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QUALITY MANUAL

ISO15189:2022

29th September 2025

This document, together with specified procedures, represents the Quality Management System of Micropathology Limited. It has been compiled to meet the United Kingdom accreditation service requirements of a Quality Management system and appropriate national and international standards including ISO15189:2022

1st edition – 28th October 2024

Revision September 2025

Addition of Micropathology Ltd Organisational Structure chart page 14

Removal of the following job descriptions page 15 as no longer in use:
Scientist M-129-n; Post-doctoral Scientist M-666-n; Laboratory Assistant – temporary M-2267-n and M-2268-n. Removal of Accessions Manager M-1053-n – now included in M-2351-n & M-2778-n. Removal of Laboratory Manager M-1518-n – now included in M-2777. Removal of Sequencing laboratory manager role M-1055-n.

Page 15 addition of the following job descriptions:
Post-grad Scientist & Laboratory Lead M-2777-n
Post-doc Scientist in Genomics M-2729-n
Post-doc Scientist & Accessions Lead M-2351-n
Post-doc Scientist, Manual Extractions & Accessions Lead M-2778-n
Research Post – Graduate Scientist M-2280-n
Sequencing Lab Manager M-2923-n
Post-doc Scientist & Veterinarian M-2816-n
Post-doc Scientist: M-2635-n; M-2483-n; M2947-n; M-2604-n; M-2727-n; M-2948-n; M-2452-n; M-2443-n
Post-doc Scientist & R&D Lead M-2957-n
Post-Grad Scientist: M-2451-n; M-2266-n; M-2961-n; M- 2962-n; M-2958-n
Senior Scientist M-2866-n
Lab Post Graduate Scientist M-2278-n; M-2353-n; M-2264-n.

Changes made to the following job descriptions:
Lab Office Admin assistant M-480-n to Laboratory Office Administrator M-480-n
Quality Assistant M-2409-n to Quality Lead M-2409-n
Quality Support M-2728-n to Training & Quality Support M-2728-n
IT Manager M-1100-n to IT Lead M-1100-n

Software Developer M-1841-n to Senior Software Engineer M-1841-n, addition of Software Engineer M-2827-n

Human Resources & Training Officer Support M-1934-n to Human Resources & Deputy Training Officer M-1934-n

Bioinformatics R&D Lead & Equipment Manager to Lead M-2513-n

Post-Doc Scientist, Equipment and Nucleic Acid Extraction Manager to Lead M-2422-n

Senior Bioinformatician/ Post-Doctoral Scientist M-2642-n to Post Doctoral Scientist & Bioinformatician Lead M-2642-n

Genetics Manager M-2507-n to Post-Doctoral Scientist & Genetics Lead M-2507-n

Serology Manager M-1061-n to Serology Lead M-1061-n

Amendment of IT Security Policy from S-1936-n to M-1936-n

Contents

GENERAL INFORMATION

Title of Laboratory

The laboratory is a part of Micropathology Limited, an independent research and diagnostic service provider.

Information on the services provided is available on the company's website (http://www.micropathology.com/) from where the Laboratory User Handbook (also held on iPassport for internal use) can be downloaded.

The routine diagnostic work of the company comprises of the molecular diagnosis of infectious diseases, genetic disorders, identification of human remains and familial relationship testing. In addition to these services the laboratory also undertakes a variety of research and contract testing activities and supports post-graduate research with other institutions. The research-based activities do not fall under the requirements of ISO15189:2022.

The Quality Manual

The ISO15189:2022 standard objective is the promotion of the welfare of patients and satisfaction of laboratory users through confidence in the quality and competence of medical laboratories. It is through compliance to the ISO15189:2022 standard that the laboratory continually increases the effectiveness of the management system. It ensures that as a laboratory service we continue to meet the needs and requirements of users and ensure the continued welfare of the patient.

This Quality Manual sets out to detail how Micropathology Ltd complies with this standard.

The Quality Policy of Micropathology Limited

Scope of the service:-

Micropathology Limited specialises in using the latest molecular techniques to provide a clinically supported service for rapid diagnosis and management of infectious and genetic disease. We also provide a human genetic profiling for relationship testing and human identification genetics service. Our staff undertakes biomedical research covering human and veterinary pathology. This includes contract research and clinical trials for external organisations, in concert with continuous in-house assay development.

The directors and staff of the company strive to provide the highest possible standards in all aspects of the company's activities. We welcome a continuing dialogue with our clients in any aspect of clinical diagnostic testing.

In order to provide these services, which meet or exceed the needs and requirements of its users and patients, the laboratory management team is fully committed to:

Providing the highest quality analytical pathology service by:-

- Upholding professional values and continuing commitment to good professional practice and conduct.
- Staff recruitment, training, development and retention at all levels to provide a full and effective service to its users.
- Ensuring the use of examination procedures used is the highest achievable quality and they are fit for intended use.
- Procuring and maintaining the most appropriate equipment and resources to enable the provision of quality examinations of specimens.
- Giving advice on the collection and handling of all diagnostic samples, (to minimise uncertainty of results), allowing the production of quality assured results in a timely, confidential and clinically useful manner.
- Ensuring laboratory staff are familiar with the contents of this Policy, the Quality Manual and all procedures relevant to their work.
- Ensuring samples are treated in the strictest of confidence and with due care and respect
- Regular assessments of the satisfaction of users and staff. (E.g. by feedback from meetings, service updates, Christmas letters and user information sheets).
- Participation in internal audit schemes.
- Participation in National and European standards of excellence relevant to our clinical diagnostic work.
- *Compliance with all relevant local and national legislation, including environmental legislation.*

Achieving continual quality improvement in all areas of the laboratory by:-

- Continually developing the Quality Management System to allow improvements to all elements of the diagnostic Service.
- Annually reviewing the performance of company over the previous year and subsequently setting quality indicators, objectives and plans for the future, which will be implemented to comply with this Quality Policy. These Quality Objectives are set at the Annual Management Review and are reviewed monthly at Laboratory meetings for progress.
- Following Caldicott principles and complying with the standards set by external organisations, e.g. ISO15189:2012, ISO15189:2022, Health and Safety Executive, Human Tissue Authority.
- Regularly reviewing the effectiveness of the Quality Management System through regular internal auditing.

The health, safety, welfare and development of all Micropathology Ltd staff by:-

- Ensuring a friendly working environment to encourage the retention and recruitment of highly professional staff, committed to excellent professional practice.
- Regularly reviewing, by audit and inspection, compliance with the Department's health & safety procedures.
- Analysing incidents, complaints and accident reports, applying remedial, corrective and/or preventative actions as appropriate and reviewing these actions for effectiveness.
- Providing resources for training, education and development for all staff.

Treating all visitors and callers to the Department with courtesy and respect by:-

- Being helpful and polite and giving consideration to their health, safety and welfare whilst in the laboratory and office facilities.

4 GENERAL REQUIREMENTS

4.1 Impartiality

Laboratory management is committed to impartiality in all activities undertaken at Micropathology Limited. The laboratory is structured and managed to safeguard impartiality, and management understands that it is responsible for the impartiality of its activities and that it shall not allow commercial, financial or other pressures to compromise impartiality, in accordance with procedures S-1930-n Anti-bribery and Corruption Policy, S-1931-n Gifts and Hospitality and S-1932-n Code of Conduct. Staff are required to complete/sign the Ethical Conduct form S-1693-n at induction and at annual performance reviews (S-2369-n Performance Review SOP).

4.2 Confidentiality

4.2.1 Management of Information

Micropathology Limited is responsible, through legally enforceable agreements, for the management of all patient information obtained or created during the performance of laboratory activities. Management of patient information includes privacy and confidentiality and is outlined in the Data Protection Policy S-1987-n. All staff enter into a Safety and Confidentiality Agreement, S-483-n. Data is stored in accordance with GDPR, and is retained in accordance with the documentation: M-176-n Guidance on the Use of Clinical Samples Retained in the Pathology Laboratory, M-175-n The Retention and Storage of Pathological Specimens and Records (5th edition) and S-178-n Procedure for the Control of Clinical Material. The laboratory's cyber security policy is detailed in M-1936-n IT Security Policy. Management of information is detailed in S-177-n Control of Records. No patient information is put in the public domain (unless by prior arrangement with the user). The Laboratory User Handbook S-748-n provides users with information as to how the laboratory manages patient information.

4.2.2 Release of Information

All staff at Micropathology Limited are trained in patient confidentiality during their induction process (Induction S-30-n) and are bound by the terms of the Safety and Confidentiality Agreement S-483-n. The laboratory's Data Protection Policy S-1987 is designed to protect the privacy and confidentiality of patients, staff and other members of the public and to ensure that Micropathology Ltd complies with the General Data Protection Regulation (GDPR), the Data Protection Act 2018 and the Caldicott2 Report, March 2013. The company

is also registered with the Information Commissioners Office for Data Protection. Any request to release confidential patient information must be made to Prof. Colin Fink or Dr Mark Atkins.

4.2.3 Personnel Responsibility

Micropathology Limited ensures that personnel (including contractors, personnel of external bodies or individuals with access to laboratory information acting on the laboratory's behalf) keep confidential, all information obtained or created during the performance of laboratory activities. Staff and any visitors are required to sign, and are bound by, the companies Safety and Confidentiality Agreement, S-483-n.

4.3 Requirements regarding patients

Micropathology Limited ensures that patients' well-being, safety and rights are its primary considerations.

The laboratory provides opportunities for laboratory users to provide helpful information to aid users in the selection of examination methods and the interpretation of results; all request form templates (available to download from the company website www.micropathology.com) have a field for clinical information, including prompts for relevant information. Details for contacting the laboratory are also available on the company website and in the Laboratory User Handbook S-748-n in the event of clarification on any request. The User Handbook also details information about the laboratory's Diagnostic and Advisory service for users.

The company employs a company representative, who visits and telephone clients on a regular basis and provides feedback, via a written report, on their satisfaction with the service. Any suggestions for improvement, complaints and any requests are documented in written reports which are available on iPassport. Where relevant, content within these reports is acted upon by the laboratory.

Information is publicly available to users on the company's website (http://www.micropathology.com/) from where the Laboratory User Handbook (S-748-n) can be downloaded. This gives details of the laboratory services including, but not limited to, information about the examination process, laboratory location and hours of operation, completion of the request form, transportation of samples, requirements for consent, sample rejection criteria, factors affecting the performance of examination or interpretation of results,

test turnaround times and sample requirements. Price lists are available via the customer portal on the website.

Examinations offered by the laboratory are periodically reviewed at the Annual Management Review S-1929-n, to ensure that assays offered are clinically relevant. Examinations are reviewed as per the Assay Review procedure S-2223-n.

The laboratory management has established procedures for disclosing to users, incidents that resulted or could have resulted in patient harm, and records of actions taken to mitigate those harms in accordance with the procedures, Identification and Control of Non-Conformances S-572-n and Process Errors S-2742-n.

All samples or remains received are treated with due care and respect, in accordance with the document, Procedure for the Control of Clinical Material S-178-n.

Informed consent is the responsibility of the requesting laboratory/user. Micropathology Ltd requires informed consent from individuals for genetic testing, information regarding this is detailed in the User Laboratory Handbook, S-748-n.

The availability and integrity of retained patient samples and records is detailed in the Procedure for the Control of Clinical Material S-178-n and in Temperature and Data/Humidity Logging S-36-n. Samples, and associated data, are held in accordance with the Royal College of Pathologists 'Guidance on the Use of Clinical Samples Retained in the Pathology Laboratory', M-176-n and 'The Retention and Storage of Pathological Specimens and Records (5th edition)' M-175-n. The details of all records held at Micropathology Ltd is documented in S-177-n Control of Records.

Results Release S-1063-n defines the procedure for providing results using standard LIMS reports and for reporting critical/urgent reports by telephone. StarLIMS usage S-42-n provides information for staff as to how results should be reported and authorised. Micropathology Ltd does not deal directly with patients

Samples received are tested free from discrimination. All patient samples are anonymised and given a laboratory number, as per the procedure Specimen Receipt S-10-n.

5 Structural and governance requirements

5.1 Legal entity

Micropathology Ltd (Company registration number 3022426) is the sole entity legally responsible for the diagnostic activities performed on site.

5.2 Laboratory director

5.2.1 Laboratory director competence

Prof. Colin Fink, the Laboratory Medical Director, and Dr Mark Atkins, Consultant Medical Virologist Microbiologist are Fellows of the Royal College of Pathologists. Requirements of the post are detailed in the relevant job descriptions (M-479-n and M-1607-n).

5.2.2 Laboratory director responsibilities

Prof. Fink maintains ultimate responsibility for the overall operation and administration of the laboratory, this includes responsibility for the implementation of the management system, including the application of risk management to all aspects of laboratory operations, so that risk to patient care and opportunities to improve are systematically identified and addressed. Prof. Fink and Dr Atkins are both responsible for directing the clinical diagnostic work and act in the manner of a Caldicott guardians. The duties and responsibilities are detailed in the relevant job descriptions as detailed in M-479-n and M-1607-n.

5.2.3 Delegation of duties

Prof. Fink maintains ultimate responsibility for the overall operation of the laboratory. The director's delegate selected duties and responsibilities to qualified and competent personnel, as detailed in M-54-n Training Policy and Competency Assessments, S-13-n Clinical Advice, Authorising & Out of Hours Service and S-1251-n Clinical Decision Making Competency Assessment Form for Scientific Staff.

5.3 Laboratory activities

5.3.1 General

In compliance with 5.3.1 the range of laboratory activities is defined in the Laboratory User Handbook S-748 -n. This document explicitly states which procedures and sample types are not UKAS accredited and explains that the remainder are.

5.3.2 Conformance with requirements

Micropathology Ltd shall meet the requirements of ISO15189:2022 and strive to maintain this accreditation when performing work at the laboratory and office facilities.

5.3.3 Advisory activities

The laboratory management ensure the provision of appropriate clinical advice and interpretive comments that meet the needs of users is available, detailed in the procedure, S-13-n Clinical Advice, Authorising and Out of Hours Service.

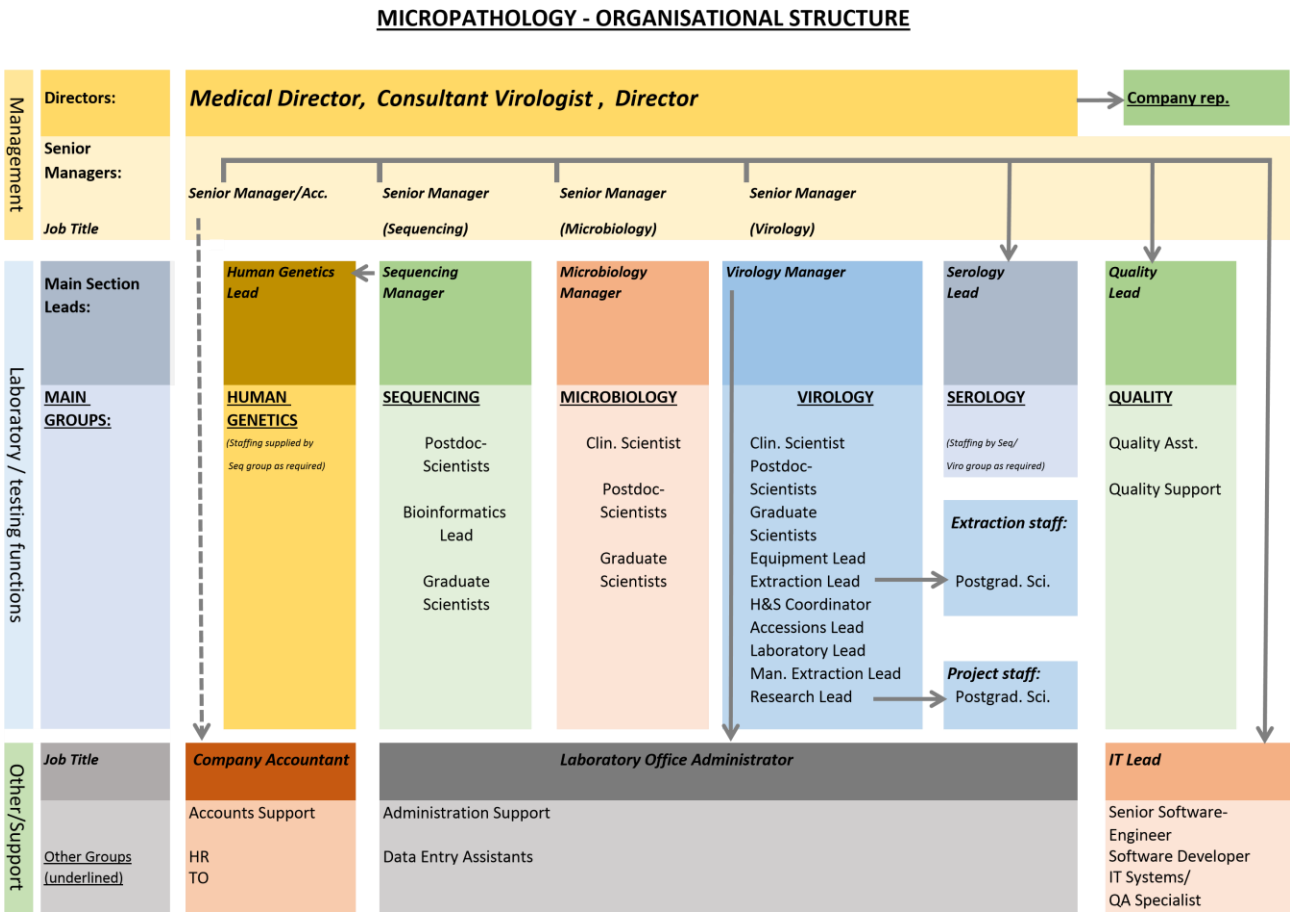
Staff may alert users to scientific and logistic issues with samples by telephone or email communication. Staff may also indicate any issues by way of a caveat or interpretative comments on reports**.** Medical and scientific staff consult on the effective provision of services at laboratory meetings.

Information is made available to users on the company's website (http://www.micropathology.com/) from where the Laboratory User Handbook (S-748-n), and Assay Information Sheets can also be downloaded.

5.4 Structure and authority

5.4.1 General

Micropathology Ltd defines its organisation and management structure, and inter-relationships between staff, illustrated in the company organisational structure chart below.



Key roles of Medical Laboratory Director, IT, Quality, Health and Safety, Training Officer are assigned along with relevant deputies or assistants. Additional roles of responsibility are defined within individual staff job descriptions.

There is currently one Medical Laboratory Company Director and a Consultant Microbiologist / Virologist who are aided by two HealthCare Professions Council state-registered Clinical Scientists (Microbiology and Virology). They in turn are aided by a number of post-doctoral or post-graduate scientists, one of whom is registered with the IBMS as a Biomedical Scientist and one as an FRCPAth registered Immunologist. The company also employ two Company Representatives, an accountant and several workers who provide administrative assistance.

All staff have a line manager. Staff responsibilities and line managers are detailed in individual job descriptions, which are based on the following or associated templates

Company Representative *M-191-n*
Company Accountant *M-298-n*
Medical Director *M-479-n*
Laboratory Office Administrator *M-480-n*
Clinical Scientist Microbiology *M-2506-n*
Clinical Scientist Virology *M-2501-n*
Quality Lead *M-2409-n*
Quality Assistant *M-791-n*
Training & Quality Support *M-2728-n*
Health and Safety Co-ordinator *M-622-n*
Training Officer *M-623-n*
Human Resources and Deputy Training Officer *M-1934-n*
Administration support *M-1390-n*
Consultant Medical Microbiologist / Virologist *M-1607-n*
Information Technology Lead *M-1100-n*
IT Systems Quality Assurance Specialist *M-2007-n*
Senior Software Engineer *M-1841-n*
Software Developer *M-2827-n*
Administration & Accounting support *M-1689-n*
Data Entry Assistant *M-2199-n*
Post-Graduate Scientist and Laboratory Lead *M-2777-n*
Post-Doctoral Scientist in Genomics *M-2729-n*
Post-Doctoral Scientist and Accessions Lead *M-2351-n*
Post-Doctoral Scientist, Manual Extractions & Accessions Lead *M-2778-n*
Research Post – Graduate Scientist *M-2280-n*
Post-Doctoral Scientist & Veterinarian *M-2816*
Post-Doctoral Scientist - *M-2635-n, M-2483-n, M-2947-n, M-2604-n, M-2727-n, M-2948-n, M-2452-n, M-2443-n,*
Post-Doctoral Scientist & Research and Development Lead *M-2957-n*
Post-Graduate Scientist - *M-2451-n, M-2266-n, M-2961-n, M-2962-n, M-2958-n*
Senior Scientist *M-2866-n*
Laboratory Post Graduate Scientist: *M-2260-n, M-2278-n, M-2353-n, M-2264-n*
Post-Doctoral Scientist, Bioinformatics and Equipment Lead *M-2513-n*
Post-Doctoral Scientist, Equipment and Nucleic Acid Extraction Lead *M-2422-n*
Post-Doctoral Scientist and Bioinformatician Lead *M-2642-n*
Post-Doctoral Scientist and Genetics Lead *M-2507-n*
Serology Lead *M-1061-n*

ROLES

Equipment Maintenance *M-928-n*
Virology Manager *M-1054-n*
Microbiology Manager *M-1056-n*
Sequencing Laboratory Manager *M-2923-n*
Deputy training officer *M-1930-n*
Deputy health and safety officer *M-1935-n.*
Fire warden *M-263-n*

Job descriptions are retained in each individual's training record folder or, in the case of the directors, the personnel file. Individual staff member's terms and conditions of service (contracts of employment) are retained by Management in the personnel file. Staff may have more than one role. Details of these roles are also held within individual training folders.

Communication processes within section groups and between groups at Micropathology Ltd is documented in S-1939-n Communication.

The laboratory has documented defined training programmes to ensure all staff are competent to perform their assigned duties, M-54-n Training Policy and Competency Assessment.

The document S-1699-n Assay Responsibilities (change or cover and ongoing responsibility), details points that should be considered when staff have been assigned responsibility for the running/overseeing of an assay. The document S-1700-n Assay Responsibilities, details the names of staff members who are responsible / have authority for specific assays.

Diagnostic assays are performed according to Standard Operating Procedures that are available on the QMS, iPassport. A template is provided for the guidance of those writing new procedures S-5-n Master SOP. In-house diagnostic assays, non-standard methods, standard methods used outside the intended scope, or validated methods subsequently modified, are all validated for their intended use prior to their introduction, according to the SOP Assay validation - MASTER (S-508-n) and template (S-266-n). The laboratory management have established a procedure, for the acceptance testing and verification of equipment (S-804-n MASTER – Equipment/method/software upgrade verification), to demonstrate acceptability of equipment performance and 'fitness for purpose' upon installation.

5.4.2 Quality management

The laboratory management has an appointed a Quality Team. The Quality Team report directly to management. They ensure that the quality management system

(QMS) is implemented and maintained; identifying any deviations from the management system or from the procedures for performing laboratory activities and the initiation of action to prevent or minimise such deviations; reporting to the laboratory management on the performance of the QMS and any need for improvement, and ensuring the effectiveness of laboratory activities

5.5 Objectives and policies

Laboratory management have defined their intent of the QMS in a Quality policy. This is detailed on page 8 of this Quality Manual. This policy is reviewed annually to ensure it is appropriate to Micropathology Ltd. A signed copy is displayed in the company kitchen all staff to review. It is also available on the electronic QMS iPassport, Quality Policy S-1115-n. Quality objectives set at the Annual Management review are determined in line with the Quality policy.

The laboratory management team defines quality objectives at the Annual Management Review. The quality objectives are communicated to the laboratory through the annual management review report (S-1929-n) and laboratory meetings. Staff are responsible for ensuring that plans are made to meet these objectives. Quality objective progress is subject to discussion in laboratory meetings and may, if required, be subject to amendment. The annual management review determines whether the preceding year's objectives have been successfully completed and provides an opportunity for revising them or creating new ones.

The laboratory management have a procedure Change Control S-1099-n to ensure appropriate change management and to enable the integrity of the Quality Management System to be maintained during periods of change. The change control request form (MASTER – Change Control Form S-1098-n) serves to monitor change within the company premises.

The laboratory management have a document S-640-n Quality Indicators, which details methods used to monitor quality improvement processes in the pre-examination, examination and post-examination areas of the laboratory.

5.6 Risk management

The laboratory management ensure that processes for identifying risks of harm to patients and opportunities for improved patient care associated with its examinations and activities are established, implemented and maintained, as outlined in the procedure Risk Management and Opportunities for Improvement S-2722-n.

The laboratory director ensures that risk management is applied to all aspects of the laboratory service and that it is evaluated for effectiveness and modified when identified as being ineffective. This is detailed in the Medical Director job description M-479-n.

6 Resource requirements

6.1 General

The laboratory ensures it has available the personnel, facilities, equipment, reagents, consumables and support services necessary to manage and perform its activities as defined in this Quality Manual. These are further defined in points 6.2 – 6.8.

6.2 Personnel

6.2.1 General

The laboratory has access to a sufficient number of competent staff for performing all of its activities. A staff list is available in the User Laboratory Handbook S-748-n and on the company website www.micropathology.com. The company organisational chart and job description templates are shown in section 5.4.1 of this Quality Manual.

The laboratory management ensures that all personnel of the laboratory, either internal or external, that could influence the laboratory activities act impartially and ethically, as per the procedure S-1693-n Ethical Conduct; are competent, as per the procedure M-54-n Training Policy and Competence Assessments, and work in accordance with the laboratory's management system.

The laboratory management communicates to laboratory personnel the importance of meeting the needs and requirements of users as well as the requirements of the ISO15189:2022 standard. This Quality Manual sets out to detail how we comply with this standard. All staff are required to be familiar with this document.

The laboratory has an induction programme, S-30-n Induction, which introduces personnel to the organisation, the department in which the person will be working, the terms and conditions of employment, staff facilities, health and safety requirements, and occupational health services, this is recorded in S-598-n Induction Record which is retained in each individual's personnel file.

6.2.2 Competence requirements

The laboratory specifies the competence requirements for each function influencing the results of laboratory activities, as detailed in M-54-n Training Policy and Competency Assessment.

Staff follow a supervised SOP-based training in all relevant aspects of their routine diagnostic work (see Training policy and competency assessment M-54-n, Training record form S-587-n and Personal Training Programme M-199-n). The training officer oversees this process. The laboratory also ensures all personnel have the competence to perform laboratory activities for which they are responsible, through regular witness audits, as detailed in the procedure Auditing S-168-n.

Competency is individually tailored for each staff member as detailed in M-54-n Training Policy and Competency Assessment. Staff are responsible for maintaining ongoing evidence of their competency by completing training logs and records of ongoing CPD; these activities are monitored during the annual competency review process (S-200-n Competency Spreadsheet; S-1687-n Assessment of Clinical Competency).

The laboratory documents information demonstrating competence of its personnel, through Training Records (S-587-n), Auditing (S-168-n), Internal Quality Assurance (S-183-n), Inter-Laboratory Comparison - EQA (S-531-n and S-1434-n), Inter-operator comparison (IOC record form S-2581-n; IOC sequencing and genetics S-1255-n & S-1256-n; IOC Serology S-1924-n; IOC Virology S-2521-n) and quizzes generated and logged on iPassport.

6.2.3 Authorisation

The laboratory authorises personnel to perform specific laboratory activities, including but not limited to, the following:

a) Selection, development, modification, validation and verification of methods as per the procedures S-1700-n Assay Responsibilities, S-1699-n Assay Responsibilities (Change or Cover). Responsibilities for the use of iPassport for the update of documents relating to assays is defined in Use of iPassport S-715-n.
b) Review, release, and reporting of results as per the procedures Results Release S-1063-n and Clinical Advice, Authorising & Out of hours service S-13-n
c) Use of laboratory information systems, in particular: accessing patient data and information, entering patient data and examination results, changing patient data or examination results, detailed in the procedure S-42-n StarLIMS Usage.

6.2.4 Continuing education and professional development

All personnel are encouraged to participate in continuing education and regular professional development. The suitability of the programmes and activities are periodically reviewed. This is set out in the procedures: Guidelines for Continuing Professional Development S-281-n and Training Policy and Competency Assessments M-54-n. Records are kept electronically or in personal or training record files, records include: Annual statement of CPD S-1107-n and CPD diary S-1108-n.

6.2.5 Personnel records

The laboratory has procedures and retains records for determining:

a. the competence requirements of personnel (specified in 6.2.2 a)
b. training and re-training
c. authorisation of personnel
d. monitoring the competence of personnel

Detailed in M-54-n Training Policy and Competence Assessments. Personnel records are kept as detailed in the procedure for personnel management S-182-n. Job

descriptions, training and competency, copies of registration certificates and Continuing Professional Development are kept in the individual's training folder.

Job descriptions are based on the templates as detailed in section 5.4 Structure and Authority, (Page 14 of this Quality Manual). Copies are retained in each individual's training record folder or, in the case of the directors, the personnel file.

6.3 Facilities and environmental conditions

6.3.1 General

Micropathology Ltd has a procedure R-1952-n, Health and Safety and Welfare at Micropathology Ltd, that details facility maintenance and environmental conditions. There is a designated Health & Safety Co-ordinator, and Deputy Health & Safety Officer and Fire Warden and Fire Marshalls. They are responsible for defining, implementing and maintaining the Health and Safety and Fire procedures and relevant standards within the company, to ensure it is maintained in a functional and reliable condition. Fire risk assessments are carried out according to the protocol provided in Fire Risk Assessment Procedure (S-31-n).

Copies of the Laboratory Safety Manual (R-589-n) and Waste Disposal procedure (S-51-n) are available on iPassport and displayed in the laboratory respectively.

Area guidelines are displayed in each area of the laboratory to ensure safety (e.g. PPE and occupancy limitations) and validity of examination results (cleaning protocols, workflow restrictions to prevent contamination). Personal protective equipment (gloves, lab coats, eye protection) is available for each employee and for visitors.

The laboratory containment facilities conform to the requirements of the Advisory Committee on Dangerous Pathogens guidelines.

Daily cleaning is performed across the laboratory and is recorded using designated area cleaning records. A more thorough monthly clean is performed, and is again recorded. These cleaning schedules ensure the laboratory facilities remain suitable for laboratory activities.

Additionally, environmental contamination is monitored via the procedure described in S-1257-n Environmental swabbing. This monitors for any environmental contaminants that may affect the validity of examination of examination results.

Room temperature and humidity are monitored on a daily basis in accordance with S-36-n and results recorded on the forms S-1269-n and S-1569-n.

6.3.2 Facility controls

Control of access is implemented in accordance with the procedures Control of Records S-177-n, Control of Clinical Material S-178-n and the Safety and Confidentiality Agreement S-483-n.

The laboratory has procedures to prevent contamination, interference, or adverse influences on laboratory activities; environmental swabbing is conducted on a weekly basis, as per the procedure Environmental Swabbing S-1257-n, to identify any possible contamination. Where contamination is suspected or has occurred, samples are re-assayed as per the procedure Ensuring the Quality of Examination Results - Repeat Testing of Samples S-796-n.

Purite water is used in extraction blanks and for all equipment. Air-conditioning is monitored for contamination.

The laboratory has established a procedure, Waste disposal and Disinfection Protocol S-51-n, for the disposal of clinical waste. Waste is stored in the laboratory in large, rigid, lidded containers prior to autoclaving. Autoclaved waste is transported to the clinical waste skip at the rear of the laboratory to be removed by authorised agents.

The laboratory is divided into specific areas allowing effective separation between the pre-amplification (clean) and post-amplification (sequencing) rooms to prevent sample contamination. Please refer to the laboratory floor plan as detailed in Appendix 1.

The laboratory details the provision of safety facilities and devices in the Laboratory Safety Manual R-589-n, this includes details on First Aid provision, fire procedures,

occupational health, safety procedures relating to biological and chemical hazards and waste disposal. Personal protective equipment (gloves, lab coats, eye protection) is available for each employee and visitors.

Laboratory facilities are maintained in a functional and reliable condition through daily cleaning and monthly laboratory cleans.

6.3.3 Storage facilities

The laboratory has ample storage space, with conditions that ensure the continuing integrity of documents and records, samples, equipment, reagents and consumables.

The laboratory management have established a procedure for the Control of Records. S-177-n and Records Table S-2639-n. Current process and quality records are stored electronically in the QMS iPassport. There is adequate storage space for the retention of paper records, as appropriate. Archived paper copies may be scanned to the Company server and stored for reference. Experimental data results are stored electronically on the server and are backed up in accordance with above procedure (S-177-n). Patient records are stored electronically on the LIMS.

Patient samples and materials used in examination processes are stored in a manner that prevents cross contamination and deterioration as per the Procedure for the Control of Clinical Material S-178-n.

Clinical material:

Fridges and freezers are available for the storage of clinical material. Clinical samples are archived in numbered boxes kept at -20^{o}C. Storage of these samples is detailed in the Procedure for the Control of Clinical Material S-178-n. Monitoring of the fridge freezer temperatures is detailed in Temperature and Humidity Data Logging S-36-n.

Extracted nucleic acids

Specimen extracts are available for repeat testing or additional testing. Extracts are stored at 4^{o}C. Storage of these samples is detailed in the Procedure for the Control of Clinical Materials (S-178-n). Monitoring of the fridge freezer temperatures is detailed in Temperature and humidity data logging (S-36-n).

Reagents and consumables:

Reagents and controls are stored at 4ºC, -20ºC or -70ºC, as required, in fridges and freezers in the laboratory or storerooms. Monitoring of the fridge freezer and room temperatures and humidity, as applicable, is detailed in Temperature and Humidity Data Logging S-36-n.

Some reagents may be stored at room temperature. Consumables are stored in various locations within the laboratory and store rooms. Please refer to the laboratory floor plan as detailed in Appendix 1

Hazardous substances:

Storage and disposal facilities for hazardous materials and biological waste is detailed in the procedure Waste Disposal and Disinfection Protocol S-51-n and the Autoclave Operating Procedure S-50-n. There are separate cabinets for the storage of duty-free spirits, other flammable liquids, acids, alkalis and toxic chemicals. Non-toxic chemicals are stored in the appropriately labelled cupboard in the laboratory.

6.3.4 Personnel facilities

Toilets, which are cleaned and maintained by the Venture Centre, can be found in the corridor next to the units. Shower facilities and additional toilets are available further along the corridor. Basic catering and dining facilities are provided within the unit. Members of staff are provided with locking desk drawers for the storage of personal effects and protective clothing is stored in various locations within the laboratory. The seminar room provides an area for meetings and quiet study.

Details of facilities provided to staff and what condition they should expected to find and leave them in are detailed in the Employee handbook S-2257-n.

6.3.5 Sample collection facilities

Patient samples are not taken at Micropathology Ltd. Micropathology Ltd. may sometimes take samples from staff for occupational reasons as defined in S-1981-n Primary Sample Collection and Handling at Micropathology Ltd.

6.4 Equipment

6.4.1 General

The laboratory management have established procedures for the selection, procurement and management of equipment that fulfil the requirements of the ISO15189:2022 standard; see S-186-n Procurement and Management of Equipment for details of this procedure and associated responsibilities. Details of preventative maintenance, incident reporting and equipment records are also detailed within this SOP.

Management of laboratory information systems are detailed in S-1833-n Software Systems Management and Development at Micropathology Ltd and S-1268-n LIMS retrospective validation.

6.4.2 Equipment requirements

The laboratory has access to the equipment required for the correct performance of laboratory activities. Equipment is detailed on the QMS iPassport under ‘Laboratory Records’, ‘Equipment’.

Where equipment is used outside of the equipment manufacturer’s functional specifications laboratory management ensure requirements of the ISO15189:2022 standards are met, as detailed in the procedures S-804-n MASTER - Equipment/ method/software upgrade verification, S-868-n MASTER - Equipment Move Validation and S-1058-n MASTER Equipment verification - post service/repair/ on-loan /removed from storage.

All equipment is logged in the Asset Register database (held on the company server). Each piece of equipment is then registered on iPassport, where relevant documentation is held. Records of pipettes are held on the Pipette database. Each piece of equipment is assigned an inventory number. The Equipment Managers maintain overall responsibility for the management of these registers.

The Information Technology Manager is responsible for maintaining the laboratories software and IT related hardware as defined in the relevant job description (M -100-n)

and the IT department are responsible for maintaining LIMS, defined in StarLIMS Restricted Access and Administrator Capabilities, S-834-n.

The laboratory maintains and replaces equipment as needed to ensure the quality of examination results are per the procedure S-186-n Procedure for Procurement and Management of Equipment.

6.4.3 Equipment acceptance procedure

The laboratory management have established a procedure, for the acceptance testing and verification of equipment (See S-804-n MASTER - Equipment / method / software upgrade verification) to demonstrate acceptability of equipment performance and 'fitness for purpose' upon installation or software upgrade.

Equipment acceptance testing post repair, post service, on loan or removed from storage is detailed in S-1058-n and equipment move validation S-868-n; Pipette servicing and calibration is detailed in S-2723-n Pipette SOP.

6.4.4 Equipment instructions for use

All staff are required to agree and sign the company Safety and Confidentiality Agreement S-483-n, this includes a declaration that equipment will not be tampered with – including computer software.

Equipment is operated by trained, authorised and competent personnel, in accordance with the Procedure for Procurement and Management of Equipment S-186-n. Training is recorded on The Equipment Training Log Form S-805-n, which is kept in staff training folders.

All relevant instruction manuals are uploaded to the electronic Quality Management System software, iPassport; digital copies are also stored on the company server and any physical copies are stored in the foyer as detailed in S-186-n Procurement and Management of Equipment. In both instances, manuals are subject to document control as detailed in the procedure Document Control S-1-n.

6.4.5 Equipment maintenance and repair

The laboratory management have established a programme of preventative maintenance in accordance with the procedure S-186-n Procurement and Management of Equipment.

Defective equipment is removed from diagnostic service and is labelled as out of service until it has been verified to meet specific acceptance criteria, as per procedure S-186-n. The impact on any patient results prior to and during the breakdown is investigated and a non-compliance raised if necessary.

Where equipment has to be removed from the direct control of the laboratory for servicing or repair, its performance is verified upon return before routine use, as detailed in the procedures Equipment verification – post service / repair / on loan or removed from storage S-1058-n and Pipette service and calibration S – 2723-n.

All equipment, where required, should be decontaminated, prior to service, repair or decommissioning. A decontamination certificate should be completed by laboratory staff (Decontamination certificate for contractors R-1557-n).

6.4.6 Equipment adverse incident reporting

Adverse incidents and accidents are reported in accordance with the procedure S-186-n, Procurement and Management of Equipment; the procedure for responding to any manufacturer's recall is also detailed in this document.

6.4.7 Equipment records

Records are kept and maintained for each item of equipment that influences the results of laboratory activities, as detailed in the procedure S-186-n Procurement and management of equipment. Software is referenced in relevant SOPs. Equipment is labelled with an inventory number; the inventory of laboratory equipment is kept in the iPassport database. The inventory of pipettes is kept in a separate database F:\UKAS ISO15189 2012\Equipment\Pipettes. IT related equipment is held in Spiceworks, an IT network monitoring tool.

Equipment preventative maintenance visits are recorded on the QMS iPassport and in three equipment folders "Equipment - Service contracts", "Equipment - Calibration certificates" and "Equipment - Service reports" stored in the Quality Management System cupboard.

The pipette calibration records can be found in the ‘Pipette Calibration Records’ file in the laboratory and the relevant year folders within F:\UKAS ISO15189 2012 \Equipment\Pipettes. Use of this database is detailed in S -2723-n Thermal cycler Calibrations. Certificates are located in the F:\UKAS ISO15189 2012 \Equipment\Thermocycler Validations folder. Additionally, all certificates are also attached to the corresponding equipment on iPassport.

To ensure all equipment post calibration or service is fit for purpose, service reports and calibration certificates are reviewed and signed and dated as a statement of acceptability (as defined in the Procurement of Management of Equipment procedure S-186-n).

For any out-of-service, retired or obsolete equipment, records on iPassport are set as inactive. All documents / records of equipment are maintained for the lifespan of the equipment, or longer, as per the procedure Control of Records S-177-n.

6.5 Equipment calibration and metrological traceability

The laboratory management has a procedure for the calibration of equipment and for determination of traceability, where required, of any equipment involved in the diagnostic process, S-223-n Equipment Calibration and Metrological Traceability.

6.6 Reagents and consumables

The laboratory has procedures for the selection and procurement of reagents and consumables, as detailed in S-2749-n Selection of Suppliers and S-2735 Use of the Purchase Order System.

There is an established procedure for the proper management of all materials used in the provision of the service. See S-192-n Reagents and Consumables (Management of Materials), for details on reception and storage, acceptance testing, inventory management, instructions for use, adverse incident reporting, and records. In-house databases are used to record primer and control batches and acceptance testing in accordance with the procedure S-1696-n Online Controls Register User Guide and S-1790-n Primer e-register User Guide. S-36-n Temperature and Humidity Data Logging, details the monitoring of temperature and humidity related to the storage of reagents and consumables.

6.7 Service agreements

The laboratory has established a document for the Establishment and Review of Service Level Agreements (SLAs) S-633-n, for the provision of medical laboratory services**.** Every request received by Micropathology Ltd is an agreement to perform a diagnostic service, where relevant and appropriate.

The laboratory has a service level agreement template which may be used (S-632-n). In this, the requirements of the user and provider of the laboratory service are defined. The laboratory will also consider user defined service level agreements.

SLAs are reviewed as detailed in S-633-n. Micropathology Ltd communicate with users three months inside the anniversary of the review date of the SLA to determine whether the SLA is to continue. Notes of these communications are held on iPassport.

6.8 Externally provided products and services

6.8.1 General

The laboratory has established procedures for the selection and purchasing of external services, supplies, equipment, reagents and consumables that may affect the quality of its service, detailed in S-186-n Procedure for Procurement and Management of Equipment, S-192-n Reagents and Consumables (Management of Materials) and S-2749-n Selection of Suppliers.

6.8.2 Referral laboratories and consultants

Micropathology Ltd does not routinely refer specimens to other laboratories. If necessary, samples can be sent for referral according to the procedure Examination by Referral Laboratories and Sending Samples to other Laboratories S-11-n. Accreditation status, EQA performance and general laboratory performance may also be requested by way of a letter (Accreditation status letter S-564-n). Results are transcribed into the Micropathology Ltd LIMS for indefinite retention of data. Results are forwarded to the user along with details of where the testing was performed and any clinical reference values / biological interval information.

6.8.3 Review and approval of externally provided products and services

Monitoring of suppliers is detailed in S-2749-n Selection of Suppliers. Information on approved suppliers is kept on the 'Suppliers List' spreadsheet.

7 Process requirements

7.1 General

As per the procedure S-2722-n Risk Management and Opportunities for Improvement, the laboratory identifies potential risks to patient care in the pre-examination, examination and post-examination processes and identifies opportunities to improve patient care.

7.2 Pre-examination processes

7.2.1 General

The laboratory has procedures for all pre-examination activities, see S-10-n Specimen Receipt (accessions), S-14-n Manual Extraction - Sample Pre-treatments, and extraction SOPs S-1642-n Nucleic Acid Extraction using KingFisher Instruments and S-392-n Nucleic Acid Extraction using the QIASymphony Robot. Pertinent bench procedures are displayed in the laboratory.

7.2.2 Laboratory information for patients and users

Details of the laboratory services including laboratory location, hours of operation and contact information, completion of the request form, transportation of samples, scope

of examinations, turnaround times, availability of advisory services, patient consent, sample rejection criteria and factors affecting the performance of examinations or the interpretation of results and the laboratory complaints procedure are all detailed the Laboratory User Handbook, S-748-n.

The laboratory produces a series of educational information sheets covering several tests offered by Micropathology Ltd. These are readily available on the company website www.micropathology.com for reference.

Additionally, the laboratory receives requests from HM Coroners for identification of human remains. The company will NOT undertake receipt of specimens for testing directly from members of the public, for reasons of medical safety.

7.2.3 Requests for providing laboratory examinations

7.2.3.1 General

Each request accepted by the laboratory for examinations is considered an agreement, set out in S-764-n Memorandum of Terms of Service.

Micropathology Limited prefers to deal with healthcare providers and diagnostic laboratories, however some special interest groups of patients approach Prof. Fink directly. Investigative tests on samples from these patients will only be considered if Prof. Fink or a GP referral (to Prof. Colin Fink) are received. The company accepts requests for diagnostic testing on any locally sourced pathology request form. The company will only carry out testing from *bona fide* laboratory, hospital or medical practitioner sources.

Users are able to source standard request forms and request forms for the identification of human remains via our website (http://www.micropathology.com/) . Details for the correct completion of the request form, to ensure an unequivocal link between the patient sample and the request, are included in the Laboratory User Handbook S-748-n.

When necessary, the laboratory will contact users to clarify the user's request as detailed in the User Handbook S-748-n and as per the procedure S-10-n Specimen Receipt (Accessions).

7.2.3.2 Oral requests

Requests for additional testing on a sample already received may be made by telephone or email as detailed in the Laboratory User Handbook S-748-n and in the procedure S-2246-n Telephone Message and Additional Test Request.

7.2.4 Primary sample collection and handling

7.2.4.1 General

Micropathology Limited mainly handles specimens that have been collected by our clients who are themselves familiar with the safety requirements necessary for their sample collection.

For the identification of human remains service, tissue samples are generally provided by hospital mortuary services. Personal items from the deceased or mouth swab specimens from close relatives are usually collected by police officers or coroner's assistants. Mouth swabs may also be self-collected by next of kin; these are sent by post to Micropathology at the instruction of the requesting HM Coroner. Human Identification Sample Receipt S-1919-n, provides information on secure specimen collection.

On occasion staff samples may be taken for occupational health purposes. The procedure for pre-collection activities in relation to staff sampling is defined in Primary Sample Collection and Handling at Micropathology Ltd S-1981-n.

To ensure excess sample is not collected and sent to Micropathology Ltd, sample volume requirements are stated in the User Handbook S-748-n. The laboratory periodically reviews sample volumes at the Annual Management Review S-1929-n. Each assay is reviewed as per the document S-2223-n Assay Review Procedure; sample volumes and suitability of sample type forms part of the review.

7.2.4.2 Information for pre-collection activities

Micropathology Limited are not involved in the collection of primary samples from patients. The laboratory provides information to users about sample types and volumes and instructions for the proper completion of request forms in the Laboratory User Handbook S-748-n. Copies of the request forms our website (http://www.micropathology.com/). Samples requiring further preparation upon receipt into the laboratory are handled in accordance with the Specimen receipt procedure, S-10-n.

The laboratory's criteria for acceptance and rejection of samples specific to the examinations requested is detailed in the Laboratory User Handbook and the procedure for rejecting samples is detailed in S-10-n.

7.2.4.3 Patient consent

Requesting laboratories are responsible for obtaining/providing evidence of informed consent. Information regarding consent for genetic testing is detailed in the User Laboratory Handbook, S-748-n.

7.2.5 Sample transportation

Information regarding sending samples to the laboratory and the packaging of samples for transportation is detailed in the Laboratory User Handbook S-748-n; it is the responsibility of the sender to comply with safety regulations for clinical specimen transportation and to send samples in a timely manner to protect sample integrity.

Transport of specimens to other diagnostic laboratories at the client's request, or the return of a sample to the sender, is performed according to the procedures S-779-n Specimen Transportation and S-11-n Examination by Referral Laboratories and Sending Samples to other Laboratories. The correct packaging of samples for transportation is detailed in the Laboratory Safety Manual R-589-n.

7.2.6 Sample receipt

7.2.6.1 Sample receipt procedure

Specimens received by the laboratory are subject to handling conditions laid out in the Laboratory Safety Manual R-589-n and in the SOP S-10-n Specimen Receipt

(Accessions). Rejection of specimens and instructions for the handling of samples marked as urgent is also covered in S-10 Specimen Receipt.

The date and time of receipt of samples into the laboratory is captured both in the LIMS system and additionally on an Accessions Sample Labelling Form S-859-n. The identity of the persons receiving the sample into the laboratory is captured on the accessions sample labelling form (S-859-n).

Specimen receipt for human identification samples is performed as per the procedure S-1919-n, Human Identification Sample Receipt.

7.2.6.2 Sample acceptance exceptions

Specimen rejection criteria is detailed in the procedure S-10-n Specimen Receipt (Accessions).

When a compromised clinically critical or irreplaceable sample is accepted, after consideration of the risk to patient safety, the final report shall indicate the nature of the problem and, where applicable, that the result should be interpreted with caution, as per the procedure S-10-n Specimen Receipt (Accessions).

7.2.7 Pre-examination handling, preparation, and storage

7.2.7.1 Sample protection

The laboratory has procedures and appropriate facilities for securing patient samples, ensuring sample integrity and preventing loss or damage during, handling, preparation and storage as defined in S-178-n Procedure for the Control of Clinical Material, S-177-n Control of Records and S-36-n Temperature and Humidity Data Logging.

7.2.7.2 Criteria for additional examination requests

Time limits for requesting additional examinations on the same sample are detailed in the Laboratory User Handbook S-748-n.

7.2.7.3 Sample stability

Sample stability for serology assays and kits are detailed in the Laboratory User Handbook S-748-n. Stability of microbial and viral targets are detailed in S-1695-n

Stability of Samples for Microbial Target Detection and S-1915-n Viral Sample Stability respectively.

7.3 Examination processes

7.3.1 General

The laboratory selects examination procedures for diagnostic use, which have been validated or verified, to assure the clinical accuracy of the examination for patient testing; performance specifications for each examination relate to that examination and its impact on patient care. The procedures are documented in S-266-n Assay Validation Procedure and S-508-n Assay Validation – MASTER.

All procedures and supporting documentation, such as SOPs, instructions, standards, manuals and reference data relevant to the laboratory activities are document controlled as per the procedure S-1-n Document Control. Documents are readily available to personnel on the Quality Management System iPassport.

All diagnostic assays are performed according to Standard Operating Procedures that are available on the QMS, iPassport. Personnel follow these established procedures and the identity of persons involved in the testing of diagnostic samples are recorded on laboratory worksheets (S-639-n, S-716-n, S-717-n, S-807-n, S-901-n, S-1484-n, S-1881-n), as per the procedure S-1792-n Completion of PCR worksheets. Worksheets are subsequently electronically archived, or are recorded on the equipment used in the analysis of the patient samples.

Persons responsible for performing an assay are also responsible for ensuring that SOP, validation, primer and assay review documentation remains up to date, this is defined in S-1699-n Assay Responsibilities (change or cover) and S-1700-n Assay Responsibilities. Responsibility for reviewing and approving the review of assays is defined in S-2223-n Assay Review Procedure.

Authorised personnel periodically evaluate the examination methods provided by the laboratory to ensure that they are clinically appropriate for the requests received; this forms part of the Assay Review Procedure S-2223-n and the Assay Validation –

MASTER S-508-n. A template is provided for the guidance of those writing new or updating existing procedures, S-5-n Master SOP.

7.3.2 Verification of examination methods

The laboratory has a procedure, S-804-n MASTER Equipment/Method/Software upgrade verification, to verify that it can properly perform examination methods before introducing into use, by ensuring that required performance can be achieved, as specified by the manufacturer / method. If an examination method is revised by the issuing body, the laboratory shall repeat the verification to the extent necessary.

Completed verifications are subject to Document Control S-1-n and are held electronically on the QMS, iPassport as per the procedure S-177-n Control of Records (and associated table S-2639-n Records table).

7.3.3 Validation of examination methods

In-house diagnostic assays, non-standard methods, standard methods used outside the intended scope or validated methods subsequently modified are all validated for their intended use prior to their introduction according the SOP Assay validation - MASTER (S-508-n) and template (S-266-n). Validation procedures for each assay are recorded using this template and include the objective evidence in the form of performance characteristics, in support of the assay validation.

Assay validation reviews are completed by the operator of that assay; this is to ensure that reviews are completed by personnel with the appropriate authorisation and competence, as detailed in S-508-n.

When changes are proposed to a validated examination process, the clinical impact of the proposed change is reviewed. When examination procedures are changed so that results or their interpretation may be significantly different, then Micropathology Limited informs all users of the service by letter or email in advance of the change and/or the addition of a caveat to reported results, informing them of an impending or recent alteration.

Completed validations are subject to Document Control S-1-n and are held electronically on the QMS, iPassport.

7.3.4 Evaluation of measurement uncertainty (MU)

The laboratory management have a document Uncertainty of Measurement and Quality Control Monitoring S-910-n which details the estimation of measurement uncertainty for assays and other imported uncertainties, which may influence the results of an assay.

Information is available to users on request, as detailed in the Laboratory User Handbook S-748-n.

7.3.5 Biological reference intervals and clinical decision limits

Biological reference intervals and clinical decision limits, when needed for interpretation of examination results, are included and reviewed as per the procedures Master SOP S-5-n and Assay Validation - MASTER S-508-n. Any changes made are communicated to users when applicable.

Reference values for Serological and HBV detection assays are detailed in the Laboratory Use Handbook S-748-n.

7.3.6 Documentation of examination procedures

Diagnostic assays are performed according to Standard Operating Procedures that are available on the QMS, iPassport. A template is provided for the guidance of those writing new procedures, Master SOP S-5-n.

Manufacturer’s instructions are held electronically on iPassport as controlled (external) documents. Deviations from the instructions are validated, documented and reviewed separately.

When examination procedures are changed, so that results or their interpretation may be significantly different, then Micropathology Limited informs all users of the service

by letter or email in advance of the change and/or the addition of a caveat to reported results, informing clients of an impending alteration.

All documents associated with the performance of the examinations are also subject to Document Control (S-1-n).

7.3.7 Ensuring the validity of examination results

7.3.7.1 General

The laboratory monitors the validity of examination results to ensure that the quality of the examination process is maintained, through the application of the following processes and procedures:

a) Internal Quality Control of ELISAs - S-158-n.
b) The inclusion of positive and negative controls in nucleic acid detection assays is detailed in the relevant SOPs and associated validation procedures.
c) Assay internal positive control is detailed in the SOP Ensuring the Quality of examination results – Repeat testing of samples S-796-n.
d) External Quality Assessment schemes – Participation in EQA schemes is detailed in the Inter-laboratory comparisons (EQA) S-531-n and Procedures for Evaluation and Improvement S-187-n SOPs.
e) Internal Quality Assurance - IQA S-183-n.

7.3.7.2 Internal quality control (IQC)

The laboratory uses quality control materials in all diagnostic assays in accordance with instructions detailed in assay specific assay validations (Assay Validation – MASTER S-508-n) / Master SOP S-5-n) or manufacturer’s specifications.

All controls used in in-house validated assays are used in accordance with the assay specific SOP. They are used in a manner to mimic patient samples at or near to the limit of detection of the assay (Assay validation – MASTER S-508-n and Master SOP S-5-n).

The laboratory has designed several excel based programs which monitor the Quality controls of quantitative and qualitative assays to detect trends in examination performance that may indicate problems in the examination system, such as lot-to-lot failure or change in examination method (S-910-n Uncertainty of measurement and Quality Control Monitoring).

The laboratory management has a procedure, Ensuring the Quality of Examination Procedures - Repeat Testing of Samples S-796-n, which prevents the release of patient results in the event of quality control failure. The laboratory procedure Identification and Control of Non-Conformities and Risk Management S-572-n, documents the process for implementing action when the laboratory does not conform to its own quality specifications.

7.3.7.3 External quality assessment (EQA)

The laboratory management have a document, Inter laboratory comparison (EQA) S-531-n, detailing the requirement for the laboratory to participate in suitable external quality assurance panels. The procedure S-5-n Master SOP requests details of EQA or interlaboratory comparison schemes for individual assays.

The procedure Inter laboratory Comparison (EQA) S-531-n, also details the requirement to arrange informal inter laboratory comparisons in the absence of a suitable formal external panel.

The evaluation of laboratory performance in inter-laboratory comparison schemes is recorded on:

- EQA Analysis form (QCMD/NEQAS) S-1433-n
- NEQAS EQA review form S-570-n

in accordance with the procedure Inter laboratory comparison (EQA) procedure S-531-n and individual procedures for analysis of EQA panels from QCMD (S-1158-n), NEQAS (S-1558-n) and INSTAND (S-1534-n). Results are also discussed in General

Laboratory Quality meetings and Section meetings, all of which are minuted. The minutes are available on iPassport, the electronic Quality Management system.

Where EQA results fall outside specified acceptability criteria, appropriate action is taken, as per the procedures Inter laboratory Comparison (EQA) S-531-n and Identification and Control of Non-Conformances and Risk Management S-572-n; this includes an assessment of whether the non-conformance is clinically significant. If determined that the impact is clinically significant, a review of patient results that could have been affected and the need for amendment is considered. Users are advised as appropriate.

7.3.7.4 Comparability of examination results

When different methods or equipment, or both, are used for an examination, staff consider the comparability of results for patient samples, as defined in the validation process, Assay Validation Procedure S-266-n and Assay Validation MASTER S-508-n and referenced in the Master SOP S-5-n.

7.4 Post-examination processes

7.4.1 Reporting of results

7.4.1.1 General

Examination results are reported in accordance with instructions detailed within each assay specific SOP, and as detailed in S-1063-n Results Release. Reports include all available information necessary for the interpretation of the results as detailed in S-2248-n Reporting Results in StarLIMS. All issued reports are retained in LIMS as detailed in S-2248-n and S-42-n StarLIMS usage.

The laboratory has a procedure to notify users when examination results are delayed, based on the impact of the delay on the patient, detailed in S-1063-n

All information associated with issued reports is retained in accordance with management system requirements, S-177-n Control of Records.

7.4.1.2 Result review and release

Responsibilities and procedures for how examination results are reviewed, authorised and released for reporting, including by whom and to whom, are specified in the procedure S-1063-n Results Release.

The laboratory ensures that authorised personnel confirm the validity of results via consideration of any acceptance criteria (IQC) and any clinical information provided and previous diagnostic testing at Micropathology Ltd.

7.4.1.3 Critical result reports

S-1063-n Results Release details the procedure when examination results fall within established critical decision limits: Actions taken are documented including date, time, responsible person, person notified, results conveyed, verification of accuracy of communication, and any difficulties encountered in notification. Records are maintained of any results given over the telephone, in accordance with S-2246-n Telephone message and Additional Test Request, and are logged on the Telephone Message Logging Form S-808-n. These records are attached to the relevant patient entry in StarLIMS. S-1063-n Results Release also details the escalation procedure when an end user cannot be contacted.

7.4.1.4 Special considerations for results

Results are reported via a standard pro-forma report produced automatically on StarLIMS.

When results are transmitted as an interim report, the final report is subsequently forwarded to the user. Records of any results that are provided verbally, including verification of accuracy of communication, are kept as per the procedure S-2246-n Telephone Message and Additional Test Request SOP. All verbal results are followed up by a written report.

7.4.1.5 Automated selection, review, release and reporting of results

The laboratory does not automatically select and report results.

7.4.1.6 Requirements for reports

All reports transmitted from Micropathology Ltd include the examination results, biological reference values / critical decision values, interpretation of results, any other comments, particularly those concerning the points in report attributes.

Patient identification, date of primary collection, date and time of report release and report pagination, identification of the report issuing laboratory, name of the person reviewing and authorising the result, type of primary sample and details of the examinations performed are also included

Examinations undertaken as part of a research or development programme and for which no specific claims on measurement performance are available are clearly marked on reports as not UKAS accredited.

Any interim reports are identified; users are notified that a final report is to follow.

7.4.1.7 Additional information for reports

When applicable, a report may include interpretative comments on test results as detailed in S-13-n Clinical Advice, Authorising & Out of Hours Service.

Reports may be annotated to indicate if the primary sample is unsuitable for examination or the nature of the sample may have compromised the result obtained. Result trends or significant changes over time may be commented upon, as detailed in S-1063-n Results Release.

7.4.1.8 Amendments to reported results

The laboratory management have established a procedure, S-1063-n Results Release, for issuing an amended report. The reason for the amendment is recorded and included in the revised report. When necessary, the user will also be contacted by telephone to alert them of a potentially significant change. New reports are differentiated by date and time sign off.

Amendments to reports are recorded within the database automatically. The original report, and amended reports, remain with the relevant patient entry in StarLIMS and are retrievable.

7.4.2 Post-examination handling of samples

The laboratory management have a documented procedure for the Control of Clinical Material S-178-n,, detailing the identification, suitability of sample, collection, retention, indexing, access, storage, maintenance and safe disposal of clinical samples.

7.5 Nonconforming work

The laboratory management has an established procedure for the identification and control of non-conformities and the implementation of corrective and preventative action, documented in S-572-n Identification and control of Non-Conformances and S-1934-n Non-conformance Reporting and Resolution Instructions. Risk management and Opportunities for Improvement is detailed in S-2722-n.

7.6 Control of data and information management

7.6.1 General

The procedure S-42-n StarLIMS Usage defines how users can access the patient LIMS for data and result entry. S-715-n Use of iPassport provides instruction on the use of the electronic Quality Management System. LIMS, iPassport and paper records are all controlled as per the procedure S-177-n Control of Records (the table in S-2639-n provides a guide to individual and collections of records kept at Micropathology Ltd).

7.6.2 Authorities and responsibilities for information management

The authorities and responsibilities for the management of information systems are defined in S-42-n StarLIMS Usage. Staff are assigned ‘roles’ within StarLIMS; these determine which applications are available to the user and so the level of authority and responsibility the user has. Staff are also assigned roles within the electronic QMS iPassport, roles are sets of permissions that define the authority a user can have, as detailed in S-715-n Use of iPassport.

Roles of authority and responsibility are defined in individual job descriptions; these are based on the templates in section 5.4.1 Structure and Authority.

7.6.3 Information systems management

The systems used for the collection, processing, recording, reporting, storage or retrieval of examination data and information are validated by the supplier and verified for functionality by the laboratory before introduction, as per the procedure S-804-n MASTER – Equipment / method / software upgrade verification. Any changes to the system, including laboratory software configuration or modifications to commercial software, are authorised, documented and validated before implementation, as per the procedures S-1833-n Software Systems Management and Development at Micropathology Ltd and S-1268-n LIMS Retrospective Validation.

The day-to-day functioning of the systems are documented. Documentation is readily available to authorised users on the QMS iPassport - see S-715-n Use of iPassport, S-42-n StarLIMS usage, S-2247-n Booking Samples into StarLIMS and S-2248-n Reporting Results in StarLIMS.

The laboratory has a cybersecurity policy to protect the system from unauthorised access and to safeguard data against tampering or loss, detailed in M-1936-n IT Security Policy.

Systems are maintained in a manner that ensures the integrity of the data and information, this includes the recording of system failures which are raised through the IT support ticketing system, outlined in S-1833-n.

To ensure the environment for compliance to supplier specification, temperature and humidity is monitored following S-36-n (Temperature and humidity data logging).

7.6.4 Downtime plans

The laboratory management have a documented procedure Contingency plan S-259-n, to maintain services in the event of failure or downtime in the information systems which affect the laboratory service. In addition, each department has its own

contingency plan S-2743-n Genetics, S-1635-n Microbiology, S-1662-n Serology, S-1633-n Sequencing and S-1634-n Virology.

7.6.5 Off-site management

S-177-n Control of Records details off-site management of laboratory IT systems. iPassport is hosted by Genial Compliance Systems Ltd, see M-2059-n for hosting service level agreement details.

7.7 Complaints

The laboratory Management have established a procedure for the management of complaints and other feedback / suggestions received from clinicians, laboratory staff, personnel and other parties (S-1078-n). Records of such communications are kept and are acted upon if required.

Section 7 of the Laboratory User Handbook S-748-n provides users with information on submitting feedback or complaints about the service provided by Micropathology Ltd.

7.8 Continuity and emergency preparedness planning

Micropathology Ltd has a Business Contingency plan S-259-n, to ensure, in the event of unforeseen circumstances, the needs and requirements of users are still met. Individual laboratory sections also have contingency plans: Microbiology S-1635-n, Virology S-1634-n, Sequencing S-1633-n, Genetics S-2743-n and Serology S-1662-n.

8 Management system requirements

8.1 General requirements

8.1.1 General

The laboratory management have established and implemented a Quality Management System, the details of which are outlined in this Quality Manual. All documentation required of this quality management system is held within the

electronic QMS iPassport which is hosted by Genial Genetics. Each document may reference other related documents within the document text by referencing each document's iPassport unique identification number. All staff are involved in continually monitoring the effectiveness of the QMS in accordance with the ISO15189:2022 standard.

To ensure compliance with ISO15189:2022 the laboratory shall determine and implement throughout the laboratory, all processes required of the QMS, to include assay responsibilities (S-1699-n and S-1700-n), objectives and policies (S-1929-n and S-1115-n); actions to address risks and opportunities for improvement (S-2722-n), continual improvement (S-187-n and Quality Indicators S-640-n); corrective actions (Identification and Control of Non-Conformities and Non-Compliances, S-572-n); evaluations and internal audits (S-168-n) and Management Reviews (S-1929-n)

The laboratory ensures these processes are documented and are effective through the process of regular auditing (Auditing S-168-n). Non-compliance reporting and monitoring of quality objectives allows continual improvement of these processes.

8.1.2 Fulfilment of management system requirements

The laboratory has appointed a Quality Team who are responsible for the establishment, implementation and maintenance of the quality management system to ensure consistent fulfilment of the requirements of the ISO15189:2022 standard.

8.1.3 Management system awareness

Micropathology Ltd ensures that staff are aware of relevant objectives and policies, and of their contribution to the effectiveness of the management system, including the benefits of improved performance, through the Annual Management Review (S-1929-n) and this Quality Manual.

If there are deviations from management system requirements, non-compliances are raised to prevent the error from reoccurring, as per the procedure, S-572-n Identification and control of Non-conformances and S-1934-n Non-conformance reporting and resolution instructions.

8.2 Management system documentation

8.2.1 General

This Quality Manual describes the Quality Management System (QMS) of Micropathology Limited for the benefit of the management and staff of the company and provides information for inspection or accreditation bodies. It contains references to the ISO15189:2022 standard and to procedures written in fulfilment of these standards.

This Quality manual contains the Quality Policy (S-1115-n).

The sections of this Quality Manual are arranged to equate with the ISO15189:2022 standard and provide information on the scope of the Quality Management System. The title of each standard is accompanied by a brief description of how Micropathology Limited seeks to comply.

New editions are circulated amongst the staff to keep them informed and up-to-date.

8.2.2 Competence and quality

The Training and Competency Assessment procedure M-54-n details the laboratory's policy commitment to the competence, quality and consistent operation of the laboratory.

8.2.3 Evidence of commitment

The Laboratory management is committed to the development and implementation of the management system and to the continual improvement of its effectiveness; this intent is defined in the company's Quality Policy S-1115-n.

Quality objectives are set at the Annual Management Review S-1929-n and are reviewed at monthly General Laboratory Quality meetings (Quality Laboratory Meeting Agenda S-2482-n); where quality indicators (as defined in the Quality Indicators SOP S-640-n), are also discussed; these are also included in the agenda of section meetings (S-2394-n).

The Quality Team are responsible for implementing and maintaining the QMS under the direction of the Medical Director (M-479-n). All staff are expected to continually improve the effectiveness of the Quality Management System under the direction of the Quality Team.

8.2.4 Documentation

Quality Management System documentation includes:

- A Quality Policy (page 7) S-1115-n
- Quality objectives, which are updated in on annual basis during the annual management review and are detailed in the Annual Management review report (S-1929-n - abridged version S-2487-n) and the Quality indicators SOP (S-640-n).
- The production of this Quality Manual (S-2761-n), and included within it references to written procedures and records as required by this International Standard.
- Documents and records determined by Micropathology Ltd staff as essential in ensuring the effective planning, operation and control of the processes, are held on iPassport, the electronic QMS. Related documents are referenced within each document using the specific documents unique iPassport reference number.
- Copies of all external regulations and standards which staff should be considerate of in their work, are held on iPassport, the electronic QMS.

8.2.5 Personnel access

All personnel involved in laboratory activities have access to the parts of the management system documentation and related information that are applicable to their responsibilities. The procedure S-715-n Use of iPassport, provides instruction on the use of the electronic QMS. The procedure S-42-n StarLIMS Usage, defines how users can access the patient LIMS for data and result entry. Log on to specific equipment is detailed in the relevant SOP. The Control of Records SOP S-177-n references the table located in S-2639-n which provides a guide to documentation kept at Micropathology Ltd.

8.3 Control of management system documents

The laboratory management have established a procedure, Document control S-1-n, which controls all internally and externally generated documents relevant to the establishment, maintenance and improvement of the Quality Management System and fulfils the requirements of ISO15189:2022.

8.4 Control of records

The laboratory management have established a procedure, S-177-n for the Control of Records to ensure the laboratory establishes and retains legible records. Document amendments are in accordance with the procedure Document Control S-1-n.

The company is registered as a data controller with the Information Commissioner's Office. Prof. Colin Fink and Dr Mark Atkins act in the manner of Caldicott guardians.

8.5 Actions to address risks and opportunities for improvement

The laboratory has a procedure to identify risks and opportunities for improvement associated with the laboratory activities, S-2722-n Risk Management and Opportunities for Improvement. As per the procedure risks raised are documented on the Risk Register spreadsheet, this includes information on actions taken and may include information of results of actions taken and possible opportunities for improvements.

8.6 Improvement

8.6.1 Continual improvement

The laboratory management has established procedures to continually improve the effectiveness of the management system, these include

- Procedures for evaluation and improvement processes S-187-n
- Quality Indicators S-640-n - for continual improvement.

- Annual Management Review and associated reports (S-1929-n and S-2487-n) – annual assessment of the laboratories performance where objectives are also set.

- Quality Policy S-1115-n

Objectives are communicated to staff through the Annual Management Review report S-1929-n and are continuously reviewed at Laboratory and Quality meetings.

8.6.2 Laboratory patients, user, and personnel feedback

The laboratory has established a procedure for the management of feedback from its users and personnel in S-1078-n Management of Complaints and User / Personnel Feedback and Suggestions. Section 7 of the Laboratory User Handbook S-748-n provides users with information on submitting feedback about the service provided by Micropathology Ltd. The company also employs two company representatives, who visit and telephone clients regularly and provide feedback, via written reports, on their satisfaction with the service, any suggestions for improvement, any complaints and any requests they might have.

Staff suggestions are sought at Section meetings and at Quality Laboratory meetings. Feedback and any action taken is recorded and is analysed in Quality Laboratory meetings (defined in S-640-n Quality Indicators and included in S-2482-n General Laboratory Quality Meeting Agenda).

8.7 Nonconformities and corrective actions

The laboratory management has established procedure for the identification and control of non-conformities and the implementation of corrective and preventative action (Identification and control of non-conformances S-572-n) with a particular focus on patient safety. Risk management and opportunities for improvement is detailed in S-2722-n. Records of non-conformities, subsequent actions and evaluation of the effectiveness of actions are maintained on the company QMS iPassport.

8.8 Evaluations

8.8.1 General

The laboratory management have established procedures, including Quality Indicators S-640-n, Procedures for Evaluation and Improvement Processes S-187-n, Identification and Control of Non-Conformances S-572-n, Risk management and Opportunities for Improvement S-2722-n, Inter laboratory Comparisons (EQA) S-531-n and Auditing S-168-n, to demonstrate that management, support, and the pre-examination, examination and post-examination processes meet the needs and requirements of patients and laboratory users and to ensure conformity to the ISO15189:2022 standard.

8.8.2 Quality indicators

The laboratory management have a document Quality Indicators S-640-n, which details the process of monitoring quality indicators. The indicators are periodically reviewed at General Laboratory Quality meetings, to ensure continued appropriateness.

8.8.3 Internal audits

The laboratory has established an internal audit programme, as detailed in the procedure S-168-n Auditing, to demonstrate that the management system:

a) Conforms to the laboratory's own requirements for its management system, including the laboratory activities.
b) Conforms to the requirements of the ISO15189:2022 standard.
c) Is effectively implemented and maintained.

Audits are conducted at planned intervals, as per the Audit Calendar S-831-n and are performed as per the Witness Examination Audit Form ISO15189:2022 S-2603-n

8.9 Management reviews

The laboratory management review the QMS at yearly intervals (8.9.1). The following items of information are considered (8.9.2);

a) Status of actions from previous management reviews, internal and external changes to the management system, changes in the volume and type of laboratory activities and adequacy of resources;

b) Fulfilment of objectives and suitability of policies and procedures;

c) outcomes of recent evaluations, process monitoring using quality indicators, internal audits, analysis of non-conformities, corrective actions, assessments by external bodies;

d) Patient, user and personnel feedback and complaints;

e) Quality assurance of result validity;

f) Effectiveness of any implemented improvements and actions taken to address risks and opportunities for improvement;

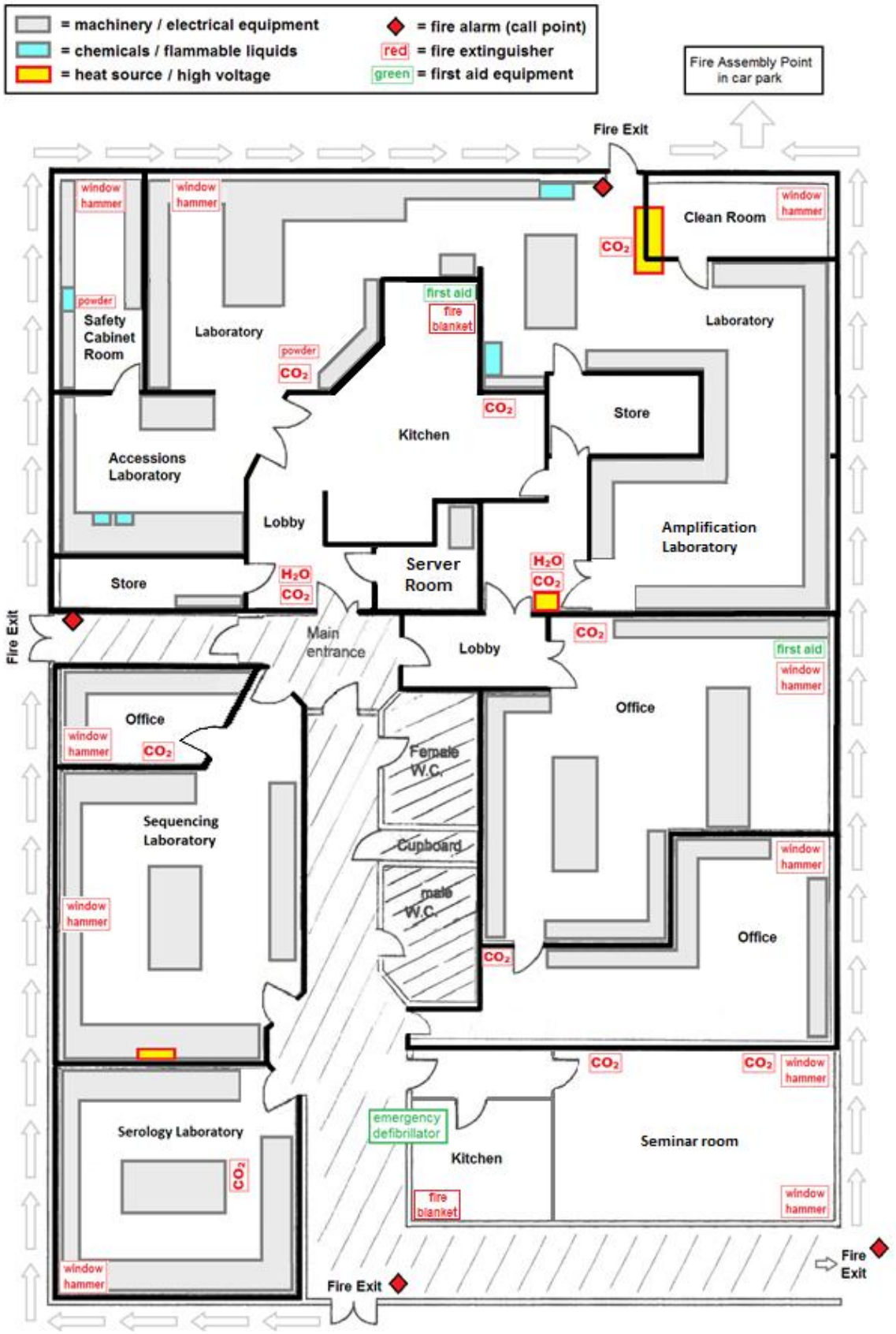
g) Performance of external providers;

h) Results of participation in inter-laboratory comparison programmes;

I) other relevant factors, such as monitoring activities and training.

The management review is documented in S-1929-n (abridged version S-2487-n), and is communicated to staff (8.9.3). Key objectives for the subsequent year are defined and plans formulated for their implementation.

Appendix 1 – Micropathology Ltd. Floorplan



Note: Shaded areas are not part of Micropathology Ltd.