



DEPARTMENT OF ENERGY
ENERGY RESEARCH AND TESTING LABORATORY SERVICES

GRFTL - ERTLS MANUAL


FOR

COAL ANALYSIS

Prepared by:

GEO-COAL SECTION
GEOSCIENTIFIC RESEARCH AND FUEL TESTING LABORATORY
Energy Center, Rizal Drive, Bonifacio Global City
Taguig City, Metro Manila

This Manual embodies the management system and technical requirements for coal analysis. Changes on its content may only be authorized by the Quality Manager of the Laboratory.



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DEPARTMENT OF ENERGY
ENERGY RESEARCH AND TESTING LABORATORY SERVICES

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Document Distribution List				

Distribution of GRFTL-ERTLS Manual for Coal Analysis

NUMBER OF COPIES	DISTRIBUTION LIST
01	Director, Energy Research and Testing Laboratory Services
02	Quality Manager, Geoscientific Research and Fuel Testing Laboratory
03	Assistant Quality Manager, Geothermal-Coal Section
04	Document Control Officer, Geothermal-Coal Section
05	First Senior SRS, Geothermal-Coal Section



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Document Masterlist, Review and Revision Status

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Title Page	GRFTL-ERTLS Manual for Coal Analysis	10-2015	2	03-2017	2	10-2015
Issue Page	Issuing Authority	10-2014	2	03-2017	1	10-2014
Preparer & Reviewer	Preparer and Reviewer	10-2014	2	03-2017	1	10-2014
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DDL	Document Distribution List	11-2015	2	03-2017	1	11-2015
DMRRS - MS	Document Masterlist, Review and Revision Status – Management Systems	01-2018	2	03-2017	13	01-2018
DMRRS - CP	Document Masterlist, Review and Revision Status – Coal Procedures	01-2018	2	03-2017	7	01-2018
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MS1	Scope	11-2015	2	03-2017	3	11-2015
MS2	Normative References	11-2015	2	03-2017	2	11-2015
MS3	Terms and Definitions and Acronyms	11-2015	2	03-2017	1	11-2015



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MS4.1	Management Requirements/ Organization	01-2017	2	03-2017	8	01-2017
MS4.2	Management Requirements/ Management System	01-2017	2	03-2017	7	01-2017
MS4.3	Management Requirements/ Document Control	10-2015	2	03-2017	5	10-2015
MS4.4	Management Requirement/ Review of Requests, Tenders and Contracts	10-2015	2	03-2017	2	10-2015
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MS4.7	Management Requirements/ Service to the Customer	11-2015	2	03-2017	5	11-2015
MS4.8	Management Requirements/ Complaints	11-2015	2	03-2017	2	11-2015
MS4.9	Management Requirements/ Control of Nonconforming Testing Work	11-2015	2	03-2017	3	11-2015
MS4.10	Management Requirements/ Improvement	11-2015	2	03-2017	2	11-2015



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MS4.11	Management Requirements/ Corrective Action	10-2017	2	03-2017	2	10-2017
MS4.12	Management Requirements/ Preventive Action	11-2015	2	03-2017	1	11-2015
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MS5.3	Technical Requirements/ Accommodation and Environmental Conditions	01-2017	2	03-2017	2	01-2017
MS5.4	Technical Requirements/ Test Methods and Method Validation	08-2017	2	03-2017	5	08-2017
MS5.5	Technical Requirements/ Equipment	08-2017	2	03-2017	4	08-2017



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MS5.6	Technical Requirements/ Measurement Traceability	10-2015	2	03-2017	3	10-2015
MS5.7	Technical Requirements/ Sampling	10-2008	2	03-2017	1	11-2015
MS5.8	Technical Requirements/ Handling of Test Items	11-2015	2	03-2017	5	11-2015
MS5.9	Technical Requirements/ Assuring the Quality of Test Results	05-2017	2	03-2017	6	05-2017
MS5.10	Technical Requirements/ Reporting the Results of Analysis	01-2017	2	03-2017	3	01-2017
OS-01	Organizational Structure of GCS	03-2017	2	03-2017	6	03-2017
OS-02	Structure of Technical Management	11-2015	2	03-2017	1	11-2015
OS-DOE	Organizational Structure of DOE	03-2017	2	03-2017	3	03-2017
OS-ERTLS	Organizational Structure ERTLS	01-2018	2	03-2017	6	01-2018
OS-GRFTL	Organizational Structure GRFTL	11-2015	2	03-2017	1	11-2015
GRFTL-LM	GRFTL Location Map	11-2015	2	03-2017	2	11-2015
RAR1	Roles and Responsibilities of Top Management	11-2015	2	03-2017	4	11-2015
RAR2	Roles and Responsibilities of Quality Manager	05-2017	2	03-2017	6	05-2017



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RAR3	Roles and Responsibilities of Supervising Science Research Specialist/Assistant Quality Manager	05-2017	2	03-2017	6	05-2017
RAR4	Roles and Responsibilities of Senior Science Research Specialist (First Senior)	10-2017	2	03-2017	3	10-2017
RAR5	Roles and Responsibilities of Senior Science Research Specialist/ Document Control Officer	10-2017	2	03-2017	3	10-2017
RAR6	Roles and Responsibilities of Analyst/ Senior Science Research Specialist	11-2015	2	03-2017	3	11-2015
RAR7	Roles and Responsibilities of Analyst/ Senior Science Research Specialist	11-2015	2	03-2017	1	11-2015
RAR8	Roles and Responsibilities of Science Research Specialist II	11-2017	2	03-2017	3	11-2017
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			Review No.	Date Reviewed	Revision No.	Date Revised
RAR11	Roles and Responsibilities of Laboratory Technician I	11-2015	2	03-2017	3	11-2015
TE	Laboratory Equipment	11-2015	2	03-2017	3	11-2015
MOS	Masterlist of Suppliers	08-2016	2	03-2017	2	08-2016
RDS	Retention and Disposition Schedule of Quality Documents	08-2016	2	03-2017	1	08-2016

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This Manual defines the mission and vision of the Department of Energy (DOE) and Geothermal-Coal Section - Geoscientific Research and Fuel Testing Laboratory (GRFTL) and the objective, functions, and quality, management and technical structures for coal analysis, which every personnel in the laboratory shall observe and achieve to deliver competent laboratory services on research and analysis, particularly in carrying out tests on proximate analysis, calorific value, sulfur, and carbon, hydrogen & nitrogen of coal and other similar samples.

1.1 DOE Mission

We, at the Department of Energy, in partnership with our stakeholders, shall improve the quality of life of the Filipino by formulating and implementing policies and programs to ensure sustainable, stable, secure, sufficient, accessible and reasonably-priced energy.

In pursuit of this mission, we commit to render efficient service with utmost integrity and professionalism.


1.2 DOE Vision

Within the next decade, by encouraging greater private sector participation and in partnership with our stakeholders, we would have:

- Achieve total and reliable energization and energy self-sufficiency;
- Developed our indigenous and renewable resources;
- Actively promoted sustainable and efficient use of energy as well as the utilization of cleaner energy and technologies;
- Developed alternative fuels for commercial applications; and
- Successfully implemented reforms in the energy sector which have brought about a competitive environment, consumer satisfaction and empowerment.

We are a globally recognized institution for energy policy, research and technology management with comprehensive data and information systems responsive to the needs of our stakeholders.

We are a center of excellence, a focused, dynamic, socially responsive, competent, motivated organization, committed to efficient service with integrity, nationalism and professionalism, working under an environment of harmony and respect.

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1.3 GRFTL Mission

We at the GRFTL are committed to support local energy exploration and development through our modern geological and geochemical research facilities.

We promote consumer protection by enabling the agency to monitor compliance of petroleum products and alternative fuels to quality and environmental standards.

We shall serve the energy industry, the academe and the public by rendering quality, responsive and cost-effective analytical and testing services.

1.4 GRFTL Vision

A world - class laboratory that provides highly specialized, professional and efficient services to its customers.

1.5 Objective


The laboratory shall endeavor to provide analytical and research services to the line bureaus on exploration and development of energy; quality, responsive and cost-effective testing and analytical services to customers and continuous training program to laboratory personnel relevant to present and anticipated tasks of the laboratory; ensure compliance with the general requirements for competence to carry out laboratory analysis; and attain international recognition for quality, management and technical competence.

1.6 Functions

Specifically on coal and related samples, the laboratory conducts analysis on moisture content, volatile matter, ash and fixed carbon or proximate analysis; ultimate analysis; calorific value; sulfur content; forms of sulfur; mercury analysis; ash fusion temperature; hardgrove grindability index; washability; size analysis; and mineral analysis.

1.7 Organizational Structure

The Geo-Coal Section, is currently composed of 7 work bodies. The Section acts as support team to the head of Technical Management. *ANNEXES/OS-01*.


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The Technical Management is headed by the Quality Manager of the laboratory.
ANNEXES/OS-02.

The Top Management is represented by the Director of ERTLS.


1.8 **Management System and Technical Aspects**

The management system and technical systems for coal analysis that are established in the laboratory conform to the requirements for competence as set by the International Standard on PNS ISO/IEC 17025.

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<i>NORMATIVE REFERENCES</i>			


The standard references used in writing this Manual are:

- | | | |
|-----|---|---|
| 1.1 | PNS ISO/IEC 17025:2005 | General requirements for the competence of testing and calibration laboratories |
| 1.2 | PNS Guide to the Expression of Uncertainty in Measurement and EURACHEM/CITAC Guide CG 4 | Quantifying uncertainty in analytical measurement |
| 1.3 | DOE/ERTLS/GRFTL documents | Organizational structures, bidding procedure, vision and mission, etc., in hard or soft copies/DOE intranet serve as sources for some information in the Manual |
| 1.4 | ISO Standard Methods | Procedures on sample preparation and proximate analysis |
| 1.5 | ASTM Standard Methods | Procedures on calorific value determination, sulfur analysis and CHN analysis |

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TERMS AND DEFINITIONS AND ACRONYMS			

In addition to the relevant terms and definitions given in PNS ISO/IEC 17025:2005 and EURACHEM/CITAC Guide CG 4, which apply to this Manual, some terms used in the laboratory are operationally defined.

- | | | |
|---------------------|---|--|
| Contract | - | Any written agreement, e.g., MOA, to provide a customer with laboratory services, specifically testing services. |
| Document | - | Policy statement, procedure, specification, calibration data, quality control chart, textbook, poster, notice, memorandum, software, drawing, plan, etc. These may be on various media, whether hard copy or electronic, and they may be digital, analog, photographic or written. |
| Management System | - | Quality, administrative and technical systems that govern the operations of the laboratory. |
| Manual | - | Refers to the GRFTL-ERTLS Manual for Coal Analysis. |
| Reference Standards | - | Coal standards purchased from suppliers. |

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TERMS AND DEFINITIONS AND ACRONYMS				

For concise description of the requirements on management and technical aspects, acronyms are adopted in this Manual.

ADL	-	Air-drying Loss
AFETD	-	Alternative Fuels and Energy Technology Division
ASTM	-	American Society for Testing and Materials
CWSB	-	Chemicals and Waste Storage Building
DC	-	Division Chief
DOE	-	Department of Energy
EA	-	Executive Assistant
ERTLS	-	Energy Research and Testing Laboratory Services
FMS	-	Financial Management Services
GCRDD	-	Geothermal and Coal Resources Development Division
GRFTL	-	Geoscientific Research and Fuel Testing Laboratory
GSD	-	General Services Division
HRMD	-	Human Resources Management Division
ISO	-	International Organization for Standardization
ITD	-	Information Technology Division
ITMS	-	Information Technology and Management Services
LOA	-	Leave of Absence
LWO	-	Laboratory Work Order
MANCOM	-	Management Committee



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TERMS AND DEFINITIONS AND ACRONYMS

MOA	-	Memorandum of Agreement
NPC	-	National Power Corporation
NPTL	-	National Petroleum Testing Laboratory
OD	-	Office of the Director
ODC	-	Office of the Division Chief
PCV	-	Petty Cash Voucher
PDC	-	Personnel Development Committee
PDF	-	Position Description Form
PM	-	Procedures Manual
PNOC	-	Philippine National Oil Company
PR	-	Purchase Request
RFS	-	Requisition for Services
RLS	-	Request for Laboratory Services
RMMSCD	-	Retail Market Monitoring and Special Concerns Division
SF	-	System Flowchart
SPVG SRS	-	Supervising SRS
SRS	-	Science Research Specialist
SR SRS	-	Senior SRS

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MANAGEMENT REQUIREMENTS			

4.1 Organization

4.1.1 Laboratory for Energy Analysis and Research

Geoscientific Research and Fuel Testing Laboratory (GRFTL) is one of the two laboratories under Energy Research and Testing Laboratory Services (ERTLS) which provides specialized technical services through its modern geological and geochemical research facilities in support of energy exploration and development as well as the testing of processed fuels to determine compliance to Philippine National Standards (PNS). *ANNEXES/OS-ERTLS, OS-GRFTL.*

4.1.2 Geo-Coal Section (or Geo-Coal)


Geo-Coal, under GRFTL-ERTLS, is the coal and geothermal water testing laboratory of the DOE, which manages the country's exploration, development, utilization, distribution and conservation of energy. It conducts laboratory analysis and research on coal and geothermal water samples using ISO and ASTM standard methods.

4.1.3 Location

Geo-Coal is guided by the laboratory's manuals on management system policies, systems procedure, work instructions and forms which are applied in all work activities in its permanent location at the DOE, Energy Center, Rizal Drive, Bonifacio Global City, Taguig City, Metro Manila. *ANNEXES/GRFTL-LM.*

4.1.4 Conflict of Interest

In performing activities, Geo-Coal personnel are guided by the role of the laboratory and the responsibilities defined in this Manual. The roles and responsibilities of each position in the laboratory and the roles and responsibilities of the Director of ERTLS and the Division Chief of GRFTL are described. These roles and responsibilities will form the basis for the identification of any potential conflict of interest in the activities to be involved into or conducted by the laboratory.

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4.1.5 a) Managerial and Technical Personnel

The Quality Manager has the authority to implement the laboratory management systems in this Manual.

b) Undue Pressure

Geo-Coal likewise renders laboratory services to the public, e.g., private firms and students, but is free from their pressures and influences, which may adversely affect the quality of the laboratory service.

The laboratory personnel do not interact or talk to customers until called or requested to go to the Fourth Building, where the customer is, in order to attend to the customers' technical queries, among others.

c) Customer Confidentiality

Geo-Coal has a procedure to ensure the protection and proper handling of the records of test results to ensure that all tests, records and results are treated with utmost confidentiality and released only to authorized persons. *SP1.1, SP4.3.*


Only the OD staff can release test reports. Geo-Coal personnel are not allowed to interact or talk to the customers until they are called or requested to go to the Fourth Building to attend to technical queries of the customers, among others.

d) Operational Integrity

The DC/Quality Manager of GRFTL ensures that its personnel at the Geo-Coal are not and will not be involved in any activity that may compromise the confidence in the laboratory's competence, impartiality, judgement, or operational integrity.

e) Support Services

Geo-Coal is strengthened by the support extended by DOE's ITMS, FMS, Administrative Services and Legal Services, as well as the other DOE units if necessary. However, our quality

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objectives and operations are communicated primarily for the support of our head in GRFTL, who acts as the Quality Manager of the laboratory; and for the support of our director in ERTLS, who represents the Top Management.

f) Top Management

The roles, responsibility and authority of Top Management relating and affecting the quality of the tests for coal analysis are defined. *ANNEXES/RAR1*.

g) Laboratory Supervision

The Geo-Coal Supervisor is fully responsible for the complete and consistent supervision of his staff involved in coal analysis.

The Geo-Coal Supervisor shall act as the Assistant Quality Manager.

h) Technical Management


The Assistant Quality Manager shall act as the head of the Technical Management or Technical Manager, who has the support of the Quality Manager, Director of ERTLS and other officials of DOE.

i) Quality Manager

The Quality Manager is the Division Chief of GRFTL who has defined responsibility and authority in ensuring that the implemented management system complies at all times with the provisions and requirements of PNS ISO/IEC 17025. *ANNEXES/RAR2*.

A record of monitoring effectiveness of new system/s as a result of corrective actions being implemented shall be submitted to the Quality Manager who will evaluate and check the continuous adoption.

The record consists of the comparison of the old system with the new one and describing the benefits reaped from the new system.

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j) Managerial Deputies

In the absence of the Quality Manager, the Geo-Coal Supervisor who acts as the Assistant Quality Manager and Technical Manager assumes the responsibility. In the absence of both, the Geo-Coal Senior SRS (First Senior) takes over the responsibility. *ANNEXES/RAR3, RAR4.*


k) Role of Geo-Coal Personnel

Each member in the Geo-Coal is assigned to a specific analysis and equipment and other relevant activities to achieve the objectives of the laboratory. *ANNEXES/RAR3, RAR4, RAR5, RAR6, RAR7, RAR8, RAR9, RAR10, RAR11.*

4.1.6 Effective Communication

The communication channel in the laboratory follows the hierarchy of command, i.e., the analysts communicate any aspect of the management system to the Senior SRS to the Supervisor, who in turn, will communicate with the Quality Manager, who speaks to the Director of ERTLS/Top Management. *ANNEXES/OS-02.*

Quality meetings are regularly conducted by the Assistant Quality Manager once every quarter to ensure that all aspects of the laboratory management system and all technical requirements are properly implemented and monitored. Minutes of the meetings are filed in a folder (suitably labelled) and kept in the DOCU ROOM.

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4.2 Management System

4.2.1 Scope of Accreditation

The Geo-Coal Section implements and maintains a management system appropriate to analysis of coal and other similar energy fuels, such as residual moisture, volatile matter, ash, carbon, hydrogen, nitrogen, sulfur and calorific value. For the analyses that are accredited by PAB which are volatile matter and ash, the details are below:

4.2.1.1 The scope of accreditation for this application covers tests on volatile matter and ash. The methods used are: 1) ISO 562 3rd Ed. 2010 – Determination of Volatile Matter; and 2) ISO 1171 4th Ed. 2010 – Determination of Ash.

4.2.1.2 The laboratory makes use of the PAB laboratory accreditation endorsement for test reports containing the scope of accreditation. Tests that are not PAB accredited are marked with asterisk and the statement: “Test outside the laboratory’s scope of accreditation” is written under the “Remarks” portion. *CF8, CF9, CF10*

4.2.1.3 All endorsed test reports bear the signature of the approved signatory. *CF10, RAR4*

4.2.2 Quality Policy Statement

The laboratory commits to be an integral part of the Department of Energy’s effort to explore and develop indigenous energy resources by providing quality and timely analytical and technical services using state-of-the-art equipment with the best trained, motivated personnel who are familiar with and implement the management system embodied in the GRFTL-ERTLS Manual for Coal Analysis.

Its commitment extends to full compliance with the management and technical requirements for ISO 17025. Likewise, the laboratory shall continually strive for improvements in order to deliver high quality of service to its customers.



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MANAGEMENT REQUIREMENTS

4.2.3 Commitment to Effective Management System

The laboratory plans and implements programs/projects, e.g., centralized receiving of samples, to standardize systems flow in rendering laboratory services. *SP1.1*

4.2.4 Customer Requirements

Our primary concern is to deliver the test requirements of the customers to the quality they expect in terms of test results and fast service; if not within our capability, we extend utmost assistance.

Included in the quality of service is the laboratory's compliance to national regulations. For testing laboratories, RA 6969, otherwise known as "Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990", is applicable and our laboratory follows its Implementing Rules and Regulations.

GRFTL, as hazardous waste generator, is registered and assigned a reference no./DENR I.D. No. GR-13-76-0365.

4.2.5 Quality Manual

GRFTL-ERTLS Manual for Coal Analysis embodies the management system's policies and programs established by the laboratory and makes reference to:

- Annexes containing the organizational structures, roles and responsibilities, coal procedures manual and forms; and
- Systems Procedure Manual in the form of flowcharts which incorporates the standard procedures for the receipt, recording and analysis of samples and release of test report and performing other activities associated with these major functions.

4.2.6 Roles and Responsibilities of Technical Management and Quality Manager

The specific roles and responsibilities of the technical management and quality manager in ensuring the laboratory's compliance with the quality



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requirements of PNS ISO/IEC 17025 are identified. *ANNEXES/RAR2, RAR3, RAR4, RAR5, RAR6, RAR7, RAR8, RAR9, RAR10, RAR11.*

4.2.7 Integrity of Geo-Coal Management System

The Quality Manager safeguards the integrity of the management system by planning and implementing changes that are immediate and necessary and monitoring effectiveness of such changes.

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4.3 Document Control

4.3.1 Policy/Procedure

Geo-Coal establishes and maintains a procedure to control all documents (internal and external) associated with coal analysis.

Internal documents that form part of the quality manual are the policies and programs including the annexes containing the organizational structures, roles and responsibilities, coal procedures manual and forms; and systems procedure manual in the form of flowcharts.

External documents such as standard test methods and guidelines are suitably labelled, indexed and properly filed. Editions are checked annually by the Document Control Officer to ensure that the laboratory has the latest edition and to make necessary requests if purchase of new edition is needed.

Equipment manuals/instructions are labelled and placed within the circumference of the equipment.

A list of external documents is maintained. Document type and current edition (if applicable) are reflected in the list.


4.3.2 Document Approval and Issue

4.3.2.1 Approval and Issue

The Quality Manager finalizes, approves and issues every quality document. When approved, the document is transmitted back to the Assistant Quality Manager. The document is routed to the Document Control Officer, who keeps a copy. The document is then posted in a masterlist by the Document Control Officer, who identifies the current revision status and distribution list. *SP6.3-SP6.4, SP7.1*

4.3.2.2 Availability

All necessary documents pertaining to the quality of the laboratory are available and filed. They are revised to maintain its suitability. If obsolete, they are transmitted to GSD or if the decision is to retain at Geo-Coal area, they are suitably labelled. *SP7.2, SP7.3.*

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4.3.2.3 Identification

GRFTL quality documents show date of issue and/or revision, identification/subject or title, page numbering, total number of pages or a mark to signify the end of the document and the issuing authority.

New documents and those that are existing which have not undergone amendment have blank revision (no revision number).

All controlled documents are marked “CONTROLLED”. These are the laboratory’s Manual, forms, Retention and Disposition Schedule and Masterlist of Suppliers.

Controlled documents must be issued, reviewed and revised through the procedures for document issuance and control and must be approved by the Quality Manager.

4.3.2.4 Review

Review of documents is conducted every first semester for every 2-year interval to ensure that all quality documents are continuously suitable and compliant with the management system and technical requirements. *SP7.4*.

The status of the review of documents is updated and maintained.

4.3.3 Document Changes

4.3.3.1 Revision, Approval and Issue

The changes on the content of the quality documents are approved and issued by the Quality Manager. *SP7.2*.

4.3.3.2 Altered or New Text

A new document is printed after reflecting an alteration in the text of the final document. The revised document is approved by the Quality Manager and distributed to concerned personnel. *SP7.2*.



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4.3.3.3 Handwritten Amendments

Amendments in hand writing are approved and signed by the Quality Manager. The date when the amendment is made is likewise reflected.

After amendment, revision status is updated and revision history is filed. The revised document is then re-issued to relevant personnel.

4.3.3.4 Electronic Documents

For documents in soft copies, alteration is reflected only after the approval of the Quality Manager. The copy of the instruction is kept on file. *SP7.2*

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4.4 Review of Requests, Tenders and Contracts

4.4.1 a) Test Requirements

The Geo-Coal enters into a project with its customers through a MOA. In the initial stage, the requirements of the customers are defined. *SP8.1.*

For requests from internal and external customers, the Office of the Director personnel receive the requests and address every concern/query. When necessary, the personnel refer the customers to the Geo-Coal Section personnel. Any change on the requests should be communicated to and reflected by the Office of the Director personnel on the request form.

b) Laboratory Commitment

The laboratory assesses its capability, in terms of equipment, test methods, apparatus, chemicals and analyst availability.

c) Draft MOA

If requirements are acceptable to Geo-Coal, a MOA is drafted and signed.

When request form is complete and correct, it is transferred to the Office of the Division Chief, translated to a work order which will be transmitted to Geo-Coal Section.


4.4.2 Records of Review

The actual reviews on the contents of the MOA as well as relevant discussions with the customer are stored in the files. The record/document related to the implementation of the project, including the final output, is likewise maintained. *SP8.1.*

The Office of the Director maintains a compilation of the request forms, while the Office of the Division Chief maintains both the requests forms and the work order forms. The Geo-Coal Section maintains a compilation of the work order forms.

4.4.3 Review of Subcontracted Work

The Geo-Coal does not subcontract any of its service/work to others.

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4.4.4 Notification of Customers


When unpredictable conditions occur and result in deviations in the contract, the affected party and laboratory personnel are informed in verbal communication or when necessary, in writing.

For external customers, when unpredictable conditions occur, the customers are informed by the Office of the Director personnel by telephone, in person or in writing, when necessary.

In cases when technical explanations are necessary, the Geo-Coal personnel are allowed to notify the customers.


4.4.5 Final MOA

The previously signed contract is no longer redrafted.

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4.5 Subcontracting of Tests

If work or service cannot be provided to the customer, the laboratory rejects the job. It is a policy of the laboratory not to subcontract any of its service/work to others.

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4.6 Purchasing Services and Supplies

4.6.1 Policy/Procedure

The Geo-Coal follows the DOE's central purchasing of services and supplies, particularly the reagents and other consumable materials, that are used and affect the quality of tests. However, the technical specification/s of these services and supplies will come from the laboratory. *SP9.1, SP9.2, SP9.3, SP9.4, SP9.5, SP9.6*

If deliveries are to be made, the suppliers go directly to the DOE's General Services Division. This division receives the item, checks and inspects the delivery; forwards the item to the laboratory for inspection of the required technical specifications.

The same policy/procedure applies to the other requirements that will be procured by the laboratory, e.g., equipment, repair and preventive maintenance, calibration of equipment.

For the storage of delivered reagent or other consumable material, depending on the nature, the item is stored in a dessicator or cabinet installed in the laboratory, near the point of use.

4.6.2 Verification


The specifications provided by the laboratory should comply with the requirements of the standard test method/s used.

4.6.3 Purchasing Documents

The specifications are indicated in the PR, RFS and PCV, which are reviewed and approved by the DC/Quality Manager.

4.6.4 Approved Suppliers

A record of qualified suppliers of services and consumable materials is being maintained and updated by the Geo-Coal.

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4.7 Service to the Customer

4.7.1 Cooperation

If solicited by customers, the laboratory clarifies to the customers their requested test/s and/or allows the customers to observe the processes before testing and during actual analysis. Likewise, delays/other concerns are communicated to the customers.

4.7.2 Customer Feedback

The laboratory shall seek feedback, both positive and negative, from its customers. *SP10.6*.

Feedback forms are distributed to the internal and external customers who submit samples, inquire on laboratory testing capabilities/other relevant concerns and pick up test results/request explanation of the values in the test report. The forms are available at the Office of the Director (OD) and a copy is handed in by the OD staff to every customer.

As the OD staff gives out the form, a reminder to the customer to fill up every item in the form is expressed. The feedbacks are very significant information of the laboratory's performance in the industry in our country and outside the country (the laboratory is PNS ISO/IEC 17025-accredited) and are bases for improvements.


Upon submission, before the customer drops the form in the DROP BOX at the OD, the OD staff shall ask the customer to confirm if he has filled up all.

At the end of the month, the DROP BOX is opened and the filled-up forms are checked, whether all customers are given forms and the forms are completely filled-up. If one or both are not satisfied, the Geo-Coal staff coordinates with the OD staff for full monitoring.

It is the policy of the laboratory for Geo-Coal personnel not to interact with customer until called by the OD or ODC to go to the Fourth Building where the customer is.

The customer has also the option of dropping the form in the lobby DROP BOX located near the lobby guard.

The Human Resources and Management Division (HRMD) collects the feedback forms at the DROP BOX near the lobby guard. Whenever a feedback that concerns the laboratory performance is retrieved, the HRMD transmits the form/s to the OD. A photocopy of the Feedback is provided to an assigned laboratory staff.


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For the feedback at the OD, the same staff collects the accomplished feedback form/s, compiles in a folder and summarizes on a monthly basis both the feedbacks turned over by HRMD and from the OD.

4.7.3 Analysis of Feedback

The Assistant Quality Manager identifies concern/factor/comment which may require minor and/or major and/or immediate intervention/s. If it involves attitude of the attending employee, it is immediately discussed with the involved laboratory personnel. However, if technical competence is concerned and when necessary, the Assistant Quality Manager brings to the attention of the Quality Manager the specific feedback and the corrective measure/s. With the comment and/or approval of the Quality Manager on proposed corrective action, implementation follows.

For all factors in CF12, an average rating less than 9.00 needs improvement/corrective action. *SP10.6*.

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4.8 Complaints

a. Complaint that needs on spot action

The personnel receiving the feedback/complaint shall provide right-away action by own efforts or by bringing to the attention of / coordinating with the concerned personnel.


In addressing any complaint, the agreement and satisfaction of the customer are important.

b. Complaint involving significant period for action

The personnel shall listen to the feedback/complaint of the customer and provide him a complaint report form.

He shall assure the customer that his feedback or complaint will receive immediate attention and inform him that the laboratory will contact him at a certain date for the action taken. If an action or resolution takes longer than expected, the customer is notified and preliminary or progress feedback can be given to him.

Finally, the personnel passes the Complaint Report Form to the involved person for appropriate and immediate action. *SP10.4.*

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4.9 Control of Nonconforming Testing Work

4.9.1 Test Methods

Nonconforming testing work on coal analysis is subjected to verification. In addition to the calibration performed periodically (annual external calibration of equipment, semi-annual standard calibration of TGA-1000 and CHN analyzers, monthly for calorimeter and every batch of samples for sulfur), a coal standard is treated as sample and is tested alongside the samples received from the customers. *SP10.1, SP10.3.*


4.9.2 Other Aspects in Management System

Any nonconforming work or problem that arises in other aspects in the management system, e.g., customer complaints, quality control, instrument calibration, checking of consumable materials, staff observations or supervision, test report and calibration certificate checking, management reviews, internal and external audits, etc. is immediately acted upon. *SP10.2.*

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4.10 Improvement

The improvement in the management system in the laboratory is continually pursued. The laboratory's quality policy/quality objectives/audit results/analysis of data/corrective and preventive actions/management review are revisited to detect loopholes or serve as starting point for changes in the management system in the laboratory.

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4.11 Corrective Action

- 4.11.1 The laboratory ensures that appropriate corrective actions are implemented when non-conformities or when problems with the laboratory management system or technical operations are identified.

Non - conformities are identified through internal audit, management reviews, proficiency testing, customer's complaint/s and/or staff observation/s.

The laboratory follows a procedure in implementing a corrective action. *SP10.1-10.7*.

Specifically, when test results of two-three trials are outside the repeatability range, the test using the same method is repeated. For five trials, the specific values are shown under Remarks/ Attachments. *SP 10.1*.

For corrective action on quality control failure, a set of data on secondary standard and certified reference material from every batch of analysis and routine monitoring is gathered. Using the data, a quality control chart is prepared. From the graph, the mean value, warning limit and control limit are determined. If the results are outside the warning limit, the results are disregarded and the analysis is repeated. *SP 10.5*.

- 4.11.2 In addressing other non-conformities in the laboratory management system, a complete staff work (CSW), including the root cause, is conducted. *SP10.7*
- 4.11.3 Appropriate corrective actions are identified, the most appropriate corrective action is selected and implementation of the corrective action follows. *SP10.4*
- 4.11.4 If effective as a result of monitoring, the corrective action is adopted. If it fails in its effectiveness, another proposal of possible corrective actions is submitted to undergo the same process. *SP10.4*
- 4.11.5 Once a year, operational systems, management and technical are audited to check compliance to the laboratory's quality, systems procedures and work instructions manuals and forms.



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4.12 Preventive Action

4.12.1 Equipment Breakdown

The laboratory has an annual program on maintenance of equipment as preventive action on equipment breakdowns.

4.12.2 Other Aspects in Management System

In management reviews, areas where preventive actions are applicable and beneficial shall be included in the agenda.

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4.13 Control of Records

4.13.1 Policy and Procedure

4.13.1.1 Quality records on coal analysis and other relevant reports are filed in separate folders, suitably labelled, indexed and if applicable, marked with the date it covers to facilitate retrieval and control.

Hard copies of internal audit reports, management reviews, records of corrective and preventive actions and other records on quality are labelled and filed.

4.13.1.2 Geo-Coal records are properly stored in the DOCU ROOM of the Third Building while soft copies are kept by the supervisor/ analysts. Records retention and disposition schedule is also established.


4.13.1.3 The DOCU ROOM where the records are kept is secured with door lock and a signage is posted to limit/restrict unauthorized access.

4.13.1.4 Electronic copies of the records, when applicable, are kept by the analysts and a back-up of those records are stored in flash drives.

Templates for measurement uncertainty are secured with password to prevent unauthorized access and amendments.

4.13.2 Support Information/Others

The laboratory uses a logbook in recording/keeping original observations for coal analysis, including data on calibration of equipment using coal standards, relative humidity and temperature. Errors in recording and computations are crossed out and altered with the correct data, which are initialled/signed by the involved analyst and supervisor.

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4.14 Internal Audits

4.14.1 Schedule and Plan

The Quality Manager plans and organizes internal audits once every third quarter of the year, at the agreed schedule. In his stead, the Assistant Quality Manager performs the functions. A Senior Science Research Specialist acts as the focal person.

The audit program comprises the objective/s of the audit, areas for assessment by auditors and the proposed qualified auditors.

4.14.2 Audit Findings

Audit findings are classified as Significant Non-Conformity, Minor Non-Conformity and Observation.

Significant Non-Conformity is any non-conformity threatening the accuracy of the test results.

Minor Non-Conformity is any isolated or not directly affecting test results.

Observation is any comment not classified as non-conformity but is an area for improvement. It may also be a compliment or any of the same that motivates the laboratory personnel.


Based on any of the types of audit findings, appropriate corrective action is executed.

4.14.3 Records of Audit

A folder holding all records on internal audit, including the audit program, audit findings, corrective actions, etc., is filed at the DOCU ROOM of the Third Building.

4.14.4 Follow-up Audit

A follow-up audit is scheduled to inspect corrective actions carried out for the nonconformities identified by the auditors in their report of findings.

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4.15 Management Reviews

4.15.1 Schedule

A management review of the laboratory management system shall be conducted every second semester of the year. A preliminary plan on the specific areas that will be reviewed shall be provided to the Top Management/Director of ERTLS. *SP6.1*

The review shall take account of:

- The suitability of policies and procedures
- Reports from managerial and supervisory personnel
- The outcome of recent internal audits
- Corrective and preventive actions
- Assessments by external bodies
- The results of interlaboratory comparisons or proficiency tests
- Changes in the volume and type of the work
- Customer feedback
- Complaints
- Recommendations for improvement
- Other relevant factors, such as quality control activities, resources and staff training

The results should feed into the laboratory planning system and should include the goals, objectives and actions for the coming year.

A management review shall also include considerations of related subjects at regular management meetings.

4.15.2 Record of Management Review

The minutes of the meeting on the management review, including the findings and agreed proposed corrective actions, their timetable of implementation and monitoring schedule, shall be recorded and filed. *SP6.2*

The management shall ensure that those actions are carried out within an appropriate and agreed timescale.



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5.1 Test Parameters

5.1.1 Factors Affecting Reliability of Test Results

The laboratory analyst/s and technician, ambient temperature and relative humidity, coal test methods and equipment, measurement uncertainty and sample handling all contribute to the precision of test results on coal analysis. In the case of measurement of uncertainty, the PNS Guide to the Expression of Uncertainty in Measurement and Eurachem/CITAC Guide CG4 are used as bases.

5.1.2 Use of Coal standard and Benzoic Acid

A periodic calibration, i.e., monthly/semi-annually/annually, to examine the extent of the contribution of each factor in 5.1.1, is executed. In addition, during every test (proximate, sulfur and CHN) and once a month for calorific value determination, a coal standard is run as sample, to assure correctness of results from the analysis.

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5.2 Personnel

5.2.1 Competence

The educational attainment and/or work experience and/or training of analysts/laboratory technician complement the type of tests/work assigned to them.

A proficiency evaluation shall be performed for the laboratory personnel, either newly-hired or newly-assigned, using Form # CF14.

5.2.2 Training Policy

Newly-hired and newly-assigned personnel shall undergo a training program that will develop proficiency and confidence in the personnel. The program starts with an orientation on the processes in coal analysis, followed by a demonstration of a specific process/analysis. *SP14.3.*

A close observation and supervision by the trainer are subsequently implemented.

The personnel need to get “Passed” mark in all the factors in the proficiency rating form before they are allowed to conduct an analysis of the submitted samples from the laboratory's customers.

Familiarization of test procedure shall take one (1) month but completion time of training shall depend on the arrival of coal samples.

For training on equipment, performance testing, calibration, final performance check and preparation of procedure shall take two (2) months. *SP14.4.*

For other trainings that are relevant to laboratory skills development/enhancement, processes and data management shall be evaluated on the application that can be derived and implemented by the personnel. *SP14.1, SP14.2, SP14.4.*

5.2.3 Employees

Laboratory personnel are hired on permanent status. They are trained to conduct specific test/s and in their work, are expected to deliver and uphold the management system implemented in the laboratory.



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5.2.4 Job Descriptions

Each position in the laboratory, i.e., director, division chief, science research specialist, laboratory technician, executive assistant, clerk IV and secretary, has specific job description identified in HRMD's PDF. The PDFs are stored/filed at the ODC. The Geo-Coal keeps its own copies of the PDF of its personnel.

5.2.5 Authorized Personnel

The laboratory keeps and files print and soft copies of the educational achievement, work experience, training and work assignments and ensures that the records are being updated by the personnel every year. The work assignments include operation of equipment and preparation of test results and interpretation of test results, among others.

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5.3 Accommodation and Environmental Conditions

5.3.1 Facility

In finding a permanent location for the laboratory equipment and accessories such as the analytical balance and cylinder gases; apparatus; chemicals and waste disposal, the environment's temperature and relative humidity are prime considerations. Particularly, the requirements for one analysis are aggregated in one area as much as possible to ensure that ambient conditions do not reduce `

Recording and assignment on who to record and the alternate/s shall be indicated in the Ambient Monitoring Report.

5.3.2 Monitoring

The ambient temperature and relative humidity are recorded in a prescribed format by a laboratory technician/analyst and compiled in a folder. *SP2.4.*

5.3.3 Incompatible Activities


In the Third Building where Geo-Coal Section is stationed, the area for geothermal analysis is separated from the area where coal tests are performed.

5.3.4 Access

The entry of other personnel, not from the laboratory, to the analysis area and other laboratory premises needs approval from the DC/Quality Manager of GRFTL.

5.3.5 Housekeeping

Other than the cleaner/janitress assigned in the Building, the laboratory technicians act as housekeepers by washing used glassware and other laboratory materials, collecting and/or disposing wastes and checking whether all areas are tidy and in order. *SP12.1.*

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5.4 Test Methods and Method Validation

5.4.1 Test Procedures

The scope of accreditation for this application covers tests on coal proximate analysis. The methods used are: 1) ISO 562 3rd Ed. 2010 – Determination of Volatile Matter; and 2) ISO 1171 4th Ed. 2010 – Determination of Ash.

ISO 5068-1983/Indirect Gravimetric Method – Determination of Moisture is used for residual moisture analysis while ISO 17246 2nd Ed. 2010 – Proximate Analysis is used for the determination of Fixed Carbon.

Other tests conducted include calorific value determination, sulfur analysis and CHN analysis. The methods used are: 1) ASTM D 5865-04 – Gross Calorific Value of Coal and Coke; 2) ASTM D 4239-05 – Sulfur in the Analysis Sample of Coal and Coke Using High-Temperature Tube Furnace Combustion Methods; and 3) ASTM D 5373-02 Instrumental Determination of Carbon, Hydrogen, and Nitrogen in Laboratory Samples of Coal and Coke


In coordination with the analyst, the quality manager schedules a witnessing of test methods to ensure every procedure is carried out according to the method indicated in the test reports issued to customers.

5.4.2 Method Selection

The above test methods are procedures for proximate analysis, calorific value determination, sulfur analysis and CHN analysis validated by the ISO and ASTM and used as international standard methods.

Editions of the standard test methods are checked annually by the Document Control Officer to ensure that the laboratory has the latest edition and to make necessary requests if purchase of new edition is needed.

A list of external documents is maintained in which the document type and current edition (if applicable) are reflected.

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5.4.3 Laboratory-developed Methods

The laboratory has not developed any method for use in the analysis of coal.

5.4.4 Non-standard Methods

Non-standard methods are not adopted in the laboratory

5.4.5 Validation of Methods


The methods used for the scope of accreditation applied for by the Geo-Coal are standard methods validated by ISO and ASTM. These methods have been verified and are periodically verified through monthly and/or semi-annual calibration and testing using coal standards and/or benzoic acid.

5.4.6 Estimation of Uncertainty of Measurement

PNS Guide to the Expression of Uncertainty in Measurement and EURACHEM/CITAC Guide CG4 guides the laboratory in uncertainty measurement for coal analysis. The laboratory has an inventory of data after the equipment calibration conducted in April 2008. The computations and uncertainty values are compiled. *SP11.1*.

5.4.7 Control of Data

The data resulting from verification of methods, equipment, analysis and other relevant data are recorded in a logbook, checked by the First Senior SRS for accuracy, and are kept in file.

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5.5 Equipment

5.5.1 Identification of Equipment

Any new coal equipment installed in the laboratory is conspicuously labelled in this order: code of equipment, description of analysis the equipment is capable to do, description of process, flow chart of process and principle of operation.

5.5.2 Calibration of Equipment After Installation

As soon as installation of equipment for coal analysis is over, the suitability for operation is tested and checked by performing calibration on the equipment using coal standards. The analysis of samples starts when calibration is complete and yields values within the range stated in the Certificate of Analysis.

5.5.3 Authorized Analyst

An analyst is designated to conduct the tests using the equipment. Preferably prior to actual testing of samples, the analyst receives training on the operation from the manufacturer/supplier of the equipment.

5.5.4 Equipment Manual


A copy of the equipment's Instruction Manual is positioned within the circumference of the equipment.

5.5.5 Records

An inventory of equipment and their description is stored in soft and print copies, which are updated whenever new equipment is purchased and installed.

5.5.6 Procedure for Preventive Maintenance

Once a location is selected for the equipment, the area becomes its permanent spot. A periodic cleaning and inspection of parts are programmed for the equipment whenever necessary.

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5.5.7 Out-of-service

Whenever the equipment shows operational problems, the analyst immediately reports the problem to the Geo-Coal supervisor, who consequently requests for the necessary service for diagnosis and/or repair.

While waiting for the diagnosis and/or repair, the analyst marks the equipment appropriately (e. g. "Under Repair" or "Out of Service").

When other decision or action is preferred, the analyst marks the equipment with such decision or action.

5.5.8 Calibration After Breakdown

The equipment that is on-standby mode, awaiting repair for sometime and after repair, to be put on-stream, is calibrated in specific number of times and time periods using a set of coal standards and benzoic acid where applicable.

5.5.9 Return to Service

If the calibration of the equipment results in values within the range specified in the Certificate of Analysis of the certified reference material or secondary standard, the analyst reports to the Geo-Coal supervisor, who inspects the results. If proven that values are satisfactory, the resumption of analysis is allowed.


5.5.10 Intermediate Check

An intermediate check, wherein a coal standard is used as sample, is a practice in the laboratory.

After calibration of equipment by external accredited facility, adjustment is made, mostly in temperature; after adjustment, verification of the new temperature setting is conducted through the analysis of certified reference materials and/or secondary standard.


5.5.11 Correction Factor

Correction factors obtained in the calibration of the equipment are changing. The factors, called calibration factors, are documented in the logbook.

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5.5.12 Adjustments

The analyst does not make any adjustment in the equipment's hardware and software. However, if necessary, the services of an expert are requested.

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5.6 Measurement Traceability

5.6.1 Calibration Program

Each of the coal equipment undergoes complete calibration after installation, before it is used for analysis. Afterwards, periodic calibration, i.e., monthly/semi-annually/annually/during actual analysis, is implemented. SP2.5.

5.6.2 Reference Standards

The laboratory uses certified reference materials with their traceability established in the Certificate of Analysis or secondary standards analyzed by the laboratory with their established values and standard deviations. A calibration using these standards should yield results within the traceability range.


5.6.3 Storage and Safe Handling of Reference Standards

Newly procured coal standards are checked/inspected to ensure that they conform to the required specifications. Otherwise, they are sent back to the supplier for replacement.

The coal standards are then labelled with “date received”, “date opened” and “date of expiration”. Also, they are included in the list of coal standards used by the laboratory. The list contains all the necessary information about a particular standard:


- Part #
- Lot #
- Delivery Date or Date Received
- Certified True Values with standard deviation or uncertainty
- Quantity
- Date Opened
- Expiration Date
- Remarks

Finally, the coal standards are stored in dessicators with freshly dried dessicant.

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5.7 Sampling

The laboratory processes coal samples as they are received. It does conduct sampling for internal customers (if requested), but not for external customers.

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5.8 Handling of Test Items

5.8.1 Procedure

From the time the sample is received from the ODC, the Geo-Coal has standard procedure in handling, storing and retaining/disposing the sample.

In the sample preparation stage, after riffing, about 800 grams of coal are scooped and transferred in a plastic bottle. This amount becomes the file sample, which is stored in the rack cabinet located in the sample preparation area. After pulverizing, some portions from two opposite quarters are placed in a 50-gram plastic vial, labelled with the laboratory code, sealed and handed in to the analyst. This amount is the analysis sample. The remaining coal powder is disposed.

During analysis, not all of the mass in the plastic vial is used. The excess amount is likewise stored in the rack cabinet.

If an external customer decides analysis of additional parameter/s, the customer talks personally to or calls up the OD personnel and makes the request. The OD personnel relays to the ODC and ODC informs Geo-Coal Section.

On the other hand, if a customer is internal of DOE, the customer talks personally to or calls up the ODC personnel and ODC personnel informs Geo-Coal Section.

The additional parameter/s are recorded in the coal Sample Tracer and inputted in the database of the Section.


Consequently, the sample/s are retrieved and analysis is conducted.

The result/s are included in the test report. If the request for additional parameter/s is made after test report is issued, a new test report is prepared consisting only of the additional parameter/s requested.

A six (6) - month retention period from release of analysis/test report is given before disposal of the file sample and analysis sample is made. *SP5.3-SP5.4.*

5.8.2 Identification

The laboratory number on the plastic vial identifies the sample. This number is the one that appears on the record logbook/analysis logbook.


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5.8.3 Deficiencies

Deficiency in the sample is observed and recorded during receipt of the sample at the OD. However, if the analyst finds another deficiency that may affect the results of analysis, the deficiency is recorded in the analysis logbook. If warranted, the deficiency is exhibited in the test report. The analyst will not inform or contact the customer as he is prohibited to speak to the customer.

5.8.4 Facilities

The laboratory has allocated space for equipment, apparatus, stored chemicals, gas cylinders and other laboratory materials as well as area where the analyst/s and laboratory technician may move around from doing sample preparation to pre-analysis to analysis proper to post analysis activities. The floor layout divides the wet laboratory, which houses the chemical waste storage area, from the different elemental analysis and other tests. Individual rooms for the analysis of mercury, mineral ash and calorific value are installed and provided low-temperature surroundings/sufficiently air-conditioned rooms during equipment operation.

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5.9 Assuring the Quality of Test Results

5.9.1 Policy/Procedures


The laboratory has established standard procedures to safeguard the reliability of test results released to customers. In addition to the calibration program implemented after the installation of the equipment, the following are performed depending on the type of analysis conducted:

- a) Routine monitoring using certified reference material is carried out after every 5 batches of proximate analysis. When actual analysis of sample is performed, a secondary reference standard as sample is tested along with the sample/s from the customers.
- b) Monthly standardization of calorimeter is done using benzoic acid pellets for the calorific value determination where the relative standard deviation of ten acceptable runs must be less than 0.15%. A verification check is also implemented once a month during actual sample analysis using coal standard treated as sample to monitor the performance of the equipment.
- c) Routine calibration before every batch of analysis using certified reference materials (CRM) is made for both sulfur and CHN analysis. During actual testing, a different CRM as check standard is analyzed alongside samples.

The results should show values within indicated traceability in the Certificate of Analysis. When required, in order to confirm test results, another standard method is used. The results of the tests per sample or repeatability as well as results of the samples for both methods are compared and correlated.

The data of certified reference material and secondary standard obtained from routine monitoring and from actual sample analysis are used to produce a quality control chart. The true value and the quality control acceptance criteria (warning and control limits) are indicated in the xy plot against sequence of results. The warning limit is set to +/-2 standard deviation around the true value while the control limit is set to +/-3 standard deviation.

The results are plotted in their respective quality control chart and should not fall beyond the pre-defined criteria. If one point or data obtained falls outside the pre-defined criteria, the data is disregarded. The analysis is repeated and a new vial of secondary standard or certified reference material is used. The process becomes a cycle until the result on the

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secondary standard or certified reference material falls within the pre-defined criteria.

Also, an investigation can be started by identification of the trend in the quality control chart. When there is a consistent negative or positive trending, i.e., five consecutive points below or above the mean value and the sixth point shows the same direction, preventive measures are established to preclude the recurrence of quality control failure.

The assistant quality manager evaluates the effectiveness of the preventive/corrective measure and submits output to the quality manager for approval. *SP10.5.*

Finally, participation to interlaboratory proficiency testing on coal analysis which is done periodically is included in the program of the laboratory. The laboratory uses ISO methods for proximate analysis (i.e., ISO 5068-1983 for residual moisture, ISO 562:2010 for volatile matter and ISO 1171:2010 for ash) and ASTM methods for other parameters (i.e., D 5865-04 for gross calorific value, D 4239-05 for total sulfur, and D 5373-02 for carbon, hydrogen and nitrogen).

In this activity, the laboratory's test results are compared with other participating laboratories in order to assess its performance to improve weak areas. *SP13.1*

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5.10 Reporting the Results of Analysis

5.10.1 Standard Test Report


The Geo-Coal submits to the ODC (to be routed to OD for approval) test results in a standard format, which is the same format issued by the OD to the customer; however, with a transmittal memo as covering page. *SP4.1, SP4.2.*

5.10.2 Information in the Test Report

In CF8a and CF8b or the laboratory analysis/test report used by Geo-Coal for external customers, information such as date the report is generated, RLS number, sample description, date sample is received, date test is completed, basis of analysis, summary of test results and the statement *"The test results presented in this test report relate only to the item/s tested. This report is submitted for the exclusive use of the customer to whom it is addressed. No part of this test report shall be quoted or used for promotional purposes without the written approval of the Department of Energy"* are included. Afterwards, appear the name of analyst/s who conduct/s the tests, name of analyst who prepares and checks the report, name of Geo-Coal supervisor who reviews the report and their signatures. The report is attached to a covering memo from the Division Chief of GRFTL to the Director of ERTLS.

The laboratory analysis/test report used by Geo-Coal for internal customers (CF9a and CF9b) includes the same information as contained in CF8 except for the RLS number which is replaced by LWO number. The report is attached to a covering memo from the Director of ERTLS to the requesting division or bureau.

In CF10a and CF10b or the laboratory analysis/test report used by ERTLS for external customers, information such as date the report is generated, RLS number, requesting company, address, phone number, fax number, summary of test results, the statement *"The test results presented in this test report relate only to the item/s tested. This report is submitted for the exclusive use of the customer to whom it is addressed. No part of this test report shall be quoted or used for promotional purposes without the written approval of the Department of Energy"*, and the name and signature of the approved signatory (for CF10a); name and signature of the Director of ERTLS for (CF10b) are included. The report is attached to a covering memo from the Director of ERTLS addressed to the requesting company.

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CF8a, CF9a and CF10a are specifically used to report test parameters under the scope of accreditation. They bear the PAB laboratory accreditation endorsement. They may contain some other parameters outside the scope of accreditation but are marked with asterisk and the statement "Test outside the laboratory's scope of accreditation" is written under the "Remarks" portion.

CF8b, CF9b and CF10b are only used for the reporting of test parameters outside the laboratory's scope of accreditation and do not bear the PAB endorsement.

For each test report, the page number and the total number of pages, e.g., 1/1, will appear at the middle of the footer line.

5.10.3 Portion for Remarks/Attachments

A standard statement, "*ADL is in the as-received basis*", occupies the portion's first/other lines. However, any remark/interpretation may be written in the succeeding lines or space.

5.10.4 Electronic Transmission of Results

The laboratory allows issuance of test results through electronic mail. *SP4.3*.

5.10.5 Amendments to Test Reports

When any change is made on a test report that is already issued, the original test report is retrieved and a new test report is released to the customer. The laboratory shall label the new one with a code that will show reference to the original. However, in cases when only a further document is forwarded to the customer and the original test report is not retrieved and completely changed, the document shall be entitled, "*Supplement to Test Report, RLS #...*"

5.10.6 Data Entry, Processing and Storage of Test Results

The data in the analysis logbook are being checked by a Senior SRS and the Supervising SRS. On the test report, data entry in the Preliminary Test Results form is being done by individual analyst, inputted to the Laboratory Analysis/Test Report form by a Senior SRS and checked by the Supervising SRS.



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On processing of data, the analyst performs the computation, show the input data, the formula and computation and all are checked by the Supervising SRS.

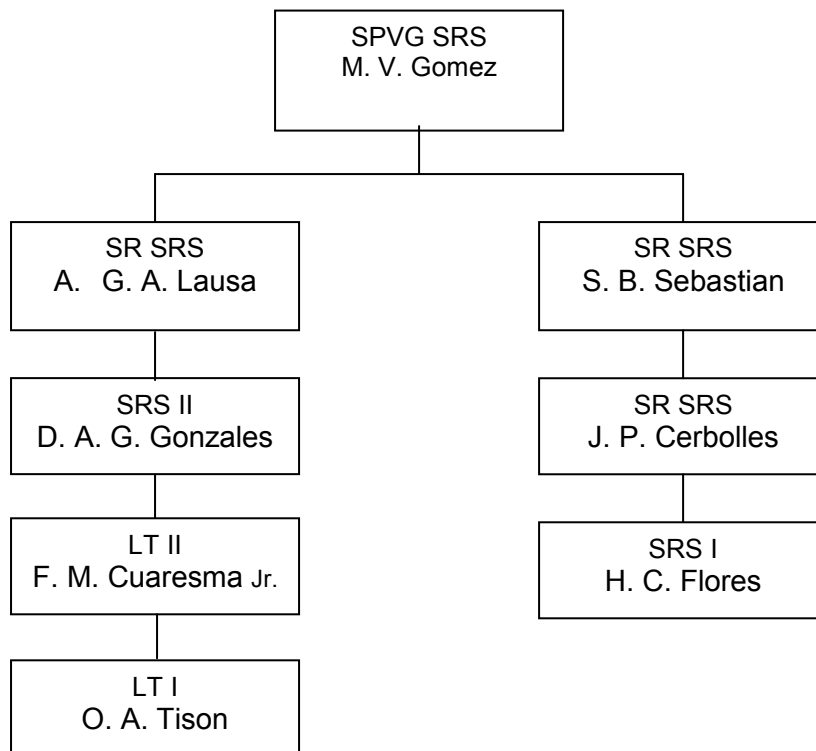
For the safekeeping of data and other information, the responsibility rests on the laboratory's Document Control Officer.



Code: OS-01

ORGANIZATIONAL STRUCTURE OF GEO-COAL SECTION

Organizational Chart
Geo-Coal Section

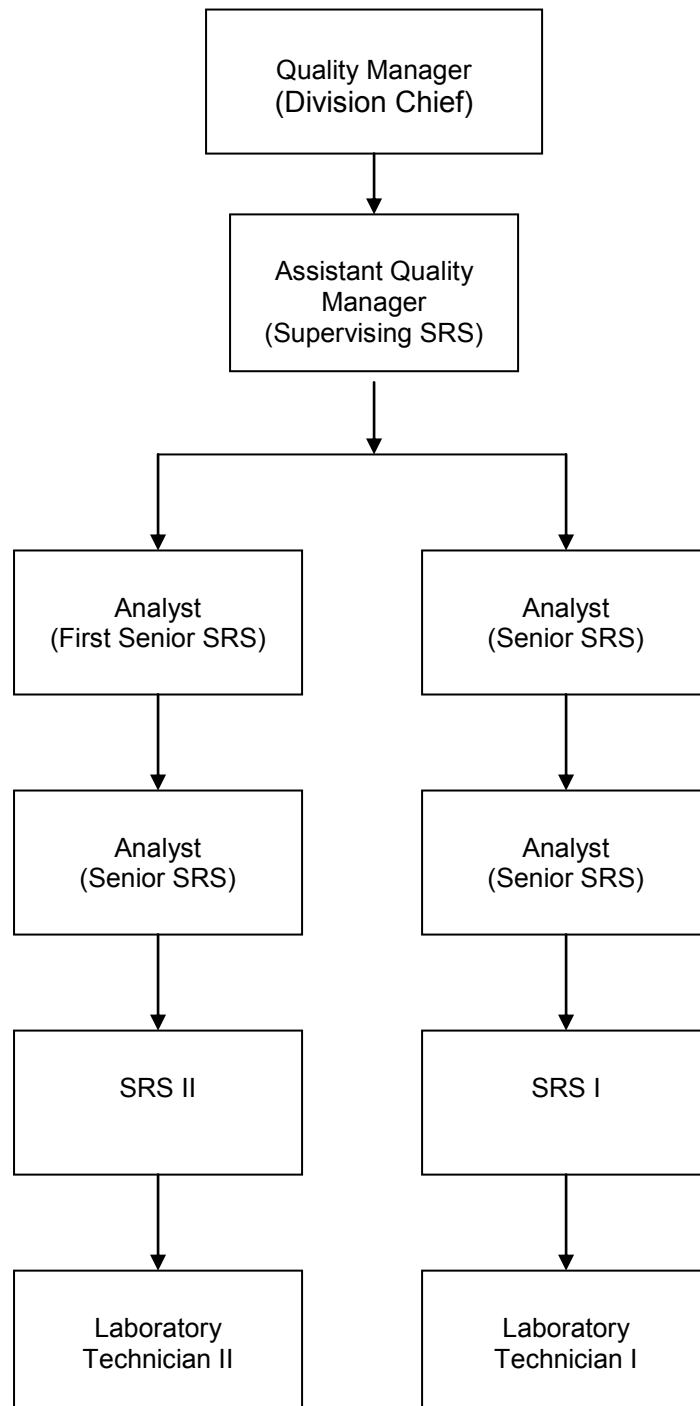




Code: OS-02

STRUCTURE OF TECHNICAL MANAGEMENT

Technical Management





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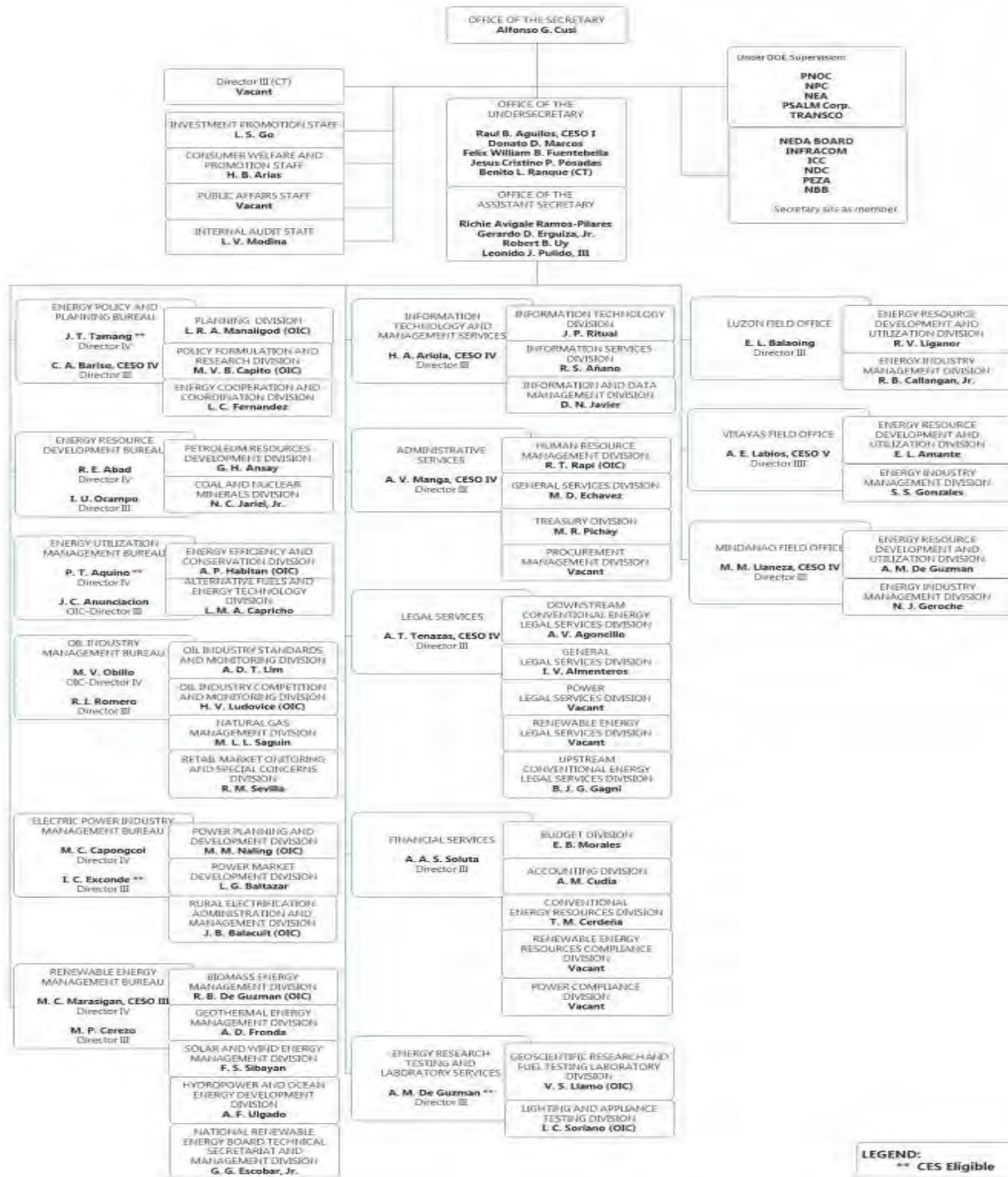
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Code: OS-DOE

ORGANIZATIONAL STRUCTURE OF THE DEPARTMENT OF ENERGY



LEGEND:
** CES Eligible



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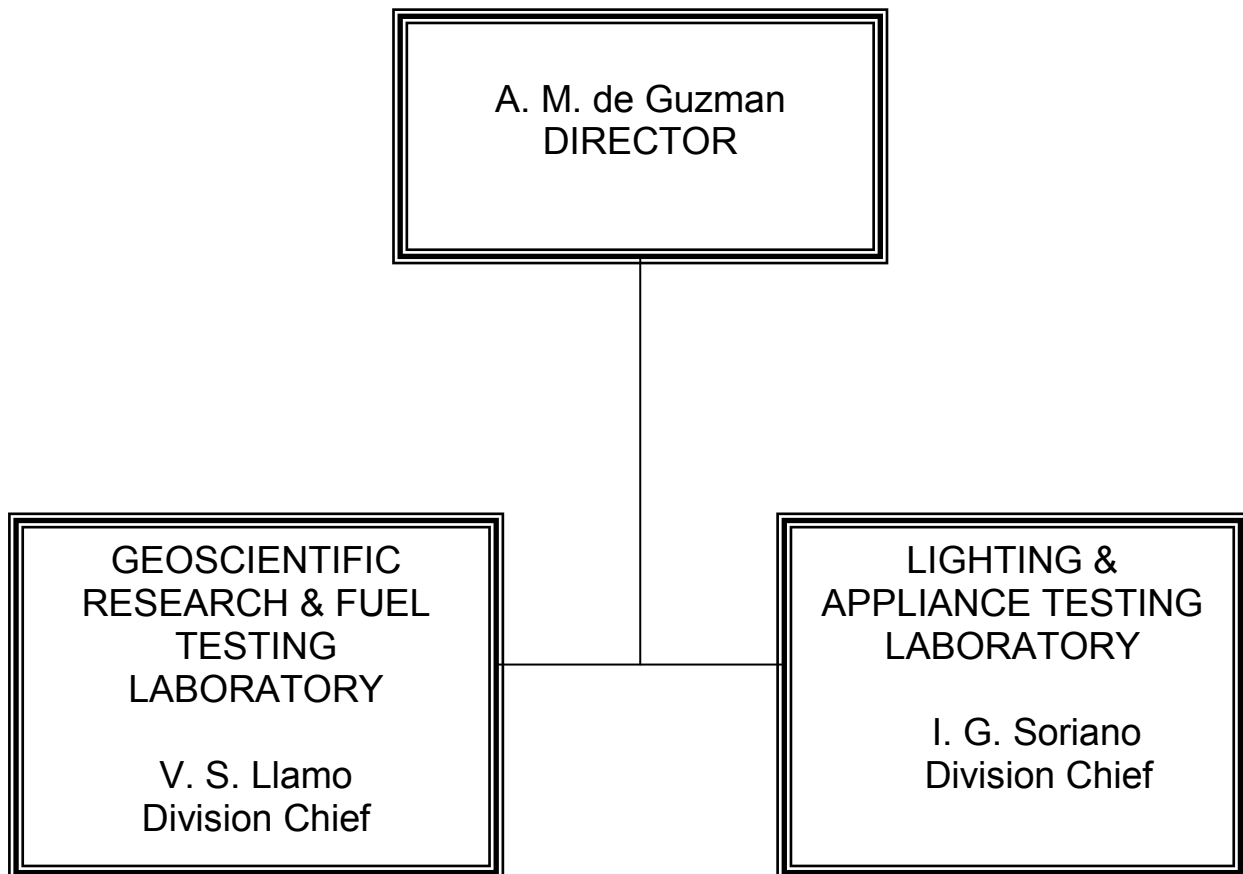
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ORGANIZATIONAL STRUCTURE OF ERTLS

ENERGY RESEARCH & TESTING LABORATORY SERVICES

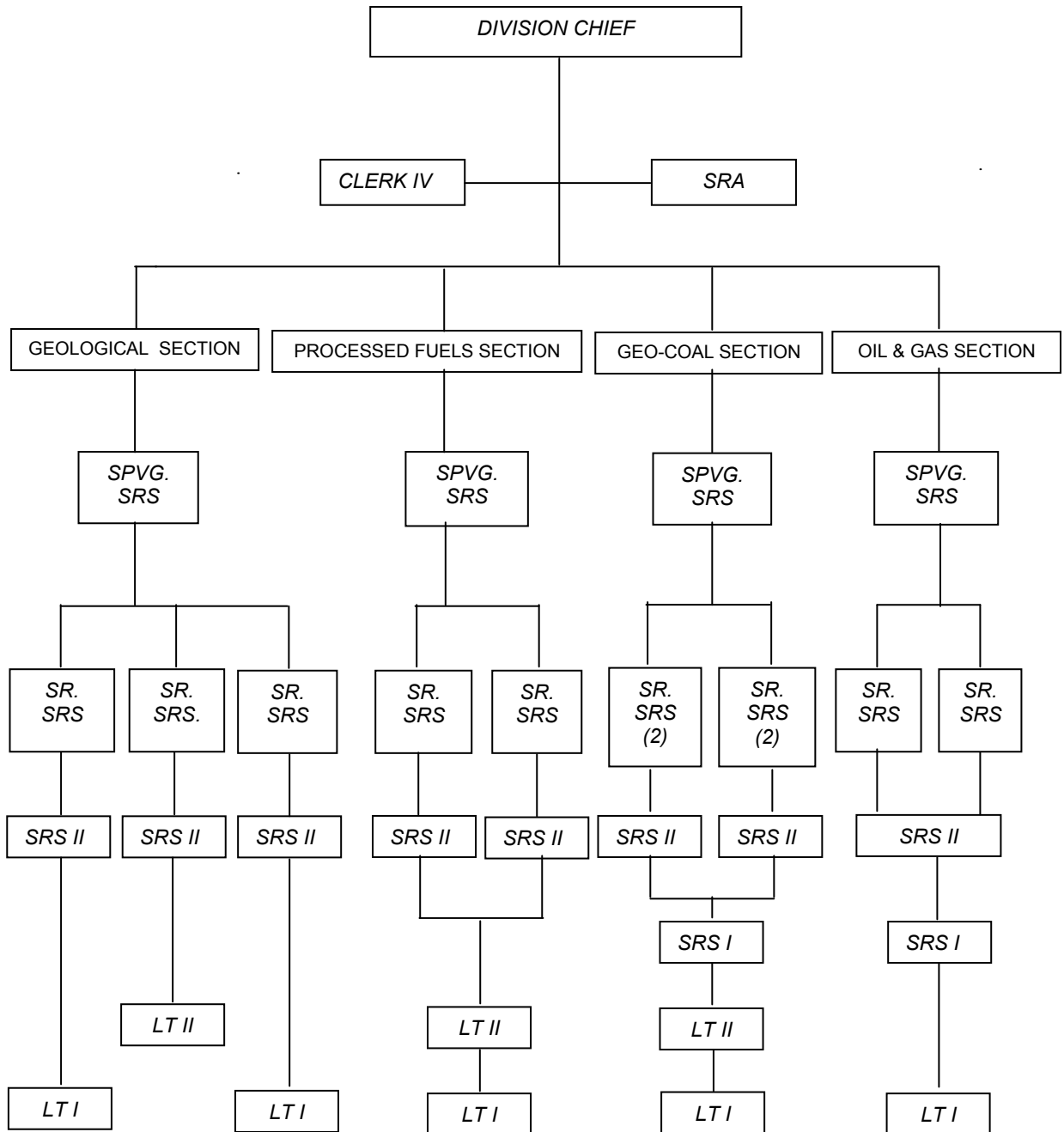




Code: OS-GRFTL

ORGANIZATIONAL STRUCTURE OF GRFTL

GEOSCIENTIFIC RESEARCH & FUEL TESTING LABORATORY





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ERTLS – Geoscientific
Research & Fuel
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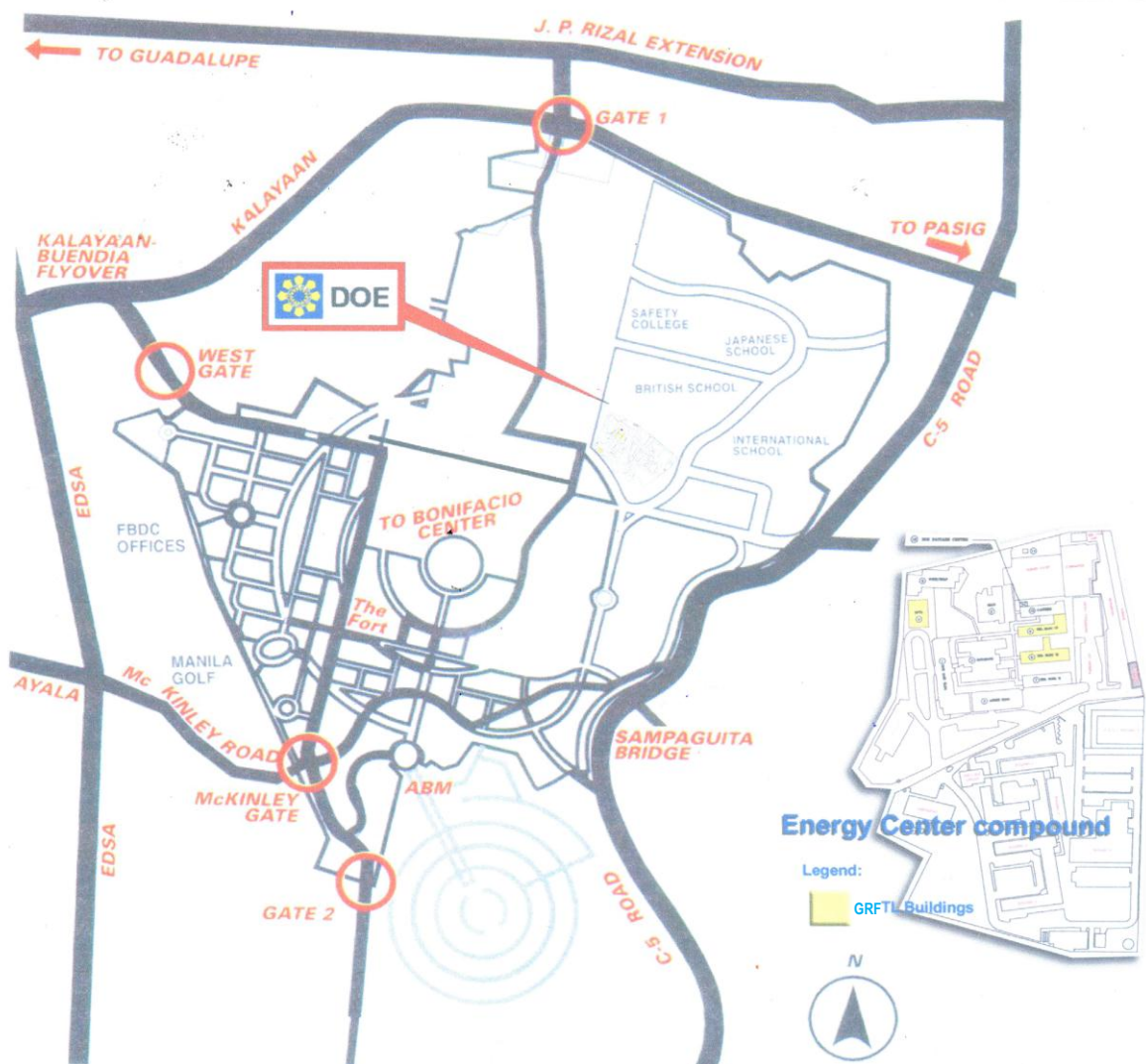
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Code: GRFTL-LM

GRFTL LOCATION MAP


Department of Energy
Energy Center, Rizal Drive
Bonifacio Global City, Taguig City



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Roles and Responsibilities of Top Management

1. Requests and sources out funds for the implementation of improvement, corrective action, change and projects pertaining to management system on coal analysis.
2. Directs the Quality Manager on vision, mission and objectives of the top management as they impact/relate to the management system on coal analysis.
3. Presides management review on laboratory quality improvements.
4. Receives, approves or is the signatory in endorsing requests for laboratory services from external customers.
5. Approves or is the approving authority/signatory in issuing test results.
6. Provides guidance to the Quality Manager in making decisions relating to systems procedures.
7. Assesses proposed programs and projects and monitoring activities if they pose threats and compromise the confidence in the Geo-Coal's competence, impartiality, judgment or operational integrity.

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RESPONSIBILITIES AND AUTHORITIES				


Roles and Responsibilities of Quality Manager (Division Chief of GRFTL)

1. Plans and organizes internal audits once every third quarter of the year, at the agreed schedule. In his stead, the Assistant Quality Manager performs the functions.
2. Approves proposed improvement, corrective action and change on management system.
3. Directs and facilitates the implementation of any improvement, corrective action and change on the existing management system.
4. Approves effectiveness of new systems resulting from improvement, corrective action and change on quality control charts, measurement of uncertainty & other quality measures.
5. Recommends, informs and/or coordinates and reports to top management concerns relevant to management system.
6. Reviews test results and endorses them to the Top Management/Signatory.
7. Approves issuances and revisions of quality documents.
8. Stays vigilant and executes appropriate actions to disallow/avoid compromises in the competence, impartiality, judgment or operational integrity of the Geo-Coal Section.
9. Checks with the Assistant Quality Manager / Geo-Coal Supervisor and other involved persons if every concern surrounding the non-conformance is addressed completely and effectively, and resumes work or service/s.

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**Roles and Responsibilities of Assistant Quality Manager/Technical Manager
(Geo-Coal Supervisor)**

1. Checks requirements of Geo-Coal on equipment and services and prepares justification and other necessary documents.
2. Plans and submits relevant projects.
3. Recommends necessary improvement, corrective action and change on existing management system.
4. Reviews quality control charts periodically for outliers, trends & makes inferences even at normal conditions when no corrective action is conducted but focuses a thorough evaluation on effectiveness after a corrective action is applied; & submits output to the quality manager for approval.
5. Reports to the Quality Manager relevant issues and concerns pertaining management system.
6. Coordinates and updates the Document Control Officer on operational management system as it relates to document control.
7. Checks accuracy of test results and endorses to the Quality Manager the test report.
8. Calls and conducts meetings of laboratory personnel on management system.
9. Plans and organizes internal audits in behalf of the Quality Manager.
10. Reports immediately to the Quality Manager any observation evident in day-to-day operation, which may compromise the confidence in the Geo-Coal's competence, impartiality, judgment or operational integrity.
11. Performs duties and responsibilities of Quality Manager in his absence.

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RESPONSIBILITIES AND AUTHORITIES			


Roles and Responsibilities of Senior Science Research Specialist

1. Conducts analysis on sulfur and carbon, hydrogen and nitrogen.
2. Coordinates with suppliers of equipment and services on procurement, preventive maintenance and repair.
3. Checks preliminary test results of analysis of coal samples and prepares test report
4. Communicates any changes on the laboratory's quality and other requirements and submits in the form of a report or memorandum to Assistant Quality Manager.
5. Prepares flowcharts of systems on coal, from receiving to analysis to release of test results.
6. Performs duties and responsibilities of Assistant Quality Manager in his absence and other roles and responsibilities assigned to him.
7. Prepares and reviews test reports (signs in Checked By in CF8 & CF9; signs in Authorized Signatory in CF10).

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RESPONSIBILITIES AND AUTHORITIES				


Roles and Responsibilities of Senior Science Research Specialist

1. Receives from the Assistant Quality Manager approved corrective actions from internal quality audit and surveillance visits and reflect changes in the manuals of the laboratory.
2. When necessary, checks barrier to flow of documents and informs/recommends improvements to the Assistant Quality Manager.
3. Updates and keeps/stores record and master lists of all management system documents (internal and external).
4. Performs issuances of quality documents.
5. Conducts proximate analysis for coal and other related samples and associated processes such as preliminary preparation to actual analysis, other handling and their storage.
6. Estimates uncertainty of measurement using data from analysis using the gravimetric method.
7. Performs other roles and responsibilities assigned to him.

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Roles and Responsibilities of Analyst/Senior Science Research Specialist

1. Conducts analysis on sulfur and carbon, hydrogen and nitrogen (CHN).
2. Performs or checks monthly/quarterly/semestral calibration of coal equipment, i.e., sulfur and CHN analyzer and other coal equipment.
3. If any equipment shows sign/s of malfunctioning, conducts tests to confirm;
4. Supervises the conduct of proximate analysis/others, including review/checking of the preliminary and final results of analysis of coal samples.
5. Initiates systematic record filing/storage.
6. Supervises records on coal and their safekeeping.
7. Prepares flowcharts of procedures on coal sample from receiving to analysis to release of samples and other management system policies and procedures and technical aspects.
8. When necessary, prepares comparative analysis and interpretation of test results.
9. In the absence of Senior Science Research Specialist (First Senior), prepares and reviews test reports (signs in Checked By).
10. Coordinates with suppliers of equipment and services on procurement, preventive maintenance and repair.

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RESPONSIBILITIES AND AUTHORITIES			

Roles and Responsibilities of Analyst/Senior Science Research Specialist


1. Performs analysis on mercury of coal and other related samples.
2. Conducts monthly calibration of mercury analyzer.
3. Monitors conduct of inventory and output of laboratory technicians.
4. Monitors and maintains neutralization, storage and waste disposal system of the laboratory.
5. Submits reportorial requirements of DENR-EMB and PDEA quarterly/semi-annually.
6. Coordinates with the suppliers of equipment and services on procurement, preventive maintenance and repair.
7. Prepares audit plan for the periodic internal audit of the laboratory.

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Roles and Responsibilities of Science Research Specialist II


Analyst observes management system policies and procedures while conducting the following processes:

1. Performs analysis using standard methods on proximate analysis.
2. Records initial results.
3. Checks results if within the repeatability limit.
4. If necessary, conducts another trial by repeating #3 and #4 until repeatability range is achieved.
5. Presents preliminary test results for checking by the senior analyst.
6. Assists the Document Control Officer in sorting, filing, labelling and safe-keeping of quality documents in preparation for IQA and external assessments.
7. Assists in finalization of laboratory manuals on coal analysis.
8. Supervises orderliness, neatness and cleanliness of sample preparation and staff room.
9. Coordinates with the suppliers of equipment and services on procurement, preventive maintenance and repair.
10. Records relative humidity and temperature in the Ambient Monitoring Report.
11. Performs other roles and responsibilities assigned to him.

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RESPONSIBILITIES AND AUTHORITIES				


Roles and Responsibilities of Science Research Specialist I

1. Conducts calibration of calorimeter and analysis on calorific value.
2. Submits computation or results of analysis on calorific value.
3. Acts as substitute to the Laboratory Technician II in sample preparation of coal and related samples.
4. Cleans and maintains equipment and calorimeter room.

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Roles and Responsibilities of Laboratory Technician II

1. Conducts sample preparation of coal and other related samples.
2. Performs inventory of chemical used in coal analysis.
3. Records temperature and relative humidity in the absence of the Laboratory Technician I.
4. Maintains the functional capacity of the equipment in the sample preparation area.
5. Coordinates and receives equipment gases from supplier.
6. Provides other assistance and services to the OD, ODC and Geo-Coal Section.
7. Records temperature and relative humidity in the testing area using CF16 in the absence of the Laboratory Technician I.

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Roles and Responsibilities of Laboratory Technician I

1. Records the temperature and relative humidity in the testing area using CF16 as stated in *SP2.4*.
2. Coordinates with CIGI purchase of gases for coal equipment.
3. Prepares requests for petty cash, purchase of supplies and procurement of services necessary for coal analysis.
4. Routes and follows up payments for procured equipment, services, chemicals and other laboratory supplies.
5. Maintains non-precision laboratory equipment.
6. Assists in field sampling.
7. Prepares and processes samples and assists in analysis (receives/logs/labels samples, weighs/dries/grinds/crushes/quarters samples, prepares reagents and materials)
8. Sets up and maintains sample recording/storage/retrieval and waste disposal system.
9. Sets up and maintains organized filing/record system.
10. Conducts and updates inventory of chemicals, gases, laboratory supplies and equipment spare parts.
11. Maintains order and cleanliness on workplace (coal instrument room, geothermal instrument room and wet laboratory).
12. Attends seminar/workshop and other trainings.
13. Undertakes reproduction and routing of documents.
14. Prepares accomplishment report.

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LABORATORY EQUIPMENT			

The Geo-Coal Section keeps an inventory of equipment for coal analysis. These are as follows:

<i>Name of Equipment</i>	<i>Specific Use</i>
Carbolite Ashing Furnace AAF-1100	Determination of ash in coal
Carbolite Volatile Matter Furnace VMF-1000	Determination of volatiles in coal
TruSpec CHNS Analyzer	Determination of carbon, hydrogen, nitrogen and sulfur content
TGA 1000 - Thermogravimetric Analyzer	Determination of moisture, volatile matter and ash content
Parr 6200 – Calorimeter	Determination of calorific value
NIC-MA 2000 – Mercury Analyzer	Determination of elemental mercury content
Leco AC 350 – Calorimeter	Determination of calorific value
Jouan Coal drying Oven	Sample preparation
Diano-XRF Spectrometer	Mineral analysis
HI-VI Rotary Sample Splitter	Sample Preparation
Retsch Ultra Centrifugal Mill	Sample preparation
Leco Sulfur Analyzer	Determination of sulfur content
Wemco Heavy Media Plant	Cleaning coal
Odelco Top Loading Balance –2 units (30 & 60 kg)	Determination of weight of samples
Analytical Balances	Determination of weight of samples
Osk Hardgrove Grindability Testing (HGI)	Determination of HGI
Riffle Sampler	Sample preparation
Retsch Jaw Crusher	Sample preparation
Tyler Sieve Shaker	Sample preparation
Retsch Mill Pulverizer	Sample preparation
Prufer Ash Furnace	Determination of ash content
Prufer VM Furnace	Determination of VM
Strohlein Minimum Free Space Oven	Analysis of moisture content