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REV. 0

WORK PLAN FOR GROUND WATER ELEVATION DATA RECORDER/MONITOR WELL INSTALLATION AT GRAND JUNCTION, COLORADO

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DISCLAIMER

Prepared for
U.S. Department of Energy
UMTRA Project Office
Albuquerque, New Mexico

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LIST OF ACRONYMS AND ABBREVIATIONS

Acronym	Definition
cm	centimeter
DCO	data collection objective
DOE	U.S. Department of Energy
FORE	field operation readiness evaluation
ft	foot
FTR	field technical representative
HSA	hollow-stem auger
m	meter
PRS	project regulatory specialist
RAC	Remedial Action Contractor
SOP	standard operating procedure
TAC	Technical Assistance Contractor
UMTRA	Uranium Mill Tailings Remedial Action

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this document is to describe the work that will be performed and the procedures that will be followed during installation of ground water monitor wells and ground water elevation data recorders (data loggers) at the Grand Junction, Colorado, Uranium Mill Tailings Remedial Action (UMTRA) Project site. The monitor wells and data loggers will be used to gather required time-dependent data to investigate the interaction between the shallow aquifer and the Colorado River.

1.2 DATA COLLECTION OBJECTIVES

Data collection objectives (DCO) identify reasons for collecting data. The following are DCOs for the Grand Junction ground water elevation data recorder/monitor well installation project:

- Long-term continuous ground water level data and periodic ground water samples will be collected to better understand the relationship between surface and ground water at the site.

- Water level and water quality data will eventually be used in future ground water modeling to more firmly establish boundary conditions in the vicinity of the Grand Junction processing site.

- Modeling results will be used to demonstrate and document the potential remedial alternative of natural flushing.

2.0 MONITOR WELL AND DATA LOGGER INSTALLATION TASKS

2.1 MONITOR WELL AND DATA LOGGER LOCATIONS

A maximum of six ground water monitor wells and eight data loggers will be installed at the site. Data loggers will be installed in the six new monitor wells and two existing monitor wells, 736 and 746. The proposed locations of the monitor wells and data logger installation locations are shown in Figure 1.

The loggers will collect six water level measurements per day at 4-hour intervals. Field technicians will download the recorded data to a personal computer and check the data logger for proper operation at approximately 3-month intervals.

2.2 PERMITS, CLEARANCES, AND ACCESS AGREEMENTS

No monitor well permits or access agreements are needed for the installation of data loggers in the existing well. The six proposed monitor wells (Figure 1) will require access agreements prior to field work. These new monitor wells will also require monitor well permits.

The Colorado Division of Water Resources will be contacted by the project regulatory specialist (PRS) for permitting information. The PRS will apply for and obtain any necessary permits. Property management will obtain any needed access agreements before any field work is initiated.

2.3 SITE CONDITIONS

Based on field observations during regular ground water sampling, the depth to the water table near the Colorado River is anticipated to be within 10 feet (ft) (3 meters [m]) of land surface. Well logs from monitor wells close to the river show that the surficial aquifer materials consist of medium- to fine-grained sand, with some clay and silt. A high percentage of cobbles are present in alluvial material near the river. The Mancos shale is usually encountered at a depth greater than 15 ft (4.5 m) below land surface.

2.4 WELL AND DATA LOGGER INSTALLATION METHODS

Past drilling experience at the site indicates that the hollow-stem auger (HSA) drilling method is the most appropriate drilling method for the subsurface materials typically encountered. Therefore, new monitor wells will be installed using the HSA method. Monitor wells will be installed according to UMTRA Project standard operating procedure (SOP) 14.3.1 (JEG, n.d.). Each shallow well will be approximately 15 to 30 ft (4.5 to 9 m) deep and consist of approximately 5 ft (2 m) of 4-inch (10-centimeter [cm]) diameter PVC well screen and approximately 10 to 25 ft (3 to 7.6 m) of 4-inch (10-cm) diameter PVC casing. The wells will be drilled to the top of the bedrock, and the screen set above the bedrock. Well construction materials and hand tools will be supplied by a licensed well driller contracted

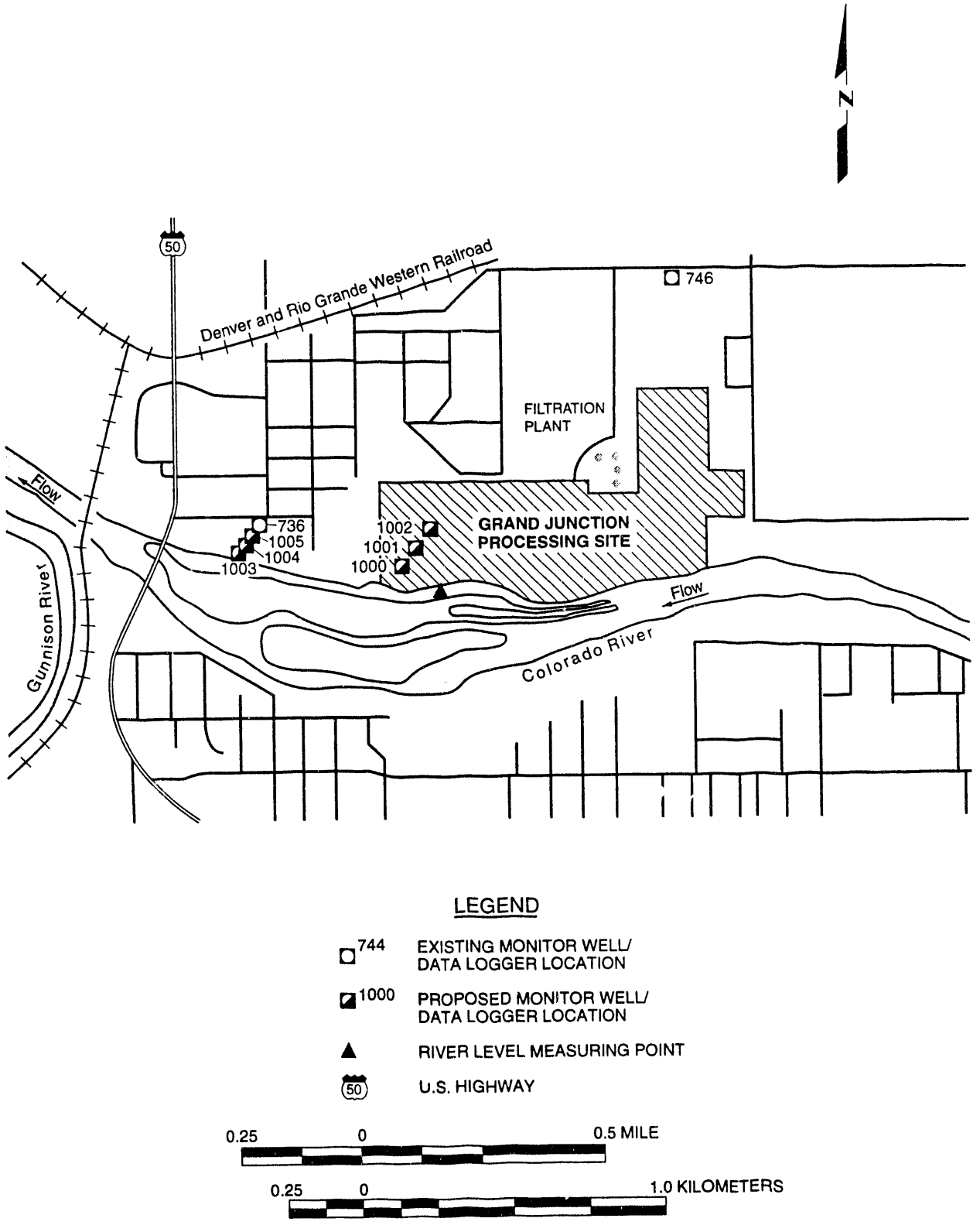


FIGURE 1
PROPOSED APPROXIMATE MONITOR WELL AND DATA LOGGER LOCATION MAP
GRAND JUNCTION, COLORADO, PROCESSING SITE

through Jacobs Engineering Group, Inc., the Technical Assistance Contractor (TAC).

Data loggers and pressure transducers will be installed and calibrated in each monitor well following the manufacturer's instructions. Data loggers will be suspended in the monitor well for approximately 30 minutes to allow for cable stretch and proper temperature equilibration between the ground water and data logger. Proper data logger operation will be verified by comparing the water level reading given by the data logger to the actual water level reading determined with a water level probe. Length of transducer cable will vary depending on depth to water and anticipated water level fluctuations in the monitor well. Existing ground water data, such as depth to water and historical water level fluctuations, will be reviewed to ensure data loggers and pressure transducers are installed so that the instruments operate properly throughout the year.

To verify proper data logger operation, data loggers will be checked immediately after installation by field personnel. Approximately 2 weeks after installation, the data logger operation will again be verified by field personnel. Once proper data logger operation is ensured, data will be downloaded at approximately 3-month intervals.

In addition to the SOPs mentioned above, the following applicable SOPs (JEG, n.d.) will be followed during monitor well and data logger installation:

14.1.2	Instructions for Field Technical Representative
14.1.3	Drilling and Test Pit Technical Repres: ntative
14.1.4	Verification of Grout Mix for Monitor Wells
14.1.5	FTR Daily Diary
14.1.6	Procedures for Completing the Daily Field Activity Report
14.1.7	Field/Off-Site Procurement of Supplies & Services
14.3.1	Drilling Procedures
14.4.1	Soil and Rock Core Borehole and Test Pit Logging
14.4.2	Preparation of Logs for UMTRAP Documents
16.1.1	Monitor Well Installation
16.1.2	Well Development

16.1.19 Permitting Procedures for Installation or Decommissioning of Monitor Wells

16.1.22 Controlled Disposal of Potentially Contaminated Materials or Memorandum from Don Metzler to Clinton Smythe entitled "Evaluating Drill Cuttings and Well Development and Purge Waters"

17.4.1 Location ID for Test Borings, Test Pits, and Monitoring Locations

Internal communications will be maintained between the field representatives, site hydrogeologists, the TAC contracting department, property management, site manager, and the U.S. Department of Energy (DOE). Before any installation of wells or loggers occurs the Remedial Action Contractor (RAC) site manager will be notified of the upcoming activities, and the work party will check in with the RAC.

2.5 WELL DEVELOPMENT

No sooner than 48 hours after completion of each new monitor well, the well will be developed per UMTRA Project SOP 16.1.2 (JEG, n.d.) until the discharge is clear. The amount of water removed and approximate well yields will be recorded. The appropriate procedures will be followed to ensure proper disposal of development water.

2.6 SURVEYING

After installation, the new monitor wells will be surveyed by a local surveying contractor to establish top-of-casing elevation and Colorado state plane coordinates. The surface water elevations of the Colorado River as close as possible to the monitor well nearest the river will be surveyed.

If ground water elevations in wells nearest the river and river elevations are significantly different, a staff gauge may be installed in the river at the surveyed river location. The river stage level on the staff gauge will be recorded at the time of surveying and every 3 months when data is downloaded from the data loggers. The river levels may be resurveyed periodically to ensure they correspond to the level being read on the staff gauge.

The river and the new wells nearest the river will be surveyed as close together in time as feasible with new well water level readings taken concurrently. The rest of the monitor well network will be surveyed after this data is collected for each river elevation/new well pair. In this manner, representative water levels from the river and the shallow aquifer can be obtained that will be useful in assessing the future data collected by the data loggers. Monitor well top-of-casing and river surface elevations will be surveyed to the nearest 0.01 ft (3 millimeters).

2.7 WATER SAMPLING AND ANALYSIS

No water quality samples will be taken at this time, although the wells may be sampled in the future.

2.8 SITE RESTORATION

Moderate site disturbance is anticipated. However, areas of disturbed soil will be raked smooth by hand, all trash will be collected immediately, and established roadways and paths will be used whenever possible.

2.9 FIELD DOCUMENTATION

In addition to the daily diary kept by the field technical representative (FTR), the following documentation will be compiled and data collected:

- The monitor well locations will be photographed and located on a map. The elevations of the top-of-casing for each well point and the surface water elevations will be surveyed by the surveying subcontractor.
- Surface water elevation measuring points at the edge of the Colorado River will be surveyed with respect to the top-of-casing of the nearest new monitor well.
- Water-level measurements at each new well and from each existing monitor well will be recorded at least once just before the data loggers are installed in the wells.
- Proper functioning of the data loggers will be verified by recording the depth to water as reported by the data logger and a water level probe.

Copies of all pertinent field documentation will be maintained in the UMTRA Project Document Control Center.

2.10 ANTI-CONTAMINATION MEASURES

Before being taken onto the site, all well installation materials, including the drill rig, will be cleaned to the FTR's satisfaction as required. The TAC FTR will inspect equipment for the presence of hydraulic oil or grease, and, if necessary, the equipment will be steam cleaned to remove such material. The wells will be drilled in order from areas of lowest to highest ground water contamination to minimize rig decontamination. The drilling rig will be steam cleaned prior to moving to the next drilling location.

3.0 HEALTH AND SAFETY

3.1 LOCAL CONTINGENCIES AND CONTACTS

All personnel involved with monitor well and data logger installation will have the following equipment:

- Hard hat
- Steel-toed boots
- Safety glasses
- Work gloves
- Sunblock lotion
- Fresh drinking water

The following items will be on the site:

- First-aid kit
- Fire extinguisher

The location of the nearest hospital in case of emergency is St. Mary's Medical Center (303-244-2551) located in the city of Grand Junction, Colorado (Figure 2). The phone number for all emergencies is 911.

3.2 HEALTH AND SAFETY AUDITS

The FTR will be responsible for observing that subcontractor personnel work activities are in compliance with UMTRA Project health and safety requirements and that Occupational Safety and Health Administration codes 29 CFR Parts 1910 and 1926 (1994) are followed during all phases of well installation. The applicable SOPs (JEG, n.d.) are as follows:

7.3.1	Occupational Safety and Health Complaints
7.3.2	Occupational Safety and Health Complaints for TAC Subcontractors
14.1.2	Instructions for Field Technical Representative

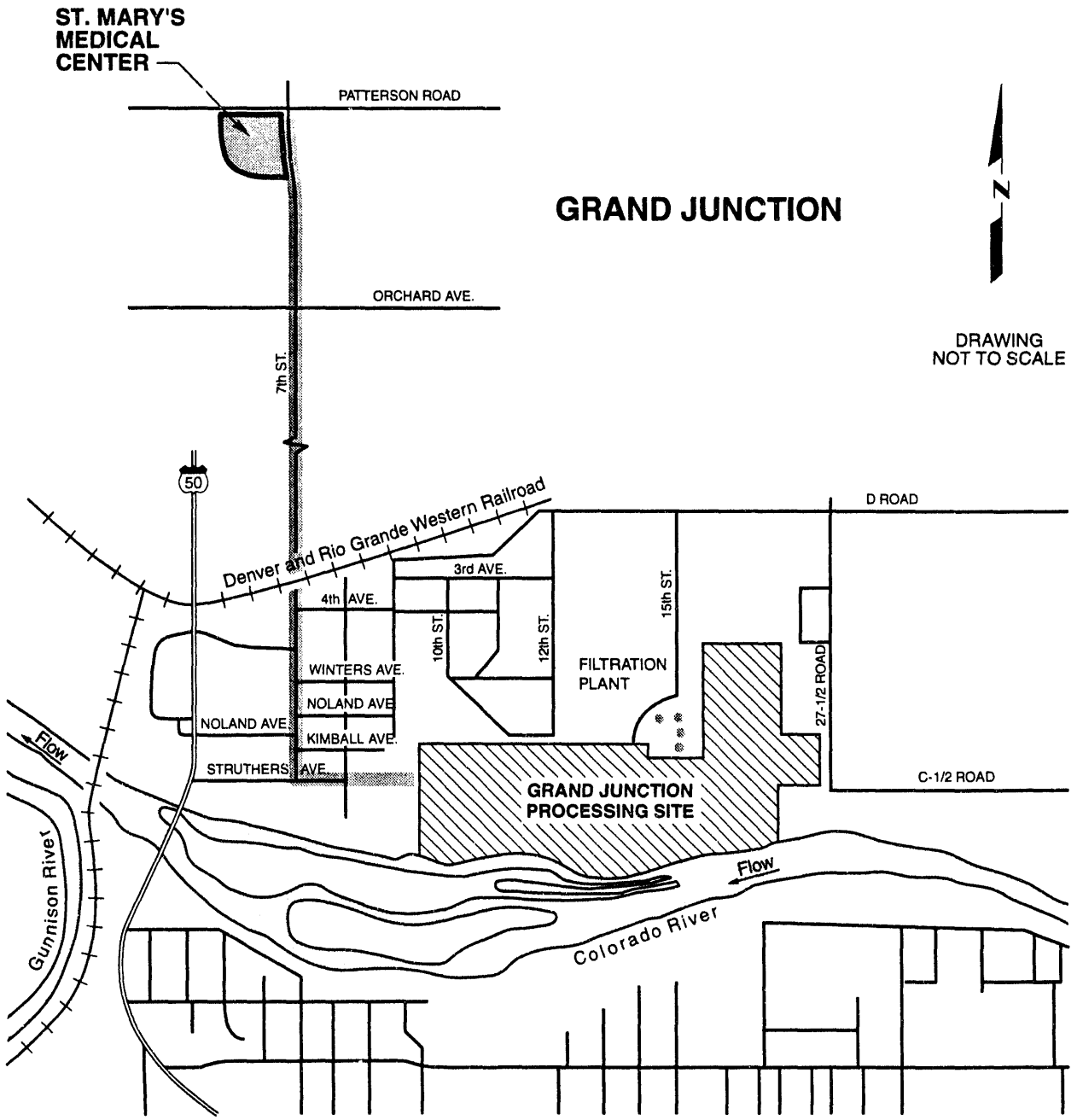


FIGURE 2
ROUTE TO HOSPITAL
GRAND JUNCTION, COLORADO, SITE

4.0 WELL AND DATA LOGGER INSTALLATION TASK SCHEDULE

The activities discussed in this work plan are part of a larger effort to install new monitor wells and data loggers at the Gunnison, Rifle, and Grand Junction sites. The same drilling contractor will be used at all three Colorado sites. To minimize mobilization fees, the drilling contractor, upon completion of well installation procedures, will move directly to the next site. The drilling schedule for the Grand Junction site will depend on completion of drilling operations at the Rifle sites.

The tasks and accompanying tentative completion dates for this work plan are as follows:

Task	Completion
Site visit	July 8
Equipment procurement	August 3
Well permits	August 15
Access agreements	August 15
Award drilling subcontract	August 21
Conduct field operation readiness evaluation (FORE)	September 19
Install wells	October 11
Survey wells and river	October 12
Install staff gauges (if required	October 14
Install data loggers	October 21
Check data logger operation	October 31

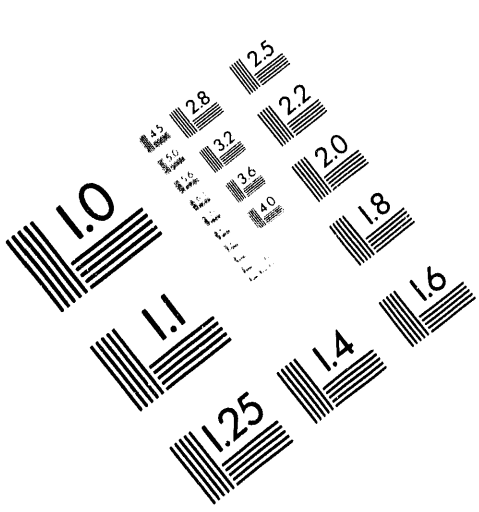
5.0 REFERENCES

JEG (Jacobs Engineering Group Inc.), n.d. *Albuquerque Operations Manual*, standard operating procedures, prepared by Jacobs Engineering Group Inc., Albuquerque, New Mexico, for the U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico..

CODE OF FEDERAL REGULATIONS

29 CFR Part 1910, *Occupational Safety and Health Standards*, Occupational Safety and Health Administration, Department of Labor (1994).

29 CFR Part 1926, *Safety and Health Regulations for Construction*, Occupational Safety and Health Administration, Department of Labor (1994).



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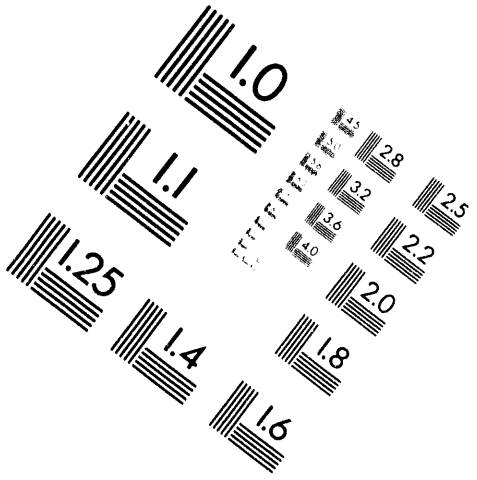

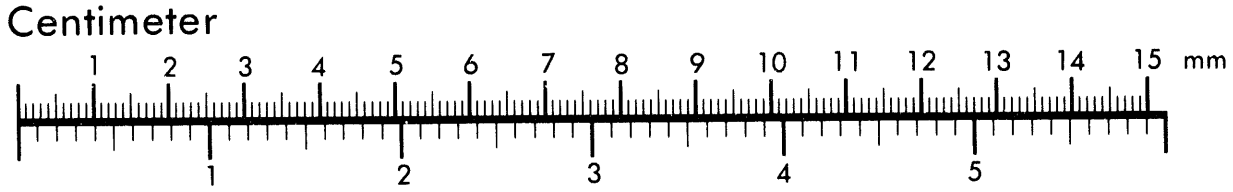

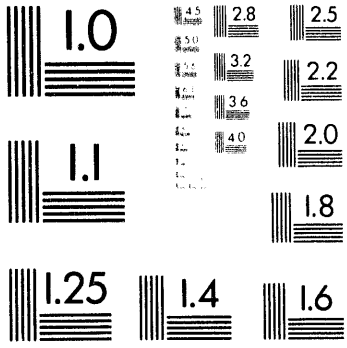

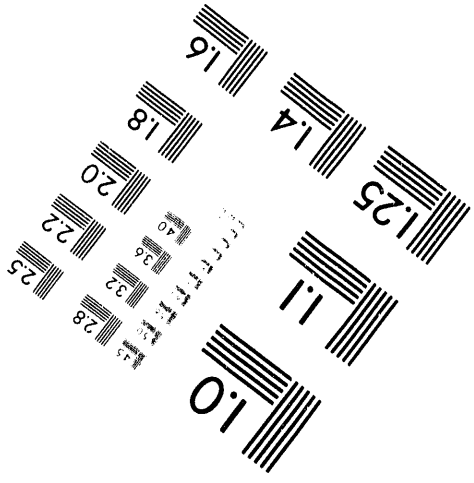

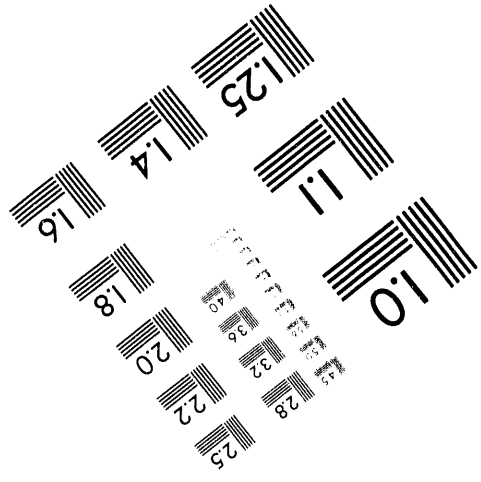

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