



**British
Geological Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL

**Report on the BGS work in
Afghanistan 2004-2008.
Prepared for the visit of H.E.
Minister Shahrani to BGS, 22
June 2010**

International Programme

Open Report OR/11/038



BRITISH GEOLOGICAL SURVEY

INTERNATIONAL PROGRAMME

OPEN REPORT OR/11/038

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Richard Ellison

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Balloon sellers of Kabul.
Picture by Bob McIntosh.

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BRITISH GEOLOGICAL SURVEY

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The London Information Office also maintains a reference collection of BGS publications, including maps, for consultation.

We publish an annual catalogue of our maps and other publications; this catalogue is available online or from any of the BGS shops.

The British Geological Survey carries out the geological survey of Great Britain and Northern Ireland (the latter as an agency service for the government of Northern Ireland), and of the surrounding continental shelf, as well as basic research projects. It also undertakes programmes of technical aid in geology in developing countries.

The British Geological Survey is a component body of the Natural Environment Research Council.

British Geological Survey offices

BGS Central Enquiries Desk

Tel 0115 936 3143 Fax 0115 936 3276
email enquiries@bgs.ac.uk

Kingsley Dunham Centre, Keyworth, Nottingham NG12 5GG

Tel 0115 936 3241 Fax 0115 936 3488
email sales@bgs.ac.uk

Murchison House, West Mains Road, Edinburgh EH9 3LA

Tel 0131 667 1000 Fax 0131 668 2683
email scotsales@bgs.ac.uk

Natural History Museum, Cromwell Road, London SW7 5BD

Tel 020 7589 4090 Fax 020 7584 8270
Tel 020 7942 5344/45 email bgs_london@bgs.ac.uk

Columbus House, Greenmeadow Springs, Tongwynlais, Cardiff CF15 7NE

Tel 029 2052 1962 Fax 029 2052 1963

Maclean Building, Crowmarsh Gifford, Wallingford OX10 8BB

Tel 01491 838800 Fax 01491 692345

Geological Survey of Northern Ireland, Colby House, Stranmillis Court, Belfast BT9 5BF

Tel 028 9038 8462 Fax 028 9038 8461

www.bgs.ac.uk/gsni/

Parent Body

Natural Environment Research Council, Polaris House, North Star Avenue, Swindon SN2 1EU

Tel 01793 411500 Fax 01793 411501
www.nerc.ac.uk

Website www.bgs.ac.uk

Shop online at www.geologyshop.com

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BRITISH GEOLOGICAL SURVEY PROJECT ON INSTITUTIONAL STRENGTHENING OF THE AFGHANISTAN GEOLOGICAL SURVEY 2002-2008

1 BRIEF DESCRIPTION OF WORK

The overarching aim of the project was to develop capacity in the Afghanistan Geological Survey (AGS) so that it can play its proper role in helping Afghanistan to develop a viable minerals industry. Within this agenda the project has made available existing AGS archive data, and has developed an operational mines office capable of interfacing with international and national investors. As the project progressed, the emphasis of the work moved to promote the potential of Afghanistan's mineral resources to the outside world, through the AGS web site and in commodity brochures. Substantial progress was made also in the initiation of laboratory facilities and the commencement of structured work programmes in the AGS for the first time since the late 1980s.

An important comment on this project was made in the DFID Annual Review of February 2007:

".....Unambiguously, this project has contributed to the overall goal and purpose of creating a viable Afghan minerals industry through institutional strengthening and capacity building of the AGS...."

Approximate cost at FEC

An accountable grant from DFID, value c.£3.8M

The main beneficiaries

Work was carried out for the Afghanistan Ministry of Mines, often guided personally by the Minister, who intervened on several occasions.

The main beneficiaries include the staff of the Afghanistan Geological Survey, who received more than 50 technical training courses. In addition 150 staff were trained in English to level 3 or above and 90 staff graduated from training in basic IT. Notable amongst these beneficiaries are numerous women employees whose participation was assisted by the project funding a crèche. This is a major achievement bearing in mind that the Geological Survey only started to function again when the Taleban left Kabul in 2001.

Indirectly the Afghan nation will benefit from the work undertaken to promote Afghanistan's mineral resources and develop the mining sector. One such example is Aynak, a world-class stratabound copper deposit estimated to contain approximately 240 million tonnes of ore of good grade situated some 35 km south of Kabul. It had been investigated extensively in the 1970s and 1980s by Russian geologists. Their work was curtailed in 1989 with the withdrawal of Russian advisors, and the subsequent civil war halted any further activity. The Russian reports on the deposit were placed in the Afghanistan Geological Survey who stored them for safe keeping until the commencement of the BGS project in 2002.

The BGS team was responsible for translating, scanning and collating all the information on Aynak, including 78 Reports and 1300 maps which were mostly in Russian and based on obsolete Soviet methodology, and making it available in brochures and via a web site (for visitor statistics see below). In addition a 3-D model was built as a visualisation tool for prospective investors.

That work was the impetus for a public tendering process in October and November 2006, overseen by the World Bank, to attract suitable international mining companies to bid for exploration and exploitation rights of the deposit. It attracted fourteen international mining companies of which the Kabul Government shortlisted nine, from countries including Russia, the US, China and India. BGS was involved as advisors and the provider of information throughout the pre-qualification and tendering stages which culminated in the award of a contract in 2008.

Benefit to the public

The importance of a mining industry to private sector investment and revenue collection is well documented. The Government of Afghanistan has acknowledged that development of mineral resources will require substantial investment (eg in power generation) and that in order to attract and retain investment it needs to create an enabling environment for which the BGS project has provided a strong information platform.

In addition, artisanal mining and economic activity to develop the mining sector will help to alleviate poverty and reliance on the narcotic trade in rural areas

2 TIMELINE FOR BGS INVOLVEMENT IN AFGHANISTAN

November 2002	Visit to Kabul by Ian Penn and Mike Stephenson Plan for reconstruction of the Afghan Geological Survey
January 2003	Minister of Mines Mohammadi visits BGS Memorandum of Understanding signed
February 2003	Visit to Kabul by Mike Petterson
February 2003	Minister of Mines Mohammadi killed in plane crash
September 2003	Visit by Dave Greenbaum and Mike Petterson “...spirit of enthusiasm in AGS.....”
May 2004	Visit by Dave Greenbaum, Mike Petterson and Ian Penn AGS staff profiles and training plan completed
July 2004	BGS proposal formally submitted to DfID.
August 2004	Project set up Visit by Greenbaum and McIntosh
September 2004	Accountable grant of £3.84M awarded by DfID
October 2004	Presidential elections
October 2004	Project team in residence, Pete Dunkley PL “...electricity supply officially reduced to 4 hours in 48....”
February 2005	AGS web site running
March 2005	Refurbished BGS rooms completed

September 2005	Pete Dunkley departed, Clive Mitchell and Stan Coats took over shared PL role
September 2005	UNOPS refurbishment of AGS started “...advised and facilitated by BGS...”
November 2005	3D model of Aynak completed
December 2005	BGS moved into AGS Annex
February 2006	DfID mid term review by Graeme Hancock and Chris Morgan “...performing extremely well ...challenging circumstances... technical competence consistently high...” “the highest score of all DfID projects in Afghanistan”
May 2006	Adam Smith International contracted to work on PRR
July 2006	BGS staff withdrawn from Kabul for 4 weeks “...unacceptable level of risk...”
July 2006	Abdul Wasay appointed Director AGS
August 2006	Official opening of AGS buildings
November 2006	Minister of Mines Taniwal murdered in Paktia
January 2007	PRR stage 2 approved by Minister of Mines, Adel
February 2007	DfID Annual Review by Roger Nellist “...continues a good job....work deserves wider recognition...”
May 2007	First visit to project by DfID Afghanistan (Miguel Laric)
July 2007	Project extension approved from Oct 07 until March 08 (value £343,000) “Care and maintenance basis with full PRR commitment”
October 2007	Project extension started
January 2008	Final BGS visit to Kabul and completion of closure handover report
March 2008	ASI final report delivered
June 2008	Abdullah Geology and Mineral Resources of Afghanistan printed
July 2008	DfID Project completion review by Peter Jensen
July 2008	Internal BGS Project closure meeting



Afghanistan Minister of Mines Mohammadi and David Ovadia (BGS International) signing the memorandum of understanding, Keyworth September 2002



Afghanistan Minister of Mines Adel speaking at the BGS farewell party, Kabul January 2008

3 PRINCIPAL OUTPUTS FROM THE PROJECT

Reports on the geology and mineral resources of Afghanistan

- All available reports, 2600 in total, are brought together in an archive room, indexed, translated from Russian to English, and put into a database with 9400 entries including reference to maps and other annexes contained in the reports.
- Scans made of 200 of the reports (concerning Aynak, coal resources and industrial minerals)

2006-2008 Commodity brochure series:

The Hajigak Iron Ore Deposit

Rare Metal deposits

The potential for Copper

The Aynak Copper Deposit

Marbles of Afghanistan

Gemstones of Afghanistan

The potential for Gold

2008 The Geology and Mineral Resources of Afghanistan, 2 Vols. British Geological Survey Occasional Publication No. 15.

2008 Industrial Minerals, June, p54-59. Afghanistan: Revival and Redevelopment.

2008 Proceedings of 15th Extractive Industry Geology conference, Cardiff. On the road to Qalamkar: The Block Seller of Kabul.

2008 Map of Industrial Mineral Resources in the Greater Kabul area. Afghanistan Geological Survey website (available as .pdf download).

2008 BGS Afghanistan project. Interview for BBC Midlands Today

2008 Environmental Geochemistry and Health. (paper accepted for publication) "A pilot study on iodine in soils in Greater Kabul and Nangahar provinces of Afghanistan".

2007 NERC News, Natural Environment Research Council Newsletter. "BGS helps to rebuild Afghan laboratory capability."

2007 Geoscientist, 17, No. 8, "Laboratories for Afghanistan".

2007 Chemistry World Vol. 4, No.6. "Between a Rock and a Hard Place".

2007 NERC News, January 2007. Natural Environment Research Council Newsletter. "BGS helps to rebuild Afghan laboratory capabilities".

2007 "Thin Section Preparation in Afghanistan" Logitech White Paper, http://www.logitech.uk.com/enote/En197_Geo/form.asp, accessed December 13th 2007.

- 2007** Royal Society of Chemistry Podcast Interview, June 2008. “Rebuilding laboratories in Afghanistan”.
- 2007** Papers given at the International Conference on Geology and Mineral Resources of Afghanistan, 15-16 October 2007, Kabul:
- Institutional Strengthening of the Afghanistan Geological Survey.
- The Sediment-Hosted Aynak Copper Deposit, Logar Province, Afghanistan.
- 2006** Planet Earth. “Repairing war damage in Afghanistan”.
- 2006** Planet Earth. “Afghanistan’s gemstones”.
- 2006** Mining Journal Special Publication 2006. “Afghanistan”.
- 2005** Geoscientist Vol 15 part 9. “The human story: a survey in wartime”.
- 2005** Earthwise 22, 8-9. A fresh start in Afghanistan.
- 2005** Capacity building of developing country public sector institutions in the natural resource sector. 185-194 *in* Marker, B R, Petterson, M G., McEvoy, F and Stephenson, M H (editors). Sustainable Minerals Operations in the Developing World. Geological Society of London Special Publication No. 250.
- 2004** British Association for the Advancement of Science, Exeter. Presentation: “A new Survey for a new nation - M G Petterson presents an overview on the BGS – Afghanistan project
- 2003** Geoscientist Vol 13 part 3. “Rebuilding a survey”
- 2003** DFID Earthworks, 16, 6. Reconstructing the Afghan Survey.
- 2003** Geoscientist, 13, 16-17. Dynamism and optimism of Afghanistan’s geologists will drive reconstruction of Afghanistan Geological Survey and the natural resources sector.
- 2002** DFID Earthworks, 15, 3. Training needs analysis for geoscience organisations

General Advice to AGS staff, local stakeholders and international visitors

- An estimated 2500 individual visits were made to the BGS office (an average of four per day) where information and advice was given on a large range of geoscientific matters.

Training

- 56 students from the Kabul University and Kabul Polytechnic have participated in training courses since May 2006.
- 150 staff trained in English to level 3 or above, including 17 at advanced level, and 42 more are currently training above level 3.
- 99 staff have graduated from the training in basic IT, and 43 more are currently taking the course.
- Sustained on the job training has taken place over 3 years in:
 - Scanning reports and data
 - Use of databases for registration of data and samples, and recording test data
 - Use of rock cutting machinery and thin section making
 - Industrial minerals collection and testing
 - Geochemical laboratory management and testing
- 52 specific training courses, lectures, and workshops have been given (listed below) – mainly for AGS staff, but with some participation by Ministry of Mines staff and University students

	Course Name	Course Date	Participants
1	Intermediate Petrology (office based)	August '07	8
2	Field Geology 3 (field based)	July '07	20
3	Basic Geology 2 (office based)	June 07	25
4	GIS	May '07	12
5	Mineral economics: Lead and Zinc	May 07	20
6	Field Geology 2 (field based)	April '07	16
7	Gemmology	March 07	4
8	GIS introduction given by LIWAL	March 07	13
9	Thin section	February-March 07	9
10	Industrial minerals and construction	February 07	9
11	Map and Compass Work (office based)	March '07	41
12	UAE Field Geology (field based)	January '07	12
13	Introduction to Petrology (office based)	November 06	9
14	Basic Geology 1 (office based)	August '06 - January '07	45
15	Field Geology 1 (field based)	August '06 - January '07	25
16	Geological Field Techniques (office based)	November 06	25

17	Observation & Collection of Construction Materials (field based)	August '06 - January '07	10
18	Upkeep of gemmology laboratory & maintenance of thin section collection	November 06	10
19	Refresher course on Introduction to Vulcan Modelling	November 06	6
20	Mineral economics	October 06	18
21	Modern Photographic Techniques & basic use of Photoshop software	October 06	10
22	Role of Geological Surveys in Promoting Inward Investment to the Mining Sector	November 06	20
23	Familiarisation of the Aynak Data Package	January 07	10
24	Thin Section	November 06	8
25	Basic Overview of the Modern Mining Industry & the Role of the Cadastre System	February '06 - July '06	19
26	Intermediate level database development using Microsoft Access	February '06 - July '06	12
27	Introduction to database development using Microsoft Access	February '06 - July '06	9
28	Introduction to Igneous Rocks	February '06 - July '06	10
29	Introduction to Remote Sensing	February '06 - July '06	10
30	Introduction to Plate Tectonics	February '06 - July '06	10
31	Introduction to Volcanology	February '06 - July '06	10
32	Metallic and Industrial Minerals exploration (office and field based)	February '06 - July '06	15
33	Mineral Economics (commodity trading & production techniques)	February '06 - July '06	20
34	Introduction to Vulcan Modelling	February '06 - July '06	6
35	Minerals in the Marketplace (office and field based)	February '06 - July '06	25
36	Organisational Management	February '06 - July '06	32
37	Impact of Mineral Taxation on Inward Investment to Afghanistan	February '06 - July '06	40
38	Laboratory Training in Industrial Minerals Evaluation	February '06 - July '06	10
39	Mining Industry	August '05 - January '06	19
40	Mining systems	August '05 - January '06	19

41	Mineral Exploration & Evaluation	August '05 - January '06	6
42	Laboratory Training in Industrial Minerals Evaluation	August '05 - January '06	12
43	Studio & Field Photography Techniques & processing/metadata	August '05 - January '06	6
44	Seminars for senior management	August '05 - January '06	30
45	Restructuring of the AGS	February '05 - July '05	26
46	Mining Industry and Mining Cadastre Systems	February '05 - July '05	19
47	Mineral Exploration and Evaluation	February '05 - July '05	6
48	Data entry of archive collections	February '05 - July '05	8
49	Scanning in the digitisation suite	February '05 - July '05	8
50	Industrial minerals workshop	February '05 - July '05	80
51	Seminars for senior management	February '05 - July '05	50
52	Industrial Minerals Workshop	October '04 - February '05	110

National promotional material

- Publication of a major article on Afghanistan's mineral potential in the August 2006 edition of the Mining Journal (the leading technical publication of the international mining industry);

Brochures on:

- Aynak Copper Deposit
- The potential for Copper
- Gemstones of Afghanistan
- Afghanistan Marble
- Lead Zinc mineralization
- Achin magnesite deposit
- Rare Metal deposits
- The potential for Gold
- Hajigak iron deposit
- *Geology and Mineral Resources of Afghanistan* by Abdullah: prepared in English with illustrations and tables re-drawn. To be made available as a print on demand via the AGS website.

Active advice and assistance has been given to Afghanistan's new international mineral promotion effort at:

- 3 international PDAC conferences in Canada
- Mines and Money conference in London

- Presentations at two other international minerals industry conferences;
- Marble promotion event in Dubai, September 07

Aynak

- BGS has developed a 3D Vulcan technical model of Aynak, probably the single most high-level professional technical output of the whole project,
- BGS facilitated the Aynak tendering process
- Aynak information package produced for PDAC
- Data package prepared for Aynak tender bidders

Laboratories and other rooms

BGS has maintained and equipped 5 key technical laboratories and support facilities:

- Industrial Minerals sample preparation and testing lab
- Thin section lab
- Petrography lab
- Gemmology lab
- Geochemistry lab
- Sample registration room
- Rock Cutting room

- In addition BGS maintains 7 other rooms in the Annex, including the BGS office, training rooms, server room etc.

- 8 offices in the main building refurbished (prior to move into Annex offices)

Databases and other information made available

- All Russian topographic maps at 1:250 000: on AGS server
- All Russian 1:250 000 geological maps, digitized by the USGS: on AGS server
- Legacy thin sections collection registered and cleaned: 4264 slides, and 2088 photographs
- Archive photographs: 1240 scanned and registered
- 10 000 photos from current projects registered and listed

AGS website

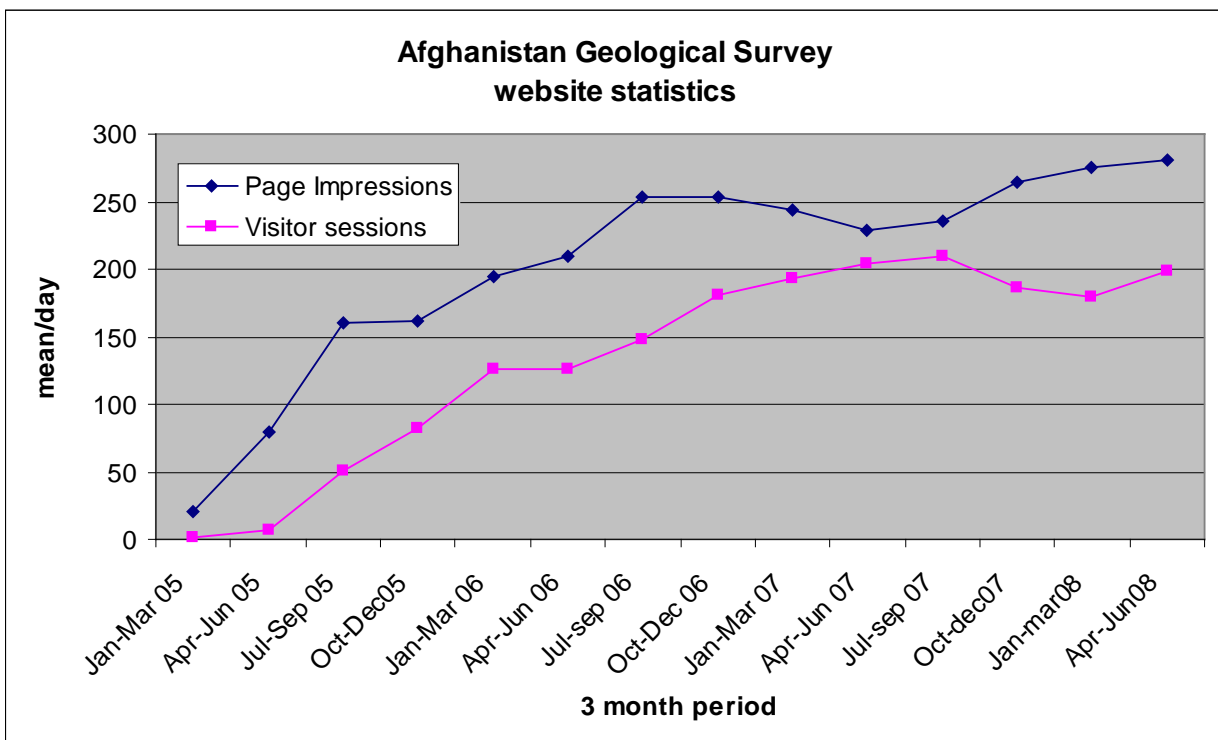
- hosted (for the time being) by the BGS.
- daily 'visitor sessions' to the site have risen to more than 180 per day since the site was launched in 2005, and continue at around 120 to 150 visitor session per day (see illustration below)
- **on 14 June 2010 the New York Times published an article suggesting the value of minerals in Afghanistan to be \$1trillion. This produced a spike of 4500 visitor sessions to the AGS Web Site (see illustration below).**

The website currently contains information on:

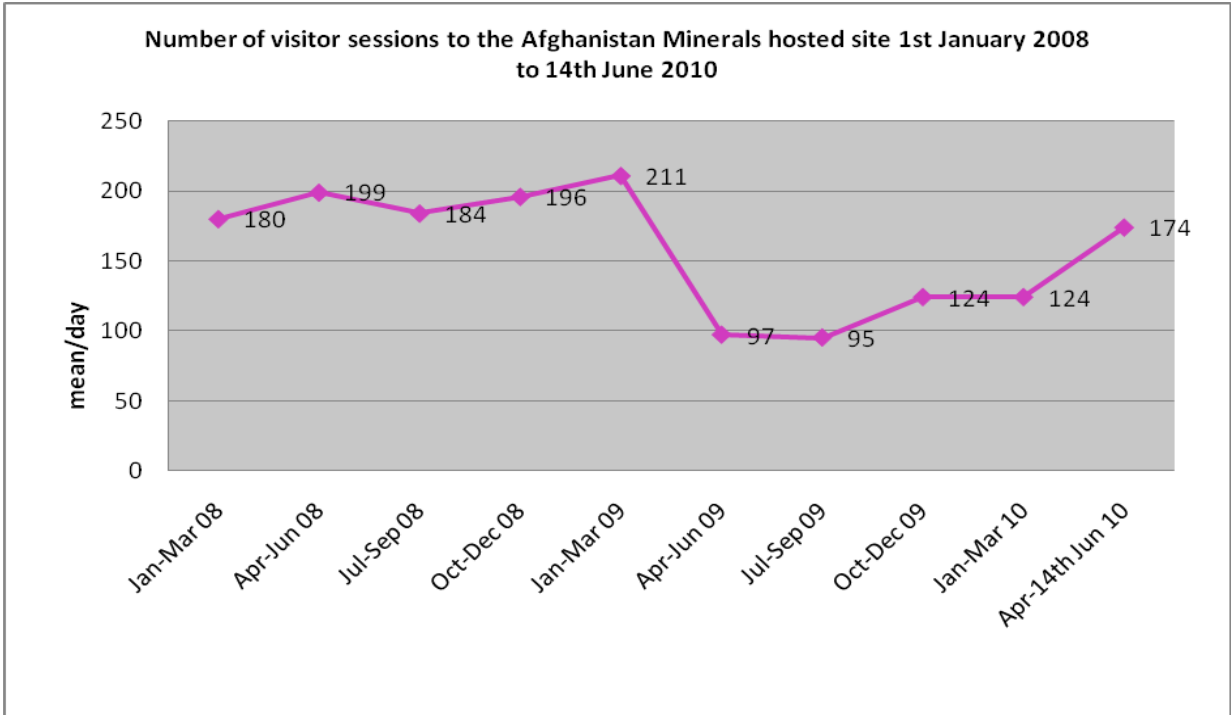
- [Afghan Marble Showcase to be held in Dubai on 11th September 2007.](#)
- Tenders for the:
[Sarpolak/Takhmak amethyst deposit, Baghlan province](#)
[DashtTop chromite deposit, Wardak province](#)
[Qara Zaghan gold deposit, Baghlan province](#)

[Oshko chromite deposit, Paktiaprovince](#)

- [Companies selected for Aynak Tender](#)
- [Mining Journal Supplement](#) on Afghanistan
- History of the AGS
- Geology of Afghanistan
- Information on base metals, ferrous metals, industrial minerals, rare earth elements
- Precious metals
- Precious stone
- Information resources in the AGS
- Information on donor organizations
- Links to other authorities and organizations eg AIMS, Ministry of Communications, Ministry of Finance
- Separate page for the Department of Mines Affairs
- Image galleries

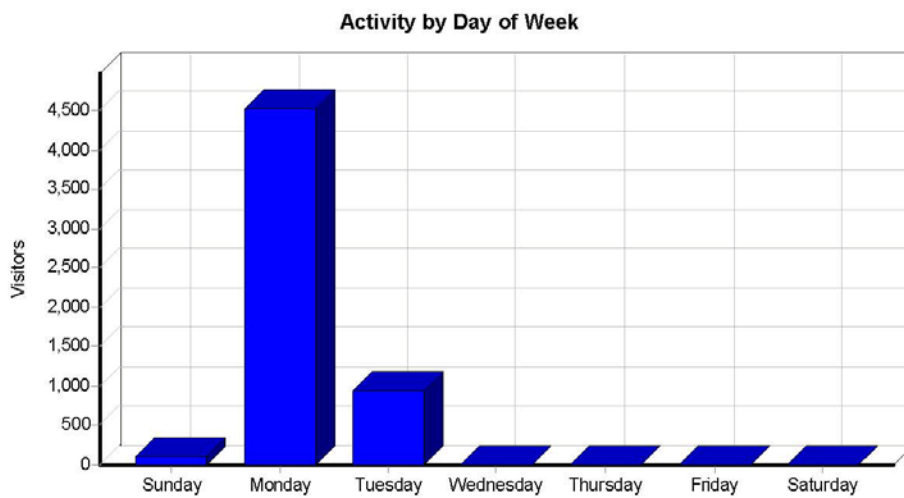


AGS Web site visitors January 2005 to June 2008



AGS Web site visitors January 2008 to June 2010

By Day of Week



Activity by Day of Week

Day	Hits	Page Views	Visitors	Bandwidth(KB)
Sunday 13 June 2010	4,027	118	95	74,567
Monday 14 June 2010	187,861	6,313	4,522	5,566,485
Tuesday 15 June 2010	34,391	1,078	929	970,396
Wednesday	0	0	0	0
Thursday	0	0	0	0
Friday	0	0	0	0

AGS Web site visitors 13 to 15 June 2010

IT hardware and software

- 35 PCs, 29 of them linked to AGS servers and loaded either with Microsoft Office or Microsoft Open Office.
- 6 PCs with Arc 9 GIS software
- 6 PCs and a server at the Ministry of Mines Cadastre Office
- 5 high capacity UPS in AGS
- 2 high capacity UPS in the Cadastre Office
- 5 printers
- Large format scanner
- 2 small format scanners

Other equipment

- 12 sets of geology field equipment
- 4 vehicles: 2 pickups and 2 Nissan Patrol
- 8 digital cameras
- 10 microscopes
- 1 photocopier

AGS Library and Museum

- A new Library has been established, with around 5000 books, including UK Open University course books and videos.
- The AGS Museum displays have been renewed.

Other support for AGS

- For security guards
- For the crèche

Rebuilding the Afghanistan Geological Survey (2002-2005)

Office space



From this



To this

IT room



From this



To this

Laboratories



From this



To this