

#### 4. 短期調査（第3次）報告書

## 現地調査報告

トルコ地質リモートセンシングプロジェクト第3次短期調査団

平成14年5月26日～6月5日

### 調査方法：

本邦にて要請6ソフトウェアのメーカーウェブサイトによりトルコ国内の代理店情報を検索し、事前に訪問の連絡を行った。コンピュータおよび周辺機器に関しては、参考銘柄のDELLのメーカーウェブサイトから2社のトルコ国内正規代理店(SispaおよびSentim)と事前連絡を行い、製品のスペック等を連絡して、市場調査を依頼した。

また、イスタンブール滞在中に商社6社に連絡、このうち4社と面談を行った。

### 調査結果

#### 1 リモートセンシング (RS) および GIS ソフトウェア

ENVIを除く、全てのRS/GISソフトウェアはトルコ国内にメーカーのExclusive distributorを有する。すなわち、トルコ国内では全ての正規ソフトウェアバージョンはこれら正規代理店以外からの調達是不可能である。また、全てのRS/GISソフトウェアは国際ライセンス価格が設定されており、トルコ国内においても米ドルまたはEUROにおいて固定となっている。これらの国際ライセンス価格以外での取引は実施されておらず、国際価格からの値引きは不可能である。

#### 2 コンピュータおよび周辺機器

機材情報シート記載の参考銘柄コンピュータは全て現地調達可能である。しかし情報シート精査を行った結果、情報シート記載の仕様が(例えばビデオメモリーとか)、実際の製品型番仕様と一致しないものがあり、情報シートの仕様一部変更が必要である。また、周辺機器の記憶装置に関しては、トルコ国内で調達できないものが多く、さらに情報シート記載の機器インターフェース仕様と合致するものも少なかったため、仕様変更が必要である。HP社のプロッタープリンター4機種は現地調達可能であり、仕様は変更ない。

#### 3 富士デジタルカラープリンターおよびOCEカラーキャナー

両製品ともに、機材の納入、据付、調整、アフターケアには技術専門性が要求されると考えられたのでコンピュータ+周辺機器のグループから切り離してメーカー現地法人訪問を行い、製品技術面の調査、およびメンテナンス・アフターサービスの確認を行った。その結果、それぞれの製品は技術的水準が高く、緊密な技術サポートが必要であ

り、両社のアンカラ正規・関連代理店がこれらの業務を実施できることを確認した。

#### 4 ASD スペクトロメーター

メーカーはトルコ国内に正規代理店を擁せず、製品の輸入および定期的な調整メンテナンスのための輸出入に現地代理店が必須なことから、スペクトロメータの販売および地質調査分野に経験のあるソフトウェア代理店に、合衆国メーカーの代理店を依頼し、両社ともにこれを了承した。

#### 5 商社関連：住友商事、三井物産、Yaman および Meteksan (Sispa 関連会社) が応札への関心を示した

考察（現地調達方針作成のための技術的な情報）

##### 1 RS/GIS ソフトウェア

前述のように排他的代理店がメーカーによって固定されて国際価格にて販売し、その他のルートからのライセンス取得は無効なものとなることから、正規代理店とのライセンス契約以外に正規ライセンス取得はありえない。また、現地サポートも本邦調達では不可能である。すなわち、商社等が落札したとしても、トルコ国内正規代理店からの製品調達、および実施機関と現地代理店とのライセンス契約およびアフターケア・ユーザーサポートは必須である。ENVI に関しては、今回にかぎり RS ソフト代理店が現地取次店として臨時のメーカー代理店を引き受けることが、メーカー側から承認された。

銘柄指定は可能か？

##### 2 コンピュータおよび周辺機器

同等品調査の結果、他 1 社で同等品以上の製品を確認した。また、CPU を Pentium III 1.4GHz まで下げると、あと 2 製品が該当することになる。しかし、価格差も大きくなる。サーバーのハードディスクアレイ、RAID 5 ホットスワップ、サーバ・クライアント調整等にかかなり高度な技術専門性が要求されることから、商社等との契約であったとしても、トルコ国内正規代理店からの調達およびアフターケアは必須である。

##### 3 富士デジタルカラープリンターおよび OCE カラーキャナー

前述のように、調整およびメンテナンスに特殊な技術を要することから、商社等との契約でも、トルコ国内正規代理店からの調達およびアフターケアは必須である。

#### 4 ASD スペクトロメータ

製品の定期的な調整保守のために合衆国への輸出入を行うことが必要なことから、現地に取次代理店が必須であり、これらの業務は本邦調達では不可能である。同等品は存在しないとのことであるが、工業所有権等で、銘柄指定する必要あり。

スペック的にも非常に技術レベルが高く、製品納入時の操作指導、RS 解析を含むトレーニングは必要と考えられる。また、関連会社が ASTER データとスペクトロメータデータの解析の経験を有するとのことで、実施機関 MTA もこれらを含めたトレーニングを希望している。

補足：実施機関情報

6月1日に実施機関を非公式に訪問し、現在所有機材およびユーザサイドメンテナンス等の情報収集を実施した。

保有機材は以下のとおりである

- 1 Unix ワークステーション 6台 (うち5台は Erdas、1台は ArcInfo)
- 2 Windows コンピュータ 4台 (Erdas デモプログラム、ArcView、ArcInfo)
- 3 HP A0 プロッター 2台
- 4 A3 カラープリンタ
- 5 A3 カラーキャナ
- 6 A4 白黒レーザプリンタ
- 7 テープドライブ DDS
- 8 イーサネット、48 クライアント接続 100/10-Base TX/T

メンテナンス：ソフトウェアは購入以来アップグレードは実施しておらず、実施の希望有り。現地代理店とは保有 RS/GIS ソフトウェア年間保守契約は実施していないが、サポートは受けているとのこと。

帰国後調査

以下の添付書類に詳細を記載した

PC サーバ比較表

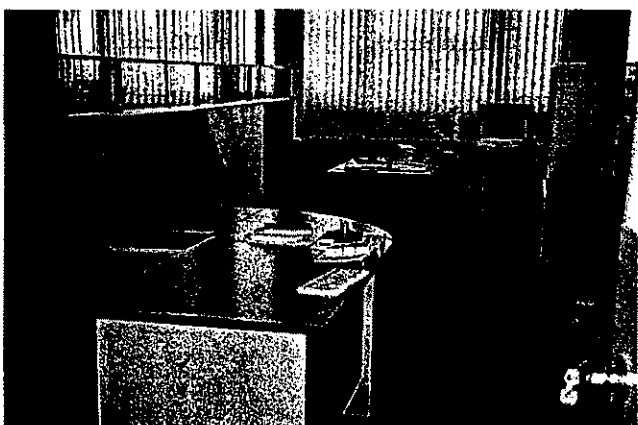
要請書転記表 (現地調達可能製品、仕様、参考価格等)



新築解析棟(プロジェクトサイト)入口



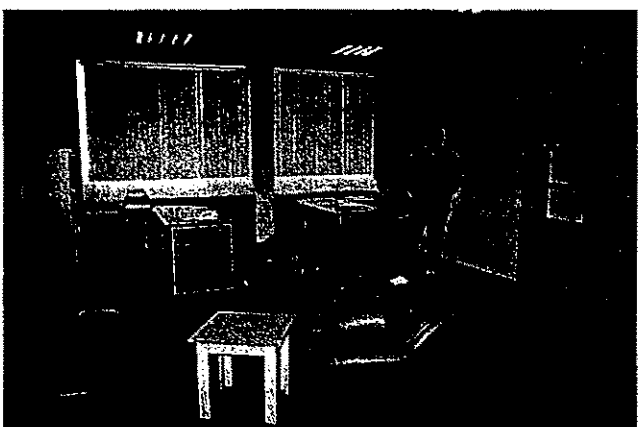
プロジェクトコーディネーター Erdem博士と  
C/PのひとりBora氏



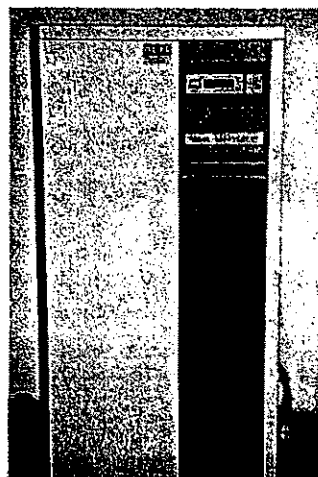
解析室コンパートメント



Cartographyコンパートメント



JICA専門家居室



UPS

PCサーバー比較表

メーカー	商品名	型番	CPU	メモリ	VRAM	最大HDD容量 (73GB換算)	HDDベイ 1"	ホットプラグ対応	RAID5	DDS	その他
情報システム記載仕			Xeon2.2GH z	4GB	32MB	73GB*8	8	8	○	○	
Dell	Poweredg e4600		Xeon2.2GH z	512MB- 12GB、 DDR SDRAM	8MB	73GB*8	8	8	○	○	
Compaq	ProLiant ML530	T02X2400 - 512k2P10 24MB	Xeon2.4GH z	1GB- 16GB、 DDR SDRAM		73GB*14	14	14			ミラーメモリ 機能、自 動サーハ復 旧機能
IBM	xSeries34 2	8669-5AJ	Pentium III 1.4GHz (2way)	256MB- 4GB		73*6	6	6	ServeRAI D-4Lx		ホットスワップ 電源
Fujitsu	Primergy H450		Xeon1.6GH z	512MB- 16GB、 DDR SDRAM		73*12	12	12	○		冗長電源 オプション
HP	hp server tc 4100	P5417A# ABJ	Pentium III 1.4GHz	256MB- 4GB、 ECC SDRAM		73GB*8	8	8			

調達仕様書 方法	要請書 No.	機材名	機材の用途	機材情報シート(要請情報)の転記						プロジェクト選定用				JICS内部選定用	
				特に必要な仕様 / 特別付属品	数量 (単位)	参考銘柄 メーカー名	参考銘柄 型番	単価 (US\$)	現地 調達	転写 指定	現地確認	型番変更	その他 連絡事項	調達選定用欄	情報選定用欄
	1	PC (Desktop, Dual Monitor)	ASTERデータ処理・解析(DEM作成, キヤノン作業他), InSAR処理	CPU(Pentium4 2.2GHz), OS(Win 2000), IGB-RAM, 64MB-VRAM(Dual Monitor), 73GB-SCSI x 2, CDWR, CD, SCSI2-card, Network-card, 21 inch Display x 2	3	DELL	Precision 340	18,706	○		MMGA4 DDR ATI Radeon VE MM VGA/DVI Video has 32MB memory. Screens will be dual-headed with an "y" cable, either 2 same views or double sized continuous screen, cable with 2*DB-15 pin output ports for monitors	MMGA4 DDR ATI Radeon VE Video		the same video card specified by two DELL distributors	
	2	PC (Desktop, Single Monitor)	ASTERデータ処理・解析(スベクトル解析他)	CPU(Pentium4 2.2GHz), OS(Win 2000), IGB-RAM, 64MB-VRAM, 73GB-SCSI x 2, CDWR, CD, SCSI2-card, Network-card, 21 inch Display	6	DELL	Precision 340	6,699	○			nVIDIA Quadro4 700XGL 64MB		SISPA quotation should be changed as nVIDIA Quadro4 700XGL 64MB	
	3	PC file server	ファイル共有サーバー	CPU(Intel Xeon 2.2GHz), OS(Win 2000 server), 4GB-RAM, 32MB-VRAM, Internal-HDD(73GB x 8units), External HDD(73GB x 6units), SCSI-Disk array(RAID5 + 1台で HOTSPARE, CD, SCSI-card, Network-card, Monitor-17inch, InternalDDS-4mm)	1	DELL	PowerEdge 4600	27,818	○		AS PE4600 has no AGP expansion slot, 64 or 32 MB video cards can not be installed onto the system. Integrated ATI-Rage XL Video controller is embedded and non-upgradeable	ATI-Rage XL Video controller 8MB SDRAM	他メーカー製品調査の結果, ネットワーク対応17インチディスプレイ以上装備の同製品はComping他3社で確認できた	PowerEdge4600 is not designed for graphics applications SISPA quotation should specify video specs	
	4	PC License server	ソフトウェアのインストールライセンス管理(兼 ASTERデータ処理・解析)	CPU(Pentium4 2.2GHz), OS(Win 2000), IGB-RAM, 32MB-VRAM, 73GB-SCSI, CDWR, CD, SCSI-card, Network-card, 17 inch Display	1	DELL	Precision 340	4,712	○					SISPA quotation should be changed as 73*1 HDD	
	5	PC(Laptop)	現地調査及びリモートセンシング作業用	CPU(Mobile Pentium3 1GHz), OS(Win 2000), IGB-RAM, 64MB-VRAM, 60GB-SCSI, CDWR, CD, SCSI-card, Network-card	2	DELL	Latitude C840	4,249	○			Mobile Pentium 4 1.7GHz CPU 60 GB SCSI HDD		SISPA quotation should be changed as IGB DDR RAM memory	
	6	ポータブル スペクトロメータ	野外観測用 可視・近赤外線 分光放射計	測定波長範囲:350~2500nm, スペクトル分解能:3nm(350~1000nm)・10nm(1000~2500nm), サンプル間隔:1.4nm(350~1000nm)・2nm(1000~2500nm), 検出感度:100% (全波長域), 入力方法:光ファイバー	1	Analytical Spectral Devices, Inc.	FieldSpec Pro FR	80,341	○						

		機材情報シート(個別情報)の転記							プロジェクト連絡用				JICS内部連絡用		
調達仕様書 方法 No.	要請書 No.	機材名	機材の用途	特に必要な仕様 / 特別付属品	数量 (単位)	参考銘柄 メーカー名	参考銘柄 型番	単価 (US\$)	現地 調達 指定	現地確認	型番変更	その他 連絡事項	調達課 使用欄	情報課 使用欄	
				*FieldSpec Pro FR構成 (含アクセサリー) Fieldspec Pro FR (A110070)、Radiometric Calibration of FR Bare Fiberoptic (S701500)、 Spectron, 5×5inch Cal.White (128160)、 Spectron, Wooden case for 5×5inch (128300)、 High Intensity Reflectance Probe (A122000)、Auxiliary Spectrometer Battery(PRO SERIES) (A145051)、8 Deg NIRFR FOV Lens Foreoptic (A120500)、Radiometric Calibration of 8 Deg FR FOV Lens (S701570)、 2m FR Fiberoptic Cable (135340)、Auxiliary Spectrometer Battery charger (A147080)											
	7	デジタルカラープリンター	極画面像出力 用	プリント方式:レーザー露光 熱転写転写方式、記録 密度:400, 267dpi/100 mm、プリント時間:93秒/ A3サイズ、フレーム毎: 120MB	1	FUJIFILM	PICTROGR APHY 4000 II	16,152	○	Maintenance/support can be done by Ankara agent of Fujifilm Turkey				Donner Paper 30.5cmx92cmx1 receiver paper 29.7cmx90cmx1	
	8A	画像処理・解析ソフト ウェア	ASTERデータ処理・ 解析(スベック ル解析、モザイ ク作業他)	AOI(解析対象範囲)処 理機能、Image Catalog 機能、Spatial Modeler機 能、Knowledge Classifier 機能、Expert Classifier 機能、Model Maker機 能、70-デジタライゼス、 保存(5年間)	3	米国ERDAS 社	ERDASImagi nc6.5 Win2000 (Professional 、Vector)	30,053	○						
	8B	画像処理・解析ソフト ウェア	ASTERデータ処理・ 解析(DEM作成 他)	ASTERデータ処理機能、精度レボ ール出力機能、70-デジタライゼス、 保存(5年間)	1	米国ERDAS 社	ERDASImagi nc6.5 Win2000 (OrthoBASE Pro)	32,200	○						



【要請書転記表】

案件名:トルコ国 地質リモートセンシング

調達仕様書 方法	仕様書 No.	要請書 No.	機材名	機材の用途	特に必要な仕様 /特別付属品	数量 (単位)	参考銘柄 メーカー名	参考銘柄 型式	単価 (US\$)	現地調達 指定	プロジェクト運輸用			JICS内輸送用			
											現地確認	型番変更	その他 連絡事項	調達	使用機		
		9	画像処理・解析ソフト ウェア	ASTERデータ処理・解析(スベック トール解析、モザイク作業、DEM 作成他)	Generic Database機能 画像データとGCP、ルックア ップデータ等を一つのファイル で管理する機能、 Algorithm Librarian機能、 プロセッシングライブラリ 保存(5年間)	2	カナダPCI社	PCI Geomatics Windows2000 (Geomatica Prime, Ortho Engine Productivity Tools, Ortho Engine Satellite Models, Ortho Engine Automatic DEM)	14,300	○							
		10	SAR画像処理・解析ソフト ウェア	SAR画像処理・解析ソフト ウェア(INSAR処理、 DEM作成他)	JERS-1, ENVISAT, ERS, RADARSATのSAR データをサポートする機能、 ハードウェアサポート(5年) 、ソフトウェアライセンス	1	カナダ Atlantis Scientific Inc.	EarthView APP and InSAR PRO Combo Includes ENVISAT modules for APP and InSAR) Windows 2000	56,250	○							
		11A	GISソフトウェア	空間情報の作成、加工、管 理、分析、表 現	空間検索機能、ポリゴン、 オブジェクト機能、マップ繪 集機能、地形解析機能、 サーフェス解析機能	2	米国ESRI社	ARC View 3.x + Spatial Analyst (Windows2000)	6,080	○							
		11B	GISソフトウェア	空間情報の3次元表示・解 析	データ(シェープファイル、 ArcInfo、カレック、タック ット、TIN、CADY-タ)の3 次元表示機能、TINデータ の生成・編集機能	1	米国ESRI社	ARC View 3D Analyst (Windows2000)	4,000	○							
		12	画像処理・解析及び GISソフトウェア	地図情報及び 衛星画像の処 理・解析	ASTERレベル1A/1Bデー タ(HDF及びCEOS7オー プン)読み込み機能、 GPSデータ取り込み機能、地 理の衛星除去機能、地 理断面図の自動生成機 能	3	米国 microimages 社	TNTempV6, B(M60), A0 テキスト印刷用 プリンタライ (P1E) Windows2000	7,500	○							
		13	画像処理・解析ソフト ウェア	ASTERデータ処理・解析ソフト ウェア(スベックトール 解析他)	ASTERレベル1A/1Bデータ 読み込み機能、IDLによる拡張 機能	2	米国 Research Systems, Inc.社	ENVI (Windows2000)	6,579	○							

【要請書記表】

案件名:トルコ国 地質リモートセンシング

調達仕様書 No.	要請書 No.	機材名	機材の用途	特に必要仕様 / 特別付属品	数量 (単位)	参考製 メーカー名	参謀製 型番	単価 (US\$)	現地 調達	プロジェクト産地用			JICS内産地産物用		
										現地確認	型番変更	その他 連絡事項	調達頻使用欄	情報提供使用欄	
	14	B0サイズプリンター	大判衛星画像 印刷用	42inch(801.067mm), 600 ×600dpi, color thermal injet, 160MB-RAM, 6GB-HDD plus Adobe, PostScript, 3, 10ヶ語対 応, ネットワーク対応内蔵	1	米国HP社	hp designjet 800ps (42 in) (C7780C)	8,051	○						
	15	A3サイズ インクジェット カラープリンター	カラー図面出力 用	2,400dpi, ネットワーク対 応, 普通紙(コピー用紙) 高画質印刷	2	米国HP社	deskjet 1220c (C2693A)	665	○						
	16	A3サイズ レーザーシート カラープリンター	カラー図面出力 用	乾式電子写真方式(レ ザープリンター), A3サイズ対 応, 2400dpi, 標準解像度: 192MB(最大384MBまで 拡張可能) 3.2GB ハードディスク内蔵, 両面印刷機能, ネットワー ク対応(10/100Base-TX) 内蔵, オイルレス定着	1	米国HP社	hp color LaserJet 9550n (C7097A)	5,959	○						
	17	A4サイズ レーザーシート プリンター	書類等印刷用	乾式電子写真方式(レ ザープリンター), 解像度: 600dpi, 普通紙, 上質 紙, 再生紙, チェル, OHP フィルム対応, ネットワー ク対応(10/100Base-TX)内 蔵, 両面印刷	1	米国HP社	hp LaserJet 4100n (C8050A)	1,549	○						
	18	A0サイズ 複写機	大判地図情報 等入力用	35センチ, 600dpi, 原 図保護用キリットシートA0サ イズ, カラー-TWAINドライ バ	1	オランダOce 社	Oce 4780	15,752	○		OCE4780 is replaced by 4036	OCE4036		Management/ support can be from: in Athens branch of C.I.T. Turkey	
	19	A3サイズ 複写機	地図情報等入 力用	Color A37ラフ, 1600dpi, 14bit入力, ネット ワーク対応(オプション) ESNSBI, LCIN-CS0A50)	1	EPSON	ES8500	1,195	○			EPSON GT- 10000+	600 X 2300dpi		
	20	外付け ハードディスクドライブ	画像データ保存 用	60GB-SCSI, USB DuoPort搭載, ドライバソフト はWindows2000英語版 に対応のこと	5	Logitec社	LHD- H60SU2	228	○						SCSI quotation should be changed as LHD-H60SU2
	21	CD-writer(external)	データ保存用	×40 reading, ×24 writing(CDR), SCSI & USB1.1両対応, ドライバソフトはWindows 2000英語版に対応のこと	1	不明	CDRW- 248U		○			Choose one from left 左から選択してく ださい	SCSI&US BI is not available		SCSI & USB compatible is not available
	22	DVD-writer(external)	データ保存用	9.3GB, SCSI-2, ドライバソフトは Windows2000英語版に 対応のこと	3	Logitec社	LDV-R47S		○			Choose one from left 左から選択してく ださい	SCSI DVR is for mastering		SCSI DVR はソフトリ ング用で価格帯が違 います(\$4950)
	23	MO-drive(external)	データ保存用	640MB対応SCSI外付型 MOディスク, USB変換 ケーブルを付属, ドライバソ フトはWindows2000英語版 に対応のこと	3	Logitec社	LMO- A8465/U	2,562	○			No 640MB MO drive is available Plasmon 5.25" 5.2GB SCSI MO	Check if acceptable		640MB Modrive is not available

調達仕様書 方法	仕様書 No.	機材名	機材の用途	特に必要な仕様 / 特別付属品	数量 (単位)	参考銘柄 メーカー名	参考銘柄 型番	単価 (US\$)	現地調達 指定	プロジェクト運用用			JCS内標準装備		
										現地確認	型番変更	その他 連絡事項	調達課使用欄	情報課使用欄	
	24	CCD projector	プレゼンテーション 用	XGA (1024×768)、1000 Lumens	1	COMPAQ	MP2800	3,190	○	Not available in TR market Pro UST 3M Projection or Canon LV-X1 at the same configuration					
	25	Digital camera	現地調査用	4MB pixel, battery- AA4, 3V(3.3V)スマートダイ 7(128MB)	2	OLYMPUS	C- 4040ZOOM	1,048	○						
	26	画像処理及びGPSソフト Vx7	現地調査用	英語版ソフト、 Windows2000英語版に 対応、英語版マニュアル、 GPS7ソフト(SONY)、車 載用電源	1	同和工管	MIRIN							見積取付済、 V100R00、10データ 覆けは5センチ付(精度 が向上している)、英 語OSで動作確認済 み(V12更新)	
	27	GPS receiver+Map module	現地調査用	PC interface cable、The MapSource? WorldMap CD-ROM	4	GARMIN	eTrex Vista	715	○						
	28	3DSurfaceソフトVx7	3Dデータ作成 及びデータ7ホー ムが変換用	英語版ソフト、 Windows2000英語版に 対応	1	Golden software	Surfer 8	725	○						
	29	ラスターデータ編集ソフト	ラスターデータ編集 集	英語版ソフト、 Windows2000英語版に 対応	11	Adobe	Photoshop 6.0	1,227	○	4*Adobe Publishing Collection Packet (Photoshop6, Illustrator10, Pagemaker7, Acrobat5)	7*Photoshop6+5* Acrobat5			総合パッケージ×4に補 完ソフトライセンスを合計 した価格を4で割った 単価となっています	
	30	データ編集ソフト	ベクターデータの編 集	英語版ソフト、 Windows2000英語版に 対応	4	Adobe	Illustrator 10	0	○						
	31	データ編集ソフト	ビジュアルネット 作成用ベクトル レイアウト	英語版ソフト、 Windows2000英語版に 対応	4	Adobe	Pagemaker 7	0	○						
	32	データ編集ソフト	PDFデータの編 集	英語版ソフト、 Windows2000英語版に 対応	9	Adobe	Acrobat 5	0	○						
	33	データ編集ソフト	各種データの編 集	英語版ソフト、 Windows2000英語版に 対応	11	Microsoft	MS Office XP Professional	436	○						
	34	プログラム言語ソフト	各種プログラム 作成用	英語版ソフト、 Windows2000英語版に 対応	4	Microsoft	Visual Basic 6.0 Professional	530	○	Replaced by Visual Studio Net Pro 2002, English.	Visual Studio Net Pro 2002, English				

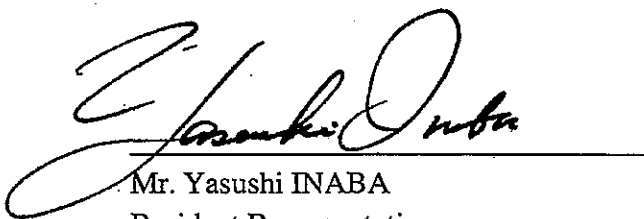
## 5. R/D 及び協議議事録

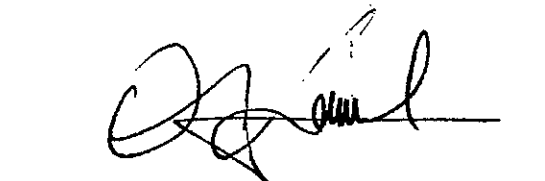
**RECORD OF DISCUSSIONS BETWEEN  
JAPAN INTERNATIONAL COOPERATION AGENCY  
AND  
AUTHORITIES CONCERNED OF  
THE GOVERNMENT OF THE REPUBLIC OF TURKEY  
ON THE JAPANESE TECHNICAL COOPERATION FOR  
THE GEOLOGIC REMOTE SENSING PROJECT**

Japan International Cooperation Agency (hereinafter referred to as "JICA") had a series of discussions through the Resident Representative of JICA in the Republic of Turkey, with the Turkish authorities concerned with respect to desirable measures to be taken by both Governments for the successful implementation of the Geologic Remote Sensing Project in the Republic of Turkey.

As a result of the discussions, JICA and the Turkish authorities concerned agreed to recommend to their respective Governments the matters referred to in the document attached hereto.

Ankara, July 4, 2002

  
Mr. Yasushi INABA  
Resident Representative  
JICA Turkey Office  
Japan International Cooperation Agency  
Japan

  
Mr. Ali Kemal ISIKER  
General Director  
General Directorate of Mineral Research  
And Exploration (MTA)  
The Republic of Turkey

## THE ATTACHED DOCUMENT

### I. COOPERATION BETWEEN BOTH GOVERNMENTS

1. The Government of the Republic of Turkey will implement the Geologic Remote Sensing Project (hereinafter referred to as "the Project") in cooperation with the Government of Japan.
2. The Project will be implemented in accordance with the Master Plan which is given in Annex I (R/D).

### II. MEASURES TO BE TAKEN BY THE GOVERNMENT OF JAPAN

In accordance with the laws and regulations in force in Japan, the Government of Japan will take, at its own expense, the following measures through JICA according to the normal procedures under the Technical Cooperation Scheme of Japan.

#### 1. DISPATCH OF JAPANESE EXPERTS

The Government of Japan will provide the services of the Japanese experts as listed in Annex II (R/D).

#### 2. PROVISION OF MACHINERY AND EQUIPMENT

The Government of Japan will provide such machinery, equipment and other materials (hereinafter referred to as "the Equipment") necessary for the implementation of the Project as listed in Annex III (R/D). The Equipment will become the property of the Government of the Republic of Turkey upon being delivered C.I.F. (cost, insurance and freight) to the Turkish authorities concerned at the ports and/or airports of disembarkation.

#### 3. TRAINING OF TURKISH PERSONNEL IN JAPAN

The Government of Japan will receive the Turkish personnel connected with the Project for technical training in Japan.



### III. MEASURES TO BE TAKEN BY THE GOVERNMENT OF THE REPUBLIC OF TURKEY

1. The Government of the Republic of Turkey will take necessary measures to ensure that the self-reliant operation of the Project will be sustained during and after the period of Japanese technical cooperation, through the full and active involvement in the Project by all related authorities, beneficiary groups and institutions.
2. The Government of the Republic of Turkey will ensure that the technologies and knowledge acquired by the Turkish nationals as a result of the Japanese technical cooperation will contribute to the economic and social development of the Republic of Turkey.
3. The Government of the Republic of Turkey will grant in the Republic of Turkey privileges, exemptions and benefits as listed in Annex IV(R/D) and will grant privileges, exemptions and benefits no less favorable than those granted to experts of third countries or international organizations performing similar missions to the Japanese experts referred to in II -1 above and their families.
4. The Government of the Republic of Turkey will ensure that the Equipment referred to in II-2 above will be utilized effectively for the implementation of the Project in consultation with the Japanese experts referred to in Annex II (R/D).
5. The Government of the Republic of Turkey will take necessary measures to ensure that the knowledge and experience acquired by the Turkish personnel from technical training in Japan will be utilized effectively in the implementation of the Project.
6. In accordance with the laws and regulations in force in the Republic of Turkey, the Government of the Republic of Turkey will take necessary measures to provide at its own expense:
  - (1) Services of the Turkish counterpart personnel and administrative personnel as listed in Annex V (R/D);
  - (2) Land, buildings and facilities as listed in Annex VI(R/D);



- (3) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than the Equipment provided through JICA under II-2 above; and
  - (4) Means of transport and travel allowances for the Japanese experts for official travel within the Republic of Turkey.
7. In accordance with the laws and regulations in force in the Republic of Turkey, the Government of the Republic of Turkey will take necessary measures to meet:
- (1) Expenses necessary for transportation within the Republic of Turkey of the Equipment referred to in II-2 above as well as for the installation, operation and maintenance thereof;
  - (2) Customs duties, internal taxes and any other charges, imposed in the Republic of Turkey on the Equipment referred to in II-2 above; and
  - (3) Running expenses necessary for the implementation of the Project.

#### **IV. ADMINISTRATION OF THE PROJECT**

1. General Director, General Directorate of Mineral Research and Exploration (hereinafter referred to as "MTA") as the Project Director, will bear overall responsibility for the administration and implementation of the Project.
2. Head of the Geological Research Department, as the Deputy Project Director, will assist the Project Director.
3. Coordinator of Remote Sensing and GIS Division, as the Project Manager, will be responsible for the managerial matters of the Project.
4. Remote Sensing Center (RSC)-Project Application Unit Manager, as the Coordinator, will be responsible for the technical matters of the Project.





5. The Japanese Chief Advisor will provide necessary recommendations and advice to the Project Director and the Project Manager on any matters pertaining to the implementation of the Project.
6. The Japanese experts will give necessary technical guidance and advice to the Turkish counterpart personnel on technical matters pertaining to the implementation of the Project.
7. For the effective and successful implementation of technical cooperation for the Project, a Joint Coordinating Committee will be established whose functions and composition are described in Annex VII(R/D).

## **V. JOINT EVALUATION**

Evaluation of the Project will be conducted jointly by the two Governments through JICA and the Turkish authorities concerned, at the middle and during the last six months of the cooperation term in order to examine the level of achievement.

## **VI. CLAIMS AGAINST JAPANESE EXPERTS**

The Government of the Republic of Turkey undertakes to bear claims, if any arises, against the Japanese experts engaged in technical cooperation for the Project resulting from, occurring in the course of, or otherwise connected with the discharge of their official functions in the Republic of Turkey except for those arising from the willful misconduct or gross negligence of the Japanese experts.

## **VII. MUTUAL CONSULTATION**

There will be mutual consultation between the two Governments on any major issues arising from, or in connection with this Attached Document.



## **VIII. MESURES TO PROMOTE UNDERSTANDING OF AND SUPPORT FOR THE PROJECT**

For the purpose of promoting support for the Project among the people of the Republic of Turkey, the Government of the Republic of Turkey will take appropriate measures to make the Project widely known to the people of the Republic of Turkey.

## **IX. TERM OF COOPERATION**

The duration of the technical cooperation for the Project under this Attached Document will be four (4) years from August 01, 2002.

<b>ANNEX I (R/D)</b>	<b>MASTER PLAN</b>
<b>ANNEX II (R/D)</b>	<b>LIST OF JAPANESE EXPERTS</b>
<b>ANNEX III (R/D)</b>	<b>LIST OF MACHINERY AND EQUIPMENT</b>
<b>ANNEX IV (R/D)</b>	<b>PRIVILEGES, EXEMPTIONS AND BENEFITS FOR JAPANESE EXPERTS</b>
<b>ANNEX V (R/D)</b>	<b>LIST OF TURKISH COUNTERPART AND ADMINISTRATIVE PERSONNEL</b>
<b>ANNEX VI (R/D)</b>	<b>LIST OF LAND, BUILDINGS AND FACILITIES</b>
<b>ANNEX VII (R/D)</b>	<b>JOINT COORDINATING COMMITTEE</b>

## MASTER PLAN

### Sub-project A: Mineral Resources Exploration

#### 1. Super Goal

Investment for the mineral resources development is promoted.

#### 2. Overall Goal

- (1) MTA/Remote Sensing Center (MTA/RSC) is able to extract promising area utilizing advanced remote sensor data, such as ASTER (and/or PALSAR).
- (2) Basic data with analytical results utilizing advanced remote sensor data are supplied to mining sectors.
- (3) Technical expertise focusing on analysis of the advanced remote sensor data for mineral resources exploration is transferred to other institutes and third countries through training courses.

#### 3. Project Purpose

MTA/RSC is able to utilize advanced remote sensor data such as ASTER and/or PALSAR data for mineral resources exploration.

#### 4. Outputs

- (1) The project operation unit (MTA/RSC) is established.  
(In common with the sub-project A and B)
- (2) Equipment and advanced satellite data are introduced and maintained properly.  
(In common with the sub-project A and B)
- (3) Image processing of ASTER data for mineral resources exploration can be carried out by the C/P personnel.
- (4) Case studies of mineral resources exploration utilizing ASTER data are accumulated.
- (5) Spatial analysis by GIS can be carried out by the C/P personnel.  
(6) and (7) refer to the sub-project B
- (8) MTA/RSC can provide necessary technical support to implement training courses.  
(In common with the sub-project A and B)

#### 5. Activities of the Sub-project A

Necessary activities to achieve the above-mentioned outputs will be conducted.

*BA.*

**Sub-project B: Analysis of Environment and Natural Hazard**

**1. Super Goal**

Achievements realized by the MTA/RSC concerning utilization of the advanced remote sensing technology contribute to the revision of the environment and natural hazard policies or regulations by the Turkish government.

**2. Overall Goal**

(1) Accumulation and utilization of the advanced remote sensor data such as ASTER and/or PALSAR data for environmental conservation and disaster prevention are expanded and enhanced at the MTA/RSC.

(2) Technical expertise focusing on analysis of the advanced remote sensor data for environmental conservation and disaster prevention is transferred to other institutes and third countries through training courses.

**3. Project Purpose**

MTA/RSC is able to utilize the advanced remote sensor data such as ASTER and/or PALSAR data for environment and natural hazard analysis.

**4. Outputs**

(1) The project operation unit (RSC) is established.

(In common with the sub-project A and B)

(2) Equipment and advanced satellite data necessary to utilize satellite data are introduced and maintained properly.

(In common with the sub-project A and B)

(3), (4) and (5) refer to the sub-project A

(6) Analysis for natural hazard area using SAR and ASTER data can be carried out by the C/P personnel.

(7) Environmental analysis using remote sensor data can be carried out by the C/P personnel

(8) MTA/RSC can provide necessary technical support to implement training courses.

(In common with the sub-project A and B)

**5. Activities of the Sub-project A and B**

Necessary activities to achieve the above-mentioned outputs will be conducted.



**LIST OF JAPANESE EXPERTS**

1. Chief Advisor
2. Coordinator
3. Expert on Digital Image Processing
4. Expert on Geologic Remote Sensing

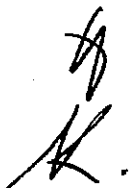
Note: Other experts in specific fields of technology may be dispatched, if necessary.



**LIST OF MACHINERY AND EQUIPMENT**

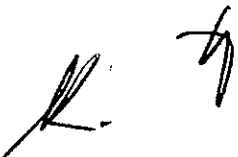
1. Equipment, machinery and materials necessary for the implementation of the Project.
2. Other equipment, machinery and materials regarded as necessary for the effective and smooth implementation of the Project by both sides.

Note: The content, specifications and quality of equipment, machinery and materials will be decided through mutual consultation within the allocated budget of the Japanese fiscal year.



**PRIVILEGES, EXEMPTIONS AND BENEFITS  
FOR JAPANESE EXPERTS**

1. The Government of the Republic of Turkey will grant exemptions from income tax and other charges of any kind imposed on or in connection with allowances remitted from abroad.
2. The Government of the Republic of Turkey will grant exemptions from customs duties with respect to importation of personal effects by the Japanese experts and their families, as well as importation of machinery and equipment for their activities.



**LIST OF TURKISH COUNTERPART  
AND ADMINISTRATIVE PERSONNEL**

1. Counterpart Personnel
  - (1) Project Director
  - (2) Deputy Project Director
  - (3) Project Manager
  - (4) Coordinator
  - (5) Technical Counterparts
  
2. Administrative Personnel
  - (1) Administrative Staff
  - (2) Technical Supporting Staff
  - (3) Secretaries/ Typists
  - (4) Clerks
  - (5) Drivers
  - (6) Other supporting staff necessary for the implementation of the Project

Note: Secretaries, typists and drivers for the Japanese experts will be assigned by the Government of the Republic of Turkey from the allocated budget for the Project according to the Turkish regulations





**LIST OF LAND, BUILDINGS AND FACILITIES**

The following will be prepared by the Government of the Republic of Turkey for the implementation of the Project.

1. Room for the Japanese Chief Advisor
2. Room for the Japanese Experts and Turkish counterpart personnel
3. Conference room
4. Store rooms
5. Other facilities necessary for the implementation of the Project

*A.* *g*

**JOINT COORDINATING COMMITTEE**

1. Functions

The Joint Coordinating Committee meeting will be held at least once a year and whenever necessity arises in order to fulfill the following functions:

- (1) To formulate the Annual Plan of Operations (APO) of the Project based on the Tentative Schedule of Implementation (TSI) and Plan of Operations (PO) within the framework of the Record of Discussion,
- (2) To coordinate necessary actions to be taken by both sides,
- (3) To review the overall progress of the PO as well as the achievement of the APO, and
- (4) To exchange opinions on major issues that arise during the implementation of the Project.

2. Composition

(1) Chairperson

Project Director (General Director of Mineral Research and Exploration: MTA)

(2) Members

(Turkish Side)

- (a) Deputy Project Director(Head of Geological Research Department, MTA)
- (b) Project Manager (Coordinator of RS & GIS Division, MTA)
- (c) Coordinator (RS Center-Project Application Unit Manager, MTA)
- (d) Counterparts for the Long-term Experts
- (e) Staff of International Projects and Foreign Relations Division, MTA
- (f) Other personnel concerned to be decided by Project Director, if necessary

(Japanese Side)

- (a) Chief Advisor
- (b) Coordinator
- (c) Other Japanese Experts designated by the Chief Advisor
- (d) Representative(s) of JICA Office in the Republic of Turkey
- (e) Other personnel concerned to be decided and dispatched by JICA, if necessary

-Note: Official(s) of the Embassy of Japan and SPO (Undersecretariat of State Planning Organization) of Prime Ministry, the Republic of Turkey, representatives of General Directorate of Mining Affairs, and Mining Associations may attend the Joint Coordinating Committee meeting as observer(s).

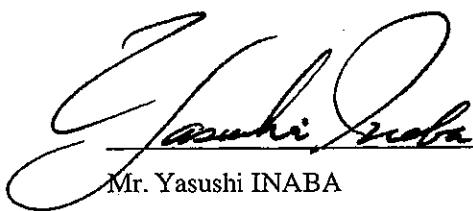
MINUTES OF MEETING BETWEEN  
JAPAN INTERNATIONAL COOPERATION AGENCY  
AND  
THE AUTHORITIES CONCERNED OF  
THE GOVERNMENT OF THE REPUBLIC OF TURKEY  
ON THE JAPANESE TECHNICAL COOPERATION FOR THE PROJECT ON  
GEOLOGIC REMOTE SENSING PROJECT IN THE REPUBLIC OF TURKEY

Japan International Cooperation Agency (hereinafter referred to as "JICA") had a series of discussions through the Resident Representative of JICA in the Republic of Turkey, with the Turkish authorities concerned with respect to desirable measures to be taken by both Governments for the successful implementation of the Geologic Remote Sensing Project (hereinafter referred to as "the Project") in the Republic of Turkey.

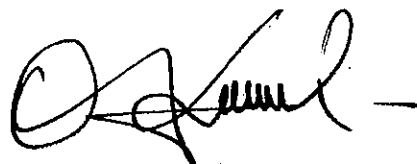
As a result of the discussions, JICA Turkey Office and the Turkish authorities concerned signed the Record of Discussions (hereinafter referred to as "R/D") on Japanese Technical Cooperation for the Project.

The document attached hereto is intended to record the common understandings reached between both sides in regard to the provisions stipulated in the R/D and to supplement the content of R/D.

Ankara, July 4, 2002



Mr. Yasushi INABA  
Resident Representative  
JICA Turkey Office  
Japan International Cooperation Agency  
Japan



Mr. Ali Kemal ISIKER  
General Director  
General Directorate of Mineral Research  
and Exploration (MTA)  
The Republic of Turkey

## ATTACHED DOCUMENT

### 1. Name of the Project

Both sides agreed to use "Geologic Remote Sensing Project" as the name of the Project.

### 2. Implementing Agency of the Project

The General Directorate of Mineral Research and Exploration (Maden Tetkik ve Arama Genel Müdürlüğü, hereinafter referred to as "MTA") will bear overall responsibility for the implementation of the Project.

The project will be implemented at the Remote Sensing Center (hereinafter referred to as "RSC") under the Geological Research Department of MTA.

The present organization chart of MTA and Geological Research Department of MTA is shown in ANNEX1, ANNEX2.

### 3. Administration of the Project

General Director of MTA, as the Project Director, will bear overall responsibility for the coordination and implementation of the actions and proceedings in order to achieve the general goals of the Project.

Head of Geological Research Department, as the Deputy Project Director, will assist the Project Director.

Coordinator of Remote Sensing and GIS Division, as the Project Manager, will be responsible for the managerial matters of the Project.

RS Center-Project Application Unit Manager, as the Coordinator, will be responsible for the technical matters of the Project.

The organization chart for the administration of the Project is as shown in ANNEX3.

### 4. Duration of the Project

The duration of the technical cooperation for the Project will be four (4) years from August 01 , 2002.

### 5. Site of the Project

The Project will be implemented at the RSC under the Geological Research Department of MTA.

The Turkish side explained that the Project would be implemented at a building in the premise of MTA, and that renovation of the building has been completed.

The Address of the premise is as follows.

## 6. Master Plan of the Project

### Sub-project A: Mineral Resource Exploration

#### 1) Super Goal

Investment for the mineral resources development is promoted.

#### 2) Overall Goal

- (1) MTA/RSC is able to extract promising areas utilizing advanced remote sensor data, such as ASTER (and/or PALSAR).
- (2) Basic data with analytical results utilizing advanced remote sensor data are supplied to mining sectors.
- (3) Technical expertise focusing on analysis of the remote sensor data for mineral resources exploration is transferred to other institutes and third countries through training courses.

#### 3) Project Purpose

MTA/RSC enables utilization of advanced remote sensor data such as ASTER and/or PALSAR data for mineral resources exploration.

#### 4) Outputs

- (1) The project operation unit (RSC) is established.  
(In common with the sub-project A and B)
- (2) Equipment and advanced satellite data are introduced and maintained properly.  
(In common with the sub-project A and B)
- (3) Image processing of ASTER data for mineral resources exploration can be carried out by the C/P personnel.
- (4) Case studies of mineral resources exploration utilizing ASTER data are accumulated.
- (5) Spatial analysis by GIS can be carried out by the C/P personnel.
- (6) and (7) refer to the sub-project B
- (8) MTA/RSC can provide necessary technical support to implement training courses.  
(In common with the sub-project A and B)

### Sub-project B: Analysis of Environment and Natural Hazard

#### 1) Super Goal

Achievements realized by the MTA/RSC concerning utilization of the advanced remote sensing technology contribute to the revision of the environment and natural disaster policies or regulations by the Turkish government.

#### 2) Overall Goal

- (1) Accumulation and utilization of the advanced remote sensor data such as ASTER and/or PALSAR data for environmental conservation and disaster prevention are expanded through MTA/RSC.
- (2) Technical expertise focusing on analysis of the advanced remote sensor data for environmental conservation and disaster prevention is transferred to other institutes and third countries through training courses.

### 3) Project Purpose

MTA/RSC enables utilization of the advanced remote sensor data such as ASTER and/or PALSAR data for environment and natural hazard analysis.

### 4) Outputs

- (6) Analysis for natural hazard area using SAR and ASTER data can be carried out by the C/P personnel.
- (7) Environmental analysis using remote sensor data can be carried out by the C/P personnel.

## 7. Fields, Schedule of Technology Transfer

### 1) Fields

Both sides agreed that technology transfer from the Japanese experts to the Turkish counterparts (hereinafter referred to as "the C/P") would be made in the following fields;

- (1) Familiarization training to new hardware and software,
- (2) Optical sensor data analysis for natural resource exploration with ASTER data,
- (3) Microwave sensor data analysis for natural hazard with JERS-1 SAR and/or PALSAR data,
- (4) Environmental analysis,
- (5) GIS-based integrated spatial analysis,
- (6) Support to technical training programs to the third countries.

Details of each field of technology transfer are described in ANNEX4.


### 2) Schedule

Plan of Operation and Annual Plan of Operation are as shown in ANNEX5 and ANNEX6.

## 8. Proposed Case Study Areas

Both sides agreed on the locations, of which maps are presented by MTA, as the proposed case study areas for exploration of natural resources and natural hazard studies. Those maps are as shown in ANNEX7.

Both sides agreed that case study areas could be changed depending on unexpected situation occurred.



## 9. Measures to be taken by the Japanese Side

The Project will be carried out under the framework of Technical Cooperation, which combines the following three (3) components:

### 1) Dispatch of Japanese Experts

(Long-term experts)

Both sides agreed that long-term experts would be dispatched in the following fields.

- (1) Chief Advisor
- (2) Coordinator
- (3) Expert on Image Processing
- (4) Expert on Geologic Remote Sensing

(Short-term experts)

Both sides agreed that short-term experts would be dispatched in the following fields in relation to the fields of technology transfer as necessity arises.

At this moment, the experts in the following fields are expected to be dispatched:

- (1) TIR analysis
- (2) DEM processing with ASTER data
- (3) Interferometry with SAR data
- (4) Environmental and natural hazard analysis
- (5) GIS-based integrated spatial analysis
- (6) Photo-geology

The requesting form for dispatch of Japanese experts (Form A1) should be submitted to the Government of Japan by the Turkish side at least two (2) months prior to the scheduled arrival date to the Republic of Turkey.

### 2) Training of the C/P in Japan

JICA explained that a certain number of the C/P would be accepted for training in Japan during the cooperation period according to the following program:

- 1.Number : One (1) or two (2) yearly
- 2.Term : About a couple of weeks to one (1) month, depending upon the fields as well as the C/P dispatched to Japan
- 3.Fields : Remote Sensing

JICA, further, requested the Turkish side and latter agreed that the C/P may apply to other training courses conducted by JICA, however, sufficient consultation should be held between the Japanese experts and the C/P before the application to avoid impeding the smooth implementation of the Project.

The application form for the training program in Japan (Form A2-A3) should be submitted to the Government of Japan by the Turkish side at least two (2) months prior to the scheduled arrival date to Japan.

### 3) Provision of Equipment

Both sides confirmed the machinery, equipment and other materials (hereinafter referred to as “the Equipment”) necessary for technology transfer in the Project and the Turkish side requested to the Japanese side the provision of the Equipment which is as shown in ANNEX 8.

JICA agreed to convey the request of the Turkish side as for the Equipment to the Japanese authorities concerned, stating that the actual provision will be subject to the budget appropriation of the Government of Japan.

JICA explained and the Turkish side agreed that the costs and responsibility necessary for domestic transport, installation, maintenance and repair of the Equipment should be borne by the Turkish side.

The requesting form for provision of equipment (Form A4) should be submitted to the Government of Japan by the Turkish side immediately after R/D has been signed.

## 10. Measures to be taken by the Turkish Side

### 1) Buildings and Facilities for the Project

The Turkish side will prepare the building and facilities necessary for the implementation of the Project.

Office space for the Japanese experts which are equipped properly with office equipment such as phones, facsimiles, international telephone lines include internet, electric wiring, desks and other necessary furnishings will be prepared by Turkish side before the commencement of the Project.

The layout of the building and facilities is as shown in ANNEX 9.

### 2) Long Term Assignment of the C/P

For the successful implementation of the Project, both sides confirmed that at least two (2) full-time counterparts will be assigned to the following each long-term expert.

(a) Expert on Image Processing

(b) Expert on Geologic Remote Sensing.

Both sides also confirmed the allocation of the part time services of the C/P who are listed in Annex 10 and the administrative personnel.

Should the allocation of the C/P and the administrative personnel be changed for either the personnel or administrative reasons, the Turkish side will immediately take necessary measures to supplementary assign appropriate number of personnel for the Project.



### 3) Machinery, Equipment and Materials

The Turkish side will supply at its own expense machinery, equipment, instruments, vehicles, tools, consumables, spare parts and any other materials for the implementation of the Project other than those provided by the Government of Japan through JICA.

### 4) Local Costs

The necessary amount of local costs by the Turkish side will be indispensable for the successful implementation of the Project.

In this regard, both sides confirmed that the cost necessary for operation of the Project, which is listed below, is to be borne by the Turkish side.

- (1) Expense for satellite data
- (2) Field allowance and transportation for ground truth
- (3) Expense for sample analysis
- (4) Allocation of temporary supportive staff for data processing, ground truth, etc.
- (5) Expense for workshops and seminars
- (6) Expense for consumables, electricity, etc.
- (7) Expense for maintenance of the equipment

The Turkish side presented the budgetary plan for these costs through the project periods, which is shown as Annex11.

### 5) Sustainability of the Project

The Turkish side will take necessary measures to ensure that the self-reliant operation of the Project will be sustained during the period of the Japanese technical cooperation, through the full and active involvement of all related authorities, beneficiary groups and institutions for the Project so that the technologies and knowledge acquired by the counterpart personnel through the Project should ultimately contribute to the economic and social development of the Republic of Turkey.

In relation with this, both sides agreed the contents of the diagram of the Project concept and a tentative plan of future functions of MTA/ RSC shown as ANNEX12 and ANNEX 13.

## 11. Tentative Schedule of Implementation

Both sides agreed on the Tentative Schedule of Implementation for the Project as shown in ANNEX 14.

## 12. Project Cycle Management

### 1) Application of Project Cycle Management Method

Both sides reconfirmed that project planning, monitoring and evaluating method entitled Project Cycle Management (hereinafter referred to as "PCM") would be applied to the Project to monitor and evaluate the level of the achievement and enhance the communication for its smooth implementation.

### 2) Project Design Matrix

Both sides reconfirmed that the Project Design Matrix (hereinafter referred to as "PDM") ought to be designed at the planning stage of the Project, as a framework clarifying the multi-level chain of cause-to-effect such as input to output, output to project purpose, and project purpose to overall goal.

Then, both sides agreed on the PDM as shown in ANNEX15 and confirmed the following:

- (1) The C/P and the Japanese experts should examine the indicators in the planning stage of the Project, which is scheduled within six (6) months after the Project starts, so that Indicators and/or targets for project purpose and outputs should be as objectively verifiable as possible.
- (2) PDM should continue to be reviewed and revised if necessary, with further discussion between both sides.

### 3) Monitoring

Both sides agreed on the following:

- (1) Based on PDM, regular monitoring on the achievement of the Project should be implemented primarily by the C/P and the Japanese experts, in order to grasp the progress and the achievement of the Project and to modify the plan and take necessary actions for smooth implementation.
- (2) Within the first 6 months after the commencement of the Project, the C/P and the Japanese experts should establish the monitoring plan and system which and thereafter, monitoring should be done and the results should be distributed to the organization and/or personnel concerned with the Project.

### 4) Evaluation

Both sides agreed on the following:

- (1) Evaluation of the Project is to be conducted, based on the five basic evaluation components as shown in ANNEX16.
- (2) The midterm evaluation will be conducted jointly by both sides in the middle of the cooperation period, in order to examine the achievement of the Project and modify the plan if necessary.
- (3) The final evaluation of the Project will be conducted jointly by both sides, approximately 6 months before the termination of the cooperation period, in order to examine the achievement of the Project.
- (4) JICA recommended that third party could be included in the above mentioned evaluation stage

and the Turkish side replied that it will consider this matter and make a decision until the Project starts.

### **13. Joint Coordinating Committee of the Project**

For the effective and successful implementation of technical cooperation for the Project, both sides agreed to establish a Joint Coordinating Committee and its functions and composition are described in ANNEX17.

### **14. Common Language**

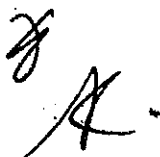
Both sides confirmed that the common language used in any activities of the Project should be English.

### **15. Project Document**

Both sides agreed that the Project Document would be finalized by mutual agreement immediately after the commencement of the Project.

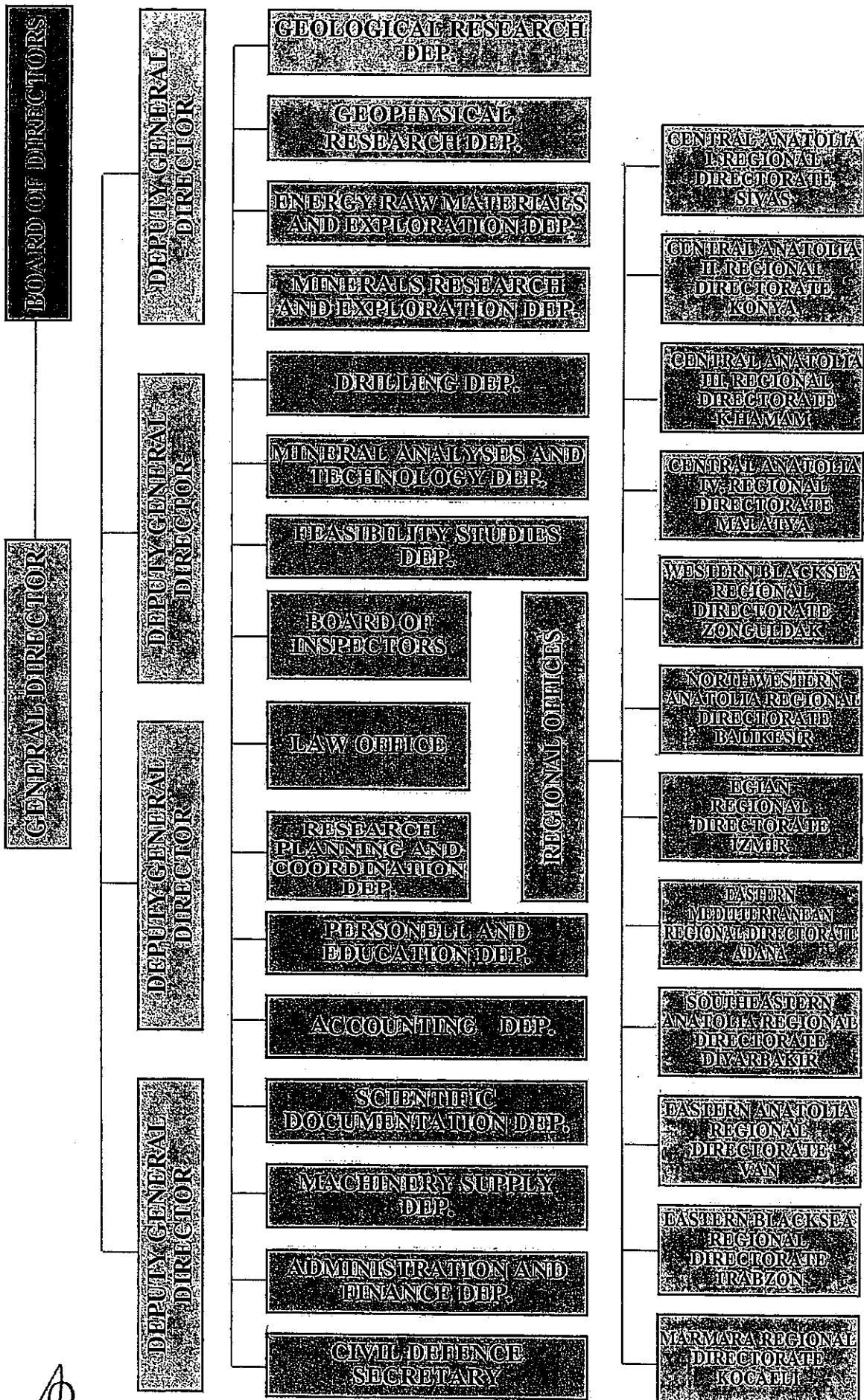
### **16. Others**

The list of attendants at the meetings is as shown in ANNEX18.



## LIST OF ANNEXES

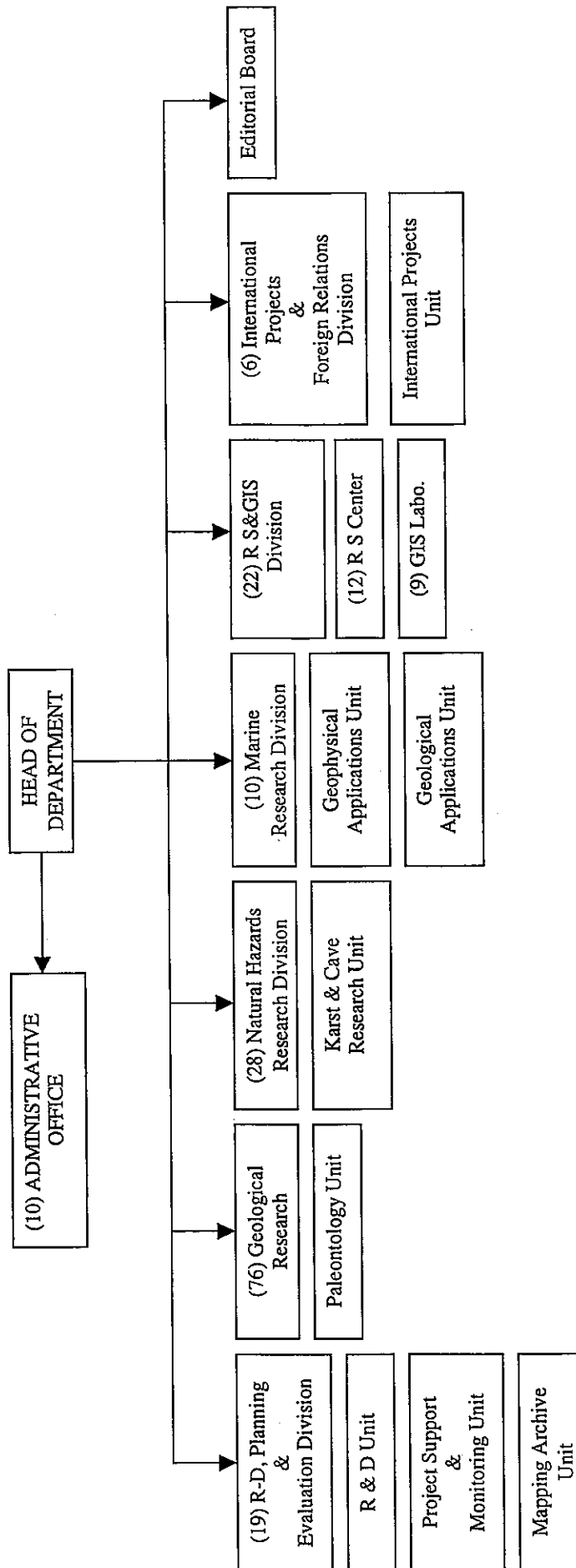
- ANNEX 1 Present organization chart of MTA
- ANNEX 2 Present organization chart of Geological Research Department
- ANNEX 3 Provisional organization chart for the administration of the Project
- ANNEX 4 Detail of the fields of technology transfer
- ANNEX 5 Plan of Operation (PO)
- ANNEX 6 Annual Plan of Operation (APO)
- ANNEX 7 Proposed case study areas
- ANNEX 8 Equipment necessary for technology transfer in the Project
- ANNEX 9 Layout plan of the new building and rooms
- ANNEX 10 RS Center organization chart with list of counterpart
- ANNEX 11 Budgetary plan of MTA/RSC
- ANNEX 12 Diagram of the project concept
- ANNEX 13 Tentative plan of future functions of MTA/RSC
- ANNEX 14 Tentative Schedule of Implementation (TSI)
- ANNEX 15 Project Design Matrix (PDM)
- ANNEX 16 Five basic evaluation components
- ANNEX 17 Joint Coordinating Committee (JCC)
- ANNEX 18 List of attendants at the meeting



*g A*

**GEOLOGICAL RESEARCH DEPARTMENT**

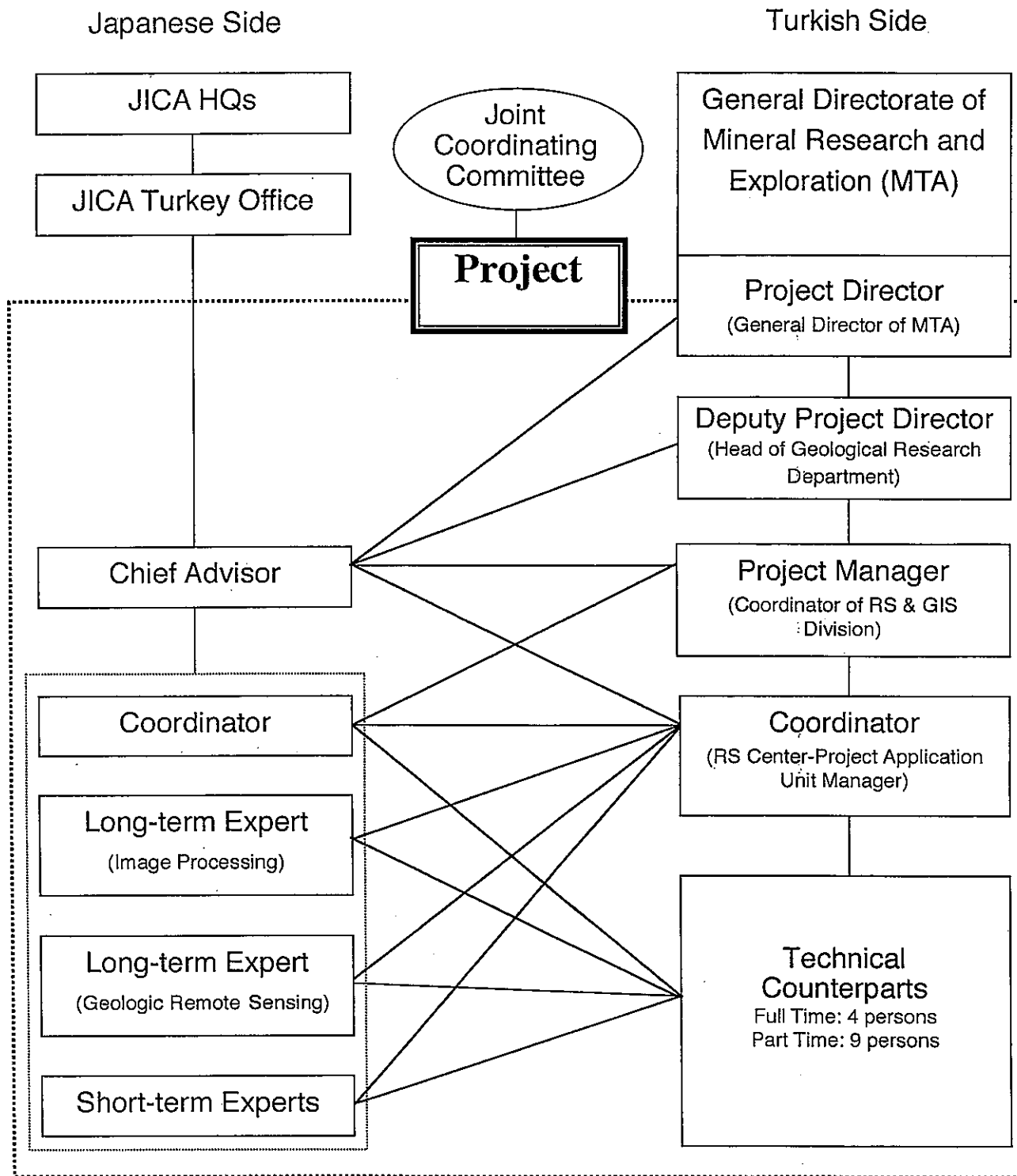
*AR*



July, 2001

TOTAL NUMBER OF PERSONNEL : 197

Provisional Organization Chart of the Project



*to AK.*

## Detail of the fields of technology transfer

### I. Familiarization Training to New Hardware and Software

1. Network and hardware installation
2. Software familiarization (remote sensing, GIS, others)
3. Spectrometer hands-on training

### II. Optical Sensor Data Analysis for Natural Resource Exploration with ASTER Data

1. Introduction to effective use of ASTER data from previous studies
2. VNIR and SWIR analysis
  - a. Conversion method from original data (radiance at sensor) to apparent reflectance
  - b. Construction and management of spectral library
  - c. Method of alteration mineral mapping
  - d. Ground-truth
  - e. Evaluation of vegetation effect to mapping quality
3. TIR analysis
  - a. Concept of thermal-infrared analysis
  - b. Image processing of thermal-infrared data
  - c. Methodology for lithological mapping with respect to silica content
  - d. Ground-truth
  - e. Evaluation of vegetation effect to mapping quality
4. Regional DEM processing based on ASTER stereo mode

### III. Microwave Sensor Data Analysis for Natural Hazard with JERS-1 SAR and PALSAR Data

1. Introduction to effective use of JERS-1 SAR and PALSAR data
2. Data handling and basic image processing of SAR data\*  
(\*:standard products prepared by ERSDAC)
3. Interferometry detecting subtle surface changes
  - a. Concept of interferometry
  - b. Processing interferogram
  - c. Analysis of ground surface movement
4. Verification by ASTER imageries and ground-truth

### IV. Environmental Analysis

Vegetation: SAR image processing for monitoring local to regional vegetation changes

### V. GIS-based Integrated Spatial Analysis

1. Mineral potential mapping with GIS
2. Hazard area mapping

### VI. Support to Technical Training Program to the Third Countries

1. Teaching material
2. Seminar and/or workshop
3. Field excursion



**Plan of Operation for Geologic Remote Sensing Project**  
 Abbreviations: (Japanese Side) CA <Chief Advisor>, LE <Long-term Expert(s)>, SE <Short-term Expert(s)>  
 Abbreviations: (Turkish Side) PD <Project Director>, PM <Project Managers>, PCT <Project Coordinator>, CP <Counterparts>

Output	Activity	Calendar Year												In charge	Remarks				
		2002			2003			2004			2005					2006			
		I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	Japan	Turkey
1 The project operation units (RSC) is established. In common with the Sub-project A & B	1-1 Allocate staff as planned.																	CA	PM
	1-2 Make plan of operation.																	CA	PM
	1-3 Make budgetary plan.																	CA	PM
	1-4 Make and implement monitoring plan.																	CA	PM
	1-5 Operate the Joint Coordinating Committee.																	CA	PM
2 Equipment and advanced satellite data are introduced and maintained properly. In common with the Sub-project A & B	2-1 Procure and install necessary equipment.																	LE,PCJ	C/P
	2-2 Operate and maintain equipment properly.																	LE	C/P
3 Image processing of ASTER data for mineral resources exploration can be carried out by the C/P personnel. For the Sub-project A	3-1 Introduce application of ASTER data.																	LE	C/P
	3-2 Introduce processing of VNIR and SWIR data.																	LE,SE	C/P
	3-3 Analyze TIR data.																	LE,SE	C/P
	3-4 Generate regional DEM processing ASTER stereo mode data.																	LE,SE	C/P
	3-5 Transfer technology of effective application of ASTER data.																	LE	C/P
4 Case studies of mineral resources exploration utilizing ASTER data are accumulated. For the Sub-project A	3-6 Carry out data acquisition of spectrometer and construction of spectral databases.																	LE	C/P
	4-1 Collect data of the proposed areas and input data.																	LE	C/P
	4-2 Analyze data of the proposed areas.																	LE	C/P
	4-3 Select the promising areas.																	LE	C/P
5 Spatial analysis by GIS can be carried out by the C/P personnel. For the Sub-project A	4-4 Carry out ground truth.																	LE	C/P
	5-1 Transfer technology of integrated spatial analysis integrating various geologic data.																	LE,SE	C/P
	5-2 Transfer technology how to select exploration areas utilizing GIS.																	LE,SE	C/P
6 Analysis for natural hazard area using Japanese SAR and ASTER data can be carried out by the C/P personnel. For the Sub-project B	5-3 Carry out resources area evaluation utilizing GIS.																	LE,SE	C/P
	6-1 Introduce basic knowledge of utilization of satellite data for disaster monitoring.																	LE	C/P
	6-2 Transfer technology how to extract possible hazard areas utilizing ASTER and/or SAR image.																	LE	C/P
	6-3 Transfer technology how to extract area of ground surface movement utilizing InSAR data.																	LE,SE	C/P
7 Environmental analysis using remote sensor data can be carried out by the C/P personnel. For the Sub-project B	6-4 Verify InSAR results by ASTER image and ground-truth.																	LE,SE	C/P
	7-1 Transfer technique how to select environmental indicator such as vegetation index.																	LE	C/P
	7-2 Introduce remote sensing technology applicable to environmental problems in Turkey.																	LE	C/P
8 MTA/RSC can provide necessary technical support to implement training courses. In common with the Sub-project A & B	7-3 Strengthen capability of designing environmental survey plan.																	LE	C/P
	8-1 Make technical support program for TCTP.																	LE	C/P
	8-2 Prepare textbooks for TCTP.																	LE	C/P
	8-3 Support seminars and/or workshops for TCTP.																	LE	C/P
	8-4 Support field excursions for TCTP.																	LE	C/P
8-5 Carry out training courses (other than TCTP).																	(LE)	C/P	

# APO

## Annual Plan of Operation (APO) for the Year 2002

Geologic Remote Sensing Project  
 Abbreviations: (Japanese Side) CA/Chief Advisor, PCJ/Project Coordinator, LE/Long-term Expert(s), SE/Short-term Expert(s)  
 Abbreviations: (Turkish Side) PDI/Project Director, PCT/Project Coordinator, CP/Counterparts

Output	Activity	Calendar												In charge		Remarks
		Japanese Fiscal Year												Japan	Turkey	
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	CA	PM
1 The project operation units(RSC) is established. In common with the Sub-project A & B	1-1 Allocate staff as planned.														CA	PM
	1-1-1 Allocate staff for FY 2002														CA	PM
	1-1-2 Make plan of C/P training in Japan for FY2002														CA	PM
	1-1-3 Follow the procedure of dispatching C/P to Japan for FY2002														CA	PM
	1-1-4 Make plan of C/P training in Japan for FY2003														CA	PM
	1-1-5 Follow the procedure of dispatching C/P to Japan for FY2003														CA	PM
	1-2 Make plan of operation.														CA	PM
	1-2-1 Make annual plan of operation for FY 2002														CA	PM
	1-2-2 Make annual plan of operation for FY 2003														CA	PM
	1-3 Make budgetary plan.														CA	PM
	1-3-1 Make budgetary plan for FY 2002														CA	PM
	1-3-2 Make budgetary plan for FY 2003														CA	PM
	1-4 Make and implement monitoring plan.														CA	PM
	1-4-1 Make a monitoring plan														CA	PM
	1-4-2 Carry out the 1st monitoring														CA	PM
1-5 Operate the Joint Coordinating Committee.														CA	PM	
1-5-1 Carry out the 1st and 2nd Joint Coordinating Meeting														CA	PM	
2 Equipment and advanced satellite data are introduced and maintained properly. In common with the Sub-project A & B	2-1 Procure and install necessary equipment.														LE, PCJ	CP, PCT
	2-1-1 Follow the necessary procedures for local procurement of the equipment														LE, PCJ	CP, PCT
	2-1-2 Follow the necessary procedures for procurement of the equipment from Japan														LE, PCJ	CP, PCT
	2-1-3 Carry out installation of equipment and wiring work for LAN														LE	CP
	2-1-4 Prepare plan of procurement of equipment for FY 2003														LE	CP
	2-2 Operate and maintain equipment properly.														LE	CP
	2-2-1 Make guidance for operation of equipment														LE	CP
	2-2-2 Make guidance for maintenance of equipment														LE	CP
	2-2-3 Make manual for operation of equipment														LE	CP
	2-2-4 Make lists of consumables for FY2003														LE	CP
	2-2-5 Carry out maintenance of equipment														LE	CP

# APO

**Annual Plan of Operation (APO) for the Year 2002** *Geologic Remote Sensing Project*  
 Abbreviations: (Japanese Side) CA/Chief Advisor, PCJ/Project Coordinator, LE/Long-term Expert(s), SE/Short-term Expert(s)  
 Abbreviations: (Turkish Side) PDJ/Project Director, PMP/Project Manager, PCT/Project Coordinator, CP/Counterparts

Output	Calendar												In charge		Remarks	
	Japanese Fiscal Year												Japan	Turkey		
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar			
3 Image processing of ASTER data for mineral resources exploration can be carried out by the C/P personnel. For the Sub-narrant A	3-1 Introduce application of ASTER data.														LE	CP
	3-1-1 Introduce characteristics of ASTER data														LE	CP
	3-1-2 Operate data search and DPR system of ASTER														LE	CP
	3-1-3 Introduce effective use of ASTER data established by previous studies														LE	CP
	3-2 Introduce processing of VNIR and SWIR data.														LE/SE	CP
	3-2-1 Introduce operation of VNIR and SWIR bands data														LE/SE	CP
	3-2-2 Introduce methodology to discriminate alteration area														LE/SE	CP
	3-2-3 Introduce photo-geological interpretation														LE/SE	CP
	3-2-4 Produce mosaicked ASTER data														LE	CP
	3-2-5 Carry out groundtruth														LE	CP
	3-3 Analyze TIR data.														LE/SE	CP
	3-3-1 Introduce fundamental concept of thermal-infrared analysis														LE/SE	CP
	3-3-2 Carry out image processing of TIR data														LE/SE	CP
	3-3-3 Carry out lithological mapping by silica content														LE/SE	CP
	3-3-4 Carry out groundtruth														LE/SE	CP
	3-4 Generate regional DEM processing ASTER stereo mode data.														LE/SE	CP
	3-4-1 Produce DEM.														LE/SE	CP
	3-4-2 Utilize DEM.														LE/SE	CP
3-5 Transfer technology of effective application of ASTER data.														LE	CP	
3-5-1 Analyze stereo image by stereo-viewing method														LE	CP	
3-5-2 Produce alteration mineral maps by hyperspectral analysis														LE	CP	
3-6 Carry out data acquisition of spectrometer and construction of spectral database.														LE	CP	
3-6-1 Operate spectrometer.														LE	CP	
3-6-2 Carry out data acquisition and calibration of spectrometer.														LE	CP	
3-6-3 Construct database of spectral response of minerals and rocks														LE	CP	

# APO

**Annual Plan of Operation (APO) for the Year 2002** Geologic Remote Sensing Project  
 Abbreviations: (Japanese Side) CA/Chief Advisor, PCJ/Project Coordinator, LE/Long-term Expert(s), SES/Short-term Expert(s)  
 Abbreviations: (Turkish Side) PDP/Project Director, PMP/Project Manager, PCTP/Project Coordinator, CP/Counterparts

Output	Activity	Calendar												In charge		Remarks			
		Japanese Fiscal Year												Japan	Turkey				
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar					
4 Case studies of mineral resources exploration utilizing ASTER data are accumulated. For the Sub-project A	4-1 Collect data of the proposed areas and input data.																LE	CP	
	4-1-1 Collect and check data																LE	CP	
	4-1-2 Input data																LE	CP	
	4-2 Analyze data of the proposed areas.																LE	CP	
	4-2-1 Analyze VNIR and SWIR data																LE	CP	
	4-2-2 Analyze TIR data																LE	CP	
	4-2-3 Analyze DEM data																LE	CP	
	4-3 Select the promising areas.																LE	CP	
	4-3-1 Analyze the areas with GIS																LE	CP	
	4-3-2 Extract promising areas																LE	CP	
	4-4 Carry out groundtruth.																LE	CP	
	4-4-1 Make plan of groundtruth																LE	CP	
	4-4-2 Carry out field survey																LE	CP	
	4-4-3 Analyze the areas combining RS data with field data																LE	CP	
4-4-4 Consider results of groundtruth																LE	CP		
5 Spatial analysis by GIS can be carried out by the CP personnel. For the Sub-project A	5-1 Transfer technology of integrated spatial analysis integrating various geologic data.																LE/SE	CP	
	5-1-1 Introduce guideline how to extract promising areas																LE/SE	CP	
	5-1-2 Study basics and concept of GIS through case study																LE/SE	CP	
	5-1-3 Apply basic methods of extract promising areas utilizing GIS																LE/SE	CP	
	5-2 Transfer technology how to select exploration area utilizing GIS.																LE/SE	CP	
	5-2-1 Extract promising areas utilizing GIS																LE/SE	CP	
	5-2-2 Apply advanced techniques of GIS to extract promising areas																LE/SE	CP	
	5-3 Carry out resource area evaluation utilizing GIS.																LE/SE	CP	
	5-3-1 Review case studies focusing on data processing in order to extract promising area																LE/SE	CP	
	5-3-2 Carry out case study of groundtruth in order to extract promising area utilizing GIS																LE/SE	CP	

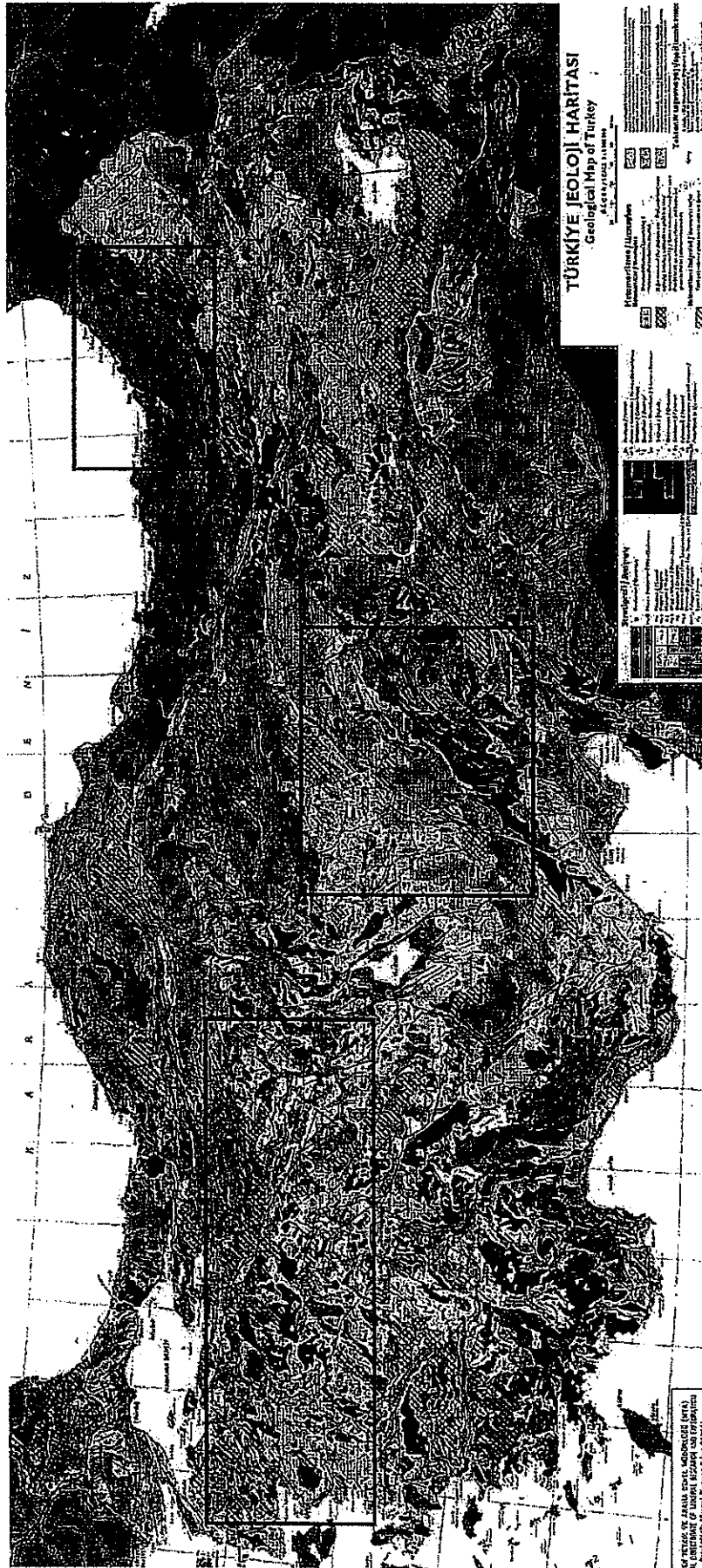
**Annual Plan of Operation (APO) for the Year 2002** *Geologic Remote Sensing Project*

Abbreviations: (Japanese Side) CA/Chief Advisor, PCJ/Project Coordinator, LE/Long-term Expert(s), SE/Short-term Expert(s)  
 Abbreviations: (Turkish Side) PDP/Project Director, PIM/Project Manager, PCT/Project Coordinator, CP/Counterparts

# APO

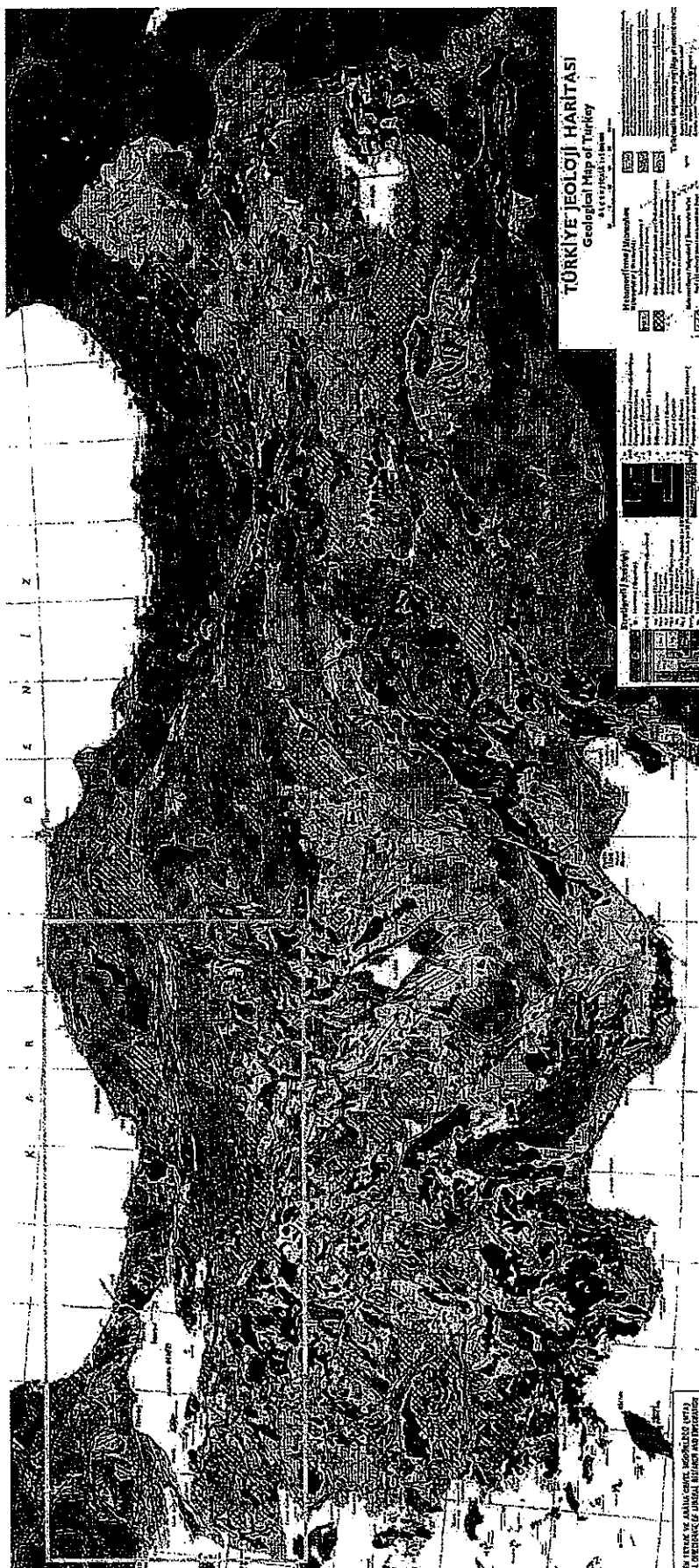
Output	Activity	Calendar												In charge		Remarks			
		Japanese Fiscal Year												Japan	Turkey				
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar					
6 Analysis for natural hazard area using Japanese SAR and ASTER data can be carried out by the CP personnel. For the Sub-project B	6-1 Introduce basic knowledge of utilization of satellite data for disaster monitoring.																LE	CP	
	6-2 Transfer technology how to extract possible hazard areas utilizing ASTER and/or SAR image.																LE	CP	
	6-2-1 Process and generate ASTER images of the proposed areas																LE	CP	
	6-2-2 Process and generate SAR images of the proposed areas																LE	CP	
	6-2-3 Carry out photo-geological interpretation																LE	CP	
	6-2-4 Create hazard area maps																LE	CP	
	6-3 Transfer technology how to extract area of ground surface movement utilizing InSAR data.																LE/SE	CP	
	6-3-1 Transfer technology how to process InSAR data.																LE/SE	CP	
	6-3-2 Extract area of ground surface movement by InSAR processing.																LE	CP	
	6-4 Verify InSAR results by ASTER image and ground-truth																LE/SE	CP	
7 Environmental analysis using remote sensor data can be carried out by the CP personnel. For the Sub-project B	7-1 Transfer technique how to select environmental indicator such as vegetation index.																LE/SE	CP	
	7-2 Introduce remote sensing technology applicable to environmental problems in Turkey.																LE/SE	CP	
	7-3 Strengthen capability of designing environmental survey plan.																LE/SE	CP	
8 MTA/RSC can provide necessary technical support to implement training courses. In common with the Sub-project A & B	8-1 Make the technical support program for TCTP.																LE	CP	
	8-2 Prepare textbooks for TCTP.																LE	CP	
	8-3 Support seminars and/or workshops for TCTP.																LE	CP	
	8-4 Support field excursions for TCTP.																LE	CP	
	8-5 Carry out training courses (other than TCTP).																LE	CP	

PROPOSED AREAS FOR MINERAL EXPLORATION STUDIES



*Handwritten signature or initials.*

PROPOSED AREA FOR HAZARD STUDIES



to A.

Equipment necessary for technology transfer in the Project

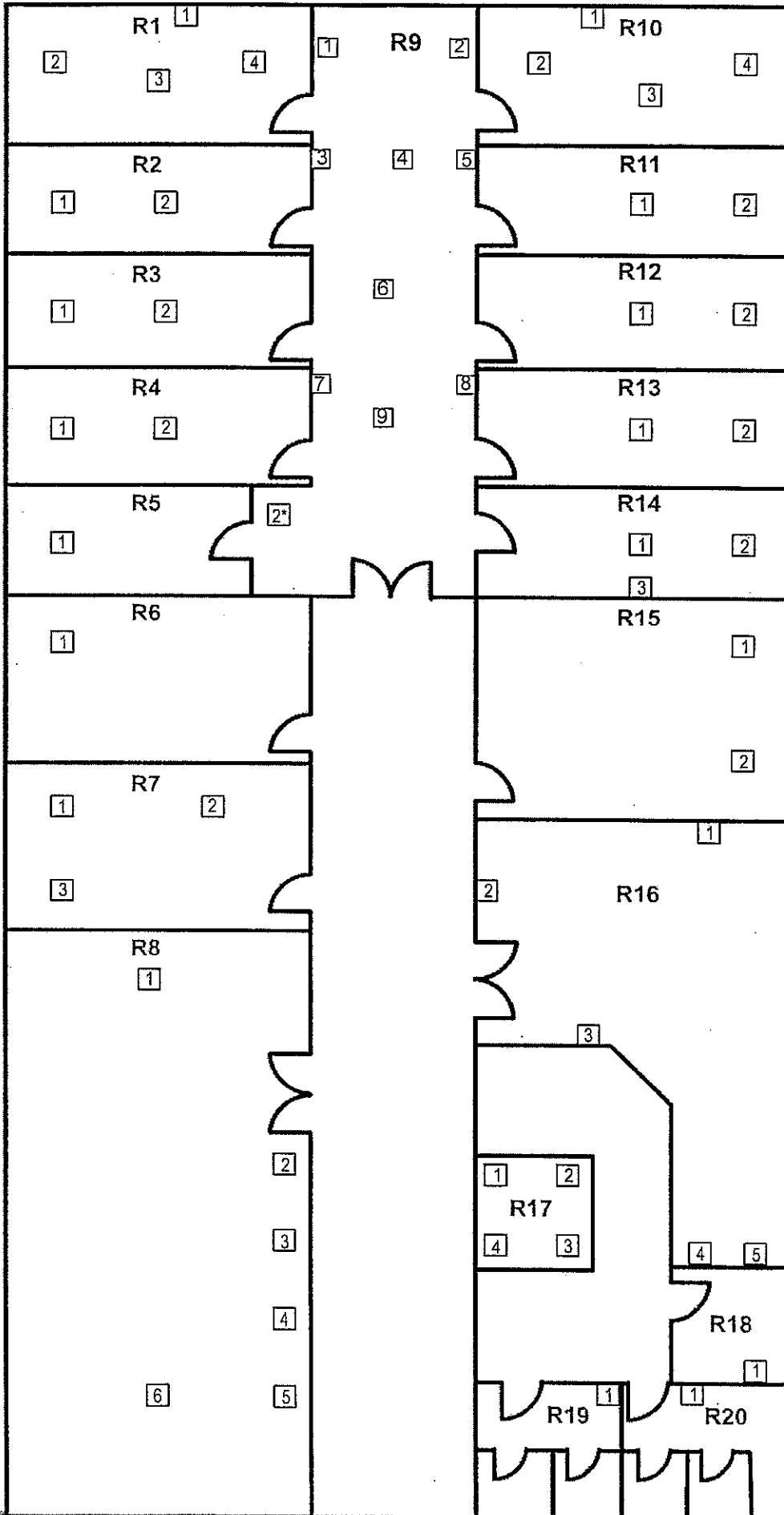
Hardware	Total	Specification
PC(Desktop)	9	CPU(Pentium4 2.2GHz),OS(Win 2000), 1GB-RAM, 64MB-VRAM, 60GB-SCSI, CDWR, CD, SCSI-card, Network-card
Display1	9	21 inch
Display2(for dual monitor)	3	21 inch
Videocard(for dual monitor)	3	for Dual monitor
PC(Laptop)	2	CPU(Mobile Pentium3 1GHz),OS(Win 2000), 1GB-RAM, 64MB-VRAM, 60GB-SCSI, CDWR, CD, SCSI-card, Network-card
Printer(B0)	1	42inch(B01067mm), 600×600dpi, color thermal incjet,128MB-RAM, 5GB-HDD
Printer(A3)	1	400dpi(Picrography)
Printer(A3)	2	Incjet 1440dpi
Printer(A4)	1	Laser color 600dpi
Scanner(A0)	1	Color 36inch, 600dpi
Scanner(A3)	1	Color A3, 1200dpi
HDD(external)	5	60GB-IDE, USB
CD-writer(external)	1	x40 reading, x24 writing(CDR)
DVD-writer	3	9.3GB, USB/SCSI
MO-drive	3	630MB
PC application server	1	CPU(Pentium4 2.2GHz),OS(Win 2000 server), 512MB-RAM, 32MB-VRAM, 60GB-SCSI, CD, SCSI-card, Network-card, Monitor-17inch
PC file server + DDS	1	CPU(Pentium4 2.2GHz),OS(Win 2000 server), 1GB-RAM, 32MB-VRAM, SCSI-Disk array, 12 slots for internal HDD, internal-HDD(72GB*12units),CD, SCSI-card, Network-card, Monitor-17inch, DDS-4mm
GPS receiver+Map module	4	
CCD projector	1	XGA (1024 x 768), 1000 Lumens
Digital camera	2	4MB pixel, battery-AA4, Compact Flush-128MB
Spectle meter	1	Portable.Measures radiance, irradiance, reflectance and transmittance from 0.35 to 2.5 microns.Spectral resolution(3nm(700nm), 11nm(1400-2100nm))

Software	Total	Specification
ERDAS Imagine 8.5	3	
ERDAS Imagine/Orthobase	1	DEM module
PCI	2	
ATRANTIS SAR	1	without PALSAR module
ENVI	2	
TNT	3	
ArcView 3.2 + Spatial Analyst	2	
ArcView 3D Analyst	1	
MIRIN	1	
Surfer	1	
Photoshop	11	
Illustrator	4	
Pagemaker	4	
PDF writer	9	
MS Office	11	with MS Access
Visual Basic	4	

Future option(if PALSAR launch on schedule)

Earth Veiw for PALSAR	1	After PALSAR launch
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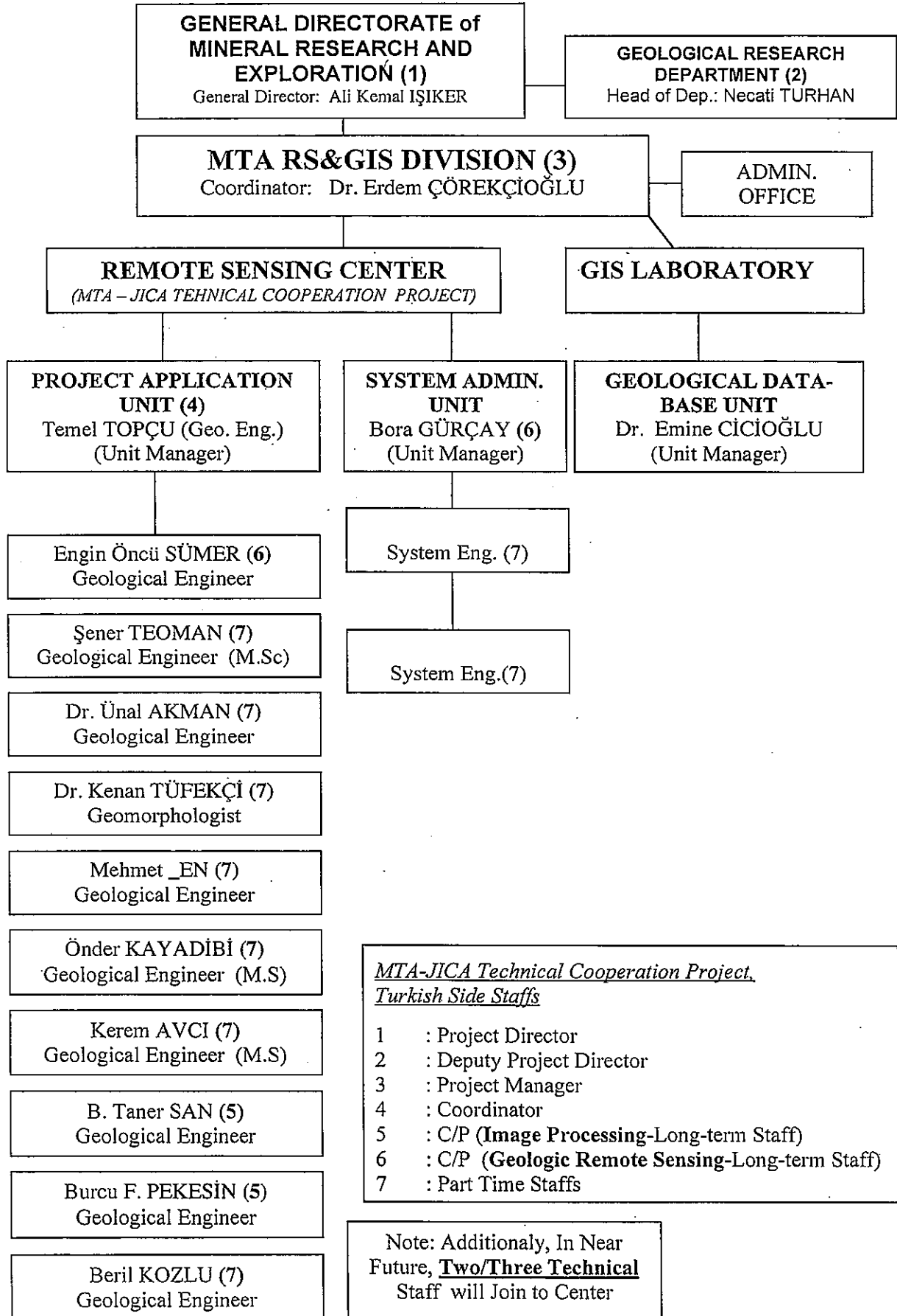


*Y.A.*

Room Number		Power	Unswitched Power Supply	Phone	Data Connection		Room Number		Power	Unswitched Power Supply	Phone	Data Connection
R1	1	✓					R10	1	✓			
	2	✓	✓	✓	✓			2	✓	✓	✓	✓
	3	✓	✓	✓	✓			3	✓	✓	✓	✓
	4	✓	✓	✓	✓			4	✓	✓	✓	✓
R2	1	✓	✓	✓	✓		R11	1	✓	✓	✓	✓
	2	✓	✓	✓	✓			2	✓	✓	✓	✓
R3	1	✓	✓	✓	✓		R12	1	✓	✓	✓	✓
	2	✓	✓	✓	✓			2	✓	✓	✓	✓
R4	1	✓	✓	✓	✓		R13	1	✓	✓	✓	✓
	2	✓	✓	✓	✓			2	✓	✓	✓	✓
R5	1	✓	✓	✓	✓		R14	1	✓	✓	✓	✓
	2*	✓	✓	✓	✓			2	✓	✓	✓	✓
R6	1	✓	✓	✓	✓		R15	1	✓	✓	✓	✓
	2	✓	✓	✓	✓			2	✓	✓	✓	✓
R7	1	✓	✓	✓	✓		R16	1	✓	✓	✓	✓
	2	✓	✓	✓	✓			2	✓	✓	✓	✓
	3	✓	✓	✓	✓			3	✓	✓	✓	✓
R8	1	✓	✓	✓	✓		R17	1	✓	✓	✓	✓
	2	✓	✓	✓	✓			2	✓	✓	✓	✓
	3	✓	✓	✓	✓			3	✓	✓	✓	✓
	4	✓	✓	✓	✓	4		✓	✓	✓	✓	
	5	✓	✓	✓	✓	5		✓	✓	✓	✓	
	6	✓	✓	✓	✓	R18		1	✓	✓	✓	✓
R9	1	✓	✓	✓	✓		2	✓	✓	✓	✓	
	2	✓	✓	✓	✓		3	✓	✓	✓	✓	
	3	✓	✓	✓	✓		4	✓	✓	✓	✓	
	4	✓	✓	✓	✓	R19	1	✓	✓	✓	✓	
	5	✓	✓	✓	✓		1	✓	✓	✓	✓	
	6	✓	✓	✓	✓	R20	1	✓	✓	✓	✓	
	7	✓	✓	✓	✓		1	✓	✓	✓	✓	
	8	✓	✓	✓	✓							
	9	✓	✓	✓	✓							

*AK*

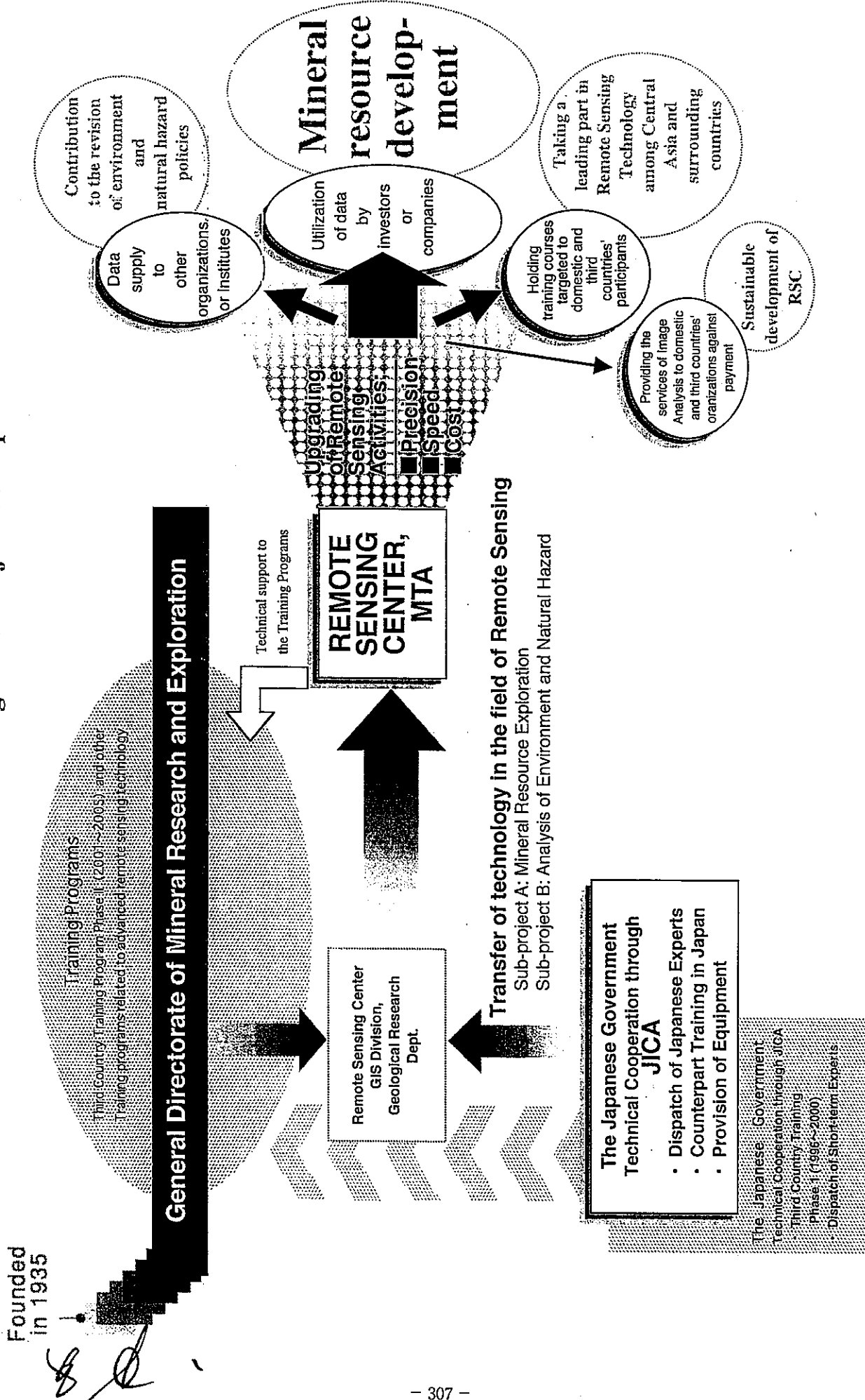
## PROPOSED ORGANIZATION CHART OF GEOLOGICAL REMOTE SENSING PROJECT



**MTA - JICA REMOTE SENSING CENTER PROJECT**  
**TURKISH SIDE FISCAL YEAR BUDGET ALLOVANCE TABLE (USD)**

The Subject of Expenditure	Fiscal Year				
	2002	2003	2004	2005	2006
Satellite Images (All Proposed areas)	21000	21000	7500	7500	-
Spectrometer Calibration	-	2500	2500	2500	2500
Field Trips (travel with plane or bus, 4 staff)	2000	4000	4400	5000	5000
Accomadation in Field (four staff)	30000	60000	60100	60200	30000
Others	-	10000	12000	13000	13500
Samples Analysis (X-RAY, petrography, paleon.etc)	10000	20000	21000	22000	22000
Part Time Worker Expenditures	5000	7000	8000	9000	2000
National Meetings and Workshops	1000	1000	2000	2500	3000
Writing Materials (papers, ink etc.)	3000	4000	5000	5500	4000
Software and Hardware Maintenance	-	10000	10000	10000	10000
<b>TOTAL (USD)</b>	<b>19000</b>	<b>139500</b>	<b>132500</b>	<b>137200</b>	<b>92000</b>

< Diagram of Project Concept >



## **MTA REMOTE SENSING CENTER (RSC)**

The remote sensing studies in MTA first started in 1972 by the geological interpretation of 1:1.000.000 scaled Landsat MSS images. In 1982, within the framework of United Nations Development project, the digital image analysis system with single user was established. However, this system could not have been updated. That's why the study of the Remote Sensing Center in MTA has not sufficiently been developed. Remote Sensing Unit was re-organized as Center and was supported with GIS by building up a multi user analysis system. The laboratory that had been supported by new software and installation, has been actively working since 1994.

There are two sub units as Remote Sensing Applications and System Support in aforementioned division functioning under the presidency of a coordinator. Already, there are 12 technical staffs (two will join in near future), working in Remote Sensing Center.

Already, RSC of MTA focused two subjects. These are; Project Applications and Education Activities.

### **1) PROJECT APPLICATIONS**

#### **a) Investigation of Natural Resources**

Remote Sensing (RS) Center carries out the following studies shown below to give a support to projects performed by other research units in the General Directorate of MTA.

The Center has given support to many investigation projects since 1995, mainly for metallic minerals (like iron, zinc, lead, copper, chrome, gold), industrial raw materials (like clay, kaolinite, marble) and energy raw material (like coal, uranium, geothermal)

Many of those studies involve the investigation of hydrothermally altered areas determined by satellite data and the extraction of lineaments in these areas.

#### **b) Natural Disaster and Environmental Projects**

The Remote Sensing Center has given many supports using GIS and remote sensing techniques in MTA to some natural hazards and environmental projects. In addition to this, the center has also conducted short-term projects for other public and private sectors.

## 2) EDUCATION ACTIVITIES of RSC

MTA Remote Sensing Center educates geologists who come from other cities and abroad (as seminar and course). So, it shares their knowledge buildup in this area with related researchers. In 2002, two educational courses were given first to the technical group coming from Sudan and second to earth scientists coming from Middle Asia.

In addition to ordinary service education, the center also educates students coming from universities as summer practice.

## FINANCIAL SITUATION of RSC

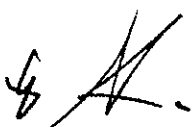
For each fiscal year, the share is being given to the Remote Sensing Center from the general budget of MTA. So that, The Remote Sensing Center makes its expenses by using these financial resources. (maintenance, renovation, restoration, the expenses of field studies, etc)

The income supplied, by Remote Sensing Center, as a project studies, done for other private/ governmental organizations, directly goes into the MTA's general budget and these resources can also be used for the expenses of Remote Sensing Center.

## FUTURE TARGETS of RSC

- To apply new remote sensing techniques for the exploration of natural resources to determine the characteristics of natural hazards and environmental effects,
- To make spatial analysis within the framework of the GIS by supporting the image analysis results with the data which was taken from the other sources,
- To provide an education to staff of MTA about natural hazards, natural resources and environmental effects,
- To apply these information and technologies in MTA projects for geological and natural resource investigations in and out of the country,
- To provide the arrangement of technical cooperation and special educational courses and seminars directed to Earth Science society in abroad,
- To organize educational courses to universities and governmental associations,
- To develop the software and new methods about image analysis and Geographical Information Systems,
- To support the investigation projects of MTA and control the applicability of Remote Sensing and Geographical Information System techniques, in addition to this; to prepare projects for searching new methods to serve for these purposes,
- To conduct joint projects with domestic and foreign associations.

- To keep the center as up to date and functional searching for recent developments in RS and GIS and to transform the center as internationally technology and education center periodically organizing educational programs.

A handwritten signature in black ink, appearing to be the initials 'G.A.' followed by a horizontal line.



## Tentative Schedule of Implementation (TSI)

Calendar Year	2002				2003				2004				2005				2006		
Japanese Fiscal Year	2002				2003				2004				2005				2006		
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III
	Signing of the R/D																		
Term of Technical Cooperation	▼																		
<b>The Japanese side</b>																			
I Dispatch of Mission																			
(1) Project Consultation Team																			
(2) Mid Term Evaluation Team																			
(3) Project Evaluation Team																			
II Dispatch of Japanese Experts																			
(1) Chief Advisor																			
(2) Coordinator																			
(3) Image Processing Expert																			
(4) Geologic Remote Sensing Expert																			
III Dispatch of Short Term Experts																			
Appropriate number of short-term experts will be dispatched as necessity arises.																			
IV Training of the C/P in Japan																			
1~2 C/P will be accepted in Japan annually.																			
V Provision of Machinery and Equipment																			
<b>The Turkish side</b>																			
I Building and Facilities																			
II Machinery, Equipment and Consumables																			
III Allocation of C/Ps and Necessary Staff																			
IV Allocation of Budget																			

PDM (Sub-project A : Mineral Resources Exploration)

**A Ver.0-3 ANNEX 15**  
June.11.2002

Project Name : Geologic Remote Sensing Project  
Project Site : Ankara

Duration : 4 years (August 01, 2002- July 31, 2006)  
Target Group : MTA Geologists

Implementing Agency of Japan : JICA  
Implementing Agency of Turkey : MTA

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
(Super Goal) Investment in mineral resources development is promoted.			
(Overall Goal) 1 MTA/RSC is able to extract promising areas utilizing advanced remote sensor data, such as ASTER (and/or PALSAR). 2 Basic data with analytical results utilizing advanced remote sensor data are supplied to mining sector. 3 Technical expertise focusing on analysis of the remote sensor data for mineral resources exploration is transferred to other institutes and third countries through training courses.	By 2008: 1 Analysis of the detailed survey (100km <sup>2</sup> ) area extracted from the semi-detailed survey areas is completed and the methodology of evaluation of possible mineral deposit is established. 2 System of data distribution is established. 3 Training curriculum focusing on the advanced remote sensing and necessary materials are made and the training is held.	1 Report on the analysis of extraction of potential target 2 Records of distribution 3 Training curriculum, textbooks, plan and record of training course	· No hindrance for field activities in the target areas.  · A proper scheme is prepared to disseminate information on the training course in/outside Turkey.
(Project Purpose) MTA/RSC is able to utilize advanced remote sensor data such as ASTER and/or PALSAR data for geological analysis aiming at mineral resources exploration.	Analysis of the semi-detailed survey (1000 km <sup>2</sup> ) areas extracted from three (3) proposed case study areas is completed by the trained C/P personnel before the termination of the project.	· Report of analysis for the evaluation of mineral potential of the area. · Report of the field survey of the selected area	· The government policy concerning mining sector is maintained.
(Outputs) 1 The project operation unit (RSC) is established. (In common with the sub-project A and B) 2 Equipment and advanced satellite data are introduced and maintained properly. (In common with the sub-project A and B) 3 Image processing of ASTER data for mineral resources exploration can be carried out by the C/P personnel. 4 Case studies of mineral resources exploration utilizing ASTER data are accumulated. 5 Spatial analysis by GIS can be carried out by the C/P personnel. 6 and 7 refer to the sub-project B 8 MTA/RSC can provide necessary technical support to implement training courses. (In common with the sub-project A and B)	1-1 Personnel, budgets and facilities of the MTA/RSC are secured. 1-2 Monitoring and meetings of the committee are working as planned. 2 Contents and condition of equipment are put in order. 3 Essential part of the technology of the image processing is transferred by 2004. 4 120 frames of ASTER data coverage over the three (3) proposed case study areas are processed and interpreted by 2006. 5 Essential part of the technology of the spatial analysis by GIS is completed by 2003. 8 Technical support program and materials for the Third Country Training Program (TCT) are produced by 2004.	1-1, 1-2 Annual reports, monitoring reports and records of meetings 2 Property records, operation and maintenance records 3 Records of evaluation made by both sides 4 The number of produced images of ASTER data 5 Records of interpretation and analysis 8 Program, textbooks and materials for training	· Project budget is properly allocated as planned.  · Trained C/P personnel continue to work at the MTA/RSC
(Activity) 1-1 Allocate staff as planned. 1-2 Make plan of operation. 1-3 Make budgetary plan. 1-4 Make and implement monitoring plan. 1-5 Operate the Joint Coordinating Committee. (In common with the sub-project A and B) 2-1 Procure and install necessary equipment. 2-2 Operate and maintain equipment properly. (In common with the sub-project A and B) 3-1 Introduce application of ASTER data. 3-2 Introduce processing of VNIR and SWIR data. 3-3 Analyze TIR data. 3-4 Generate regional DEM processing ASTER stereo mode data. 3-5 Transfer technology of effective application of ASTER data. 3-6 Carry out data acquisition of spectrometer and construction of spectral databases. 4-1 Collect data of the proposed areas and input data. 4-2 Analyze data of the proposed areas. 4-3 Select the promising areas. 4-4 Carry out ground-truth. 5-1 Transfer technology of integrated spatial analysis integrating various geologic data. 5-2 Transfer technology how to select exploration areas utilizing GIS. 5-3 Carry out resource area evaluation utilizing GIS. 6 and 7 refer to the sub-project B 8-1 Make technical support program for TCTP. 8-2 Prepare textbooks for TCTP. 8-3 Support seminars and/or workshops for TCTP. 8-4 Support field excursions for TCTP. 8-5 Carry out training courses (other than TCTP). (In common with the sub-project A and B)	(Inputs)  Japanese side 1 Dispatch of experts (Long-term) - Chief Adviser - Coordinator - Image Processing expert - Geologic Remote Sensing expert (Short-term) - Expert(s) on (1) TIR analysis (2) DEM Processing with ASTER data (3) Interferometry with SAR data (4) Environmental Analysis (5) GIS-based Integrated Spatial Analysis (6) Photo-geology  2 Training of C/P in Japan One(1) or two(2) per year  3 Provision of equipment	Turkish side 1 Buildings and facilities 2 Allocation of C/P 3 Preparation of equipment 4 Local costs	· C/P personnel remain at the MRT/RSC  · Equipment is delivered and installed without delay  (Preconditions) · Renovation of building and facilities for the project is completed.

Project Name : Geologic Remote Sensing Project  
Project Site : Ankara

Duration : 4 years (August 01, 2002- July 31, 2006)  
Target Group : MTA Geologists

Implementing Agency of Japan : JICA  
Implementing Agency of Turkey : MTA

Narrative Summary	Objective Verifiable Indicators	Means of Verification	Important Assumption
<p><b>(Supper Goal)</b> Achievements realized by the MTA/RSC concerning utilization of the advanced remote sensing technology contribute to the revision of the environment and natural disaster policies or regulations by the Turkish government.</p>	<p>Policies or regulations are revised by 2010.</p>	<p>The 10<sup>th</sup> five year development plans (2010–2015) and other regulations of governmental level</p>	<p></p>
<p><b>(Overall Goal)</b> 1 Accumulation and utilization of the advanced remote sensor data such as ASTER and/or PALSAR data for environmental conservation and disaster prevention are expanded and enhanced at the MTA/RSC. 2 Technical expertise focusing on analysis of the advanced remote sensor data for environmental conservation and disaster prevention is transferred to other institutes and third countries through training courses.</p>	<p>By 2008: 1-1 Analyzed data of the domestic priority areas is accumulated 1-2 Data analysis for environment and natural hazard requested by other institute can be carried out. 2 Training curriculum focusing on the advanced remote sensing is made and the training is executed.</p>	<p>1-1, 1-2 Annual report, Analysis data, Data supply records 2 Training plans, curriculums and textbooks</p>	<p>• Cooperation from land owners continues.</p>
<p><b>(Project Purpose)</b> MTA/RSC is able to utilize the advanced remote sensor data such as ASTER and/or PALSAR data for environment and natural hazard analysis.</p>	<p>By 2006: Trained C/P personnel extract the priority areas and start the analysis of the advanced remote sensor data for environmental conservation and disaster prevention.</p>	<p>• Records of extraction of priority areas • Records of analysis</p>	<p>• No drastic changes occur on the government policies concerning the environment and natural hazard.</p>
<p><b>(Outputs)</b> 1 The project operation unit(RSC) is established. (Common to the sub-project A and B) 2 Equipment and advanced satellite data necessary for utilizing satellite data are operated and maintained properly. (Common to the sub-project A and B) 3, 4 and 5 refer to the sub-project A 6 Analysis for natural hazard area using the SAR and ASTER data can be carried out by the C/P personnel. 7 Environmental analysis using remote sensor data can be carried out by the C/P personnel. 8 MTA/RSC can provide necessary technical support to implement training courses. (Common to the sub-project A and B)</p>	<p>By 2006: 1-1 Personnel, budgets and facilities of the MTA/RSC are secured. 1-2 Monitoring and committee of meetings are executed as planned. 2 Contents and condition of equipment are put in order. 6 Essential part of the technical transfer for the natural hazard area analysis is completed by 2005. 7 Essential part of the technical transfer for the environmental analysis is completed by 2004. 8 Technical support program and materials are produced by 2004</p>	<p>1-1, 1-2 Annual reports, monitoring reports and records of meetings 2 Property records, operation and maintenance records 6, 7 Records of analysis Records of evaluation made by both sides 8 Program, textbooks and training materials</p>	<p>• National budget is properly allocated as planned. • Trained C/P personnel continue to work at the MTA/RSC</p>
<p><b>(Activity)</b> 1-1 Allocate staff as planned. 1-2 Make plan of operation. 1-3 Make budgetary plan. 1-4 Make and implement monitoring plan. 1-5 Operate the Joint Coordinating Committee. (Common to the sub-project A and B) 2-1 Provide and install necessary equipment. 2-2 Operate and maintain equipment properly. (Common to the sub-project A and B) 3, 4 and 5 refer to the sub-project A 6-1 Introduce basic knowledge of utilization of satellite data for disaster monitoring. 6-2 Transfer technology how to extract possible hazard area utilizing ASTER and/or SAR image. 6-3 Transfer technology how to extract area of ground surface movement utilizing InSAR data. 6-4 Verify InSAR results by ASTER image and ground-truth 7-1 Transfer technique how to select environmental indicator such as vegetation index. 7-2 Introduce remote sensing technology applicable to environmental problems in Turkey. 7-3 Strengthen capability of designing environmental survey plan. 8-1 Make technical support program for TCTP. 8-2 Prepare textbooks for TCTP. 8-3 Support seminars and/or workshops for TCTP. 8-4 Support field excursions for TCTP. 8-5 Carry out training courses (other than TCTP). (Common to the sub-project A and B)</p>	<p style="text-align: center;"><b>(Inputs)</b></p> <p><b>Japanese side</b> 1 Dispatch of experts (Long-term) - Chief Adviser - Coordinator - Image Processing expert - Geologic Remote Sensing expert (Short-term) Refer to Sub- project-A 2 Training of C/P in Japan One(1) or two(2) per year 3 Provision of equipment</p>	<p><b>Turkish side</b> 1 Buildings and facilities 2 Allocation of C/P personnel 3 Preparation of equipment 4 Local costs</p>	<p>• C/P personnel remain at MRT/RSC • Equipment is delivered and installed without delay</p> <p><b>(Preconditions)</b> • Refurbishment of building and facilities for the project is completed.</p>

## Five (5) Basic Evaluation Components

### 1. Five(5) Basic Evaluation Components

The five basic components defined by JICA as mentioned below are in line with those used for the evaluation works by DAC and other international assistance organization. Introduction of these components has enabled a consistent, well-balanced evaluation, which minimizes evaluator bias. Further, it allows us to share the results, knowledge and lessons with other aid organizations, since we are using common components and can discuss with them from same viewpoints.

#### (1) Efficiency

Evaluate the method, procedure, term and cost of the project with a view to productivity.

#### (2) Effectiveness

Evaluate the results in comparison with the goals (or revised ones) defined at the initial or intermediate stage, and evaluate the attributes (factor and conditions) of the results.

#### (3) Impact

Evaluate the positive and negative effects of the project, extent of the effects and beneficiaries.

#### (4) Relevance

Preliminary evaluate whether the needs in the country have been correctly identified, and whether the design is consistent with the national and/or master plan.

#### (5) Sustainability

Evaluate the autonomy and sustainability of the project after the termination of cooperation, from the perspective of operation, management, economy, finance and technology.

### 2. Relation between Five Basic Components and PDM

The following five components are used for the evaluation and a selection of a project.

(1) Efficiency

(2) Effectiveness

(3) Impact

(4) Relevance

(5) Sustainability

These components are directly connected to the elements of PDM as shown in the Figure in the following page.

The component "Efficiency" is a measure to qualitatively and quantitatively compares all resource (input) to the results (output) of the project in order to evaluate the economic efficiency

or conversion from input to output.

The parameter "Effectiveness" is a measure to evaluate whether the purpose has been achieved or not, or to evaluate how much the outputs contributed to the achievement of the purpose, or to evaluate whether or not the characteristics of the outputs were as expected.

The parameter "Impact" is a foreseeable or unforeseeable, and a favorable or adverse effect of the project society. The evaluate impact, both the goal and project purpose should be referred to in beginning of the evaluation. Evaluation with this component could lead to more than the confirmation as whether or not the goals have been obtained. Evaluation with this component requires comprehensive surveys in many cases.






The parameter "Relevance" is to comprehensively evaluate whether or not the project meets the overall goals, politics of both the donor and recipient, local needs and given priority levels, in order to decide whether the project should be continued, reformulated or terminated.

The parameter "Sustainability" is to comprehensively evaluate how long the favorable effect as a result of the project can continue after the project has been terminated. Evaluation with this component is required to decide how much the local resources should continue to be used for the project, and to evaluate how much the country receiving the assistance has been considering important. According to OECD(1989), "Sustainability" is a component to be used for the final test of the success of a development project.

All five components are essential for any of the projects and programs. The five components give necessary information to the direction maker so that he/she can decide how to approach the next step. Since each of the five components build on the intervention strategy, they also lay the foundation for standardization in monitoring and information handling within and among organizations and agencies.

In practice, each of the five parameters should also contain project-specific information.

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<p><b>Sustainability:</b> Evaluate the extent to which the positive effect as a result of the project will still continue after external assistance has been concluded.</p>	
<p><b>Relevance:</b> Evaluate the degree to which the project can still be justified in relation to the national and regional priority levels given to the theme.</p>	
<p><b>Impact:</b> Foreseeable or unforeseeable, and favorable or adverse effect of the project upon the target groups and persons possibly affected by the project.</p>	
<p><b>Effectiveness:</b> Evaluate the extent to which the purpose has been achieved or not, and whether the project purpose can be expected to happen on the basis of the outputs of the project.</p>	
<p><b>Efficiency:</b> Evaluate how the results stand in relation to the efforts and resources, how economically the resources were converted to the outputs, and whether the same results could have been achieved by other better methods.</p>	

Input	Output	Project Purpose	Overall Goals
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## Function and Composition of Joint Coordinating Committee (Plan)

### 1. Function

The Joint Coordinating Committee (JCC) will be held at least once a year and whenever necessity arises. Its functions are as follows:

- (1) To settle on the Annual Plan of Operation (APO) of the Project in line with the Tentative Schedule of Implementation (TSI) and the Plan of Operation (PO) formulated under the framework of the Record of Discussions;
- (2) To coordinate necessary actions to be taken by both sides;
- (3) To review the overall progress of the project;
- (4) To exchange views on major issues arising from or in connection with the PO.

### 2. Composition

- (1) Chairperson

Project Director (General Director of Mineral Research and Exploration)

- (2) Members

(Turkish Side)

- (a) Deputy Project Manager (Head of Geological Research Department, MTA)
- (b) Project Manager (Coordinator of RS & GIS Division)
- (c) Coordinator (RS Center-Project Application Unit Manager)
- (d) Counterparts for the Long-term Experts
- (e) Staff of International Projects and Foreign Relations Division
- (f) Other personnel concerned to be decided by Project Director, if necessary

(Japanese Side)

- (a) Chief Advisor
- (b) Coordinator
- (c) Other Japanese Experts designated by the Chief Advisor
- (d) Representative(s) of JICA Office in the Republic of Turkey
- (e) Other personnel concerned to be decided and dispatched by JICA, if necessary

-Note: Official(s) of the Embassy of Japan and SPO (Undersecretariat of State Planning Organization) of Prime Ministry, the Republic of Turkey, representatives of General Directorate of Mining Affairs, and Mining Associations may attend the Joint Coordinating Committee meeting as observer(s).

### List of Attendants at the Meetings

#### Turkish Side

(General Directorate of Mineral Research and Exploration (MTA))

Mr. Ali Kemal IŞIKER	General Director
Mr. Necati TURHAN	Head of Geological Research Department
Mr. Erdem ÇÖREKÇİOĞLU	Coordinator Remote Sensing and GIS Division
Ms. Mesude AYDAN	Coordinator International Projects and Foreign Relations Division
Mr. Şükrü ŞAFAK	Coordinator EU Coordination Division Research, Planning and Coordination Department
Mr. Temel TOPÇU	Unit Manager Remote Sensing Lab. Unit
Mr. Bora GÜRÇAY	Unit Manager System Administrative Unit

#### Japanese Side

(JICA Turkey Office)

Mr. Yasushi INABA	Resident Representative
Ms. Yukari SAITO	Assistant Resident Representative
Mr. Ali BEKİN	Administrative Officer