / PW* = Telaga Pengeluaran / Production Well
TM* / MW* = Telaga Pemantauan / Monitoring Well

Perkhidmatan pembangunan air bawah tanah oleh Bahagian Perkhidmatan Teknikal
Groundwater development service by Technical Services Division

Negeri State	Lokasi Location	Bil. Telaga No. of wells	Aktiviti Activity	Catatan Remarks
Perak	Sekolah Menengah Sains Bagan Datuk (SABDA)	1	Penggerudian telaga pengeluaran. Production well drilling.	Kadar luahan air yang diperoleh adalah 60,000 gelen sejam dan dapat dimanfatkan kira-kira 9,000 orang penduduk The discharge rate is 60,000 gallons per hour and can be used for about 9,000 people.

Penggerudian dan pembinaan telaga di kawasan kebakaran tanah gambut
Drilling and construction of wells in fire prone peat area

Negeri State	Lokasi Location	Luahan telaga (m^3/jam) Yield (m^3/hour)	Kedalaman Depth (m)	Catatan Remarks
Sabah	Kg. Lumat, Beaufort	10	50	Semua telaga tersedia digunakan bagi mengawal kebakaran. All the wells were ready for use to control peat fire.
	Kg. Binsuluk, Kuala Penyu	15	27	Semua telaga tersedia digunakan bagi mengawal kebakaran. All the wells were ready for use to control peat fire.
Selangor	Kg.Belankan, Kompatmen 27, Hutan Simpan Kuala Langat Selatan.	70	100	Semua telaga tersedia digunakan bagi mengawal kebakaran. All the wells were ready for use to control peat fire.
	Kg. Tumbok, Kompatmen 24, Hutan Simpan Kuala Langat Selatan	70	100	Semua telaga tersedia digunakan bagi mengawal kebakaran. All the wells were ready for use to control peat fire.
Johor	Hutan Simpan Gunung Arong, Mersing	25.14	100	Semua telaga tersedia digunakan bagi mengawal kebakaran. All the wells were ready for use to control peat fire.
Pahang	Tapak semaian Jabatan Perhutanan, Hutan Simpan Bkt. Bangkong, Sg. Miang, Pekan	151	46	Semua telaga tersedia digunakan bagi mengawal kebakaran. All the wells were ready for use to control peat fire.
Terengganu	Kawasan Perindustrian Batu Tujuh, Dungun	90.1	46	Semua telaga tersedia digunakan bagi mengawal kebakaran. All the wells were ready for use to control peat fire.
Terengganu	RTB Paya Gong Pasir, Dungun	39.7	66	Semua telaga tersedia digunakan bagi mengawal kebakaran. All the wells were ready for use to control peat fire.
Kelantan	FELCRA Beris Lalang	120	60	Semua telaga tersedia digunakan bagi mengawal kebakaran. All the wells were ready for use to control peat fire.

Projek khas bekalan air
Water supply special project

Negeri State	Lokasi Location	Projek Project	Sumber Kewangan Fund Source	Catatan Remarks
Selangor	Klinik Kesihatan Beranang.	SPATR	Pembangunan Sumber Air BawahTanah Negara (Water Stress)	Pembinaan telaga pengeluaran dan sistem rawatan air ini telah memberi manfaat kepada 500-1000 orang. Production well dan water treatment system have been developed to supply water approximately 500-1000 people.
	Kolej Mara Banting	SPATR	Pembangunan Sumber Air Bawah Tanah Negara (Water Stress)	Pembinaan telaga pengeluaran dan sistem rawatan air ini telah memberi manfaat kepada 1000-2000 orang. Production well dan water treatment system have been developed to supply water approximately 1000-2000 people.
	Maahad Tahfiz Alhaabah	SPATR	Pembangunan Sumber Air Bawah Tanah Negara (Water Stress)	Pembinaan telaga pengeluaran dan sistem rawatan air ini telah memberi manfaat kepada 200-300 orang. Production well dan water treatment system have been developed to supply water approximately 200-300 people.
	Masjid Al Hasanah Bangi	SPATR	Pembangunan Sumber Air Bawah Tanah Negara (Water Stress)	Pembinaan telaga pengeluaran dan sistem rawatan air ini telah memberi manfaat kepada 1000-2000 orang. Production well dan water treatment system have been developed to supply water approximately 1000-2000 people.

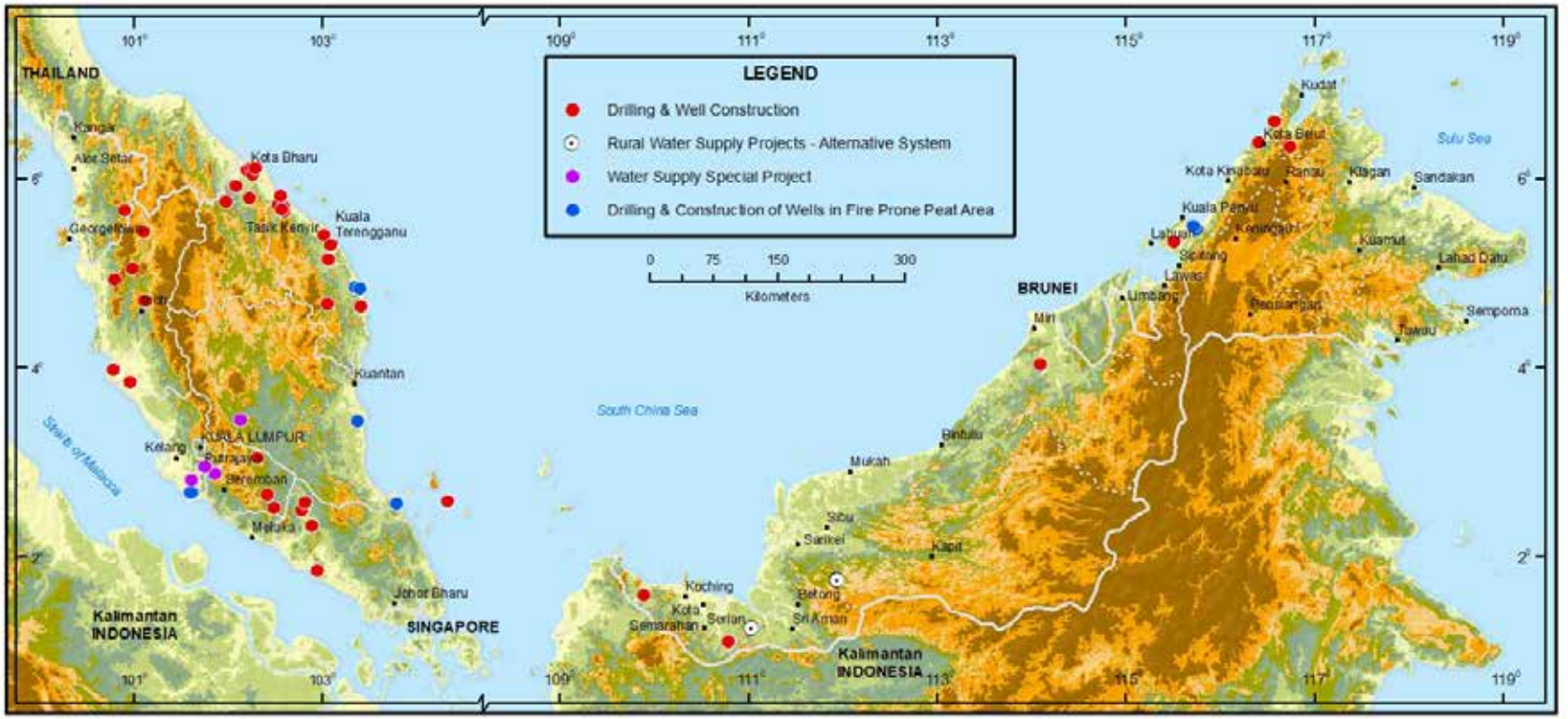
Senarai Bekalan Air Luar Bandar Sistem Alternatif 2017
List of Rural Water Supply Projects – Alternative System 2017

Negeri State	Kawasan Area	Skop Projek Project Scope	Bilangan Kampung (No. of villages)	Catatan (Remarks)
Sarawak	Rh Achang, Muding Danau, Pantu, Simunjan	Air Graviti	1	Selesai menjalankan kerja-kerja pembinaan empangan dan penyambungan paip terus ke rumah panjang. Completion of dam and pipe installation to long house.
	Rh Nunying, Nanga Bulo, Ulu Kanowit.	Air Graviti	1	Selesai menjalankan kerja-kerja pembinaan empangan dan penyambungan paip terus ke rumah panjang. Completion of dam and pipe installation to long house.
	Rh Guyu, Nanga Bulo, Ulu Kanowit.	Air Graviti	1	Selesai menjalankan kerja-kerja pembinaan empangan dan penyambungan paip terus ke rumah panjang. Completion of dam and pipe installation to long house.
	Rh Amba, Nanga Bulo, Ulu Kanowit	Air Graviti	1	Selesai menjalankan kerja-kerja pembinaan empangan dan penyambungan paip terus ke rumah panjang. Completion of dam and pipe installation to long house.

Program pemantauan air bawah tanah
Groundwater monitoring programme

Negeri State	Bil. telaga dipantau No. of well monitored	Catatan Remarks
Sarawak	23	Program pemantauan air bawah tanah telah dijalankan sekali setahun. Tiada perubahan ketara berlaku terhadap paras air bawah tanah dan kualiti air. Groundwater monitoring programme has been conducted once a year. No significant changes were recorded in the water level and its quality.
Sabah	119	Program pemantauan air bawah tanah telah dijalankan sekali setahun. Tiada perubahan ketara berlaku terhadap paras air bawah tanah dan kualiti air. Groundwater monitoring programme has been conducted once a year. No significant changes were recorded in the water level and its quality.
Perlis	1	Program pemantauan air bawah tanah telah dijalankan sebanyak dua kali setahun. Tiada perubahan ketara berlaku terhadap paras air bawah tanah dan kualiti air. Groundwater monitoring programme has been conducted twice a year. No significant changes were recorded in the water level and its quality.
Kedah	32	Program pemantauan air bawah tanah telah dijalankan sebanyak dua kali setahun. Tiada perubahan ketara berlaku terhadap paras air bawah tanah dan kualiti air. Groundwater monitoring programme has been conducted twice a year. No significant changes were recorded in the water level and its quality.
Pulau Pinang	2	Program pemantauan air bawah tanah telah dijalankan sebanyak dua kali setahun. Tiada perubahan ketara berlaku terhadap paras air bawah tanah dan kualiti air. Groundwater monitoring programme has been conducted twice a year. No significant changes were recorded in the water level and its quality.
Perak	48	Program pemantauan air bawah tanah telah dijalankan sebanyak dua kali setahun. Tiada perubahan ketara berlaku terhadap paras air bawah tanah dan kualiti air. Groundwater monitoring programme has been conducted twice a year. No significant changes were recorded in the water level and its quality.
Selangor	70	Program pemantauan air bawah tanah telah dijalankan sebanyak dua kali setahun. Tiada perubahan ketara berlaku terhadap paras air bawah tanah dan kualiti air. Groundwater monitoring programme has been conducted twice a year. No significant changes were recorded in the water level and its quality.
Negeri Sembilan	35	Program pemantauan air bawah tanah telah dijalankan sebanyak dua kali setahun. Tiada perubahan ketara berlaku terhadap paras air bawah tanah dan kualiti air. Groundwater monitoring programme has been conducted twice a year. No significant changes were recorded in the water level and its quality.
Melaka	12	Program pemantauan air bawah tanah telah dijalankan sebanyak dua kali setahun. Tiada perubahan ketara berlaku terhadap paras air bawah tanah dan kualiti air. Groundwater monitoring programme has been conducted twice a year. No significant changes were recorded in the water level and its quality.

Johor	43	Program pemantauan air bawah tanah telah dijalankan sebanyak dua kali setahun. Tiada perubahan ketara berlaku terhadap paras air bawah tanah dan kualiti air. Groundwater monitoring programme has been conducted twice a year. No significant changes were recorded in the water level and its quality.
Pahang	32	Program pemantauan air bawah tanah telah dijalankan sebanyak dua kali setahun. Tiada perubahan ketara berlaku terhadap paras air bawah tanah dan kualiti air. Groundwater monitoring programme was conducted twice a year. No significant changes were recorded in the water level and its quality.
Terengganu	67	Program pemantauan air bawah tanah telah dijalankan sekali setahun. Tiada perubahan ketara berlaku terhadap paras air bawah tanah dan kualiti air. Groundwater monitoring was conducted once a year. No significant changes were recorded in the water level and its quality.
Kelantan	102	Program pemantauan air bawah tanah telah dijalankan sekali setahun. Tiada perubahan ketara berlaku terhadap paras air bawah tanah dan kualiti air. Groundwater monitoring was conducted once a year. No significant changes were recorded in the water level and its quality.
Jumlah / Total:	587	



Pembangunan Air Bawah Tanah 2017
Groundwater Development 2017

Pemantauan Air Bawah Tanah 2017
Groundwater Monitoring 2017

Persampelan sedimen dasar sungai di Sg. Wariu, Kota Belud.
Riverbed sampling in Sg. Wariu, Kota Belud.

Kerja-kerja penggerudian dan pembinaan telaga eksplorasi di Kg. Suang Punggur, Kota Belud.
Drilling and exploration well development in Kg. Suang Punggur, Kota Belud.

Penggerudian dan pembinaan telaga tiub di Kg. Tangkol, Kota Marudu.
Drilling and construction of tube well at Kg. Tangkol, Kota Marudu.

Telaga pengeluaran bagi kegunaan domestik di Kg. Buau, Pulau Pemanggil Johor.
Production well for domestic purpose at Kg. Buau, Pulau Pemanggil, Johor.

Kerja-kerja pemantauan paras air dan kualiti air bawah tanah di sekitar daerah Kota Belud.
Monitoring groundwater level and water quality at Kota Belud District.

Pemasangan dan pengujian pam selam baru untuk telaga air bawah tanah di Sekolah Menengah Sains Bagan Datuk (SABDA).
Installation and testing of new submersible pump for groundwater well at Sekolah Menengah Sains Bagan Datuk (SABDA).

Kerja-kerja pembinaan telaga pengeluaran sedalam 100 m oleh Bahagian Perkhidmatan Teknikal di Sekolah Menengah Sains Bagan Datuk (SABDA).
Well construction work with 100 m depth by the Technical Services Division at Sekolah Menengah Sains Bagan Datuk (SABDA).

Geologi Kejuruteraan

Pembangunan negara yang pesat telah menyebabkan kawasan yang sesuai untuk pembangunan semakin terhad mengakibatkan kawasan sensitif alam sekitar dan sensitif geologi dibuka seperti kawasan tanah tinggi dan tanah gambut bagi tujuan tersebut. Pada tahun 2017, pemetaan geologi kejuruteraan kawasan gambut dan tanih lembut telah dijalankan di kawasan Mukah dan Miri, Sarawak yang melibatkan penggerudian sebanyak 189 lubang gerimit. Jabatan turut dipertanggungjawabkan melakukan siasatan geobencana yang berlaku di seluruh negara. Sejumlah 17 lokasi kejadian geobencana telah di siasat melibatkan bencana seperti runtuhan tebing sungai, aliran debris, rayapan tanah, kegagalan cerun, lubang benam dan runtuhan tembok penahan. Hasil siasatan geo bencana dapat mengenal pasti faktor-faktor geologi yang menyumbang kepada kejadian geobencana. Selanjutnya langkah-langkah kawalan dan pencegahan yang bersesuaian dapat dicadangkan kepada agensi yang berkaitan.

Engineering Geology

The rapid pace of development has resulted in the corresponding decrease of suitable areas for development and now it is encroaching into areas classified as environmental sensitive and geology sensitive such as hill and peat or soft soil areas. Therefore, the department has taken proactive steps by conducting a geological mapping of peat and soft soil engineering in Mukah and Miri areas of Sarawak, involving 189 augering holes. The information obtained from these mapping activities were widely used for land use planning by other local authorities. The department also responsible to conduct geohazard investigations all over the country. A total of 17 geohazard sites have been investigated involving various geohazard incidents such as landslide at river bank, debris flow, soil creep, slope failure, sinkhole and collapse of retaining walls. The results of geohazard investigations will identify geological factors that contribute to the disaster. Furthermore, appropriate mitigation and princidentive measures may be recommended to the relevant agency.

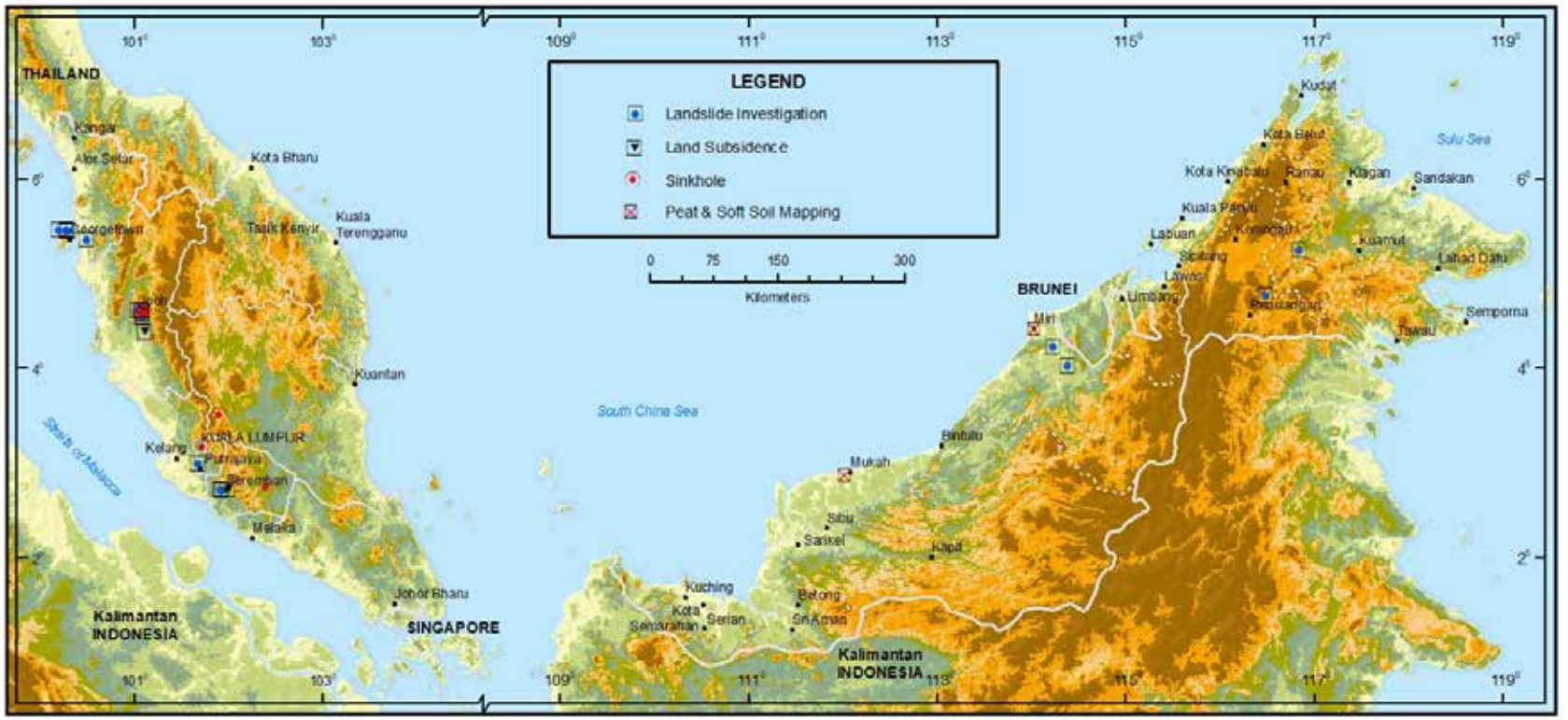
Pemetaan geologi kejuruteraan kawasan gambut dan tanih lembut
Engineering geological mapping in peat and soft soil areas

Negeri State	Kawasan Area	Jenis Pemetaan Type of Mapping	Liputan Coverage (km^2)	Catatan Remarks
Sarawak	Petian, Mukah	Pemetaan Tanah Gambut Peat soil mapping	16	Sebanyak 80 Lubang gerimit telah disiapkan dengan sela 500m A total of 80 hand auger were completed with spacing of 500 m
	Vista Perdana, Miri	Pemetaan Tanah Gambut Peat soil mapping	22	Sebanyak 109 Lubang gerimit telah disiapkan dengan sela 500m A total of 109 hand auger were completed with spacing of 500 m
Jumlah Liputan / Total Coverage:			38	

Siasatan geobencana
Geohazard investigation

Negeri State	Lokasi Area	Jenis Bencana Type of Hazard	Catatan Remarks
Sarawak	Bukit Song, Jalan Miri-Bintulu	Tanah runtuh Landslide	Kejadian yang berlaku selepas hujan lebat dan dipengaruhi oleh sesar dan perlapisan. Landslide incident happened due to heavy rainfall and the slope is controlled by fault and bedding structure
	Tebing sungai Kuala Tutoh, Baram	Tebing sungai runtuh River bank landslide	Tebing runtuh selepas hujan lebat dan dipengaruhi oleh banjir. River bank collpased due to heavy rainfall and flood
Sabah	Sen Fu Oil Palm Plantation, Tibow, Ulu Tongod	Aliran Debris Debris flow	Aliran debris yang mengangkut bahan lumpur, pokok-pokok besar dan blok-blok batuan hingga menyebabkan kematian 8 orang. Debris flow transporting mud, huge trees and blocks of rocks causing the death of 8 civilians
	Jawala Plantation, Sapulut	Rayapan tanah Soil creep	Jalan raya rosak dan terangkat. Road damaged and warping
P.Pinang	Taman Fettes, Tanjung Bungah	Tembok penahan runtuh Retaining wall failure	Siasatan kejadian kegagalan tembok penahan yang berlaku di taman perumahan. Investigation of retaining wall failure incident at residential area.
	Lorong Lembah Permai 3,Tanjung Bungah	Kegagalan cerun Slope failure	Siasatan kejadian kegagalan cerun potongan yang berlaku di tapak pembinaan. Investigation of slope failure incident at construction site.
	Taman Bevery Hills, Tanjung Bungah	Tembok penahan runtuh Retaining wall failure	Siasatan kejadian kegagalan tembok penahan yang berlaku di tapak pembinaan. Investigation of retaining wall failure incident at construction site.
	Taman Rimba Bukit Mertajam	Kegagalan cerun Slope failure	Siasatan kejadian kegagalan cerun potongan yang berlaku di cerun jalan. Investigation of slope failure incident at road slope.
	Taman Negara Pulau Pinang, Teluk Bahang	Tanah Runtuh Landslide	Siasatan kejadian tanah runtuh yang berlaku di cerun jalan rintis. Investigation of slope failure incident at earthtrack slope.
Perak	No.25F, Jalan Bunga, Kg. Tengku Hussein Lama, Manjoi, Ipoh	Runtuhan tembok Retaining wall failure	Siasatan kejadian kegagalan tembok penahan yang berlaku di kawasan perumahan. Investigation of retaining wall failure incident at residential area

Wilayah Persekutuan	Ibu Pejabat JUPEM, Jalan Semarak, Kuala Lumpur	Lubang Benam Sink hole	Siasatan kejadian lubang benam disebabkan oleh kaviti batu kapur dan getaran kuat yang berlaku disekitar kawasan yang berlaku di kawasan perumahan. Investigation of sinkhole incident due to limestone cavity and continuous vibration at the surrounding area. .
Selangor	Pusat Bandar Putra Permai, Seri Kembangan	Tanah Runtuh Landslide	Tanah runtuh pada dinding parit monsoon disebabkan akibat hujan lebat. Monsoon drain wall failure incident due to heavy rainfall.
Negeri Sembilan	Apartment Desa Jaya Villa, Senawang	Mendapan Tanah Subsidence	Siasatan tanah mendap dan mengenalpasti punca kejadian Investigation of subsidence and cause of incident
	Jalan Permai Bandar Seremban, Seremban	Tanah Runtuh Landslide	Siasatan tanah runtuh dan mengenalpasti punca kejadian Investigation of landslide and cause of incident
	Jalan Jelai-Rompin (N20) dan Jalan Bahau-Dangi, Jempol	Lubang Benam Sinkhole	Siasatan lubang benam dan mengenalpasti punca kejadian Investigation of sinkhole and cause of incident
	Tapak Bangunan Cadangan Pasar Besar Seremban Jalan Bukit Kepayang 2, Seremban	Tebing Cerun Runtuh Retaining wall failure	Siasatan tebing penahan cerun runtuh dan mengenalpasti punca kejadian Investigation of retaining wall failure and cause of incident
Pahang	Empangan Perting, Bentong	Lubang benam Sink hole	Siasatan lubang benam dan mengenalpasti punca kejadian Investigation of sinkhole and cause of incident



Aktiviti Geologi Kejuruteraan 2017
Engineering Geology Activities 2017

Jalan rosak akibat tanah runtuh di sepanjang Jalan Pan Borneo, Bukit Song, Lambir,Miri, Sarawak

Road damaged due to landslide along the Pan Borneo trunk Road, at Bukit Song, Lambir, Miri, Sarawak.

Lawatan lapangan berkaitan kejadian runtuhan tembok di No.25F, Jalan Bunga, Kg. Tengku Hussein Lama, Manjoi, Ipoh.

Field visit on the collapsed wall at No.25F, Jalan Bunga, Kg. Tengku Hussein Lama, Manjoi, Ipoh,

Geologi Alam Sekitar

Sejumlah 157 ulasan berkaitan EIA dalam pelbagai sector telah dilakukan oleh jabatan sepanjang tahun 2017.

Environmental Geology

A total of 157 technical reviews in various sectors were carried out in the year 2017.

Ulasan laporan penilaian kesan alam sekeliling untuk projek pembangunan
Review of environmental impact assessment reports for development projects

Negeri State	Bil. ulasan No. of review	Catatan Remarks
Sarawak	16	Menyediakan khidmat nasihat bagi cadangan projek pembangunan perumahan, infrastruktur, pertanian, perlombongan, pengkuarian dan empangan. Provide advisory services pertaining to the proposed development of housing, infrastructure, agriculture, mining, quarrying and dam.
Perlis	3	Menyediakan khidmat nasihat bagi cadangan pembangunan pelabuhan darat & komersial dan pembangunan pertanian. Provide advisory services for proposed inland port & commersial development and agriculture initiatives.
Kedah	14	Menyediakan khidmat nasihat bagi cadangan pembangunan bercampur, perumahan, tebus guna tanah untuk pembangunan pantai bercampur dan perlombongan pasir laut. Provide advisory services for proposed mixed development, housing, reclamation for beach mixed development and sand mining activity.
P.Pinang	23	Menyediakan khidmat nasihat bagi cadangan pembangunan bercampur, perumahan, hotel, taman pemulihan sumber & pengitaran semula sisa pepejal sektor pembinaan dan perobohan, pembangunan jalan-jalan utama Pulau Pinang, tebus guna tanah untuk pembangunan selatan Pulau Pinang, dan pembangunan pencawang elektrik. Provide advisory services for proposed mixed development, housing, hotel, C& D resources recovery and recycling park, Penang main road development, reclamation and dredging works for the Penang South Reclamation and electric power transmission development.
Perak	5	Menyediakan khidmat nasihat bagi cadangan pembangunan bercampur, resort dan kuari Provide advisory services pertaining on mixed development, resort and quarry
N.Sembilan	8	Menyediakan khidmat nasihat bagi cadangan pembangunan bercampur, perumahan, sampah, infrastruktur system kumbahan, jalanraya dan laluan kabel letrik Provide advisory services pertaining on mixed development, housing, sewerage sistem, road and transmission line
Melaka	1	Menyediakan khidmat nasihat bagi cadangan pembinaan empangan. Provide advisory services pertaining to the dam construction.

Negeri State	Bil. ulasan No. of review	Catatan Remarks
Johor	22	Menyediakan khidmat nasihat bagi cadangan Pembangunan bercampur, perumahan, industri, tempat pembuangan sampah, infrastruktur dan pertanian. Provide advisory services pertaining on mixed development, housing, industry, landfill, infrastructure and agriculture.
Pahang	28	Menyediakan khidmat nasihat bagi cadangan pembangunan bercampur, perumahan dan infrastruktur Provide advisory services pertaining on mixed development, housing and infrastructure
Kelantan	37	Menyediakan khidmat nasihat bagi cadangan pembangunan perumahan, infrastruktur, pertanian, perlombongan, pengkuarian dan empangan. Provide advisory services pertaining to the proposed development of housing, infrastructure and agriculture
Jumlah / Total:	157	

Geologi Marin

Pada tahun 2017, Unit Geologi Marin telah melaksanakan kerja-kerja survei geologi marin dalam 4 projek utama iaitu Projek Kajian Sumber Pasir Laut Negara Fasa 3 di Perairan Lepas Pantai Pahang dan Johor Timur; Projek e-Science Fund (Kajian Perlombongan Pasir Laut Mapan di Permatang Sedepa dan sekitarnya, Pelabuhan Kelang, Selangor); Projek Kajian Lembangan Sungai Muda dan Sungai Pahang.

Marine Geology

In 2017, Marine Geology Unit had conducted marine geological surveys for four main projects, namely National Offshore Sand Resource Study Phase – 3 in Offshore Pahang and of East Johor; e-Science Fund Project (A Study for the Sustainable Offshore Sand Mining in the One Fathom Bank (OFB) and its Surroundings, Off Port Klang, Selangor); Muda River and Pahang River Basin Study Project.

Survei Geologi Marin
Marine Geological Survey

Kajian Study	Negeri State	Kawasan Area	Liputan Coverage km²	Jenis Pemetaan Type of Mapping	Geofizik Geophysics	Sampel Sampling	Analisa Analyses			Catatan Remarks
							Saiz Butiran/ Karbonat/ Organik Grain Size/ Carbonate/ Organic	Geokimia	QME QME	
Kajian Sumber Pasir Laut Negara Fasa 3 National Offshore Sand Resource Study Phase – 3	Johor dan Pahang Johore and Pahang	Lepas Pantai Johor Timur dan Pahang Offshore East Johore and Pahang	38,000 km² 38,000 km²	Survei Geofizik Marin Marine Geophysical Survey	2978 garis-km (Batimetri, Sonar Imbasan Sisi, seismik) 2978 line-km Bathymetry, side scan sonar, seismic sub bottom profiler.	Tiada Nil	Tiada Nil	Tiada Nil	Tiada Nil	
Kajian Perlombongan Pasir Laut Mapan di Permatang Sedepa dan sekitarnya, Pelabuhan Kelang, Selangor A Study for the Sustainable Offshore Sand Mining In the One Fathom Bank (OFB) and its Surrounds, Off Port Klang, Selangor	Selangor Selangor	Lepas Pantai Selangor Offshore Selangor	60 km² 60 km²	Morfologi Dasar Laut Seabed Morphology	Multibeam, Batimetri, Seismik Multibeam, Bathymetry, Seismic sub bottom profiler	45 sampel cekau 45 Grab sampler	45 sampel 45 samples	Tiada Nil	Tiada Nil	Projek eScience Fund MOSTI dengan kerjasama antara Unit Geologi Marin, JMG dengan Pusat Hidrografi Nasional, TLDM, NAHRIM dan UMT. Escience Fund MOSTI Project with collaboration between Marine Geology Unit, JMG and Nasional Hidrography Centre, TLDM, NAHRIM and UMT.

Kajian Study	Negeri State	Kawasan Area	Liputan Coverage km²	Jenis Pemetaan Type of Mapping	Geofizik Geophysics	Sampel Sampling	Analisa Analyses			Catatan Remarks
							Saiz Butiran/ Karbonat/ Organik Grain Size/ Carbonate/ Organic	Geokimia	QME QME	
Projek Kajian Lembangan Sungai Muda. Muda River Basin Study Project	Kedah Kedah	Sungai Muda, Kedah Sungai Muda, Kedah.	87 km 87 km	Survei Batimetri, Persampelan cekau dan kualiti air Bathymetry Survey, Grab Sampling and Wter Qquality	Perum- gema Echo-sounder	81 Sampel Cekau 81 grab samples	81 sampel 81 samples	Tiada Nil	Tiada Nil	
Projek Kajian Lembangan Sungai Pahang Pahang River Basin Study Project	Pahang Pahang	Sungai Pahang (dari Paloh Hinai hingga ke Temerloh) Sungai Pahang (from Paloh Hinai to Temerloh)	165 km 165 km	Survei Batimetri, Persampelan cekau, persampelan teras dan kualiti air Bathymetry Survey, Grab Sampling and Water Quality	Perum- gema Echo-sounder	166 sampel cekau 166 grab samples 115 sampel teras 115 core samples	281 sampel 281 samples	Tiada Nil	Tiada Nil	

Khidmat Nasihat Lain

Bilangan Ulasan Permohonan Lesen Melombong Pasir Laut = 31

Bilangan Khidmat nasihat dan Perundingan =10

Bilangan sampel dianalisa oleh Makmal Geologi Marin = 1006

Other Advisory Services

Number of Offshore Sand Mining Licence Application Reviews = 31

Number of advisory and consultancy = 10

Number of sample analysed by Marine Geology Laboratory = 1006

Majlis Pelancaran Projek Kajian Sumber Pasir Laut Negara Fasa 3 – Lepas Pantai Pahang dan Johor Timur
Launching ceremony of Survey of National Offshore Sand Resource Study Phase 3 – Offshore Pahang and East Johore.

Sonar imbasan sisi dan boomer sedang diturunkan bagi melaksanakan survei geofizik Projek Kajian Sumber Pasir Laut Negara Fasa 3 – Lepas Pantai Pahang dan Johor Timur

Deploying of side scan sonar and boomer for geophysical survey of National Offshore Sand Resource Study Phase 3 – Offshore Pahang and East Johore

Pemasangan peralatan survei seismik bagi Projek E-Science Fund di Permatang Sedepa dan sekitarnya, Pelabuhan Kelang, Selangor.

Installation of seismic survey equipments for the Seismic Survey of E-science Fund Project at One Fathom Bank (OFB) and its Surrounds, Off Port Klang, Selangor.

Kumpulan kerja survei persampelan bagi Projek E-Science Fund di Permatang Sedepa dan sekitarnya, Pelabuhan Kelang, Selangor.

Sediment sampling survey team for E-science Fund Project at One Fathom Bank (OFB) and its Surrounds, Off Port Klang, Selangor.

Khidmat Nasihat Geosains

JMG secara aktif memberi khidmat nasihat perundingan dan khidmat nasihat kepada agensi kerajaan, pihak swasta dan individu dalam aspek perancangan guna tanah, hidrogeologi, geologi alam sekitar dan geologi kejuruteraan. Jabatan merupakan ahli dalam Jawatankuasa Penggunaan Sumber Air Peringkat Negeri, Jawatankuasa Kelulusan Pembungkusan Sumber Air Semulajadi, Jawatankuasa Pelesenan Sumber Air Bumi. Selain itu jabatan terlibat di dalam beberapa jawatankuasa peringkat negeri berkaitan dengan geobencana, seperti Jawatankuasa Perancangan Negeri, Jawatankuasa Kawasan Sensitif Alam Sekitar, Jawatankuasa Pembangunan Tanah Tinggi dan Lereng Bukit dan Jawatankuasa Pusat Setempat (OSC).

Geoscience Advisory Services

JMG actively provides consultative and advisory services to government agencies, the private sectors and individuals on aspects regarding land use planning and hydrogeology, environmental geology and engineering geology. JMG also a member of the State Water Consumption Committee, Antural Water Resource Packaging Approving Committee and Groundwater Resource Licensing Committee, State Planning Cmmittee, State Disaster Management Committee, Environmentally Sensitive Area Committee, Highland and Foothill Development Committee and One Stop Centre Committee.

Ulasan pembangunan tanah dan maklumat geosains am
Review of land development and general geosciences information

Negeri State	Jenis Ulasan Type of Review		
	Pusat Setempat One Stop Centre (OSC) (bil. / no.)	Pembangunan guna tanah Land use development (bil. / no.)	Maklumat geosains am General geoscience information (bil. / no.)
Sarawak	2	5	82
Sabah	121	36	52
Perlis	64	18	3
Pulau Pinang	73	25	8
Kedah	376	32	6
Perak	394	0	17
Selangor / WP	3198	0	25
Negeri Sembilan	638	4	43
Melaka	357	1	2
Johor	1087	6	19
Pahang	817	9	15
Terengganu	964	3	0
Kelantan	329	162	44
Jumlah / Total:	8420	301	316

Khidmat nasihat hidrogeologi
Hydrogeology advisory services

Negeri State	Bil. ulasan No. of review	Catatan Remarks
Sarawak	1	Khidmat nasihat bagi Projek River Bank Filteration(RBF) untuk membekal air ke Tg Manis di bawah Lembaga Air Sibu Advisory services to supply water to Tanjung Manis under Sibu water Board for the River Bank Filteration(RBF) project.
Sabah	1	Punca sumber air bawah tanah di Kg. Ulu Kimanis, Papar Groundwater resources at Kg Ulu Kimanis, Papar
Perlis	1	Khidmat nasihat berkaitan potensi air bawah tanah, dan lawatan tapak. Advisory services regarding groundwater potential and site visit.
Kedah	1	Khidmat nasihat berkaitan potensi air bawah tanah, dan lawatan tapak. Menyediakan ulasan teknikal permohonan baru dan pembaharuan perakuan perlesenan air mineral. Advisory services regarding groundwater potential and site visit. Provide technical reviews on new application and renewal of groundwater abstraction licence.
Selangor	238	Ulasan yang diberikan merupakan ulasan teknikal berkenaan permohonan penggunaan air bawah tanah Lembaga Urus Air Selangor,Ulasan permohonan air mineral dan juga permohonan khidmat nasihat teknikal air bawah tanah oleh masyarakat umum.
Negeri Sembilan	23	Menyediakan ullasan teknikal bagi tujuan permohonan baru dan pembaharuan lesen abstraksi air bumi.
Melaka	27	Menyediakan ullasan teknikal bagi tujuan permohonan baru dan pembaharuan lesen abstraksi air bumi.
Johor	13	Berkaitan pencarian potensi air bawah tanah untuk perusahaan air mineral, bekalan air bersih, pertanian, perikanan dan industri. Related to the search for groundwater potential for mineral water companies, clean water supply, agriculture, fishery and industry.
Pahang	2	Khidmat nasihat, lawatan tapak dan ulasan permohonan perakuan perlesenan air mineral daripada syarikat swasta.tempatan. Advisory services, site visits and mineral water licensing certification reviews from local companies.
Terengganu	13	Menyediakan ulasan teknikal dan khidmat nasihat berkaitan potensi sumber air bawah tanah kepada agensi kerajaan, pihak swasta dan orang perseorangan. Provided technical reviews and advisory services on the potential of groundwater sources for government agencies, the private sector and individuals.
Kelantan	15	Khidmat nasihat, lawatan tapak dan ulasan permohonan perakuan perlesenan air mineral daripada syarikat swasta.tempatan. Advisory services, site visits and mineral water licensing certification reviews from local companies.
Jumlah / Total:	335	

Khidmat nasihat geologi kejuruteraan
Engineering geology advisory services

Negeri State	Bil. ulasan No. of review	Catatan Remarks
Sarawak	2	Cadangan pembinaan sekolah baru dan mendapan tanah Proposed construction of new school and land subsidence
Sabah	25	Khidmat nasihat berkaitan cadangan pembangunan kawasan, perancangan kerja tanah, pembukaan tanah, semakan kecerunan serta aspek kesesuaian pembinaan kawasan cadangan pembangunan. Advisory services related to development proposals, land work planning, land clearing, slope study.
Perlis	2	Khidmat nasihat berkaitan geosains untuk cadangan pembangunan kawasan, permohonan kebenaran merancang serta pelan kerja tanah. Advisory services related to geoscience for proposed development area, planning permission application and earthwork plan.
Kedah	5	Khidmat nasihat berkaitan geosains untuk cadangan pembangunan kawasan, permohonan kebenaran merancang serta pelan kerja tanah. Advisory services related to geoscience for proposed development area, planning permission application and earthwork plan.
P.Pinang	11	Khidmat nasihat berkaitan geosains untuk cadangan pembangunan kawasan, permohonan kebenaran merancang serta pelan kerja tanah. Advisory services related to geoscience for proposed development area, planning permission application and earthwork plan.
Johor	1	Masalah cerun sebuah di kawasan kilang di Yong Peng. Slope issue at the factory in Yong Peng.
Pahang	13	Khidmat nasihat berkaitan cadangan pembangunan kawasan, perancangan kerja tanah, pembukaan tanah, semakan kecerunan serta aspek kesesuaian pembinaan kawasan cadangan pembangunan. Advisory services related to development proposals, land work planning, land clearing, slope study.
Jumlah / Total:	59	

Geopark Lembah Kinta

Aktiviti Lombong dan Kuari
Mine and Quarry Activities

Aktiviti Lombong dan Kuari

Kawalseliaan & Penguatkuasaan

Untuk mengekalkan dan meneruskan sumbangan sektor mineral terhadap pembangunan sosio-ekonomi negara, elemen kawalseliaan dan peguatkuasaan perlu dilaksanakan oleh jabatan. Objektif kawalseliaan dan penguatkuasaan adalah untuk menentukan aktiviti perlombongan mineral dan aktiviti berkaitan dijalankan secara selamat, efisien dan memenuhi standard alam sekitar dan amalan kejuruteraan terbaik. Jabatan terus melaksanakan tugasnya dalam bidang penguatkuasaan, pengeluaran lesen dan permit, serta memantau operasi perlombongan dan pengkuarian. Di penghujung Disember 2017, terdapat sebanyak 144 lombong, 399 kuari dan 36 peniaga bijih termasuk loji pemprosesan mineral yang masih beroperasi.

Pemeriksaan Teknikal Operasi Lombong dan Kuari

Pemeriksaan teknikal operasi perlombongan, pengkuarian dan pemprosesan mineral yang dilaksanakan adalah bertujuan untuk memastikan pematuhan syarat-syarat lesen atau kelulusan yang berkaitan dengan keselamatan dan perlindungan alam sekitar. Jabatan ini juga menjalankan pemeriksaan dan penyiasatan lapangan yang merupakan sebahagian daripada pra-syarat untuk penyediaan laporan yang berkaitan dengan permohonan tenemen mineral, kelulusan kerja peletupan, aduan dan kejadian kemalangan di lombong atau kuari.

Pada tahun 2017, sebanyak 2952 pemeriksaan teknikal telah dijalankan. Jumlah pemeriksaan pada tahun yang ditinjau adalah 1098 ke atas operasi perlombongan, 1597 ke atas operasi pengkuarian, 12 ke atas kawasan carigali, 151 ke atas kilang amang (hasil samping perlombongan bijih timah) dan loji pemprosesan mineral serta 94 ke atas pemegang lesen bijih mineral dan emas mentah.

Tambahan kepada pengawalseliaan ke atas kerja peletupan yang dijalankan di lombong dan kuari, pihak JMG juga dirujuk oleh Pihak Berkuasa Tempatan untuk membantu menilai serta memantau kerja-kerja peletupan yang dijalankan dalam kawasan pembangunan seperti projek pembangunan perumahan, pembinaan lebuhraya, pembinaan stesen dan syaf bagi MRT. Sebanyak 163 kerja perletupan untuk projek pembangunan telah diperiksa dan dinilai sepanjang tahun ini.

Mine and Quarry Activities

Monitoring & Enforcement

To remain and continues the contribution of mineral sector to the socio-economic development of the nation, element of monitoring and enforcement needs to be carried out by department. The objective of monitoring and enforcement was to ensure the mining, quarrying and related activities were carried out safely, efficiently and conforming best engineering practices and also the compliance of environmental standards. The department continued to discharge its duties in the areas of enforcement, issuance of licences and permits, and also the monitoring of mining and quarrying operations. At the end of December 2017, there were 144 mines, 399 quarries and 36 ore dealers included mineral processing plant still were operating.

Technical Inspection of Mine and Quarry Operations

Technical inspections of mining, quarrying and mineral processing operations were implemented in order to ensure the compliance with the conditions stipulated in the licences or approvals with regard to safety and the protection of the environment. The department also carried out field inspections and investigations, a prerequisite for the preparation of reports pertaining to applications for mineral tenements, blasting work approvals, complaints and accidents in mine or quarry.

In 2017, there were 2952 technical inspection were carried out. A total number of inspection during the year under review were 1098 on mining operations, 1597 on quarrying operations, 12 on exploration areas, 151 on amang factory (a tin mining by-product) and mineral processing plant operations and also 94 on mineral ores and raw gold licence holders.

In addition to the supervision of blasting works carried out in mine and quarry, the state JMG offices were also referred to by the Local Authorities for assistance in the evaluation and monitoring of blasting activities in areas undergoing development such as housing development, highway construction, station and shaft construction under MRT. A total of 163 blasting works for development projects were assessed and evaluated during the year.

Penerangan oleh wakil daripada pihak pemegang tenement mineral mengenai cadangan operasi perlombongan emas kepada pegawai-pegawai kerajaan.
A representative from the mineral tenement holder explained on the proposed gold mining operation to the government officers.

Kaedah '*Control Blasting*' digunakan dengan menutupi kawasan lubang letupan dengan jaring besi di Bukit Sekilau, Kuantan, Pahang.
Controlled blasting method is used by covering the blasting area with wire steel mesh at Bukit Sekilau, Kuantan, Pahang.

Pemantauan dan Kawalseliaan Aktiviti Perlombongan dan Pengkuarian

Matlamat utama pemantauan dan kawalselia yang dijalankan di lombong dan kuari adalah untuk memastikan aktiviti perlombongan dan pengkuarian dijalankan secara teratur, sistematik, mengikut amalan kejuruteraan terbaik dan mematuhi peruntukan perundangan dan peraturan. Aspek keselamatan operasi perlombongan adalah tertakluk di bawah Akta Pembangunan Mineral 1994 (APM 1994) dan Enakmen atau Ordinan Perlombongan Negeri manakala bagi operasi kuari pula adalah tertakluk kepada Kaedah-kaedah Kuari Negeri.

Selain itu, terdapat lima peraturan di bawah APM 1994 yang telah digubal dan dikuatkuasakan, iaitu

- Peraturan-peraturan Pembangunan Mineral (Skim Pengendalian Melombong, Pelan dan Buku Rekod) 2007
- Peraturan-peraturan Pembangunan Mineral (Peletupan) 2013
- Peraturan-peraturan Pembangunan Mineral (Keselamatan Semasa Penjelajahan dan Perlombongan Permukaan) 2015
- Peraturan-peraturan Pembangunan Mineral (Pelesenan) 2016
- Peraturan-peraturan Pembangunan Mineral (Effluen) 2016

Monitoring and Supervision of Mining and Quarrying Activities

The main goal of monitoring and supervising in mine and quarry was to ensure the mining and quarrying activity was carried out in an orderly, systematically, in accordance with the best engineering practices and complied with the relevant laws and regulations. The safety aspects of mining operation were governed by the Mineral Development Act 1994 (MDA 1994) and State Mining Enactments or Ordinances while quarry operation regulated by State Quarry Rules.

In addition, there are five regulations under MDA 1994, which have been gazetted and enforced, namely

- Mineral Development (Operational Mining Scheme, Plans and Record Books) Regulations 2007
- Mineral Development (Blasting) Regulations 2013
- Mineral Development (Safety in Exploration and Surface Mining) Regulations 2015
- Mineral Development (Licensing) Regulations 2016
- Mineral Development (Effluent) Regulations 2016

Operasi perlombongan dan pengkuarian pada lazimnya akan memberi impak kepada alam sekitar. Oleh itu, adalah penting operasi tersebut melaksanakan langkah secukupnya untuk menangani kemungkinan pencemaran terhadap air dan udara serta kesan gegaran bumi dan ledakan udara (bunyi) akibat kerja peletupan. Justeru itu bagi memastikan aktiviti perlombongan dan pengkuariaan dijalankan dengan baik, kerja pemantauan berkala telah dilakukan. Sepanjang tahun 2017, sebanyak 315 persampelan efluen dan 333 kerja pemantauan gegaran dan peletupan telah dijalankan.

Pihak jabatan amat mengambil perhatian terhadap aduan pihak awam berkaitan operasi perlombongan dan pengkuarian. Sejumlah 95 aduan telah diterima dan disiasat manakala sebanyak 67 perintah dan arahan telah dikeluarkan kepada pengusaha.

Mine and quarry operations inevitably have an impact on the environment. Therefore, it is important for such operations to implement necessary measures to mitigate potential water and air pollution as well as the impact of ground vibration and air blast (noise) due to blasting. Therefore, to ensure that mine and quarry activities are carried out properly, schedule monitoring was conducted. In 2017, a total of 315 mine effluent samplings, as well as 333 monitoring exercises on vibration and blasts were undertaken by the department throughout the year.

Public complaints on mine and quarry operations are of concern to the department. There were 95 complaints received and investigated by department whilst 67 orders and instructions were issued to errant miners and quarry operators.

Pemantauan kerja peletupan kuari di Kuad Kuari Sdn. Bhd., Penanti, Pulau Pinang
Quarry blasting monitoring at Kuad Kuari Sdn. Bhd., Penanti Pulau Pinang

Pemantauan kelodak Sg. Mahang, Kulim, Kedah susulan aduan dalam akhbar
Suspended solid monitoring at Sg. Mahang Kedah due to complaint in newspaper

Pelesenan

Di bawah Akta Pembangunan Mineral (APM) 1994, pemegang pajakan melombong hendaklah mengemukakan dan mendapatkan kelulusan bagi suatu skim pengendalian melombong daripada Pengarah Galian sebelum sebarang operasi pembangunan dan perlombongan dilaksanakan. Pada tahun 2017, pihak jabatan telah meluluskan sejumlah 183 Skim Pengendalian Melombong di bawah APM 1994 dan 180 Surat Kebenaran Pengkuarian di bawah Kaedah-kaedah Kuari kepada pengusaha kuari di Kedah, Perak, Selangor, Negeri Sembilan Pahang, Terengganu dan Kelantan.

Mineral dan Lesen Pembeli Emas yang dikeluarkan di bawah Peraturan-peraturan Pembangunan Mineral (Pelesenan) 2016 dan Enakmen Pembeli Emas Mentah membenarkan pemegangnya untuk membeli, menjual, menyimpan dan memproses bijih mineral dan emas mentah masing-masingnya. Sebanyak 134 Lesen Mineral / Lesen Memproses

Licensing

Under the Mineral Development Act (MDA) 1994, a mining lease holder needs to submit and obtain approval from the Director of Mines for an operational mining scheme before any development or mining commences. For the year 2017, the department approved a total of 183 Operational Mining Schemes under the MDA 1994 and issued 180 Letters of Authority to Quarry under the state Quarry Rules to quarry operators in Kedah, Perak, Selangor, Negeri Sembilan, Pahang, Terengganu and Kelantan.

The Mineral Ores and Gold Buyers Licences issued under the Mineral Ores Enactment and Gold Buyers Enactment authorise licence holders to buy, sell, store, and treat mineral ores and raw gold respectively. A total of 134 Mineral Licences / Mineral Processing Licences and 2 Raw Gold Buyers Licences were issued in 2017. Apart from that the department also

Mineral dan 2 Lesen Pembeli Emas telah dikeluarkan sepanjang 2017. Selain itu pihak jabatan juga telah mengeluarkan sebanyak 5,370 Lesen Mengangkut Mineral untuk kegunaan pemegang lesen serta 201 Permit Mengangkut Bijih Padat Timah bagi tujuan mengangkut konsentrat timah dari lombong, kedai pembeli bijih atau loji pemprosesan amang ke kilang pelebur timah, Malaysia Smelting Corporation di Pulau Pinang.

issued a total of 5,370 Transport Mineral Licences for licence holders as well as 201 Tin Ore Concentrate Transport Permits for the purpose of transporting tin concentrates from the mines, tin ore dealers or amang processing plants to the tin smelter, Malaysia Smelting Corporation in Pulau Pinang.

Seperti yang diperuntukkan dalam Kaedah-kaedah Kuari, semua operasi yang ditakrifkan sebagai kuari mesti diuruskan oleh seorang Pengurus Kuari. Mereka yang dilantik sebagai Pengurus Kuari mesti menunjukkan kecekapan beliau dengan melulusi ujian Pengurus Kuari yang dijalankan oleh Jabatan. Pada tahun 2017, sebanyak 10 ujian Pengurus Kuari telah dilaksanakan oleh Jabatan.

As stipulated in the Quarry Rules, all operations defined as quarries must be managed by a Quarry Manager. The person appointed as a Quarry Manager must demonstrate his competency by passing the department's Quarry Manager Test. In 2017, a total of 10 Quarry Manager Tests were conducted by the department.

Adalah menjadi objektif jabatan untuk memastikan semua kerja peletupan di lombong, kuari dan juga projek pembangunan di bawah kawal seliaan jabatan dijalankan dengan selamat. Justeru, jabatan telah menjalankan Peperiksaan Pembedil Amali kepada calon yang telah lulus Peperiksaan Pembedil Teori. Hanya calon yang lulus kedua-dua peperiksaan akan dikeluarkan Lesen Pembedil sebagai pembedil berkelayakan dan dibenarkan menjalankan kerja peletupan. Pada tahun 2017, pihak Jabatan telah menjalankan sebanyak 13 Peperiksaan Pembedil Amali, mengeluarkan sejumlah 62 Lesen Pembedil baru dan juga telah memperbaharui 540 Lesen kepada pemohon yang layak. Sehingga akhir tahun 2017, terdapat sejumlah 667 pemegang Lesen Pembedil di Malaysia.

It is the objective of the department to ensure that all blasting works in mines, quarries, and other development projects under the supervision of the department are carried out in a safe manner. Thus, the department conducted Shotfirer Practical Tests for candidates who had passed the Shotfirer Theory Examination. Only candidates who had passed both tests were issued Shotfirer Licence as qualified shotfirers and allowed to carry out blasting work. In 2017, the department conducted 13 Shotfirer Practical Examination and issued a total of 62 new Shotfirer Licence. The department also renewed 540 Licence to qualified applicants. As of the end of 2017, there were a total of 667 Shotfirer Licence holders in Malaysia.

Sebahagian mineral yang dihasilkan di negara ini dieksport ke luar negara. Bagi tujuan mengeksport bahan mineral dan batuan, pengeksport memerlukan permit eksport yang dikeluarkan oleh NRE. Satu laporan penilaian teknikal yang disediakan oleh JMG perlu disertakan untuk setiap permohonan. Pada tahun 2017, sebanyak 1,084 dan 1,606 laporan penilaian teknikal telah disediakan bagi eksport mineral dan bahan batuan masing-masing

Some of the minerals produced in the country are exported. For the purpose of exporting minerals and rock material, an exporter needs to have an export permit issued by the NRE. A technical assessment report prepared by JMG has to be attached to each application. In 2017, a total of 1,084 and 1,606 technical assessment reports were prepared for the export of minerals and rock material respectively.

Sesi temuduga permohonan baharu Lesen Mendulang Daerah Hulu Perak.
The interview session on new application of Panning License for the District of Hulu Perak.

Sesi Temuduga Calon-calon Ujian Amali Pembedil oleh JMG dan PDRM.
Interview session for shotfirer practical test candidate by JMG and PDRM.

05.05.2017
Taklimat operasi lombong kuari JMG Sarawak kepada Ketua Menteri Sarawak.
Briefing of JMG Sarawak mine and quarry operations to Sarawak Chief Minister.

Khidmat Nasihat dan Kepakaran

Selain daripada menjalankan penguatkuasaan undang-undang dan pemantauan operasi perlombongan / pengkuarian, jabatan juga berperanan dalam memberikan khidmat nasihat dan kepakaran kepada Pihak Berkuasa Negeri, industri dan juga orang awam. Sebagai sebuah jabatan teknikal, Pihak Berkuasa Negeri kerap merujuk permohonan-permohonan berkaitan tanah lombong, tapak kuari dan lain-lain bagi mendapatkan pandangan dan perakuan teknikal sebelum sesuatu keputusan dibuat.

Pada tahun 2017, jabatan telah menyediakan sebanyak 357 laporan Perakuan Permohonan Carigali / Pajakan lombong. Manakala bagi permohonan tapak kuari, sebanyak 22 laporan teknikal telah disediakan kepada pihak berkuasa negeri.

Jabatan juga terlibat dengan 79 ulasan Laporan EIA dan 257 laporan teknikal lain yang berkaitan dengan aktiviti perlombongan dan pengkuarian. Selain itu, sebanyak 168 Laporan Pembebasan Mineral telah disediakan dalam tahun 2017. Di samping itu pihak jabatan juga menerima sebanyak 1,617 pertanyaan berkaitan aktiviti perlombongan dan pengkuarian.

Advisory and Expertise Services

Apart from the enforcement and monitoring of the mining/ quarrying operations, the department's duties include the rendering of advisory technical services to the State Authorities, industry, and also to the public. Being a technical department, the State Authorities frequently refer to this department for comments and assessment on applications for mining land, quarries and other legal aspects before any decision were taken.

In 2017, the department prepared a total of 357 reports on applications for prospecting licence / mining rights. With regard to applications for quarry, 22 technical reports were prepared and sent to various State Authorities.

The department also was involved in 79 EIA Report evaluations and 257 other technical reports in relation to mining and quarrying. In addition, there was 168 Mineral Clearance Reports were prepared in 2017. Apart from that the department also received total of 1,617 enquiries on mining and quarrying activities.

Shot-Firer Refresher Course di Forest City, Nusajaya, Johor.
Shot-Firer Refresher Course Participants of Forest City, Nusajaya, Johor.

Aktiviti-aktiviti lain

Pihak jabatan juga menjalankan dialog, seminar dan pameran bagi meningkatkan kesedaran pihak awam terhadap industri mineral serta juga sebagai wadah untuk menyelesaikan masalah yang dihadapi penduduk berkaitan dengan aktiviti perlombongan dan pengkuarian. Sebanyak 32 seminar / dialog / pameran telah dibuat pada 2017.

Other Activities

The department also conducted dialogues, seminars and exhibitions so as to increase the public awareness on the mineral industry as well as, to solve issues and problems faced by the public pertaining to mining and quarrying activities. There were 32 seminars / dialogues / exhibitions was conducted in 2017.

Senarai Aktiviti Pembangunan Lombong & Kuari Dalam Tahun 2017
List of Mine & Quarry Development Activities in 2017

	Sarawak	Sabah	Perlis	Kedah	Pulau Pinang	Perak	Selangor	Negeri Sembilan	Melaka	Johor	Pahang	Terengganu	Kelantan	JUMLAH
Pemeriksaan Teknikal Operasi Lombong dan Kuari / Technical Inspection of Mine & Quarry Operations														
Pemeriksaan teknikal operasi lombong Mining operation technical inspection	25	16	0	38	0	211	28	9	0	106	316	140	209	1098
Pemeriksaan teknikal operasi kuari Quarrying operation technical inspection	17	96	37	90	105	440	212	111	9	64	221	62	133	1597
Pemeriksaan teknikal operasi kilang amang /loji pemprosesan mineral Amang plant / mineral processing plant operations technical inspection	5	0	4	2	6	103	15	0	0	16	0	0	0	151
Pemeriksaan teknikal tapak peletupan (selain kuari) Technical inspection of blasting sites (other than quarries)	0	21	0	7	70	36	0	25	0	2	2	0	0	163
Pemeriksaan teknikal kawasan carigali Technical inspection of exploration areas	1	1	0	0	0	0	1	0	0	2	0	0	7	12
Pemeriksaan buku urusniaga mineral (termasuk kedai bijih / kedai emas) Account books inspection on mineral dealings (including tin ore dealer / gold dealer)	0	0	0	0	0	65	15	0	0	10	4	0	0	94
Sub-Jumlah **Sub-Total**														**3115**
Pemantauan dan Kawalselia Aktiviti Perlombongan dan Pengkuarian / Monitoring of Mining & Quarrying Activities														
Persampelan efluen lombong Mine effluent sampling	1	5	7	32	0	254	0	0	0	0	4	2	10	315
Siasatan aduan Complaint investigation	1	9	0	6	14	22	7	2	0	14	11	3	6	95

	Sarawak	Sabah	Perlis	Kedah	Pulau Pinang	Perak	Selangor	Negeri Sembilan	Melaka	Johor	Pahang	Terengganu	Kelantan	JUMLAH
Perintah dan arahan Orders and instructions	10	7	1	0	4	0	13	0	0	16	10	0	6	67
Kompaun Compounds	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laporan kemalangan lombong dan kuari Mining and quarrying accident reports	0	0	0	0	0	6	2	0	0	0	0	0	3	11
Kerja ukur tanah sempadan dan cerun Survey works on land boundary and slope	0	0	0	0	0	0	0	0	0	0	15	2	3	20
Kerja ukur gegaran / habuk / kebingitan dan pemantauan peletupan Vibration and blast monitoring	6	19	3	2	76	43	100	47	4	0	10	20	3	333
Sub-Jumlah **Sub-Total**														**841**

Pelesenan / Licensing														
Skim Pengendalian Melombong Operational Mining Scheme	12	1	0	5	0	31	2	1	0	24	44	31	32	183
Surat Kebenaran Pengkuarian Letter of Authority to Quarry	0	0	0	0	0	100	25	19	0	0	11	15	10	180
Lesen Bawah Tanah Underground Licence	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lesen Air Tahunan / Negeri / Permit Air Annual / State Water Licence / Water Permit	0	0	0	0	0	0	0	0	0	0	4	0	0	4
Lesen Membeli Emas Mentah Gold Buyers Licence	0	0	0	0	0	0	0	0	0	0	2	0	0	2
Lesen Mineral/Lesen Memproses Mineral Mineral Licence / Mineral Processing Licence	0	0	1	4	4	70	15	0	0	14	0	12	14	134
Lesen Mengangkut Mineral Transport Mineral Licence	0	0	0	150	0	4430	100	0	0	250	0	0	440	5370

	Sarawak	Sabah	Perlis	Kedah	Pulau Pinang	Perak	Selangor	Negeri Sembilan	Melaka	Johor	Pahang	Terengganu	Kelantan	JUMLAH
Permit Mengangkut Bijih Padat Timah Tin Ore Concentrate Transport Permit	0	0	0	0	0	183	0	0	0	11	7	0	0	201
Laporan penilaian teknikal eksport mineral Technical assessment report for mineral export	18	0	0	0	37	661	109	43	0	120	28	24	44	1084
Laporan teknikal perakuan eksport bahan batuan Technical assessment report for rock material export	0	77	0	136	2	1006	76	0	0	278	6	8	17	1606
Permit Letupan Blasting Permit	0	0	0	6	52	12	33	16	5	5	13	0	0	142
Laporan perakuan magazin letupan Report for explosives magazine approval	0	2	0	0	0	0	3	1	0	3	0	0	0	9
Pengeluaran / pembaharuan Sijil Pembedil Issuance / renewal of Shot Firer Certificate	0	52	10	35	50	152	110	16	0	41	34	28	12	540
Lencongan sungai River diversion	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ujian pengurus lombong/kuari Test for mine / quarry managers	0	0	0	0	0	0	7	3	0	0	0	0	0	10
Ujian amali pembedil Shot firer practical test	2	0	0	6	0	0	0	4	0	0	0	1	0	13
Sub-Jumlah **Sub-Total**														**9478**

Khidmat Nasihat dan Kepakaran / Advisory and Professional Services														
Ulasan laporan EIA EIA report review	3	36	0	4	0	0	30	0	0	5	0	0	1	79
Laporan permohonan lesen carigali / pajakan Prospecting and mining lease application report	0	2	3	6	0	19	1	0	0	21	178	55	72	357

	Sarawak	Sabah	Perlis	Kedah	Pulau Pinang	Perak	Selangor	Negeri Sembilan	Melaka	Johor	Pahang	Terengganu	Kelantan	JUMLAH
Laporan permohonan tanah kuari (Pihak Berkuasa Negeri) Quarry land application report (State Authority)	4	0	0	0	0	3	0	1	0	3	2	9	0	22
Laporan pembebasan mineral Mineral clearance report	3	0	0	18	5	52	0	0	0	5	41	41	3	168
Lain-lain laporan teknikal untuk agensi lain Miscellaneous technical report for other agencies	0	95	0	5	5	0	60	5	2	53	0	0	32	257
Pertanyaan mengenai maklumat lombong / kuari Enquiries on mining / quarrying information	97	293	10	18	21	0	20	14	0	195	917	32	0	1617
Sub-Jumlah **Sub-Total**														**14298**
Lain-lain / Others														
Seminar / Dialog / Pameran Seminar / Dialogue / Exhibition	4	7	0	0	2	5	2	0	0	8	3	0	1	32
Jumlah Keseluruhan Bilangan Aktiviti **Overall Total Number Activities**														**27764**

Tanjung Kempit, Endau, Johor

Penyelidikan & Pembangunan
Research & Development

Penyelidikan & Pembangunan
Research & Development

Penyelidikan & Pembangunan

Pusat Penyelidikan Mineral (PPM) merupakan bahagian penyelidikan dan pembangunan (R&D) kepada Jabatan Mineral dan Geosains (JMG) Malaysia.

Objektif PPM adalah:

- Untuk menggalak dan mempelbagai penggunaan sumber mineral tempatan bagi menyumbang kepada pembangunan sektor perindustrian negara melalui R&D
- Untuk menggalak pengusahahasilan sumber mineral secara mapan melalui R&D

Antara fungsi PPM ialah:

- Menjalankan R&D berasaskan mineral tempatan supaya dapat menghasilkan bahan mula dan bahan tambah nilai untuk digunakan oleh industri
- Membangun teknologi pemprosesan mineral dan kitar semula yang bersesuaian
- Menjalankan penyelidikan bersama Institusi Pengajian Tinggi, agensi R&D yang lain serta pihak industri dalam bidang mineral
- Mengkomersial hasil R&D yang signifikan melalui pemindahan teknologi kepada pihak yang berminat
- Berperanan sebagai penasihat dan pusat rujukan dalam perkara-perkara yang berkaitan dengan penyelidikan mineral tempatan
- Menjalankan R&D berkaitan pengusahahasilan mineral, impak alam sekitar dan pemulihan serta menyediakan perkhidmatan sokongan kepada jabatan dalam menangani masalah yang berkaitan

Research & Development

The Mineral Research Centre (PPM) is the research and development (R&D) arm of the Department of Mineral and Geoscience Malaysia (JMG)

The objectives of PPM are:

- To encourage and diversify use of local mineral resources so as to contribute towards the development of the country's industrial sector through R&D
- To encourage the development of mineral resources in a sustainable manner through R&D

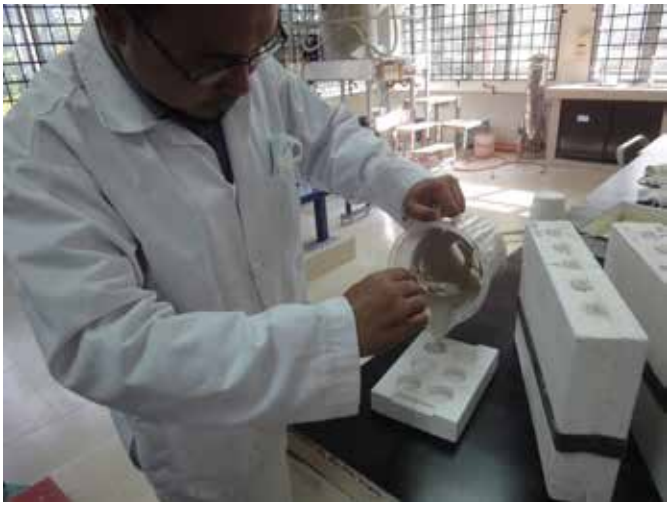
Among its functions are:

- To carry out R&D on local minerals in order to produce starting and value added materials for industrial use
- To develop suitable mineral processing and recycling technologies
- To carry out collaborative research with institutes of higher learning, other R&D agencies and industries in the field of minerals
- To commercialise significant R&D results through technology transfer to interested parties
- To assume advisory role and act as a reference centre in areas related to research in local minerals
- To undertake R&D in mineral extraction, environmental impact and rehabilitation as well as providing support services to the department in overcoming related problems

Teknologi Berasaskan Lempung
Clay-Based Technology

Bil. No.	Aktiviti / Projek R&D R&D Activity / Project	Hasil / Penemuan / Catatan Output / Finding / Remarks
1.	Teknologi Penghasilan Jasad Seramik Teknikal. Production Technology of Technical Ceramic Body.	i. Teknologi penghasilan jasad porselin tahan kejutan haba Dalam kajian R&D terdahulu, produk ujian yang dihasilkan, dari jasad yang telah direkabentuk menggunakan bahan prabakar, mempunyai pekali pengembangan terma (CTE) yang rendah dan kekuatan patah (MOR) yang tinggi tetapi agak sukar untuk dikeluarkan dari acuannya. Tumpuan kajian R&D adalah untuk menghasilkan produk ujian yang berciri sama serta lebih mudah dikeluarkan dari acuannya dengan menggunakan saiz-saiz bahan prabakar yang lebih halus dalam formulasi jasad yang direkabentuk berbanding sebelumnya. Komposisi jasad dan kandungan bahan-bahan komponennya tidak berubah. Hasil-hasil kajian R&D ini telah berjaya menghasilkan produk ujian yang lebih mudah dikeluarkan dari acuannya tetapi mempunyai MOR yang lebih rendah. Usaha kajian R&D selanjutnya adalah untuk menggunakan komponen lempung yang bersifat lebih plastik dengan peratus kandungan lebih tinggi serta mengekalkan saiz-saiz bahan prabakar yang digunakan seperti terdahulu. i. Anti-thermal shock porcelain body production technology In the prior R&D study, the developed test product, that was designed using a prefired material, exhibited low coefficient of thermal expansion (CTE) and high rupture strength (MOR) but difficult to remove from its slip-casted mould due to small shrinkage. The focus of this R&D study was to obtain test product with comparable characteristics using a finer prefired material as to improve the shrinkage for easier mould removal. The body composition and component materials used remain the same. A test product easier to remove from the mould was obtained but showed lower MOR. Another R&D study will be carried out to replace the clay component with a clay of higher plasticity and to increase its percentage amount while retaining the previous size of the prefired material used

Bil. No.	Aktiviti / Projek R&D R&D Activity / Project	Hasil / Penemuan / Catatan Output / Finding / Remarks
		ii. Teknologi penghasilan jasad porselin lutcahaya Jasad porselin bersifat lutcahaya adalah disebabkan wujudnya fasa kristal anortit ($CaO.Al_2O_3.2SiO_2$) di samping fasa-fasa kristal lain seperti kuarza (SiO_2), mulit ($3Al_2O_3.2SiO_2$) serta fasa kekaca dalam jasad selepas bakar. Nilai indeks biasan anortit (1.50 - 1.58) yang hampir sama dengan indeks biasan kekaca (1.48 – 1.53) akan meningkatkan sifat lutcahaya dalam jasad porselin. Dalam kajian R&D ini, lima (5) formulasi jasad telah direkabentuk. Kesemua formulasi jasad tersebut menggunakan komposisi tipikal kumpulan produk tembikar putih jenis porselin lutcahaya (translucent porcelain) (lempung: 30%, pasir silika: 30%, feldspar: 40%). Hasil kajian R&D ini mendapati dua formulasi jasad yang direkabentuk berpotensi untuk dikomersilkan yang dibakar pada suhu rendah (1150°C) dengan kualiti jenis porselin keras (hard porcelain). Nilai lutcahaya didapati menyamai nilai lutcahaya jenis porselin anortit (anortite porcelain) komersil tetapi tidak mencapai sasaran kekuatan patahnya (MOR) iaitu dalam lingkungan 100 MPa. ii. Translucent porcelain body production technology The translucent property observed in a porcelain body is largely attributed to the presence of anorthite crystal alongside other crystalline phases such as quartz and mullite as well as the formation of glassy matrix upon firing. The refractive index of anorthite (1.50 - 1.58) is close to the refractive index the glassy matrix (1.48 - 1.53) and hence the improved translucency. All of these body formulations use the typical composition of white porcelain products (clay: 30%, silica sand: 30%, feldspar: 40%). It was observed that two (2) of the bodies demonstrated high translucencies (fired at 1150°C) which are comparable with the commercial anortite porcelain but with lower MOR value.



Kaedah tuangan slip digunakan untuk menghasilkan sampel bentuk bebutang
Casting method slip method is used for formation of button sample

Sampel ujkaji dalam bentuk bebutang dan bebatang
Button and rectangular shape samples

Bahan mula bagi kajian bahan prabakar
Starting material prepared for prefired study

Bahan prabakar selepas proses pencampuran dan pengisaran basah
Prefired material after mixing and wet grinding process

Bahan prabakar selepas melalui proses pembakaran
Prefired material after the firing proses

Teknologi Berasaskan Batuan
Rock-Based Technology

Bil. No.	Aktiviti/Projek R&D R&D Activity/Project	Hasil/Penemuan/Catatan Output/Finding/Remarks
1.	Membangunkan teknik penghasilan kalsium karbonat sintetik berongga bagi kegunaan teknologi tinggi. Development of production technique in producing hollow synthetic calcium carbonate for high technology application.	i. Penghasilan PCC berongga menggunakan teknik semburan Penghasilan PCC menggunakan teknik semburan dapat menghasilkan PCC berongga dengan parameter yang sesuai iaitu kadar aliran gas CO_2 kurang dari 1 L/min dan kadar adukan kurang daripada 1000 rpm. Penggunaan bahan aditif selain daripada gula seperti bahan aditif semulajadi (air kelapa) juga membantu dalam penghasilan PCC berongga. Namun begitu, PCC yang terhasil tidak berongga sepenuhnya. ii. Penghasilan PCC berongga menggunakan kaedah ais kisar ionik bersukrosa Teknik lain yang digunakan dalam penghasilan PCC berongga adalah proses pengkarbonatan dijalankan pada suhu 40°C dan 50°C. Perbandingan dibuat dengan proses pengkarbonatan yang dilakukan pada suhu bilik. Parameter lain yang gunakan ialah kadar aliran gas CO_2 dan kadar adukan. Manakala bahan mentah yang digunakan ialah kapur tohor, kapur mati dan kapur karbida. Didapati PCC yang terhasil mempunyai struktur berlubang apabila proses pengkarbonatan dilakukan pada suhu 40°C dan 50°C. i. Production of hollow PCC using spray technique Hollow PCC is produced by using spray techniques with appropriate parameters, namely, CO_2 gas flow rate and stirring rate less than 1 L/min and 1000 rpm, respectively. Natural additive such as coconut water is used as an additive (besides sugar) to produce hollow PCC. Nevertheless, the PCC produced is not completely hollow. ii. Production of hollow PCC using ice blended ionic sucrose method A carbonation process is the other technique used to produce hollow PCC which was carried out at temperature of 40°C and 50°C. A comparison was made to the carbonation process at room temperature. The raw material used for this technique were quick lime, hydrated lime and carbide lime The parameters involved were CO_2 gas flowrate and stirring rate. It was observed that the PCC formed had a perforated structure.
2.	Perkhidmatan ujian batu dimensi Dimension stone testing services	Sejumlah 12 spesimen dari pihak swasta telah diuji. A total of 12 specimens from private sectors were tested.

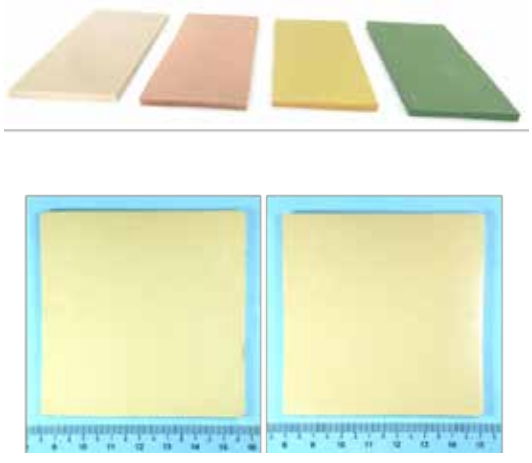
Penghasilan PCC menggunakan alat sistem semburan
Production of PCC by using spray system equipment

Penghasilan PCC pada suhu tinggi
Production of PCC at high temperature

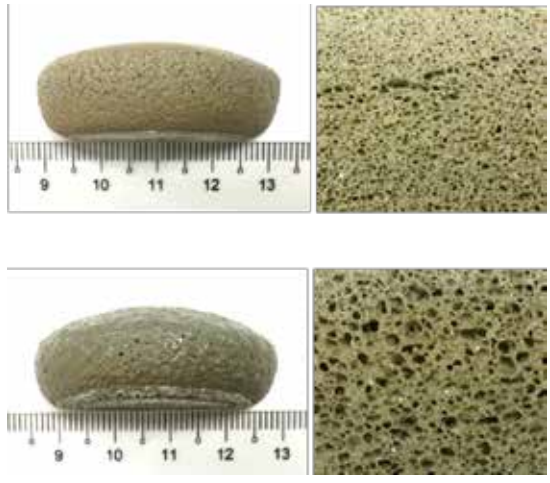
Teknologi Berasaskan Silika
Silica -Based Technology

Bil. No.	Aktiviti/Projek R&D R&D Activity/Project	Hasil/Penemuan/Catatan Output/Finding/Remarks
1.	Pembangunan jubin kaca-seramik skala industri	R&D penghasilan jubin kaca-seramik skala industri dijalankan dengan kerjasama Syarikat Terracotta Sdn. Bhd., Klang, Selangor. Komposisi jubin adalah 70% kaca soda kapur kitar semula (-75µm), 25% lempung bentonit dan 5% pigmen berwarna di mana campuran ini dilakukan di makmal PPM dan proses pemampatan sampel bersaiz 8.5cm x 8.5cm x 8-9mm dijalankan di syarikat tersebut. Setelah itu, proses pensinteran pada suhu 800-900°C terhadap sampel mentah jubin kaca-seramik dilaksanakan di makmal PPM. Produk yang dihasilkan memenuhi spesifikasi jubin seramik konvensional dan jubin kaca-seramik Neoparies keluaran Nippon Electric Glass Ltd., Jepun.
	Development of glass-ceramic tile at industrial scale	R&D production of industrial-scale glass-ceramic tiles was conducted in collaboration with Terracotta Sdn. Bhd., Klang, Selangor. The mixing process of the tiles which compose 70% soda limes glass (-5 µm), 25% bentonite clay and 5% colour pigment was prepared at PPM's laboratory. After that, the samples were compressed to size 8.5cm x 8.5cm x 8-9mm at the Terracota premises. Then the samples were brought back to PPM's laboratory for sintering process at 800-900°C. The result products meet the specifications of conventional ceramic tile and Neoparies glass-ceramic tile developed by Nippon Electric Glass Ltd., Japan.
2.	Penghasilan kaca seramik berliang daripada kaca soda kapur, bebenang bulu kaca dan abu terbang	Kajian awal adalah untuk mengenalpasti kesesuaian penggunaan kaca kitar semula soda kapur (SLG), bebenang bulu kaca (GW) dan abu terbang (FA) dalam penghasilan jubin kaca-seramik berliang (PGC). Komposisi PGC adalah 64.5% SLG, 20% GW dan 15% FA disamping itu sebanyak 0.5% silikon karbida ditambah sebagai agen pembuihan. Suhu pensinteran 850-950°C, kadar pemanasan 5-10°C/min dan masa rendaman 10-30 minit digunakan dalam proses pensinteran. Umumnya, produk kaca-seramik berliang boleh digunakan untuk penebat haba dan bunyi, agregat ringan dan penapis air bergantung kepada ciri-ciri fizikal dan mekanikalnya.
	Development of porous glass-ceramic from soda lime glass, glasswool and fly ash	The initial study was to identify the suitability use of recycled soda lime glass (SLG), glasswool (GW) and fly ash (FA) in the production of porous glass-ceramic tiles (PGC). The composition of PGC was 64.5% SLG, 20% GW and 15% FA and 0.5% silicon carbide was added as a foaming agent. Sintering temperature at 850-950°C, heating rate at 5-10°C/min and 10-30 minute of soaking time were used in the sintering process. Generally, porous glass-ceramic products can be used for heat and sound insulation, lightweight aggregates and water filters depending on physical and mechanical properties.

Bil. No.	Aktiviti/Projek R&D R&D Activity/Project	Hasil/Penemuan/Catatan Output/Finding/Remarks
3.	Harta Intelek bagi kaca-seramik bersumber kaca CRT, abu terbang dan lempung bentonit	Paten bagi produk jubin kaca-seramik yang dihasilkan menggunakan kaca *cathode ray tube (CRT)*, abu terbang dan lempung bentonit berjaya telah berjaya didaftarkan di bawah harta intelek. Tajuk paten ialah "Eco-friendly Glass Ceramic Tile from Silicate Waste" dengan nombor permohonan ialah PI 2017702278. Tuntutan dalam paten tersebut adalah 72-82% CRT, 10-20% abu terbang kategori F dan 7-10% lempung bentonit. Tuntutan lain adalah suhu rawatan haba pada 750-900°C dan saiz kaca CRT di bawah 150 µm. Produk jubin kaca-seramik yang dihasilkan setanding dengan jubin kaca-seramik Neoparies dan jubin granit semulajadi yang berada di pasaran.
	Intellectual property of glass-ceramic pattern based on CRT glass, fly ash and bentonite clay	Patent for glass-ceramic tile produced using cathode ray tube (CRT) glass, fly ash and bentonite clay had successfully been registered under intellectual property. The title of the patent is "Eco-friendly Glass Ceramic Tile from Silicate Waste" with application number of PI 2017702278. Claims in the patent were 72-82% CRT, 10-20% fly ash of category F and 7-10% bentonite clay. Other claims were heat treatment temperature at 750-900°C and size of CRT glass below 150 µm. Glass-ceramic tile products are comparable to Neoparies glass-ceramic tiles and natural granite tiles in the market.



Sampel jubin kaca-seramik skala industri
Industrial scale glass-ceramic tile samples



Sampel kaca-seramik berliang
Porous glass-ceramic samples

Teknologi Bahan Termaju
Advanced Material Technology

Bil. No.	Aktiviti/Projek R&D R&D Activity/Project	Hasil/Penemuan/Catatan Output/Finding/Remarks
1.	Penghasilan termonatrit bersaiz nano daripada sisa kuari granit	Melalui aktiviti R&D ini, satu mineral baru termonatrit telah dihasilkan daripada tindakbalas sisa kuari granit dengan larutan alkali natrium hidroksida (NaOH). Sisa kuari granit yang diambil dari Keramat Pulai, Perak digunakan sebagai bahan mentah untuk penghasilan granit bersaiz nano melalui teknik pemendakan basah dan diikuti pengadukan menggunakan ultrasonik. Hasil kajian telah mendapati termonatrit bersaiz nano telah dapat dihasilkan daripada tindakbalas sisa kuari granit dengan kepekatan larutan NaOH yang berbeza. Partikel nano yang bersaiz paling kecil iaitu antara julat 20 hingga 40 nm telah wujud dalam larutan NaOH yang berkepekatan 4.0 M. Termonatrit bersaiz nano ini akan digunakan sebagai pengisi bagi menghasilkan nanokomposit marmar sintetik.
	Production of nano-sized thermonatrite from granite quarry waste	Through this R&D activity, a new mineral named thermonatrite had been produced from reaction of granite quarry waste with alkaline solution of sodium hydroxide (NaOH). Granite quarry waste from Keramat Pulai, Perak was used as a raw material to produce nano-sized granite by using wet precipitation method and followed by ultrasonic agitation. The results revealed that nano-sized thermonatrite had been produced from the granite quarry waste at different NaOH concentrations. The smallest size of nano particles in the range of 20 to 40 nm was found in 4.0 M NaOH solution. This nano-sized thermonatrite will be used as a filler in the production of synthetic marble nanocomposite.
2.	Penghasilan Marmar Sintetik Menggunakan Dolomit dan Sisa Industri Pengkuarian Granit/Pasir Silika	Kajian bagi penghasilan marmar sintetik diteruskan bagi mendapatkan proses yang murah dan mudah dilakukan pada suhu ambien. Pelbagai mineral dan sisa industri pengkuarian seperti dolomit, pasir silika, sisa kuari granit dan bahan import komersial iaitu Alumina tri-hidrat (ATH) telah digunakan sebagai pengisi dalam kajian ini. Kesan penggunaan serpihan marmar sintetik yang dihasilkan dari pasir silika dan sisa kuari granit bersaiz +2mm turut dikaji bagi menggantikan pengisi yang lain. Penggunaan gabungan dua jenis pengisi iaitu dolomit dan serpihan marmar sintetik telah menunjukkan sifat fizikal dan mekanikal yang lebih baik berbanding ATH. Penghasilan marmar sintetik di peringkat loji perintis sedang dijalankan di Syarikat Agrostone Sdn. Bhd melalui program kerjasama teknikal yang telah dimeterai bersama PPM-JMG pada Oktober 2017. Kajian ini telah mendapat pingat emas di Invention, Innovation & Design Exposition 2017 (iidex2017).
	Production of Synthetic Marble Using Dolomite and Industrial Quarry Waste of Granite/Silica Sand	The study of production of synthetic marble was continued to acquire a cheap and easy process in an ambient temperature. Various kinds of minerals and industrial quarry waste such as dolomite, silica sand, granite quarry waste and commercial imported material of Alumina tri-hydrate (ATH) had been used as fillers in this study. The effect of using synthetic marble chips that had been produced from silica sand and granite with size +2mm was also evaluated to substitute other fillers. Combination of two types of fillers i.e. dolomite and synthetic marble chips had shown a better physical and mechanical properties compared to ATH. The production of synthetic marble in a pilot plant phase is currently being carried out at Agrostone Sdn Bhd through a technical cooperation programme with PPM-JMG in October 2017. This study had won a gold medal in Invention, Innovation & Design Exposition 2017 (iidex2017).

Bil. No.	Aktiviti/Projek R&D R&D Activity/Project	Hasil/Penemuan/Catatan Output/Finding/Remarks
3.	Harta Intelek bagi produk Ingot Gigi Leusit Intellectual property of Leucite Dental Ingot product	Paten bagi produk ingot gigi leusit yang dihasilkan daripada pasir silika tempatan telah berjaya didaftarkan di bawah harta intelek. Tajuk paten ialah "Leucite Glass Ceramic and Method of Preparing Thereof" dengan nombor permohonan ialah PI 2017704055. Patent for Leucite Dental Ingot produced from local silica sand had successfully been registered under intellectual property. The title of the patent is "Leucite Glass Ceramic and Method of Preparing Thereof" with application number of PI 2017704055.

Marmar sintetik yang dihasilkan di industri
Synthetic marble produced in industry

Sampel asal batuan dolomit yang digunakan untuk penghasilan marmar sintetik
Dolomite rock used for the production of synthetic marble

Sisa kuari granit yang digunakan untuk penghasilan marmar sintetik
Granite quarry waste used for the production of synthetic marble

Teknologi Pemulihan Lombong Dan Kuari
Mine And Quarry Rehabilitation Technology

Bil. No.	Aktiviti/Projek R&D R&D Activity/Project	Hasil/Penemuan/Catatan Output/Finding/Remarks
1.	Membangunkan Teknologi Pitoremediasi untuk pemulihan tanah dan kolam bekas lombong dan kuari	Teknik SPAK yang telah berjaya digunakan untuk kajian tebusguna kolam lombong dengan menggunakan FPFP (Floating Platform For Planting) telah dipanjangkan kepada kajian Pitoremediasi untuk pemulihan air kolam lombong. Kajian ini adalah untuk menguji keupayaan tiga jenis pokok sebagai penyerap logam berat. Juga menguji keupayaan pokok vetiver untuk hidup di platform terapung di kolam lombong yang berasid. Tiga spesis yang digunakan iaitu: i. Misai Kucing *(Orthosiphon Staminus)* ii. Vertiver *(Chrysopogon Zizanioides)* iii. Lamuju *(Plectranthus Amboinicus)* Walau bagaimana pun kajian keatas pokok lamuju dihentikan kerana ia tidak boleh hidup di dalam air yang berasid. Hanya dua jenis pokok iaitu Misai Kucing dan Vertiver boleh menyerap logam berat, secara tidak langsung mengurangkan kadar keasidan di dalam air tercemar. Kajian lanjutan telah dijalankan di peringkat makmal ke atas pokok Vertiver yang berupaya untuk hidup di atas air kolam lombong berasid.
	Phytoremediation study for the rehabilitation of ex-mining ponds	SPAK technique that had been successfully applied in reclamation of ex-mining ponds study by using FPFP (Floating Platform For Planting) was adopted in phytoremediation study to treat mine water. This study examined suitability of three types of plants to be used as heavy metal adsorbents. Suitability of Vertiver plant to be cultivated on a floating platform in acidic mine pond was also investigated. Three types of the plants species are: i. Misai Kucing *(Orthosiphon Staminus)* ii. Vertiver *(Chrysopogon Zizanioides)* iii. Lamuju *(Plectranthus Amboinicus)* However, study on the Lamuju plant was stopped because it could not survived in acidic water. It was found that two types of plants i.e. Misai Kucing and Vertiver were able to adsorb heavy metals and to reduce acidity of the contaminated water. Study on the Vertiver plant was continued on a lab-scale. This plant can survive living on the acidic mine pond.

Pokok Misai Kucing di dalam experimental nuseri
Misai Kucing plant in an experimental nursery

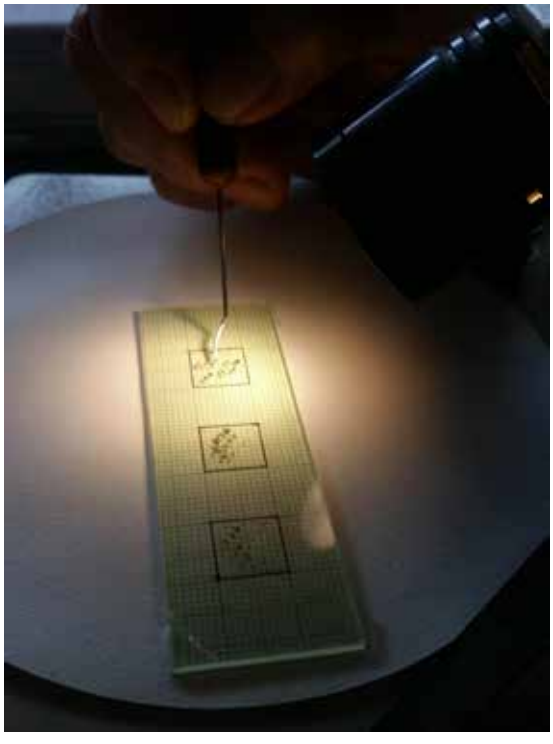
Pokok Vertiver di dalam simulasi air tercemar
Vertiver plant in simulation of contaminated water

Pokok Vertiver di dalam kolam kajian
Vertiver plant in study pond

TEKNOLOGI PEMPROSESAN MINERAL
Mineral Processing Technology

Bil. No.	Aktiviti/Projek R&D R&D Activity/Project	Hasil/Penemuan/Catatan Output/Finding/Remarks
1.	Aktiviti Penyelidikan Ke Atas Bijih Kompleks Tempatan	Aktiviti penyelidikan pada tahun ini tertumpu kepada bijih besi kompleks yang diambil dari lombong bijih besi di Kemaman, Terengganu. Ujian-ujian pemprosesan telah dijalankan dengan menggunakan kaedah pemisahan graviti (spiral), pemisahan bermagnet dan fiziko-kimia (pengapungan buih) telah dapat meningkatkan kandungan Fe > 65% dan sulfur dikurangkan kepada 0.5%. Aktiviti lain adalah menjalankan ujian pencirian dan kebolehkisaran bijih timah kompleks yang di ambil dari Pahang.
	Research Activities on Local Complex Ores	The research activities focused on complex iron ores from iron ore mines in Kemaman, Terengganu. Processing tests were carried out using gravity separation methods (spiral) and physico-chemical properties (froth flotation) increased the Fe content > 65% and sulphur was reduced to 0.5%. Another activity is to carry out the characterization and grindability tests of complex tin from Pahang
2.	Aktiviti Penyelidikan Untuk Proses Penghasilan Produk dan Pengekstrakan REE Dari Sumber Tempatan	Objektif projek ini adalah untuk menghasilkan unsur nadir bumi (rare earth element, REE) daripada amang dengan menggunakan pemprosesan secara fizikal dan pengekstrakan secara kimia. Sampel amang yang diambil dari kilang amang di Perak telah melalui proses pengasingan secara fizikal menggunakan alat meja ayun, alat pemisah bermagnet dan alat pengasingan bervoltan tinggi. Produk mineral yang terhasil dari proses ini adalah monazit dan xenotim yang mengandungi REE. Seterusnya kajian keterlarutan terhadap sampel monazite di dalam larutan asid sulfurik (H_2SO_4) dan asid hidroklorik (HCl) telah dijalankan dengan menggunakan kaedah hidrotermal pada beberapa parameter yang berbeza seperti suhu, nisbah pepejal / cecair dan masa
	Research Activities For Production and Extraction of REE From Local Sources	The objective of this project is to produce a rare earth element (REE) from amang using physical processing and chemical extraction. Amang samples from amang plant in Perak have been through physical separation process using a shaking table, magnetic separator and a high voltage separator. Mineral products resulting from this process are monazite and xenotime which containing REE. Further studies on the solubility of monazite in sulfuric acid solution (H_2SO_4) and hydrochloric acid (HCl) were conducted using hydrothermal methods with different parameters such as temperature, solid/liquid ratio and time.
3.	Perkhidmatan Ujian Pemprosesan Mineral	Sejumlah tiga ujian pemprosesan mineral telah dijalankan untuk pihak swasta / universiti. Sampel-sampel yang diterima adalah pasir silika, bijih besi, bijih timah dan bijih emas.
	Mineral Processing Testing Service	A total of three mineral processing tests were conducted for private sectors and university. Samples received were silica sand, iron ore, tin ore and gold ore.

Ujian pemisahan bermagnet untuk sampel bijih besi
High magnetic separation test for iron ore



Analisis kuantitatif kandungan mineral untuk sampel amang
Quantitative mineralogical analysis of amang sample

Ujian ketelarutan sampel monazit
Dissolution test for monazite sample

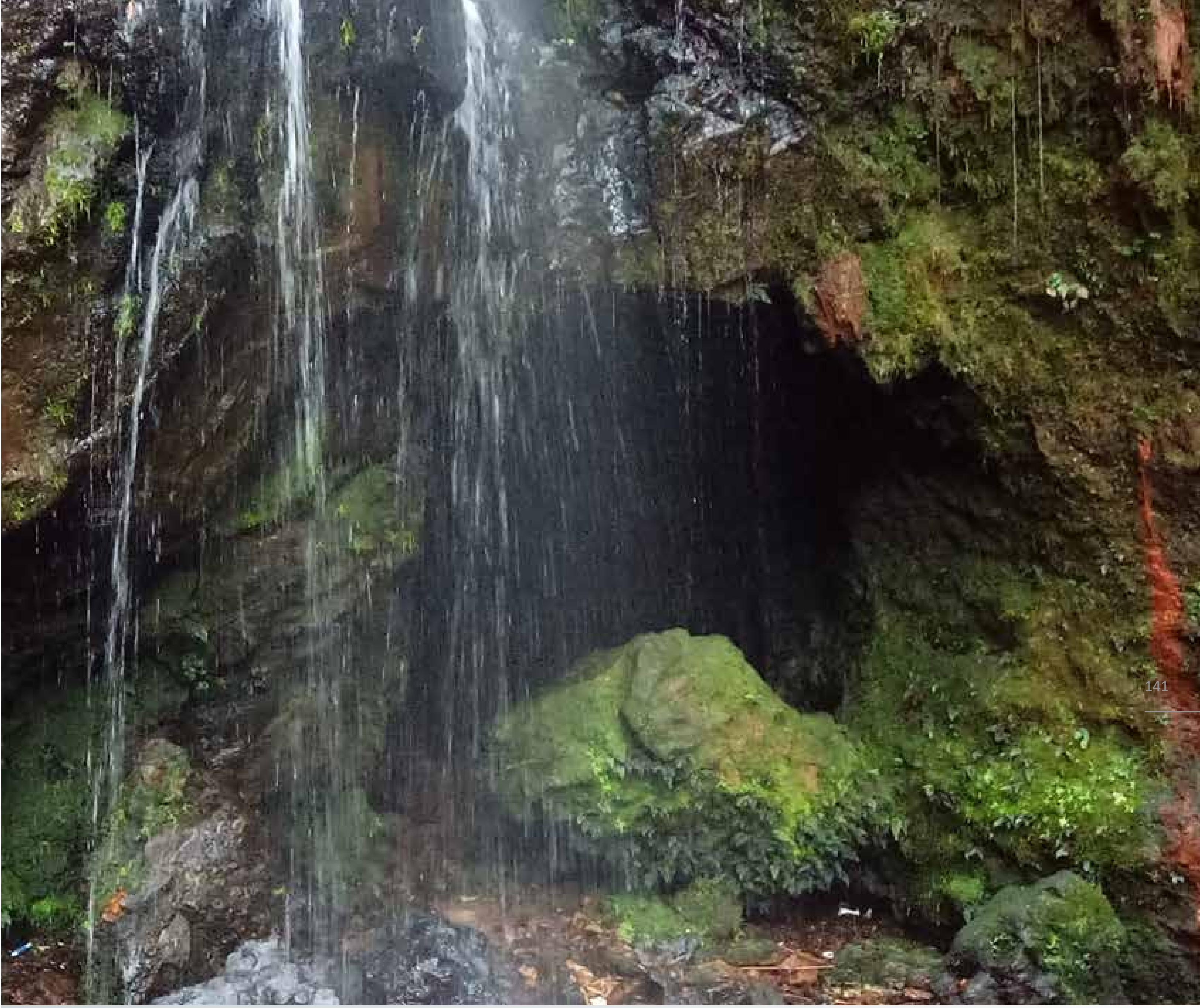
Teknologi Perlombongan dan Pengkuarian
Mining and Quarrying Technology

Bil. / No.	Aktiviti / Projek R&D Activity / R&D Projects	Hasil / Penemuan / Catatan Results / Findings / Remarks
1.	Penyelidikan dan Pembangunan Teknologi hijau industri perlombongan dan pengkuarian Research and Development of Mining and Quarrying Green Technology	Pada tahun ini aktiviti projek ini masih tertumpu kepada kajian lapangan, persampelan sedimen dan persampelan air di kawasan di sekitar kawasan Bukit Besi, Dungun, Terengganu. Pengambilan sampel di 22 lokasi persampelan air dan 12 lokasi persampelan sedimen masih diteruskan. This year the project activity is still focused on field studies, sediment sampling and sampling of water in the area surrounding Bukit Besi, Dungun, Terengganu. Sampling at 22 water sampling locations and 12 sediment sampling locations is still ongoing.
2.	Program Pemantauan Impak Perlombongan Di Kawasan Berkepentingan Awam – Lombong dan Kuari di Negeri Kelantan. Monitoring Program of Mining Impacts at Public Interest Area – Quarry Area in Kelantan	Kajian ini adalah bertujuan untuk menentukan data asas kualiti udara dan efluen dari 30 buah lombong dan 15 buah kuari di Kelantan bagi memenuhi keperluan aktiviti pengauditan di semua kuari di negeri ini. Sejumlah 59 lokasi persampelan efluen lombong dan 30 lokasi persampelan udara telah dipilih. Ujian pencirian secara in-situ dan di makmal telah dilakukan ke atas kesemua sampel. This study aims to determine the basic data of air quality and effluent from 30 mines and 15 quarries in Kelantan to meet the needs of auditing activities in all mines and quarries in the state. A total of 59 locations of mine effluent sampling and 30 air sampling locations were selected were In-situ character is ation and luboratory testing has also been performed on all samples.
3.	Pembangunan Perisian Quarry Environmental Modelling Software Versi 2 (QEMs V2.0) Development of Quarry Environmental Modelling Software Version 2 (QEMs V2.0)	Dalam tahun 2017, Pusat Penyelidikan Mineral (PPM) telah menjalankan kajian untuk membangunkan satu lagi perisian baru iaitu Quarry Environmental Modelling Software Version 2 (QEMs V2.0). Perisian ini adalah modul baru dan penambahbaikan kepada Perisian Quarry Environmental Modelling Software (QEMs) yang telah dibangunkan pada 2016. Perisian baru yang direka sendiri oleh PPM dalam usaha jabatan untuk mengenalpasti punca dan mengawal pencemaran debu, bunyi bising dan gegaran akibat aktiviti pembedilan di kuari-kuari. In 2017, Mineral Research Center (PPM) conducted a study to develop another new software called Quarry Environmental Modeling Software Version 2 (QEMs V2.0). This software is a new module and improvements to the Quarry Environmental Modeling Software (QEMs) Software that was developed in 2016. New software designed by PPM in the department's efforts to identify sources and control dust pollution, noise and vibration due to blasting activity in quarries.

4.	Pemodelan Data Hijau Bagi Persekitaran Kuari Untuk Pendidikan STEM - Projek Kerjasama dengan UKM	Kepentingan isu persekitaran merupakan salah satu asas penting untuk pendidikan STEM. Ia dapat menggalakkan dan meningkatkan penghargaan terhadap mata pelajaran sains dan teknologi di kalangan pelajar di Malaysia. Di peringkat sekolah, kesedaran di kalangan pelajar terhadap isu alam sekitar tidak banyak didedahkan dan dibincangkan. Diantara objektif projek ini adalah: · Untuk merumuskan model data dan seni bina bersepadu data hijau yang berasaskan Partikel habuk, Getaran dan Bunyi Bising (PVN) daripada aktiviti kuari untuk dianalisa. · Menetapkan keperluan visualisasi dan persekitaran data persekitaran untuk Perisian Pembelajaran Pendidikan Alam Sekitar (EELS), dan · Merancang dan membangunkan Perisian Pembelajaran Pendidikan Alam Sekitar untuk Pendidikan Sekolah di Malaysia. Projek ini baru bermula pada tahun ini dengan bantuan kepakaran daripada PPM-JMG.
	Green Data Modeling for Quarry Environment for STEM Education - Collaboration Project with UKM	The importance of environmental issues is one of the fundamental principles for STEM education. It encourages and enhances appreciation of science and technology subjects among students in Malaysia. At school level, awareness among students on environmental issues is not widely disclosed and discussed. Among the objectives of this project are: · To formulate data model and integrated green data based on Particle dust, Vibration and Noise (PVN) from quarry activity to be analyzed. · Establishing visualization requirements and environmental data environment for Environmental Education Learning Software (EELS), and · Plan and develop Environmental Education Learning Software for School Education in Malaysia. The project has just begun this year with the help of expertise from PPM-JMG.
5.	Ujian dan Penganalisaan Sampel Potensi Penjanaan Acid Mine Drainage (AMD)	Ujian dan analisis potensi penjanaan AMD dijalankan bagi mengenalpasti potensi sesuatu batuan, tanah dan juga hampas loji di kawasan lombong metalik untuk menjana AMD sekiranya terdedah kepada udara dan air. Analisis ini merangkumi beberapa set ujian seperti Net Acid Generation Test (NAG), Acid Neutralizing Capacity (ANC) dan ujian kandungan karbon dan sulfur (CSA). Sampel-sampel yang telah dianalisis akan diklasifikasikan kepada tiga (3) kategori iaitu; Potential Acid Forming (PAF), Non Acid Forming (NAF) dan Uncertain (UC). Pada tahun 2017, sebanyak 69 sampel telah diterima dari pihak industri untuk dianalisis. Jumlah keseluruhan ujian yang telah dijalankan bagi analisis tersebut adalah sebanyak 150 ujian.
	Analysis and Testing of Sample potential in generating Acid Mine Drainage	Analysis and testing of sample for Potential Acid Mine Drainage (AMD) generation were conducted to identify the potential of a rock, soil and tailings on metallic mining area to generate AMD if exposed to air and water. This analysis includes several sets of tests such as Net Acid Generation (NAG) Test, Acid Neutralizing Capacity (ANC) and Carbon and Sulfur (CSA) Determination Test. Analyzed samples will be classified into three (3) categories, which are; Potential Acid Forming (PAF), NonAcid Forming (NAF) and Uncertain (UC). In year 2017, a total of 123 samples were received from the industry to determine their AMD potential. The total number of tests that have been carried out for the analysis are 246 tests

Pemasangan alat untuk penyelidikan korelasi punca bunyi dari alat pemecah (crusher) sedang dilakukan.
Installation of instruments for correlation of noise from crushing activity at quarry site

Penyelidikan punca-punca partikel habuk untuk validasi perisian QEM sedang dijalankan di muka kuari di Simpang Pulai, Perak
Research on source apportionment of dust particles for QEM software validation was done at quarry face in Simpang Pulai, Perak



Perkhidmatan Sokongan Teknikal
Technical Support Services

Cawangan Pelaksana Pengkomersialan
Commercialisation Section

Bil. / No.	Aktiviti / Projek R&D Activity / R&D Projects	Hasil / Penemuan / Catatan Results / Findings / Remarks
1.	Harta Intelek Bagi Hasil Penyelidikan Intellectual Properties of Research Findings	Pada tahun ini, satu projek penyelidikan telah dianugerahkan perbaharuan utiliti dan tiga projek penyelidikan telah didaftarkan untuk permohonan paten. In 2017, one research finding has been granted for utility innovation and three research finding has been registered patent filing.

Senarai hasil penyelidikan PPM di bawah pendaftaran harta intelek.
List of research findings registered under intellectual property

Bil. No.	Tajuk Title	Tarikh Pendaftaran Filing Date	No. Permohonan Application No.
1.	Lead- and Barium-Free Crystal Glass	15.02.2017*	MY-160046-A**
2.	Eco-Friendly Glass Ceramic Tile from Silicate Waste	19.06.2017	PI 2017702278
3.	Leucite Glass Ceramic and Method of Preparing Thereof	26.10.2017	PI 2017704055
4.	An Apparatus for Preparing Filler	26.10.2017	PI 2017704057

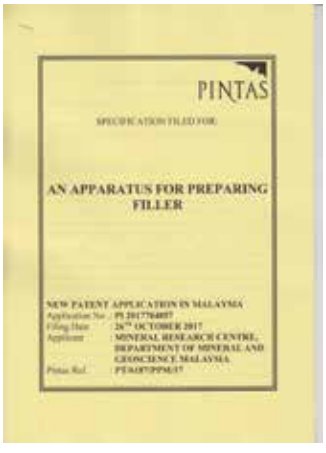
*Tarikh penganugerahan / Date of Grant
** No sijil / Certificate No.

2.	Pensijilan MS ISO 9001:2015 MS ISO 9001:2015 Certification	PPM telah melaksanakan Sistem Pengurusan Kualiti yang menepati MS ISO 9001:2008 sejak tahun 2012. Pada tahun 2017, PPM telah berjaya dinaik taraf kepada MS ISO 9001:2015. Pada tahun ini, beberapa program telah dijalankan bermula dari awal tahun untuk persediaan ke arah migrasi MS ISO 9001:2008 kepada MS ISO 9001:2015. Di antara program ini ialah Taklimat Pemahaman MS ISO 9001:2015 pada 14 Mac 2017 dan Latihan Pengurusan dan Pembangunan Risiko ISO pada 4-7 Julai 2017. PPM has implemented Quality Management System which meets the MS ISO 9001: 2008 since 2012. By 2017, PPM has upgraded to MS ISO 9001:2015. Several programs have been carried out in preparation for the migration towards MS ISO 9001: 2008 to ISO 9001: 2015 this year such as “Taklimat Pemahaman MS ISO 9001:2015” on 14 March 2017 and “Latihan Pengurusan dan Pembangunan Risiko ISO” on 4-7 July 2017.

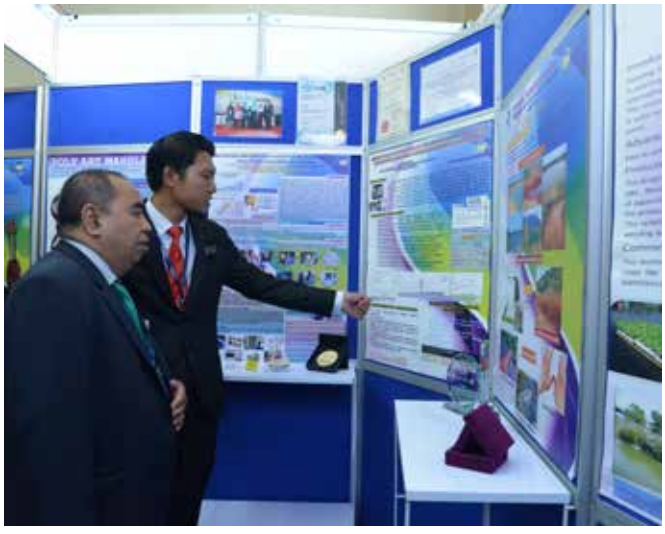
Bil. / No.	Aktiviti / Projek R&D Activity / R&D Projects	Hasil / Penemuan / Catatan Results / Findings / Remarks
3.	Penganjuran Simposium Mineral 'SIMPOMIN 2017'	PPM telah menganjurkan Simposium Mineral ke-8 (SIMPOMIN 2017). Simposium ini telah diadakan secara bersama dengan Persidangan JMG 2017. Simposium bertema "Towards Sustainable Development and Management of Mineral Resources" telah diadakan pada 26-28 September 2017 bertempat di Hotel Casuarina@Meru, Ipoh, Perak.
	Organizing Mineral Symposium 'SIMPOMIN 2017'	PPM had organized the 8th Mineral Symposium (SIMPOMIN 2017). This symposium was held back to back with JMG Conference 2017. The conference with the theme "Towards Sustainable Development and Management of Mineral Resources" was held from 26-28 September 2017 in Casuarina@Meru Hotel, Ipoh, Perak.
4.	Penyertaan Dalam Pameran Dan Pertandingan	a) 28th International Invention and Innovation Exhibition (ITEX'17) PPM telah menghantar dua penyertaan dalam 28th International Invention and Innovation Exhibition (ITEX'17) yang telah diadakan pada 11-13 Mei 2017 di Pusat Konvensyen Kuala Lumpur (KLCC). Dua rekacipta ini ialah "Development of Eco-Friendly Crystal Glass Using Local Silica Sand for Tablewares" dari Cawangan Teknologi Bahan Silika dan "Non-Chemical Retardant Agent in Producing Precipitated Calcium Carbonate (PCC)" dari Cawangan Teknologi Bahan Batuan. Kedua-dua rekacipta ini telah memenangi pingat perak. b) Invention, Innovation & Design Exposition 2017 (iidex2017) PPM telah menyertai Invention, Innovation & Design Exposition 2017 (iidex2017) yang telah diadakan pada 25-29 September 2017 di Universiti Teknologi MARA, Shah Alam, Selangor. Hasil rekacipta daripada Cawangan Teknologi Bahan Termaju yang bertajuk "An Innovative Engineered Marble for Building Materials" telah merangkul pingat emas.
	Participation in Exhibitions and Competitions	a) 28th International Invention and Innovation Exhibition (ITEX'17) PPM has sent two participation in the 28th International Invention and Innovation Exhibition (ITEX'17) which was held on 11-13 May 2017 at Kuala Lumpur Convention Centre (KLCC). The invention from Silica Based Technology Section entitled "Development of Eco-Friendly Crystal Glass Using Local Silica Sand for Tablewares" and the invention from Rock Based Technology Section entitled "Non-Chemical Retardant Agent in Producing Precipitated Calcium Carbonate (PCC)". Both inventions had received the silver medal. b) Invention, Innovation & Design Exposition 2017 (iidex2017) PPM has joined the Invention, Innovation & Design Exposition 2017 (iidex2017) which was held on 25-29 September 2017 in the Universiti Teknologi MARA, Shah Alam, Selangor. The invention from Advanced Material Technology Section entitled "An Innovative Engineered Marble for Building Materials" had won the gold medal.

Bil. / No.	Aktiviti / Projek R&D Activity / R&D Projects	Hasil / Penemuan / Catatan Results / Findings / Remarks
		c) Pertandingan Inovasi 1NRE 2017 PPM telah menyertai Pertandingan Inovasi 1NRE 2017 anjuran NRE. Hasil inovasi dari PPM yang bertajuk "Inovasi Penghasilan Kertas Menggunakan Bahan Buangan Dari Industri Gas Asetilena Sebagai Bahan Pengisi" oleh Dr Rohaya Othman dan pasukannya EUREKA telah memenangi tempat pertama dan menerima sebuah piala dan wang tunai berjumlah RM5,000. c) 1NRE Innovation Competition 2017 PPM participated in the 1NRE Innovation Competition 2017 organized by NRE. The innovation product from PPM titled "Inovasi Penghasilan Kertas Menggunakan Bahan Buangan dari Industri Gas Asetilena Sebagai Bahan Pengisi" by Dr Rohaya Othman and her team EUREKA have won first place and received a trophy and a cash of RM5,000. d) Tahun Pengkomersialan Malaysia 2017 (MCY 2017) Dua produk dari PPM telah terpilih dalam pencalonan produk MCY 2017. Produk-produk ini ialah "In-situ Technique for Paper Making" dan "Enrichment of Iron Ore Concentrate from Challenging Iron Ore Sulphide Deposit". d) Malaysia Commercialisation Year 2017 (MCY 2017) Two products from PPM had been selected for product nominations for the MCY 2017. These products are "In-situ Technique for Paper Making" from Rock Based Technology Section and "Enrichment of Iron Ore Concentrate from Challenging Iron Ore Sulphide Deposit" from Mineral Processing Technology Section.

Penyelidikan PPM di bawah pendaftaran harta intelek
PPM research findings registered under intellectual property



Gambar-gambar sekitar taklimat, latihan dan audit serta sijil MS ISO 9001:2015
Photos of MS ISO 9001: 2015 briefings, training, audits and certificates



Gambar-gambar sekitar SIMPOMIN 2017
Photos of the SIMPOMIN 2017

Gambar-gambar sekitar ITEX'17
Photos of ITEX'17

Gambar-gambar sekitar iidex2017
Photos of iidex2017

Gambar semasa penyampaian hadiah di Pertandingan Inovasi 1NRE dan sijil
Photos of 1NRE Innovation Competition 2017 and certification

Pencalonan produk PPM di Tahun Pengkomersialan Malaysia 2017
Nomination of products PPM in Malaysia Commercialisation Year 2017

Penerbitan
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Penerbitan
Publications

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Peta
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   Skala/scale 1:63,360

2. Peta Sumber Mineral Negeri Sabah
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Sorotan Peristiwa
Event Highlights

Sorotan Peristiwa
Event Highlights

22.02.2017

Sesi Taklimat Peraturan-Peraturan Mineral Akta Pembangunan Mineral 1994.

Briefing Session of Mineral Regulations in Mineral Development Act 1994.

26.02.2017 – 28.02.2017

SIMPOMIN Ke-8 dan Persidangan JMG 2017 telah diadakan di Hotel Casuarina@Meru, Ipoh dirasmikan oleh Timbalan Menteri Sumber Asli dan Alam Sekitar.

The 8th SIMPOMIN and JMG 2017 Conference held at Hotel Casuarina@Meru, Ipoh. It was officiated by Deputy Minister of Natural Resources and Environment.

07.03.2017
Seminar Kesedaran Kemampanan Industri Perlombongan dan Pengkuarian di Kota Bharu, Kelantan.
Seminar on Sustainability of Mining and Quary Industry in Kota Bharu, Kelantan.

28.03.2017
JMG telah menjadi tuan rumah kepada mesyuarat JTKP yang diadakan di Ipoh dan dipengerusikan oleh KSU Sumber Asli dan Alam Sekitar.
JMG has hosted a JTKP meeting held in Ipoh and chaired by the Natural Resources and Environment KSU.

05.04.2017
Lawatan UTHM ke JMG Pahang. Pelajar ditunjukkan dengan kaedah pendulangan oleh kakitangan JMG Pahang.
UTHM study visit to JMG Pahang. Students were shown with panning techniques method by JMG Pahang's staff.

18.04.2017

Mesyuarat Timbalan Pengarah Negeri Bil. 1/2017 dan Mesyuarat Pengarah-Pengarah Negeri Bil. 2/2017 telah diadakan di KSL Hotel & Resort Johor Bahru. Mesyuarat ini diakhiri dengan lawatan kerja ke Forest City pada 21 April 2017.

State Deputy Director's Meeting No. 1/2017 and State Directors Meeting No. 2/2017 was held at KSL Hotel & Resort Johor Bahru. The meeting was concluded with a visit to Forest City on April 21, 2017.

05.05.2017

Taklimat operasi JMG Sarawak kepada Ketua Menteri Sarawak.

Briefing of JMG Sarawak operations to Sarawak Chief Minister.

11.05.2017

Pembentangan Aspirasi TN50 NRE.

TN50 NRE Aspiration Presentation.

14.05.2017 - 21.05.2017

KUGS JMG Malaysia Terengganu bersama-sama Tn Hj Azahari, Timbalan Pengarah BPT, memberi penerangan kepada Perasmi Hari Muzium, Dato' Tengku Putera Tengku Awang, Pengerusi Jawatankuasa Perindustrian dan Perdagangan Negeri Terengganu.

KUGS JMG Malaysia Terengganu together with Tn Hj Azahari, Deputy Director of BPT, giving explanations to the Museum's Day Oficiated, Dato 'Tengku Putera Tengku Awang, Terengganu State Industry and Trade Committee Chairman.

09.05.2017
Delegasi Malaysia ke mesyuarat APEC 2017 berkaitan Penutupan Lombong dan Alam Sekitar.
Malaysian delegation at the APEC 2017 meeting relating to the closure of the Mine and the Environment.

10.05.17
Loji peleburan Malaysia Smelting Corporation Berhad, Pulau Pinang.
Smelting plant at Malaysia Smelting Corporation Berhad, Pulau Pinang.

15.05.2017
Program lawatan teknikal dan taklimat pengoperasian kilang memproses mineral di Sibelco Malaysia Sdn Bhd.
Technical visit program and briefing on the operation of a mineral processing plant at Sibelco Malaysia Sdn Bhd.

15.05.2017
Majlis Penyerahan Peralatan Sistem NatSIS kepada JMG Sabah bersama Dr. Mohamad bin Abd Manap dari Unit Penderiaan Jauh, Bahagian Perkhidmatan Teknikal, JMG.
Submission ceremony of NatSIS System Equipment to JMG Sabah with Dr. Mohamad bin Abd Manap from the Remote Sensing Unit, Technical Services Division, JMG.

19.05.2017
JMG telah menjadi tuan rumah kepada lawatan Yang Berhormat Timbalan Perdana Menteri Malaysia ke kawasan penempatan baru orang asli di Kampung Sungai Tiang, Cameron Highland, Pahang.
JMG hosted the Honorable Deputy Prime Minister of Malaysia visit to the new settlement area of Kampung Sungai Tiang, Cameron Highland, Pahang.

25.05.2017
Lawatan kerja ke Kilang Seramik Guocera di Kluang, Johor. Tujuan utama lawatan ini ialah melihat pembuatan produk berasaskan tanah liat di Kilang Seramik Guocera dan mendapatkan maklumat berkaitan industri ini khususnya perkara berkaitan bahan mentah dan keperluan ke atasnya.
Site visit to the Guocera Ceramic Factory in Kluang, Johor. The main purpose of this visit is to look at the manufacture of clay-based products at the Guocera Ceramic Factory and to obtain information about this industry, particularly in terms of raw materials and its requirements.

08.09.2017
Lawatan kerja Ketua Pengarah JMG ke JMG Pahang.
Technical visit by the Director General of JMG to JMG Pahang.

19.09.2017
Mesyuarat keselamatan Gua Pinang di Pejabat Lafarge Cement, Langkawi.
Safety meeting of Pinang Cave in Lafarge Cement office, Langkawi.

05.07.2017
Panel Penilai Jerai Geopark dan Urusetia Jerai Geopark bergambar dihadapan Galeri Geopark Jeti Semeling.
Jerai Geopark Validation Panel and Secretariat in front of Geopark Gallery Semeling Jetty.

09.07.2017
Lawatan Rasmi TKSU Ke JMG Kelantan.
Official Visit TKSU to JMG Kelantan.

13.07.2017
Lawatan YB Timbalan Menteri NRE ke Telagu Tiub JMG di Tunjung, Kota Bahru, Kelantan.
YB's Deputy Minister's visit to the JMG Tube Well in Tunjung, Kota Bahru, Kelantan.

13.07.2017

Lawatan kerja rasmi Timbalan Ketua Pengarah (Operasi) Tuan Haji Mohd Zukeri bin Ab. Ghani ke JMG Sabah.

Official Visit of Deputy Director General (Operation) Tuan Haji Mohd Zukeri bin Ab. Ghani to JMG Sabah.

19.07.2017

Majlis Sambutan Aidil Fitri dan Persaraan Pengarah JMGSWP.

Aidil Fitri Celebration in conjuction with the retirement of Director of JMGSWP.

01.08.2017

Majlis Perasmian Projek Kajian Sumber Pasir Laut Negara Fasa III-Survei Geofizik Marin Perairan Lepas Pantai Pantai Pahang dan Johor Timur oleh YBhg Datuk Hj Shahar Effendi bin Abdullah Azizi, Ketua Pengarah JMG di Tanjung Puteri Golf Resort, Pasir Gudang, Johor.

Launching Ceremony of the National Offshore Sand Resource Study Phase III - Marine Geophysical Survey of Offshore Pahang and East Johore by YBhg Tn Hj Shahar Effendi bin Abdullah Azizi, Director General of JMG at Tanjung Puteri Golf Resort, Pasir Gudang, Johor.

02.08.2017

Duli Yang Maha Mulia Sultan Johor, Sultan Ibrahim Ibni Almahrum Sultan Iskandar menerima cenderahati daripada Tuan Haji Shahar Effendi bin Abdullah Azizi sempena kunjungan hormat Ketua Pengarah JMG ke Istana Johor.

The Highness Sultan Johor, Sultan Ibrahim Ibni Almahrum Sultan Iskandar received a souvenir from Tuan Haji Shahar Effendi bin Abdullah Azizi for the visit of the Director General of JMG to the Istana Johor.

08.08.2017

Majlis Program Uji Cuba Prosedur Tetap Operasi Bagi Mencegah Kebakaran Tanah Gambut Peringkat Negeri Selangor.

Experimental Program of Operation Procedure in Operating Procedures for fire Peat Selangor State Level.

15-17.08.2017

Program Kesedaran Awam Geobencana Di Kawasan Parlimen 179 Ranau, Sabah.

Geohazard Public Awareness Programme at Ranau Parliament in Sabah.

20.09.2017

Majlis penyerahan output projek penghasilan peta bahaya dan risiko cerun (PBRC) kepada pihak berkuasa tempatan peringkat negeri Selangor.

The output handover ceremony of the project for the production of hazard maps and slope risks (PBRC) to the local authority of Selangor.

24.09.2017
Lawatan Audit oleh Kementerian Sumber Asli dan Alam Sekitar di JMGKPP.
Auditing works by the Ministry of Natural Resources and Environment at JMGKPP.

27.09.2017
Lawatan Timbalan Menteri Sumber Asli Dan Alam Sekitar Ke Projek Perintis Pembangunan Sumber Air Tanah Di SABDA
Deputy Minister of Natural Resources and Environment visit to Pioneer Land Resources Development Projects (SABDA)

30.09.2017
Sukan persahabatan tahunan ke-30 dengan Kementerian Alam Sekitar dan Sumber Air Singapura yang diadakan di Our Tampines Hub (OTH), Singapura.
The 30th annual friendly sports event with the Singapore Ministry of Environment and Resources was held at Our Tampines Hub (OTH), Singapore.

09.10.2017
Persidangan Geosains Kebangsaan Ke-30 dan Sambutan Ulang Tahun Ke-50 Persatuan Geologi Malaysia.
The 30th National Geoscience Conference and 50th Anniversary of the Malaysian Geological Society.

16.10.2017
Lawatan SPRM sempena Majlis Ikrar Bebas Rasuah di JMG Kelantan.
MACC visit in conjunction with the Corruption-Free Pledge in JMG of Kelantan.

21.10.2017
Hari Alam Sekitar Negara (HASN) 2017 Peringkat Negeri Johor.
National Environment Day (HASN) 2017 Johor State level.

23-25.10.2017
Lawatan kerja rasmi Ketua Setiausaha Kementerian Sumber Asli dan Alam Sekitar, YBhg. Dato' Sri Azizan bin Ahmad ke kawasan geobencana Kundasang.
Official site visit attended by Ministry of Natural Resources and Environment Secretary-General, YBhg. Dato 'Sri Azizan bin Ahmad to geobencana Kundasang area.

31.08.2017
Penyertaan warga JMG Sabah dalam perarakan Hari Kemerdekaan Ke-60 di Dataran Deasoka Kota Kinabalu.
Participation of JMG Sabah citizens in the 60th Independence Day procession at Dataran Deasoka, Kota Kinabalu.

30.10.2017
Majlis Penyerahan Laporan Akhir Survei Geofizik Awangan (SGA) di Wilayah Ekonomi Pantai Timur (ECER)
The Final Survey (SGA) Submission Ceremony in the East Coast Economic Region (ECER)

03.11.2017
Kunjungan hormat ke Pejabat Speaker DUN Sarawak, Datuk Amar Hj Mohamad Asfia Awang Nassar
Courtesy visit to Sarawak State Speaker, Datuk Amar Hj Mohamad Asfia Awang Nassar

20.12.2017
Mesyuarat Penyelarasan Urban Geology – The Foundation of Cities Di Antara JMG Dengan British Geological Survey (BGS).
Urban Geology Coordination Meeting - The Foundation of Cities between JMG and the British Geological Survey (BGS).

05.11.2017
Lawatan Kerja Pengarah JMG Malaysia ke JMG Kelantan.
Working Visit of Director General of JMG Malaysia to JMG Kelantan.

06.11.2017
Perasmian dan Penyerahan Telaga Tiub di Taman Sri Keranji oleh Pengarah JMG Malaysia.
Inauguration and Delivery of Tube Wells in Taman Sri Keranji by Director General of JMG Malaysia.

04.12.2017
Persidangan Malaysian Chamber of Mines (MCoM) di Hotel Zenith, Kuantan. JMG merupakan antara penganjur bersama persidangan ini.
The Malaysian Chamber of Mines Conference (MCoM) held in Zenith Hotel, Kuantan. JMG was one of the co-organisers of the conference.

04.12.2017
Majlis menandatangani MOU antara UMP Pahang dengan JMG Malaysia semasa Persidangan MCoM.
MOU between UMP Pahang and JMG Malaysia was signed during the MCoM Conference.

4-5.12.2017
Sesi perbincangan meja bulat semasa persidangan MCoM yang disertai oleh Ketua Pengarah JMG.
The round table discussions during the MCoM Conference joined by the Director General of JMG.

07.12.2017
Lawatan TKSU NRE Ke Ibu Pejabat JMG.
Visit TKSU NRE to JMG Headquarters.

Outreach Programmes
Program Outreach

15-17.08.2017
Program Kesedaran Awam Geobencana Di Kawasan Parlimen Ranau, Sabah.
Geohazard Public Awareness Programme at Ranau Parliamentary Constituency Ranau, Sabah.




11.10.2017
Program Kesedaran Awam Geobencana Di Kawasan Parlimen Kota Belud, Sabah.
Geohazard Public Awareness Programme at Kota Belud Parliamentary Constituency Kota Belud, Sabah.


11.10.2017
Program Kesedaran Awam Geobencana Di Kawasan Parlimen Kota Belud, Sabah Pada 11 Oktober 2017.
Geohazard Public Awareness Programme in Kota Belud Parliamentary Constituency, 11 October 2017.

21.10.2017
Lawatan tapak Program Mencegah Kebakaran Tanah Gambut sempena Hari Alam Sekitar Negeri Pahang di Penor, Kuantan, Pahang.
Peat Land Fire Prevention Programme site visit in conjunction with the Pahang State Environmental Day held in Penor, Kuantan Pahang.

Khidmat Masyarakat
Community Services

14.06.2017
Lawatan Amal Badan Kakitangan-Kakitangan Islam (BKKI) JMG Sabah di Rumah Anak Yatim Tambunan dan Rumah Anak Yatim Tuaran.
JMG Sabah Islamic Staff (BKKI) Charity visit at Tambunan Orphanage and Tuaran Orphanage.

Media / Publisiti
Media / Publicity

12.10.2017
Sidang media Program Kesedaran Awam Geobencana di Kota Belud, Sabah.
The media conference of the Public Awareness Program in Kota Belud, Sabah.

JMG dalam Berita
JMG in the News

19.08.2017: New Sabah Times
Program Kesedaran Geobencana.
Geohazard Awareness Program.

29.03.2017: Utusan Malaysia
Ekspedisi Saintifik Geotapak.
Geosite Scientific Expeditions.

70 mahasiswa sertai Ekspedisi Saintifik Geotapak

SUNGAI PETANI 28 Mac – Seramai 70 mahasiswa dari beberapa pusat pengajian tinggi berpeluang menyertai program Ekspedisi Saintifik Geotapak Jerai Geopark baru-baru ini yang memberikan mereka pengalaman berharga dalam bidang berkaitan.

Sepanjang program peserta meninjau lokasi berkaitan dan menyiapkan satu laporan untuk dibentangkan kepada kerajaan negeri dalam usaha mencadangkan pengiktirafan Jerai Geopark.

Peserta program itu, M. Santra Munagaran, 22, dari Universiti Teknologi Petronas (UTP), Tronoh, Perak berkata, dia gembira sekali kerana berpeluang menyertai ekspedisi memandangkan banyak perkara baharu dapat dipelajari dan memberi manfaat kepada dirinya.

"Saya berharap usaha pihak berkenaan ingin menjadi Jerai Geopark sebagai salah satu kawasan yang ada kesan sejarah lama, dapat menjadi kenyataan," katanya.

Menurutnya, generasi akan datang ingin melihat kesan sejarah lama yang masih ada, termasuk di Kedah dan negeri-negeri lain.

Nor Hasmimi Mat Husain, 23, dari Universiti Malaysia Kelantan (UMK) pula berkata, pengiktirafan perlu diberikan kepada Jerai Geopark dalam usaha menjadikan kawasan itu tarikan kepada pelancong tempatan dan luar negara.

Program anjuran Jabatan Mineral dan Geosains Malaysia itu memberi peluang kepada peserta meninjau kajian di 25 tempat menarik di daerah berkenaan.

Ketua Pengarahnya, Datuk Mior Sallehuddin Mior Jadid ketika bercakap merasmikan program itu berkata, antara tempat menarik dilawati ialah Padang Tok Sheikh, Geotapak Cenderong Seglor Laut, Lembing Dataran Selinsing Pisti, Mineral Tumasin Geotapak Tanjung Jaga, Batu Rapal, Sungai Teroi, Lembong Besi Tupah, Sungai Tupah dan Sungai Batu Pahat.

"Bila kawasan itu diiktiraf taraf sebagai Jerai Geopark, bilangan pelancong asing ke sini pasti bertambah ramai.

"Bagaimanapun, penduduk di kawasan berkenaan perlu rendah menyesuaikan diri bila menerima kunjungan orang tempatan dan luar negara," katanya.

MIOR SALLEHUDDIN MIOR JADID (berdiri tengah, belakang) bersama sebahagian daripada mahasiswa yang menyertai Ekspedisi Saintifik Geotapak Jerai Geopark di Sungai Petani, Kedah, baru-baru ini. -UTUSAN/ABD. RAZAK OSMAN

14.03.2017: Sinar Harian
Lawatan Kerja Menteri NRE ke Kilim Geoforest.
NRE Minister's Working Visit to Kilim Geoforest.

Pertahan sejarah Drop Stone, Kilim Geoforest

ALOR SETAR – Kerajaan Kedah dinasihatkan supaya tidak membuat sebarang pembangunan khususnya di kawasan Drop Stone (Batu Jatuh), Langkawi kerana di situ mempunyai kesan tinggalan sejarah purba yang begitu luas.

Menteri Sumber Asli dan Alam Sekitar, Datuk Seri Dr Wan Junaidi Tuanku Jaafar berkata, pelaksanaan pembangunan di kawasan berkenaan dikhuatiri akan merosejarah tempat bersejarah itu yang dipercayai berusia 2 bilion tahun.

"Dari fotografi yang kita lihat, sebahagian daripada Pulau Langkawi ini telah sebahagian daripada Antartika India dan menjadi satu komponen besar sebelum mereka berpisah selama dua juta tahun dan ada yang menjadi komponen India, Seri Langka dan ada yang masih tinggal di Antartika serta sedikit cebisan menjadi kepulauan Langkawi.

"Inilah sebab kenapa kita memohon pihak kerajaan negeri bekerjasama untuk mengekalkan kawasan itu walaupun di sekeliling kawasan itu boleh dibangunkan, tetapi tempat itu seluas 1,200 meter persegi kita akan pertahankan," katanya.

Beliau berkata demikian selepas menghadiri lawatan kerja ke tapak projek Rancangan Tebatan Banjir (RTB) Sungai Kedah dan Anak Bukit, di sini, kelmarin.

Wan Junaidi (kiri) ketika melawat kawasan kerja, kelmarin.

Terdahulu, Wan Junaidi adakan kunjungan hormat ke Pejabat Menteri Besar Kedah di Wisma Darul Aman serta membincangkan beberapa perkara termasuk pembangunan sektor pelancongan di Kedah.

"Perbincangan saya dengan Menteri Besar Kedah meliputi tentang hasil hutan dan kita memahami, terutamanya ada beberapa kesan sejarah yang lama di Langkawi.

"Kita mohon kerajaan negeri supaya tidak memusnahkan Drop Stone ini sebagai sebahagian daripada kawasan pembangunan kerana di situ ada kesan sejarah lama," katanya.

14.03.2017: Sinar Harian
Ekspedisi Saintifik Geotapak di Harvard Suasana Hotel Bedong, Kedah.
Geosite Scientific Expeditions at Harvard Suasana Hotel Bedong, Kedah.

Sasar diiktiraf geopark kebangsaan

Ekspedisi Saintifik Geotapak 2017 berhajat memperkenalkan cadangan pembangunan geotapak dalam

BEDONG – Jabatan Mineral dan Geosains menyasarkan Geopark Jerai berhasil diiktiraf geopark kebangsaan sebelum tahun ini.

Ketua Pengarahnya, Datuk Mior Sallehuddin Mior Jadid berkata, Geopark Jerai merupakan geopark kebangsaan ketujuh di Malaysia selepas Langkawi, Kinabalu, Gunung Mulu, Taman Negara Kuala Ketil, Kelantan dan Lembah Bujang, Kedah.

Menurutnya, Geopark Jerai adalah antara calon geopark kebangsaan bersama empat calon lain seperti Geopark Lembah Klang, Geopark Tasik Kenyir, Geopark Kinabalu dan Geopark Delta Sarawak yang masih menunggu proses pengiktirafan.

"Selain Geopark Jerai, Geopark Lembah Klang juga berada dalam proses akhir. Kalau boleh kita nak kedua-dua kawasan ini dapat diiktiraf sebagai geopark kebangsaan sebelum tahun ini," katanya.

Beliau berkata demikian ketika melancarkan Ekspedisi Saintifik Geotapak 2017 di Harvard Suasana Hotel, di sini, semalam. Hadir sama Pegawai Daerah Kuala Muda, Md Nordin Yahya.

Mior Sallehuddin berkata, kita kira 95 peratus kajian sudah dapat siap, saya lengkap serta mendapat perakuan kerajaan Kedah, ia dicadangkan diiktiraf sebagai geopark kebangsaan.

Menurutnya, menerusi ekspedisi selama dua hari itu, sembilan daripada 25 geotapak dikenal pasti lebih menarik dan dilawati peserta untuk dinikmati dari segi kandungan, sosiobudaya, arkeologi serta flora fauna terdapat di situ.

Tambahnya, cadangan Geopark Jerai meliputi dua daerah iaitu Kuala Muda dan Yan dengan keluasan 309 kilometer persegi.

Sebelum ini Langkawi merupakan geopark pertama diiktiraf di Malaysia, serta telah mendapat pengiktirafan sebagai Langkawi Unesco Global Geopark 10 tahun lalu dan geopark pertama diiktiraf di Asia Tenggara.

Senarai Pegawai Profesional
List of Professional Officers

Senarai Pegawai Profesional
List of Professional Officers

Ibu Pejabat / Headquarters		
Ketua Pengarah, JUSA B Director General	Datuk Shahar Effendi Abdullah Azizi	BSc(Hons) (Mining Eng.) (Leeds) Postgraduate Diploma, Mining Project Evaluation (DEES), Paris School of Mines, France.
Timbalan Ketua Pengarah (Operasi), JUSA C Deputy Director General (Operations)	Mohd. Zukeri bin Ab. Ghani, P.Geol	BSc(Hons)(Geology)(UKM)
Timbalan Ketua Pengarah (Koporat dan Ekonomi Mineral), JUSA C Deputy Director General (Corporate and Minerals Economy)	Kamal bin Daril, P.Geol	BSc(Hons) (Geology) (UKM) MSc (Mineral Economics) (Michigan)
Pengarah, C54 Director	Abdul Rahman bin Mohd Yusoff, P.Geol Bersara pada / Retired as of 26 Mei 2017	BSc(Hons)(Earth Science)(UKM)
	Mohd. Badzran bin Mat Taib, P.Geol Bermula / from 1 Ogos 2017	BSc(Hons)(Geology)(UKM)
	Joanes Muda, P.Geol sehinggga / until 16 Oktober 2017	BSc(Hons)(Earth Science)(UKM) MSc(Geology) (UMS)
	Hisamuddin bin Termidi Mulai / from 16 Oktober 2017	BEng (Mining) (Laurention University)
	Mohd. Nazan bin Awang, P.Geol Bermula / from 14 September 2017	BSc(Hons)(Geology)(UKM)
Ketua Penolong Pengarah Kanan, C52 Senior Principal Assistant Director	Mohd. Badzran bin Mat Taib, P.Geol Sehingga /until 15 Januari 2017	BSc(Hons)(Geology)(UKM)
	Kamaruddan bin Abdullah	BEng (Hons) (Mineral Resources Eng.) (USM) MSc (Occupational Safety & Health) (Murray State University, USA)
	Ling Nan Ley @ Ling Nan Leh, P.Geol	BSc (Hons) (Earth Science) (UKM) MSc (Engineering Geology) (Durham University, UK)
	Nicholas Jacob a/l T. Jacob, P.Geol Mulai / From 16 Januari 2017	BSc (Hons) (Geology) (UKM) MSc (Environment) (UPM)
	Mohd. Zulkiflee bin Che Soh, P.Geol	BSc (Hons) (Geology) (UKM)
	Siti Aminah binti Abdul Sarif, P.Geol	BSc(Hons) (Applied Geology) (UM)
	Siti Faridah binti Yusop	BSc(Hons) (Geology) (UM)
Ketua Penolong Pengarah Kanan, M52 Senior Principal Assistant Director	Mohd. Azalizam bin Alias	BSc (Hons) (Biology) (UKM)

Ketua Penolong Pengarah, C48 Principal Assistant Director	Nurul Huda bin Romli Sehingga /until 12 Mei 2017	BEng (Hons) (Mineral Resources Eng) (USM) MSc (OSH) (UNSW)
	Habibah binti Tahir Sehingga /until 01 Februari 2017	BSc (Hons) (Geology) (UKM) MSc (Environment) (UPM)
	Yusari Basiran, P. Geol	BSc (Hons) (Applied Geology) (UM) MSc (Mineral Industry) (UKM)
	Dr. Sia Say Gee, P.Geol	BSc (Hons) (Applied Geology) (UM) PhD (Coal Geology) (UM)
	Haniza binti Zakri, P.Geol	BSc (Hons) (Geology) (UKM) MSc (Geology) (UKM)
	Norsham binti Samsudin, P.Geol	BSc (Hons) (Geology) (UKM)
	Nurzaidi bin Abdullah, P.Geol Sehingga /until 01 Jun 2017	BSc (Hons) (Geology) (UKM) MSc (Remote Sensing) (UPM)
	Abd. Rahim Harun, P.Geol	BSc (Hons) (Geology) (UKM)
Ketua Pegawai Teknologi Maklumat, F48 Principal IT Officer	Che Aslinaliza binti Che Ahmed	BSc (Information Technology) (UKM) MSc (Information Technology) (UITM)

Ketua Penolong Pengarah, M48 Pincipal Assistant Director	Zahirul Fahmi bin Zaini Sehingga /until 10 November 2017	BBA (Hons) (UIAM)
Pegawai Geosains Kanan, C44 Senior Geoscience Officer	Dr. Ferdaus bin Ahmad, P.Geol Sehingga /until 06 September 2017	BSc (Hons) (Geology) (UM) MSc (Engineering Geology) (Leeds) PhD (Engineering Geology) (Leeds)
	Kamarulbahrin bin Hashim, P.Geol Mulai /from 02 Oktober 2017	BSc (Hons) (Applied Geology) (UM)
	Ummi Daemah binti Hussin, P.Geol	BSc (Hons) (Applied Geology) (UM) MSc (Environment) (UPM)
	Brendawati binti Ismail	BSc (Hons) (Geology) (UM)
	Mazlan bin Mohd Zain, P.Geol Mulai /from 01 Februari 2017	BSc (Hons) (Applied Geology) (UM) MSc (Environment) (UPM)
	Suhaimizi Yusoff, P.Geol	BSc (Hons) (Earth Science) (UKM) MSc (Geomatic Engineering) (UPM)
	Khairul Zaman bin Ibrahim, P.Geol	BSc (Hons) (Geology) (UKM) MSc (Industrial Mineral) (UKM)
	Mohd Anuar bin Ishak, P.Geol	BSc (Hons) (Geology) (UM)
	Fathullah Abu Naim, P.Geol Mulai /From 01 Februari 2017	BSc (Hons) (Geology) (UM)
	Zahidi bin Hamzah, P.Geol	BSc (Hons) (Geology) (UM)
	Zamila binti Abdul Rahman	BSc (Hons) (Geology) (UKM)
	Mohd. Yuzlan bin Yusoff, P.Geol Mulai /From 01 Februari 2017	BSc (Hons) (Geology) (UM)
	Iszaynuddin bin Abd. Hamid, P.Geol	BSc (Hons) (Geology) (UKM)
	Rosni binti Lokmanul Hakim, P.Geol	BSc (Hons) (Geology) (UM)
	Safura binti Alias	BEng (Hons) (Mineral Resources Eng) (USM)
	Salmiah binti Nawi	BEng (Hons) (Mineral Resources Eng) (USM) MSc (Mining Engineering) (Queen's University, Canada)

Pegawai Geosains, C41 Geoscience Officer	Abdul Razak bin Zainal Abidin, P.Geol	BSc (Hons) (Applied Geology) (UM)
	Nightingale Lian Marto, P.Geol	BSc (Hons) (Geology) (UM) MSc (Environmental Management) (UMS)
	Mohd Shafiq Farhan bin Mohd Zainudin, P.Geol	BSc (Hons) (Geology) (UM)
	Maziadi bin Mamat	BEng (Hons) (Mineral Resources Eng) (USM)
Pegawai Tadbir, M41 Administration Officer	Abd Jalil bin Tahir	MBA (Hawaii Pacific University, USA)

Bahagian Perkhidmatan Teknikal / Technical Services Division		
Pengarah, JUSA C Director	Dato' Hj Mohd Za'im bin Abdul Wahab	Mining Engineering (BSc) Newcastle University Diploma in Mechanical Engineering Dess, Mining Education, Paris School of Mines, France
Timbalan Pengarah, C54 Deputy Director	Mohd Ariff bin Omar	BSc(Hons) (Chemistry) (Nottingham) MMIC
Ketua Penolong Pengarah C54	Mahisham bin Ibrahim, P.Geol	BSc(Hons) (Geology) (UKM)
Ketua Pegawai Geosains, C52 Principal Geoscience Officer	Hazan Maheran binti Mohd (bersara pada 10.07.2017)	BSc(Hons) (Chemistry) (UKM) AMIC
	Abdullah bin Sulaiman, P.Geol	BSc(Hons) (Applied Geology) (UM) MSc (Oceanography) (Southampton)
	Ahmad Zulkifli bin Kamaruzaman, P.Geol	BSc(Hons) (Geophysics) (USM)
	Zamri bin Ramli, P.Geol	BSc(Hons) (Applied Geology) (UM) MSc (Environment) (UPM)
	Dato' Ir Ahmad Zukni bin Ahmad Khalil	Sarjana Muda (Kepujian) Kejuruteraan Sumber Mineral, USM BEng (Hons) Mineral Resources Engineering (USM)

Ketua Pegawai Geosains, C48 Principal Geoscience Officer	Asminah binti Rajuli, P.Geol	BSc(Hons) (Geology) (UKM) MSc (Environment) (UPM)
	Mohd Rais bin Ramli, P.Geol	BAppSc(Hons) (Geophysics) (USM)
	Webster Wong @ Wong Vui Chung, P.Geol	BSc(Hons) (Applied Geology) (UM) MSc (Environmental Management) (UMS)
	Hairani Sham binti Manas	BAppSc(Hons) (Geophysics) (USM)
	Mat Niza bin Abd Rahman, P.Geol	BSc(Hons) (Geology) (UKM)
	Nor Azian bin Hamzah	BSc (Hons) Geology, UKM
	Mohamad Sari bin Hasan Bertukar ke JMG Johor	BSc(Hons) (Geology) (UKM)
	Mohamad bin Kasim	BSc(Hons) (Chemistry) (USM) AMIC
	Rokiah bin Abdullah	Ijazah Sarjana Muda Sains dan Kepujiam (Kimia) UKM
	Dr. Pauline Dushyanthi a/p Paul Nesaraja	BSc(Hons) (Chemistry) (UM) MSc (Hydrogeology) (Birmingham) PhD (Environmental Chemistry) (University of Buffalo, State University of New York) AMIC
	Mohd. Saad bin Samsudin	BSc(Hons) (Chemistry) (UKM) AMIC
	Mohd Fauzi bin Muhammad Said	BSc(Hons) (Chemistry) (UKM) AMIC
	Wan Ibrahim bin Wan A Rahman	BSc(Hons) (Chemistry) (UKM) AMIC
	Dr. Ferdaus bin Ahmad (mulai / from 6 September 2017	BSc (Hons)(Geology) University Malaya MSc (Engineering Geology)(Leeds) PhD (Engineering Geology)(Leeds)

Pegawai Geosains Kanan, C44 Senior Geoscience Officer	Halim bin Darahim	BAppSc(Hons) (Geophysics) (USM)
	Hamid bin Ariffin	BSc(Hons) (Applied Geology) (UM)
	Mohd Anuar bin Md Razali, P.Geol	BAppSc(Hons) (Geophysics) (USM)
	Syed bin Omar (Cuti belajar / study leave)	BSc (Hons) (Applied Geology) (UM) MSc (Eng. Geology) (Newcastle-Upon-Tyne, England)
	Amin Noorasid bin Abd Jalil, P.Geol	BSc(Hons) (Geology) (UMS)
	S. Pasupathi a/l Subramaniam	BSc(Hons) (Chemistry) (USM)
	Noran Alwakhir bin Shaarani, P.Geol	BSc(Hons) (Geology) (UM) MSc (Applied Marine Geoscience) (Bangor University, UK)
	Sharizan bin Ibrahim	BAppSc(Hons) (Applied Chemistry) (UiTM) MSc (Metallurgical Eng.) (UNIMAP)
	Yusril A'mali bin Mohd Yusuf @ Hamid	BSc(Hons) (Chemistry) (UPM) AMIC
	Azrul bin Arifin	BSc(Hons) (Applied Chemistry) (UiTM)
	Noor Akhmar bin Kamarudin	BSc(Hons) (Chemistry) (UPM)
	Mohd Fahami bin Abas	BAppSc(Hons) (Analytical Chemistry) (USM) MSc (Management) (UUM)
	Halime bin Azahari @ Adnan	BSc(Hons) (Applied Chemistry) (UiTM)
	Mohd Fuzi bin Hashim	BSc(Hons) (Chemistry) (UM)
	Lee Beng Huat, P.Geol	BSc(Hons) (Geology)(UKM) MSc (Geology) (UKM)
Pegawai Teknologi Maklumat Kanan, F44 Senior IT Officer	Syamilah bt Samsudin @ Murad	BSc(Hons) (Information Technology) (UUM)
Pegawai Geosains, C41 Geoscience Officer	Mohd Zahar bin Ibrahim	BSc(Hons) (Chemistry) (USM)
	Mohamed Fadzli bin Rahman (Cuti belajar / study leave), P.Geol	BSc(Hons) (Geology) (UM)
	Muhamad Safid bin Saad, P.Geol	BAppSc (Hons) (Geophysics) (USM)
	Nurul Husna binti Ismayatim	BSc(Hons) (Chemistry) (UKM)
	Intan Shazwani binti Abdul Ghani	BSc(Hons) (Chemistry) (UM) AMIC
	Amir Mizwan bin Mohd Akhir, P.Geol	BSc(Hons) (Geology) (UKM)
	Akrimi Masua binti Mohamad	BAppSc(Hons) (Analytical Chemistry) (USM) AMIC
	Muhammad Fawwaz bin Zainal Abedin, P.Geol	BSc(Hons) (Geology) (UMS)
	Mohd Farid bin Abd Kadir, P.Geol	BSc(Hons) (Geology) (UKM)
	Nur Sarah binti Othman	BSc(Hons) (Applied Geology) (UM)
	Nurul Zulaikha Akma binti Mohd Zaki	BSc(Hons) (Geology) (UMS) MSc (Geofizik Kejuruteraan & Persekitaran) (UKM)
	Norshakira binti Ab Ghani	BSc(Hons) (Applied Geology) (UM) MSc (Petroleum Geology) (UM)

Pusat Penyelidikan Mineral / Mineral Research Centre		
Pengarah, Jusa C Director	Md Muzayin bin Alimon	BSc(Hons)(Chemistry)(UKM); MSc(Mineral Processing) (Pennsylvania State)
Pegawai Penyelidik Kanan, Q54 Senior Research Officer	Mahadi bin Abu Hassan (retired as 4/5/2017)	BSc(Hons)(Geology)(UKM)
	Kori bin Mohammad, P.Geol	BSc(Hons)(Geology)(UKM) MSc(Engineering Geology) (Leeds)
	Aminudin bin Mahmud, P.Geol	BSc(Hons)(Geology)(UKM) MSc(Engineering Geology)(Leeds)
	Abdul Rois bin Abdul Mois	BAppSc(Hons) (Minerals Science and Technology) (USM); MSc(Ceramic Engineering)(Sheffield)
	Mohamad Haniza bin Mahmud	BEng(Hons)(Mineral Resources Engineering) (USM) Adv. Diploma(Environmental Engineering) (Manchester) MSc(Materials Engineering) (USM)
	Dr. Nazwin binti Ahmad	BEng(Hons)(Mining Engineering)(Nova Scotia); PhD(Advanced Material)(Leeds)
Pegawai Penyelidik Kanan, Q52 Senior Research Officer	Dr. Ismail bin Ibrahim	BEng(Hons)(Mineral Resources Engineering) (USM); MSc(Mineral Resources Engineering) (USM); PhD(Mineral Processing)(USM)
	Dr. Izhar Abadi bin Ibrahim Rais	BEng(Hons)(Mineral Resources Engineering) (USM); MSc(Mineral Resources Engineering) (USM); PhD(Mineral Resources Processing) (USM)
	Dr. Rashita binti Abd Rashid	Diploma(Chemical Engineering) (UTM); BEng(Hons)(Chemical Engineering) (UTM); MSc(Mineral Resources Engineering) (USM); PhD(Materials Science)(UKM)
	Malek bin Selamat	BEng(Hons)(Mineral Resources Engineering)(USM); MPhil(Advanced Material)(Leeds)
	Salmah binti Baharuddin	BSc(Computer Science)(Hons) (USM); MSc(Image Processing)(USM)
	Abdullah bin Hussin	Diploma()(ITM); Adv. Diploma(Land Survey)(ITM)

Pegawai Penyelidik Kanan, Q48 Senior Research Officer	Marlinda binti Daud	BEng(Hons)(Materials Engineering) (USM)
	Siti Mazatul Azwa bt. Saiyed Mohd Nurddin	Diploma(Science)(ITM); BAppSc(Hons)(Industrial Chemistry) (USM); MSc(Advanced Materials Engineering)(UPM)
	Dr. Rohaya binti Othman	Diploma(Textile Technology)(ITM); BSc(Hons)(Textile Technology) (UiTM); PhD(Materials Science)(UKM)
Pegawai Penyelidik, Q44 Research Officer	Hamdan bin Yahya	BSc(Hons)(Materials Science)(UKM) MSc (Materials Engineering) USM
	Mohd Syahrir bin Mohd Rozi	BEng(Hons)(Chemical Engineering) (UTM)
	Mohd Idham bin Mustaffar	BEng(Hons)(Chemical Engineering) (UTM) MEng(Bioprocess Engineering) (UTM)
Pegawai Penyelidik, Q41 Research Officer	Norinsafrina binti Mustaffa Kamal (cuti belajar / study leave)	BEng(Hons)(Environmental Engineering) (Melbourne)
	Anuar bin Othman	Diploma(Science)(ITM) BSc(Hons)(Chemistry)(USM) BSc(Hons)(Industrial Chemistry)(UTM) MSc(Chemistry)(UTM)
	Roshaida binti Arbain	BEng(Hons)(Mineral Resources Engineering) (USM); MSc(Mineral Resources Engineering) (USM)
	Aspaniza bt. Ahmad	BEng(Hons)(Materials Engineering) (USM); MSc(Materials Engineering)(USM)
	Fatihah bt. Azmi	BEng(Hons)(Civil Engineering)(UMP); MSc(Enviromental Engineering) (USM)
	Hamizah bt Abdul Samad	BEng(Hons)(Materials Engineering) (USM); MSc(Materials Engineering)(USM)
	Siti Noorzidah bt. Mohd Sabri	BEng(Hons)(Materials Engineering) (USM); MSc(Materials Engineering)(USM)

Sarawak		
Pengarah, C54 Director	Enggong ak Aji, P.Geol	BSc(Hons)(Earth Science)(UKM); MSc(Exploration Mineral)(UKM)
Timbalan Pengarah, C52 Deputy Director	Hilary Muyan ak Nicholas Thomas, P.Geol	BSc(Hons)(Geology)(UM)
Ketua Unit, C52 Head Of Unit	Sulong ak Enjop, P.Geol	BSc(Hons)(Earth Science)(UKM); MSc(Hydrogeology)(London), DUCL
	Ismail bin Hanuar	BSc(Hons)(Chemistry)(USM),(MMIC)
Ketua Pegawai Geosains, C48 Principal Geologist	Ajon Winnie	BSc(Hons)(Geology)(UKM)
	Setebin @ Roslan bin Rajali	BSc(Hons)(Applied Geology)(UM) MSc(Env. Hydrogeology)(Cardiff, U.K)
	Jaithish John	BSc(Hons)(Applied Geology)(UM) MSc (Applied Geosciences)(University Of Pennsylvania, USA)
	Hussein bin Mohd Juni	BSc(Hons)(Geology)(Texas, USA)
	Edward ak Muol	BSc(Hons)(Applied Geology)(UM)
	Segar a/l Velayutham	BSc (Hons)(Chemistry)(USM), MMIC
Pegawai Geosains Kanan, C44 Senior Geologist	Zamzuri bin Ghazalee, P.Geol	BSc (Hons)(Applied Geology)(UM)
	Japri bin Bujang, P.Geol	BSc (Hons)(Geology)(UKM)
	Azzudin bin Shebli	Adv. Dip (Applied Chemistry)(ITM), MMIC MSc (Coal) (UNIMAS)
	Rengga ak Gendang	BSc (Hons)(Geology)(UM)
	Manggon ak Abot	BSc (Hons)(Geology)(UKM)
		MSc (Geology, Mineralogy & Petrology) (Oregon State, USA)
	Dr. Joseph Jubin ak Aruh @ Aro, P.Geol	BSc (Hons)(Geology)(UM) MSc (Pengurusan Sumber Lestari)(UPM) PhD (Environmental Hydrology and Hydrogeology) (UPM)
	Freddy ak Heward Chinta, P.Geol	BSc (Hons)(Earth Science)(UKM)
	Mohd Aswandi bin Ariff	BSc (Hons)(Industrial Chemistry)(UPM) (MMIC)
	Dana ak Badang, P.Geol	BSc (Hons)(Geology)(UKM); MSc (Environment Conservation)(UKM) PhD (Environmental and Development) (UKM)
	Julia ak Kaya, P.Geol	BSc (Hons)(Geology)(UKM)
	Hermawati binti Tambeng	BSc (Hons)(Applied Chemistry)(UiTM) (MMIC)
	Salehuddin bin Mohamad	B.Eng (Hons.)(Mineral Resources Engineering)(USM)
	Thomson ak Galin, P.Geol	BSc (Hons)(Geological Science)(Leeds). MSc (Earth Sciences by Research) (Royal Hollaway, University of London)

Pegawai Teknologi Maklumat F44 Information Technology Officer	Silvia Joseph	Ijazah Sarjana Muda Sains Komputer (Sistem Komputer) (UPM) Master Of Advanced Information Technology (Universiti Malaysia Sarawak)
Pegawai Geosains, C41 Geologist	Shahrul Ridzuan bin Zainal Rashid, P.Geol	BAppSc (Hons)(Geophsics)(USM)
	Clarence Anyau ak Tibu, P.Geol	BSc (Hons)(Geology)(UKM)
	Nazirrahmat bin Suleiman	(Hons)(Geology)(UKM)
	Ledyhernando Taniou, P.Geol	BSc (Hons)(Geology)(UMS)
	Zaidulkhair bin Jasmi, P.Geol	BSc (Hons)(Geology)(UKM)
	Mohd Firdaus bin Noor Azman	BSc (Hons)(Geology)(UMS)
	Mohd Afiq bin Mohd Atan, P.Geol	BSc(Hons)(Geology)(UMS)
	Angela EE	BSc (Hons)(Geology)(UMS)
	Marina binti Mardzuki	BSc (Hons) (Chemistry) (USM)(LMIC)
	Benson Ling Jin Yaw	BSc (Hons)(Geology)(UKM)

Sabah		
Pengarah, C54 Director	Mohd Yusop bin Ramli, P.Geol	BSc(Hons)(Geology)(UKM)
Timbalan Pengarah, C52 Deputy Director	Jontih Inggihon@Enggihon	BSc(Hons)(Geology)(UKM); Adv. Diploma(Computer Science)(UKM)
Ketua Unit, C54 Head Of Unit	Abdul Kadir bin Ahmad	BSc(Hons)(Chemistry)(UKM), AMIC
Ketua Unit, C52 Head Of Unit	Ir. Azman bin Ab. Majid *(until 01.05.2017)*	BSc(Hons)(Mining Engineering) (University of Leeds)(UK); Ahli Lembaga Jurutera Malaysia(Jurutera Profesional - 1995)
	Paulius Godwin @ Paulus	BSc(Hons)(Geology)(UKM)
	Nurul Huda Bin Romli *(from 15.05.2017)*	BEng(Hons)(Mineral Resources Eng.) (USM); MSc(OSH)(University of New South Wales) (Australia)
Ketua Pegawai Geosains, C48 Principal Geologist	Hilary Muyan Nicholas Thomas, P.Geol *(until 16.01.2017)*	BSc(Hons)(Geology)(UM)
	Che Aziz bin Che Soh, P.Geol *(until 28.02.2017)*	BSc(Hons)(Geology)(UKM)
	Dr. Frederick Francis Tating, P.Geol	BSc(Hons)(Earth Science)(UKM); MSc(Environment)(Kumamoto University); PhD(Eng. Geology & Rock Mechanic) (University of Twente)(Netherlands)
	Jenneth Cyril @ Liliana	BSc(Hons)(Geology)(UKM)
	Rokiah binti Abdullah *(until 16.01.2017)*	BSc(Hons)(Chemistry)(UKM), AMIC
	Morius Bantas	BSc(Hons)(Chemistry)(UKM); MSc(IT Management)(UTM); AMIC

Pegawai Geosains Kanan, C44 Senior Geologist	Fredolin Javino, P.Geol	BSc(Hons)(Applied Geology)(UM)
	Daulip @ Dee Dee Langkait @ L Lakkui, P.Geol	BSc(Hons)(Earth Science)(UKM)
	Jaineh Lingi, P.Geol	BSc(Hons)(Applied Geology)(UM); MSc(Geology)(UMS)
	Bailon Golutin, P.Geol	BSc(Hons)(Geology)(UMS)
	Cleafos Totu	BSc(Hons)(Earth Science)(UKM)
	Jayawati Fanilla Sahih binti Montoi	BSc(Hons)(Geology)(UM)
	Faye Donna Edmund, P.Geol	BSc(Hons)(Geology)(UKM); MSc(Applied Geosciences) (Pennsylvania,USA)
	Khairun Nasir bin Mokhtar	BSc(Hons)(Chemistry)(UM), AMIC
	Arthur Clement Makulim, P.Geol	BSc(Hons)(Geology)(UMS)
	Eddie Affandy bin Mohd Yuslee, P.Geol	BSc(Hons)(Geology)(UMS)
	Farid bin Zainudin, P.Geol	BSc(Hons)(Geology)(UMS)
	Alvyn Clancey Mickey, P.Geol	BSc(Hons)(Geology)(UMS); MSc(Geology)(UMS)
Pegawai Geosains, C41 Geologist	Mazrali bin Alway, P.Geol	BSc(Hons)(Applied Geology)(UM)
	Muhammad Umar bin Sarimal (*study leave – 02.09.2016-01.09.2018)*	BSc(Hons)(Geology)(UMS)
	Mahadi bin Santa	BSc(Hons)(Geology)(UMS)
	Mison bin Ajum	BSc(Hons)(Geology)(UMS)
	Kennedy bin Mohd Imran	BSc(Hons)(Applied Geology)(UM); MSc(Eng. Geology)(University of Newcastle Upon-Tyne)(England); M.D.(Zamboanga Medical School Foundation)
	Redzuan bin Ahmad Banjar, P.Geol	BSc(Hons)(Geology)(UM)
	Mazuan bin Roslan	BSc(Hons)(Geology)(UMS)
	Ahmad Khairut Termizi bin Mohd Daud, P.Geol	BSc(Hons)(Geology)(UMS); MSc(Geology)(UMS)
	Lim Li Chien, P.Geol	BSc(Hons)(Geology)(UMS)
	Goh Khean Siong, P.Geol	BSc(Hons)(Geology)(UKM); MSc(Geology)(UKM)
	Mohd Shafreen bin Mad Isa	BEng(Hons)(Mineral Resources Eng.) (USM)
	Nurul Sakinah binti Ab. Satar	BSc(Hons)(Chemistry)(UiTM)
Pegawai Teknologi Maklumat, F41 IT Officer	Azlan bin Ahmad	BSc(Hons)(Computer Science)(UKM)

Pahang		
Pengarah, C54 Director	Dato' Ir. Azman Bin Ab. Majid (Mulai 01.05.2017)	B.Sc.(Hons)(Mining Engineering) University of Leeds, UK
Timbalan Pengarah, C52 Deputy Director	Wan Saifulbahri Bin Wan Mohammad, P.Geol	B.Sc. (Hons)(Geologi) UKM
Ketua Pegawai Geosains, C48 Principal Geologist	Mohamed Hizam Bin Abdul Kadir (Mulai 01.10.2017)	B.Eng.(Hons)(Mineral Resources) USM
	Hj. Shari Bin Ismail, P.Geol	B.Sc. (Hons)(Geologi Gunaan) UM
Pegawai Geosains Kanan, C44 Senior Geologist	Mohammad Aznawi Bin Hj. Mat Awan, P.Geol	B.Sc. (Hons)(Geologi) UKM
	Zainal Abidin Bin Jamaluddin, P.Geol	M.Sc.(Geofizik/Kejuruteraan dan Persekitaran) UKM; B.Sc. (Hons)(Geologi) UKM
	Yusuf Bin Imbun, P.Geol	B.Sc.(Hons)(Geologi) UKM
	Adha Syuraini Bin Abd Ghani	B.Eng.(Hons)(Mineral Resources) USM
	Zaki Bin Alias, P.Geol	B.Sc.(Hons)(Geologi Gunaan) UM
Pegawai Geosains, C41 Geologist	Mohd Asnizam Bin Ayub, P.Geol	B.Sc.(Hons)(Geologi) UKM
	Mohammad Sobri Bin Borhan	B.Eng.(Hons)(Mineral Resources) USM
	Muhammad Bin Abdullah	B.Sc.(Hons)(Geologi) UMS
	Zaidi Bin Mat Zin	B.Sc.(Hons)(Geologi) UKM
	Nafizah Binti Md. Padzin	B.Sc.(Hons)(Sains Gunaan) UMK
	Khairunnisa Binti Alias	B.Sc.(Hons)(App.Geology) Penn. State, USA

Perak		
Pengarah, C54 Director	Mohd. Sidi bin Daud, P.Geol	Bsc(Hons)(Geology)(UKM)
Timbalan Pengarah, C52 Deputy Director	Mohd. Zaidi bin Mohd. Hasan, P.Geol	Bsc(Hons)(Geology)(UKM)
Ketua Pegawai Geosains, C48 Principal Geoscience Officer, C48	Basharuddin bin Ismail, P.Geol	BSc(Hons)(Geology)(UKM)
Pegawai Geosains Kanan, C44 Senior Geoscience Officer, C44	Nor Azian bin Hamzah (sehingga/ until 1.3.2017)	BSc(Hons)(Geology)(UKM)
	Othman bin Kangsar, P.Geol	BAppSc(Hons)(Geophysics)(USM) MSc(Eng. & Environment Geophysic) (UKM)
	Mustaza B. Mustafa	BEng(Hons)(Mineral Resources Eng.) (USM)
	Suzannah binti Akmal, P.Geol (study leave from 5.9.2016)	BSc(Hons)(Geology)(UM)
	Azmi bin Abu Bakar, P.Geol	BSc(Hons)(Applied Geology)(UM) MSc(Geology)(UKM)

Pegawai Geosains, C41 Geoscience Officer, C41	Mohd. Shahrizal bin Mohamed, P.Geol Sharifodin (study leave from 5.9.2016)	BSc(Hons)(Geology)(UKM)
	Zaiton binti Abdullah	BEng(Hons)(Mineral Resources Eng.) (USM)
	Azizan anak Juhin, P.Geol	BSc(Hons)(Geology)(UMS)
	Saiful bin Abdullah, P.Geol	BSc(Hons)(Geology)(UKM)
	Muhammad Azfar bin Kamaruddin, P.Geol	BSc(Hons)(Geology)(UMS)
	Hanizam Shah bin Saidin	BEng(Hons)(Mineral Resources Eng.) (USM) MSc(Mineral Resources Eng.)(USM)
	Nurul 'Amalina binti Md. Nor	BSc(Hons)(Geology)(UM) MSc(Geotechnical Eng.)(UiTM)
	Asman bin Alias, P.Geol	BSc(Hons)(Geology)(UMS)
	Nur Asikin binti Rashidi, P.Geol	BSc(Hons)(Geology)(UKM) MA(Archaeology)(USM)

Johor		
Pengarah, C54 Director	Kosong	
TimbalanPengarah, C52 Deputy Director	Mohamad Sari bin Hasan, P. Geol	BSc(Hons) (Geology) (UKM)
Ketua Unit (Geosains), C48 Head Of Unit	Noorazhar bin Ngatimin, P. Geol	BSc(Hons) (Geology) (UM)
Ketua Unit (Pembangunan Lombong dan Kuari), C48 Head Of Unit	Kosong	
Pegawai Geosains, C44 Head Of Unit	Nor Asmah binti Abd Aziz, P. Geol	BSc(Hons) (Geology) (UKM)
	Mohd Fauzi bin Rajimin @ Jeman, P. Geol	BSc(Hons) (Geology) (UKM)
	Muhammad Hazli bin Mohamed Hanapi, P. Geol	BSc(Hons) (Applied Geology) (UM)
	Mohammed Syahrizal bin Zakaria	BSc(Hons) (Geology) (UKM)
	Norhazidi bin Masrom, P. Geol	BSc(Hons) (Geology) (UKM)
	Noraini binti Basiri, P. Geol	BSc(Hons) (Geology) (UKM)
	Mohd Hisham bin Md Nawi	BEng(Hons) (Mineral Resources Eng.) (USM)
Pegawai Geosains, C41 Geoscience Officer	Arda Anasha binti Jamil	BSc(Hons) (Geology) (UM)
	Yong Adilah binti Musfata	BSc(Hons) (Geology) (UM)
	Nur Syahidatul Zubaida binti Abilah @ Abdillah	BSc (Geoscience opt Hidrogelogy) (Pennsylvania State University, USA)
	Ahmad Fadhil bin Ahmad, P. Geol	BSc(Hons) (Geology) (UMS)
	Muhammad Falah bin Zahri	BSc(Hons) (Geology) (UMS)

Selangor/W. Persekutuan		
Pengarah, C54 Director	Henri Litong Among, P.Geol (bersara pada / retired of 1.8.2017)	Bsc(Hons)(Geology)(UKM)
Timbalan Pengarah, C52 Deputy Director	Tuan Rusli bin Tuan Mohamed, P.Geol (Mulai/ from 16.1.2017)	Bsc(Hons)(Geology)(UKM) MSc (Eng.Geology)(UKM)
Ketua Unit, C48 Head Of Unit, C48	Abdul Hadi bin Abdul Rahman, P.Geol (Mulai / from 1.2.2017)	BSc(Hons)(Geology)(UM) MSc (Eng.Geology)(UKM)
	Faizal bin Arshad	Beng (Hons) (Mineral Resources Eng.) (USM)
Ketua Unit, C44 Head Of Unit, C44	Ropidah binti Mat Zin, P.Geol	BSc (Hons) (Applied Geology) (UM) MSc (GIS) (UiTM)
Pegawai Geosains Kanan, C44 Senior Geoscience Officer, C44	Hasnida binti Zabidi @ Zainudi	BSc(Hons)(Earth Science)(UKM)
	Mahat bin Sibon, P.Geol	BSc(Hons)(Geology)(UM) MSc(Geology)(UKM)
	Qalam A'zad bin Rosle	BSc(Hons)(Geology)(UM) MSc(Structural Geology with Geophysics)(Leeds)
	Mazatul Akmar binti Aros	BSc(Hons)(Geology)(UM)
Pegawai Geosains, C41 Geoscience Officer, C41	Muhammad Ezwan bin Dahlan	BSc(Hons)(Geology)(UKM)
	Nur Diyana binti Yahya	BEng(Hons)(Mineral Resources Eng.) (USM)
	Ahmad Khuzer bin Mohamad Azmi	BEng(Hons)(Mineral Resources Eng.) (USM)
	Mohammad Ramzanee bin Mohd Noh	BSc(Hons)(Geology)(UKM)
	Muhammad Anasrullah bin Abd Rahim, P.Geol	BSc(Hons)(Aplied Geology)(UM)
	Wan Neqhaikal bin Wan Abdul Karim	BSc (Hons)(Geology)(UM)

Kelantan		
Pengarah, C54 Director	Mohd Nazan bin Awang, P.Geol (sehingga / until 14.09.2017)	BSc(Hons)(Earth Science)(UKM)
	Che Abdul Rahman bin Jaafar, P.Geol (mulai / from 16.10.2017)	BSc(Hons)(Earth Science)(UKM)
TimbalanPengarah, C52 Deputy Director	Mohamad Hussein bin Jamaluddin	BSc(Hons)(Geology)(UKM)
Ketua Unit, C48 Head Of Unit	Yusuf bin Bujang, P.Geol (sehingga / until 15.01.2017)	BSc(Hons)(Geology)(UKM) MSc(Hydrogeology)(London)
	Nurzaidi bin Abdullah, P.Geol (mulai / from 01.06.2017)	BSc(Hons)(Geology)(UKM) MSc(Remote Sensing)(UPM)
Ketua Unit, C44 Head Of Unit	Mohamad Yusof bin Che Sulaiman, P.Geol	BSc(Hons)(Applied Geology)(UM)
	Mat Wadi bin Ab Satar	BEng (Hons)(Mineral Resources Eng.) (USM)
Pegawai Geosains Kanan, C44 Senior Geoscience Officer	John ak Joseph Jinap (sehingga / until 05.09.2017)	BSc (Hons)(Applied Geology)(UM)
	Mohd Yuzlan bin Yusoff, P.Geol (sehingga / until 31.01.2017)	BSc (Hons)(Applied Geology)(UM)
	Ahmad Rosli bin Othman, P.Geol	BSc (Hons)(Applied Geology)(UM) MSc (Alam Sekitar & Pembangunan)(UKM)
	Mohamed Asri bin Omar, P.Geol	BSc (Hons)(Geology)(UKM)
Pegawai Geosains, C41 Geoscience Officer	Aidil bin Arnolous Rema	BEng (Hons)(Mineral Resources Eng.) (USM)
	Muhammad Azri bin Ismail	BSc (Hons)(Geology)(UM)
	Muhammad Kamal bin Kamarudin	BSc (Hons)(Geology)(UKM)

N. Sembilan / Melaka		
Pengarah, C54	Mohd Badzran bin Mat Taib, P.Geol Hingga 1 Ogos 2017 Joanes bin Muda, P.Geol Mulai 16 Oktober 2017	BSc(Hons)(Geology)(UKM) BSc(Hons)(Earth Science)(UKM) MSc(Geology) (UMS)
Timbalan Pengarah, C52	Azemi bin Hj. Eki, P.Geol	BSc(Hons)(Geology)(UKM) MSc(Material Eng.)(USM)
Ketua Unit, C48	Azizan bin Ali, P.Geol	BSc(Hons)(Applied Geology)(UM) MSc(Engineering Geology)(UKM)
Pegawai Geosains,C48	Dorsihah binti Mohamad Jais, P.Geol	BSc(Hons)(Geology)(UM)
Ketua Unit,C44	Hairul bin Mohamed Shaharudin	BSc(Hons)(Mineral Resources Eng.) (USM)
Pegawai Geosains Kanan,C44	Azhar bin Ahmad Nazri, P.Geol	BSc(Hons)(Earth Science)(UKM)
	Norhayati binti Mohd Rawi, P.Geol	BSc(Hons)(Geology)(UKM)
	Masrita binti Mohd Aras, P.Geol	BSc(Hons)(Geology)(UKM)
	Mohd Nizam bin Md Nordin	BSc(Hons)(Geology)(UKM)
Pegawai Geosains,C41	Muhammad Nursafwan bin Mustafa	BSc(Hons)(Science)(Applied Geology) (UM)
	Siti Fariza binti Abdul Hamid, P.Geol	BSc(Hons)(Geology)(UKM)
	Noran Nabilla binti Nor Azlan	BSc(Hons)(Geology)(UKM)

Terengganu		
Pengarah, C54 Director	Mohd Zukeri bin Ab. Ghani, P.Geol (sehingga/ until 05.06.2017)	BSc(Hons) (Geology) (UKM), BoG
Timbalan Pengarah, C52 Deputy Director	Che Abdul Rahman bin Jaafar, P.Geol (sehingga/ until 01.03.2017)	BSc(Hons)(Earth Science)(UKM), BoG
	Che Aziz bin Che Soh, P.Geol (mulai/ from 01.03.2017)	BSc(Hons)(Earth Science)(UKM), BoG
Ketua Unit, C48 Head of Unit	Hamlee bin Ismail, P.Geol	BSc(Hons)(Geology)(UKM), MSc (Industrial Mineral) (UKM), BoG
Ketua Pegawai Geosains, C48	Abdul Hadi bin Abdul Rahman, P.Geol (sehingga/ until 01.03.2017)	BSc(Hons)(Geology)(UM), MSc (Industrial Mineral) (UKM), BoG
Ketua Unit, C44 Head of Unit	Tang @ Tan Hai Hong, Ir.	BEng(Hons)(Mineral Resources Eng.) (USM)
	Suhaimizi bin Yusof, P.Geol (sehingga/ until 15.02.2017)	BSc(Hons)(Earth Science)(UKM) MSc(Geomatic Engineering)(UPM), BoG
	Muhammad Fadzli bin Deraman, P.Geol (mulai/ from 15.02.2017)	BSc(Hons)(Applied Geology)(UM) BEng(Hons)(Civil)(UiTM), BoG
Pegawai Geosains, C41	Norzuhairil bin Zubir, P.Geol	BSc(Hons)(Geology)(UKM), BoG
	Razaidi Shah bin A Kadir, P.Geol	BSc(Hons)(Geology)(UMS), BoG
	Khairul Nazri bin Yaakub, P.Geol	BSc(Hons)(Geology)(UM), BoG
	Nor Azrah binti Md Atan	BSc(Hons)(Geology)(UKM)
	Mohd Faiz bin Ahmad Roshdi	BSc(Hons)(Applied Geology)(UM)

Kedah /Perlis / P. Pinang		
Pengarah, C54 Director	Azhari bin Ahmad, P.Geol (mulai / from 16.Okt 2017)	BSc (Hons) (Geophysics) (USM)
Timbalan Pengarah, C52 Deputy Director	Yusuf bin Bujang, P.Geol from	BSc (Hons) (Geology) (UKM) MSc (Hidrogeology) (London)
Ketua Unit Sumber Mineral, C48 Head Of Unit	Hamdan bin Ariffin, P.Geol	BSc (Hons) (Applied Geology) (UM) MSc (Mineral Resources Eng.) (USM)
Ketua Unit Pengurusan Maklumat, C44 Head Of Unit	Badrol bin Mohamad, P.Geol	BSc (Hons) (Earth Science) (UKM)
Ketua Unit Lombong dan Kuari, C44 Head Of Unit	Ir. Tony Chew	BEng (Hons) (Mineral Resources Eng.) (USM) MBA (UMS)
Pegawai Geosains Kanan, C44 Senior Geoscience Officer	Ahmad Zamani bin Samat, P.Geol	BSc (Hons) (Geology) (UM) MSc (Engineering & Geophysics) (UKM)
Pegawai Geosains Kanan, C44 Senior Geoscience Officer	Nur Susila binti Md Saaid, P.Geol	BSc (Hons) (Applied Geology) (UM) MSc (Sedimentology & Stratigraphy) (UKM)
Pegawai Geosains Kanan, C44 Senior Geoscience Officer	Wan Salmi bin Wan Harun, P.Geol	BSc (Hons) (Applied Geology) (UM) MSc (Engineering & Environmental Geophysics) (UKM)
Pegawai Geosains, C41 Geoscience Officer	Azihan bin Mat Arshad	BEng (Hons) (Mineral Resources Eng.) (USM)
Pegawai Geosains, C41 Geoscience Officer	Muhammad Mustadza bin Mazni, P.Geol	BSc (Hons) (Geology) (UMS)
Pegawai Geosains, C41 Geoscience Officer	Fakhruddin Afif bin Fauzi, P.Geol	BSc (Hons) (Geology & Geophysics) (University of Adelaide)
Pegawai Geosains, C41 Geoscience Officer	Anis Nasuha binti Mustapha @ Rosli, P.Geol	BSc (Hons) (Applied Science Geophysics) (USM) MSc (Applied Geophysics) (USM)
Pegawai Geosains, C41 Geoscience Officer	Amer Ekram bin Azmi, P.Geol	BSc (Hons) (Geology) (UM)

Jawatan Kader Di Agensi Luar
Cader Posts In Other Agencies

Jabatan Kerja Raya **Public Works Department**		
Ketua Pegawai Geosains, C48 Principal Geoscience Officer	Nicholas Jacob a/l T. Jacob, P.Geol Sehingga / Until 15 Januari 2017	BSc (Hons) (Geology) (UKM) MSc (Environment) (UPM)
	Zaidi bin Daud, P.Geol	BSc(Hons)(Geology)(UM)
	Abd. Rashid bin Ahmad	BSc(Hons)(Geology)(UKM)
	Afandi bin Muda, P.Geol	BSc(Hons)(Applied Geology)(UM)
	Habibah binti Tahir Mulai / From 02 Februari 2017	BSc(Hons)(Geology)(UKM) MSc (Environment) (UPM)
Cawangan Kejuruteraan Jalan & Geoteknik Road & Geotechnic Engineering Branch		
Pegawai Geosains Kanan, C44 Senior Geoscience Officer	Hisam bin Haji Ahmad, P.Geol	BSc(Hons)(Geology)(UM) MSc (Engineering and Environment Geophysics)
Kementerian Tenaga, Teknologi Hijau & Air **Ministry of Energy, Green Technology & Water**		
Jabatan Bekalan Air		
Pegawai Geosains, C41 Geoscience Officer	Nik Mohd Nishamuddin bin Nik Rahimi	BSc(Hons)(Geology)(UKM)
	Kamarulbahrin Hashim, P.Geol (Sehingga / Until 30 September 2017)	BSc(Hons)(Applied Geology)(UM)
Kementerian Wilayah Persekutuan Malaysia **Ministry of Federal Territories**		
Jabatan Bekalan Air		
Ketua Pegawai Geosains Kanan, C52 Principal Geoscience Officer	Nizarulikram bin Abdul Rahim, P.Geol	BSc(Hons)(Geology)(UKM) Master of Intellectual Property (UKM)
Pegawai Geosains, C41 Geoscience Officer	Mohd. Firdaus bin Noor Azman Mulai / From 6 September 2017	BSc(Hons)(Geology)(UMS)
Kementerian Sains, Teknologi dan Inovasi **MOSTI**		
Jabatan Meteorologi		
Ketua Pegawai Geosains, C48 Principal Geoscience Officer	Dr. Mohamad Abd. Manap, P.Geol Mulai / From 15 Jun 2017	BSc(Hons)(Earth Science)(UKM) MSc (Remote Sensing) (UPM) PhD (Environmental Hydrology and Hydrogeology) (UPM)