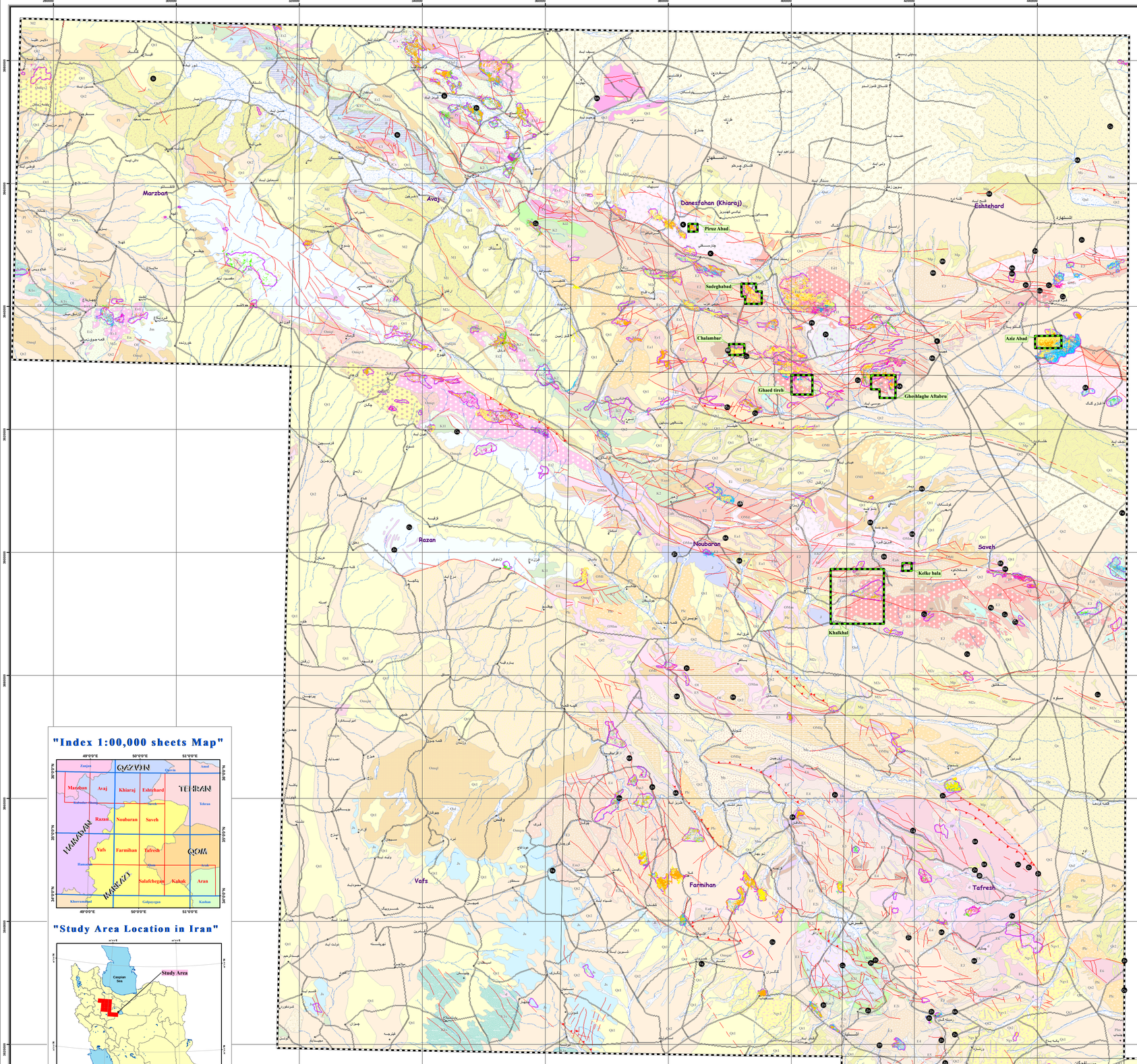

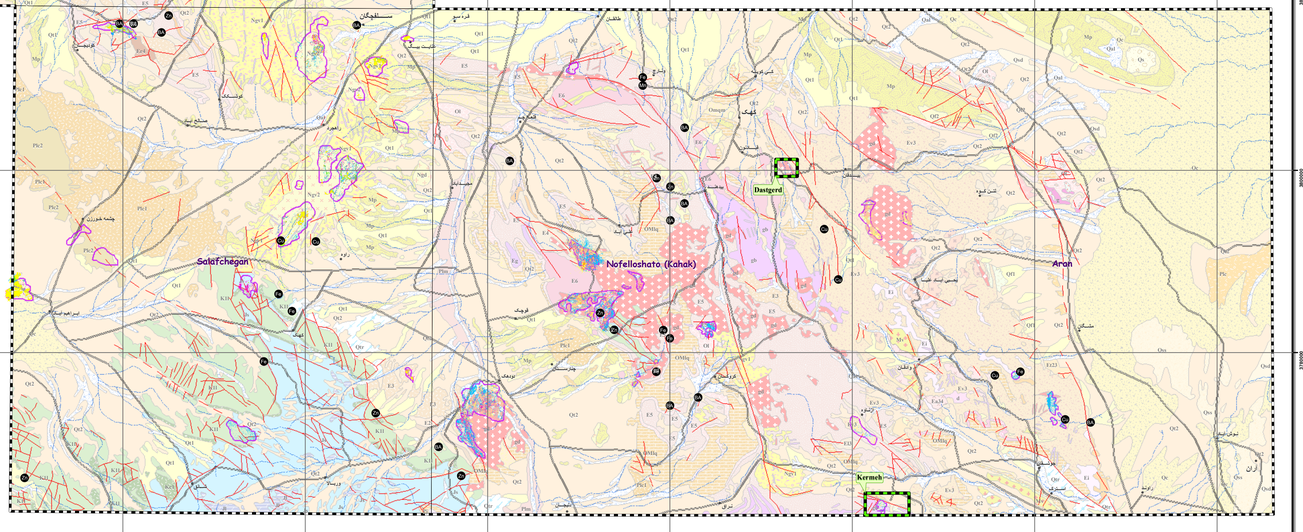

"Index 1:00,000 sheets Map"

"Study Area Location in Iran"

5 2.5 0 5 10 15 20 Km

Scale	1:250,000
Map Projection	UTM (WGS84) - Zone 39N
Height Datum	Geoeid

Title:

"Geological & Alteration Map Of Avaj-Salafchegan Project"

Geological Survey of Iran
Exploration Departmant

Director Manager : N. Abedian
Project Manager : B. Borna
Supervisors : M. Dori

Parsi Kan Kav
Consulting Engineering Company
Date / May 2009 \ Bahar 1388

Project Managers : R. Zarinfar, A. Kazemi
Field Geologists : R. Zarinfar, A. Kazemi, D. Atar, M. Tavossi, M. Mehri
Petrography by : S. Ebrahimi
Report gathered by : M. Mazlum, M, Khanibeik
Cartography by : A. Khosravipour

L E G E N D

C

Qz3 — Qz:Sand dunes; Qd:Sand dunes; Qc:Ghaz-in plain Silty material; Clayflats
Qd2 — Qal:Alluvium; Qsc:Clay flat(mainly clay & silt)
Qz2 — Qsc:Sand sheets
Qd2:Intermediate level terraces
Qd1 — Qd1:Low gravel fans; m2:Lava flow
Qz1 — Qt1:Old & high level terraces
Qt1 — Qt1:High gravel fans; m1:Scoria
Qtr — Qtr:Travertine
m2 — b:Basalt
m1 — rd:Rhyodacitic lava flow
b — Pf:Clayey beds
rd — Plc:Conglomerate with interlations of sandstone & clay (HEZARDARREH FOR.)
Pf — Plm:Marl
Plm — Plc2:Unconsolidated pyroclastics & volcanic conglomerate
Plc — Plc1:Conglomerate,sandstone & pyroclastic beds
Plc2 — Ng2:Porphyritic amphibole andesite,dacite & pyroclastic beds
Plc1 — Ngr1:Pyroclastics,andesite & basaltic andesite
Ng2 — Mv:Dacite-andesite
Ngr1 — M2:Red beds UPPER RED FORMATION
M2 — M2c:Conglomerate UPPER RED FORMATION
M2c — M1:Red sandestone;marl,conglomerate (UPPER RED FORMATION)
M1 — Mg:Gypsum
Mg — Mc:Grey,coarse pebble conglomerate
Mc — Mvq:Analcitite-bearing basanite,andesite & tuff
Mvq — Mm:Red,marl,sandy marl,sandstone,gypsum & conglomerate, Band-e- Chai basin
Mm — Mc:Dark red-brown,conglomerate & sandstone
Mc — Mt:Sandy tuffaceous rocks,dacitic-andesitic tuffs
Mt — OMl:Coraline limestone
OMl — Omqm:Marl,sandestone,limestone QOM FORMATION
Omqm — Mp:Conglomerate, andstone, marl
Mp — Omql:limestone,marl tuff QOM FORMATION
Omql — OMqC:Conglomerate,sandstone,sandy limestone & sandy marl
OMqC — OMpg:Mainly gypsum
OMpg — OMab:Andesite,basalt
OMab — OMv:Rhyolitic pyroclastics,lava,ignimbrite
OMv — OMm:Marl,marly & sandy limestone
OMm — OMr:Rhyolitic lava
OMr — OMd:Dacitic lava
OMd — Ol:LOWER RED FORM. Red gypsiferous marl,sandy marl,claystone,shale,siltstone
Ol — v:Basic volcanic rocks generally epidotized
g:masses of gypsum
s:Salt dome(Eocene-Oligocene)
EOv — EOc:Volcanic conglomerate & sandstone
EOc — EOv:Trachyandesitic to basaltic lavas,agglomerate & breccia
Ea — Ea:Aglomerate,sandstone"
E6 — E6:Dark grey to red pyroclastic with different composition & texture,andesite & basaltic lava,tuffaceous nummulitic limestone & marl
Eg — Eih:Ignimbrite & crystal vitric tuff
E5 — Eab:Porphyritic andesite & basalt
Eg:Gypsum
E5:Green tuff,tuffaceous sandstone,shale,marl,mudstone,limeston & gypsiferous marl
E4 — Eth:Grey to red,sandy nummulitic limestone
E3 — Et3:Organa-detritic,sandy marly nummulitic limestone
Eab — Eab:Andesite basalt
E4:Red-brown,tuff,marl & limestone
E4 — Er4:Brownish,rhyolitic & andesite lava
E3 — Et3:Organo-detritic,grey-brown limestone with nummulites
Ex3 — Ex3:Greyish-reddish intermediate-basic lava,hyaloclastites,with some volcano-sedimentary & acidic rocks
Ea3 — Ea34:Aphanitic andesite
Ea3 — Ea3:Marl,intercalated with shale,limestone & tuff
Ea3 — Et3:Mainly andesitic pyroclastics
Eda — Eda:Dacite-andesitic lava flows
Ea3 — E3:Green tuff,tuffite,tuffaceous sedimentary rocks,limestone, shale & marl
Ed6 — Ed6:Dacitic lava
Ed23 — ai:Acid tuff
Ed — ae:Nummulitic limestone
Ed23 — EPJ3:Porphyritic andesite-basalt
Ed23 — Ed23:Greyish-reddish dacite,dacitic andesite
Ed23 — an:Mainly andesitic lava
E2 — Ea2:Aphanitic
E2 — E2:Fine pyroclastics,tuffits,sandy limestone
Eh2 — Er2:Green tuff-tuffite-rhyolitic ash tuff,tuffaceous sandstone,marl,Limestone,shale
Eh2:Hyaloclastite
Eh2:Volcanic breccia
Ea2:Green-grey andesite,dacitic andesite
E2i — E2i:Ignimbrite,Rhyolitic,tuff & intermediate to basic lava
E1 — E1:Basal-red yellowish,conglomerate,sandstone,sandy marl & sandy limestone
Ed1 — ae:Nummulitic limestone
Ea1 — Ea1:Rhyolitic pyroclastics,ignimbrite,lava
Ed1:Dacitic rocks
Er1 — Er1:Mainly rhyolitic tuff
Et1 — Et1:Dacitic Pyroclastics mainly tuff
Er1:Rhyolitic lava
Ev1 — Ev1:Andesite,dacite & related rocks KARAJ FORMATION
Ean1 — Ean1:Andesitic lava,breccia,agglomerate

M E S O Z O I C

Km2 — Km2:Light grey,Globotruncana-bearing marl
K2 — K2:Limestone platy & marl
K2 — Kl2:Grey,sandy,glauconitic limestone,containing Exogyra & Inoceramus(conglomeratched at base)
K11 — Kl11:Limestone with orbitolina & Rusdist
K11 — Kl1:Shale
K1 — Kv1:Andesite,basalt
Kv1 — Kc1:Red conglomerate,sandstone,dolomitic sandstone & dolomite
Kc — Kc:Calcareous slate
Jl — Jl:Dolomite,limestone,marl,locaely volcanics & gysum LAR F.
Jd — Jd:Marly limestone,limestone,ammoniferous DALICHAY FORM.
Js — Js:Dark grey shale,sandstone, SHEMSHAK FORMATION
Jm — Jm:Slighly metamorphic rocks
J — J:Slate,Phyllite
TRs — Jss:Mainly Brownish sandstone
TRsh — TRsh:Shale intercalated with sandstone & limestone,containing lamellibranchs,Ammonite & Heterastridium
TR — TRch:Crystallized white & grey limestone with fossil fragments in the upper part
TR:Limestone,dolomite ELIKA FORMATION

Pj — Pj:Limestone,dolomitic limestone
Pr — Pr:Sandstone,marly limestone,limestone DORUD RUTEH NESEN FORMATION
C — C:Quartzite,dolomite SINAK FORMATION
Cm — Cm:Dolomite,shale,limestone MILA FORMATION
Cq — Cq:White quartzite LALUN FORMATION
Cl — Cl:Sandstone LALUN FORMATION
iCbt — iCbt:Shale,sandstone,dolomite BARUT FORMATION
iCs — iCs:Dolomite SOLTANIEH DOLOMITE
PCk — PCk:Green slatly shale KAHAR FORMATION

C O N E

Omqg — Omqg:Limestone,sandstone,sandy limestone & sandy marl
Omqm — Omqm2:Andesite,deite,basalt QOM FORMATION
Omqr — Omqr1:Andesite & related rocks QOM FORMATION
Omqt — Omqt:tuff QOM FORMATION
Ec — Ec:Conglomerate
Ei — Ei:Rhyolitic breccia ignimbrite,ignimbrite
Ea — Ea:Limestone Nummulitic ZIARAT FORMATION
gb — gb:Gabbro

ap:Aplite
gd:Granit-Granodiorite (Post-Lower Miocene)
d:Granodiorite-diorite (Partly Post-Miocene)
gp:Pyroxene gabbro (Post-Eocene)
r3:Rhyolites : dike & small bodies
Pa:Pyroxene andesite
lc:Latite trachyandesite,andesite
Ph:Andesite,phonolite
t1:Rhyolitic pyroclastics
r:Alkaline rhyolitic lava
Dike:Acidic
Dike:Intermediate-basic
Ngd:Microgranodiorite-quartzdiorite,& rhyolite as dome structures,Post-Miocene

S Y M B O L S

ORE INDICATION

- Ag Silver
- Cu Copper
- Ba Barite
- Bt Bentonite
- Fe Iron
- K Kaolan
- Mn Manganese
- Pb Lead
- Zn Zinc
- Si Silica
- KA kaolin

Alteration

- Fe Oxide (Hematite + Jarosite + Goethite)
- Phillic (Illite + Moscovite + Quartz)
- Propylitic (Epidote + Chlorite)
- Argillic (Kaolinite + Montmorillonite)
- Advanced argillic (Pyrophyllite + Alunite)

Exploration of Alteration Area From ASTER satellite Image

Fault
Probably Fault
Drainage
City - Village
Road
Promising Area