

MEMORANDUM OF UNDERSTANDING
BETWEEN
SOUTH DAKOTA SCIENCE AND TECHNOLOGY AUTHORITY
AND
FERMI RESEARCH ALLIANCE, LLC

This Memorandum of Understanding (“MOU”) is entered into by and between the South Dakota Science and Technology Authority (“SDSTA”), as operator of the Sanford Underground Research Facility (“SURF”) under Cooperative Agreement (“CA”) number _____ and Fermi Research Alliance, LLC (“FRA”), as operator of the Fermi National Accelerator Laboratory (“Fermilab”) (referred to hereinafter as the “Parties”) under U.S. Department of Energy (“DOE”) Contract Number DE-AC02-07CH11359.

A. Purpose and Vision

The partnership between SDSTA and FRA is vital to the success of both organizations. The successful execution of the Long Baseline Neutrino Facility and the Deep Underground Neutrino Experiment (LBNF/DUNE) lays the foundation for SURF as an internationally renowned underground laboratory hosting a world-leading multidisciplinary science program for decades into the future.

This MOU establishes a process to ensure strong communication, coordination, and resolution of issues between SDSTA and FRA, which is essential to a robust partnership and the successful execution of LBNF/DUNE and existing and future DOE experiments at SURF.

This document is a non-binding agreement between SDSTA and FRA. No language in this MOU shall be construed to modify any language in existing or future agreements, including subcontracts, between SDSTA and FRA.

B. Scope and Applicability

This MOU relates to all LBNF/DUNE-related activities in Lead, SD, and recognizes the mutual interests of the Parties as well as the need for cooperation while pursuing the goals of scientific research during the duration of the LBNF/DUNE Project. Coordination among the Parties regarding the LBNF/DUNE Project is necessary to ensure project success and efficient and safe operations at SURF while meeting LBNF/DUNE requirements.

C. Standard Forms of Agreements

The Parties have entered into or expect to enter into contracts, and SDSTA has entered into a CA with DOE that, collectively with this MOU, make up the cooperative model contributing to the successful delivery of the LBNF/DUNE Project and reflecting the following relationships:

- Traditional Prime/Subcontractor (For certain LBNF/DUNE work)
- Landlord/Tenant
- Easement Owner/Assignee

A summary of the existing contracts and their purpose is set out below. A complete list is attached as Exhibit A. Future agreements between the Parties may be entered into and appended herein without executing any modification or revision to this MOU, unless expressly requested by one of the Parties.

D. Contracts

<u>Existing Contracts</u>	<u>Purpose</u>	<u>Parties</u>
Ross Shaft Refurb	Refurbishment construction	FRA – SDSTA
Ross Shaft Support	LBNF/DUNE Project Support Service for exclusive use of Ross Shaft during Project construction (with limited exceptions)	FRA – SDSTA
LBNF Staff Services	Engineering support to the LBNF Project	FRA – SDSTA
Reliability Projects Support	Reliability projects support	FRA – SDSTA
SURF Ops Cooperative Agreement (CA)	SURF Operations	DOE – SDSTA
DOE Lease	Land lease	DOE – SDSTA
DOE Easement	Temporary construction easement	DOE – SDSTA
SDSTA Easements	Third party easements	SDSTA – various parties
Facility and Land Use Agreements	Third party easement use	SDSTA – Kiewit Alberici Joint Venture (KAJV)
Homestake PDA	Transfer of property to SDSTA	Homestake – SDSTA

Additionally, the Parties recognize in the course of the FRA-SDSTA alliance to execute LBNF/DUNE, there are and will be a number of activities that are implied but not expressly stated in existing contracts, including that:

- SDSTA is providing access to SURF to facilitate the construction of LBNF/DUNE,

- SDSTA is facilitating access (for FRA and its concomitant DOE oversight) to certain third-party property,
- Participation of both parties in various DOE and other reviews, and
- Reasonable cooperation in the completion of a party's assessments, evaluations, and/or certain audit activities.

The Parties acknowledge that in order for the LBNF/DUNE Project to be successful, each must participate in good faith in the types of activities identified above. To the extent that any of the activities create a material burden on resources, the Parties agree to pursue formalizing the activity as a requirement in an existing or future binding agreement.

Without committing to enter into any future agreements and understanding that any such future agreement is contingent upon available funds and other requirements, the following future agreements might be required:

- Long Term - Decommissioning Plan (consistent with the latest version of said Plan).

E. Roles and Responsibilities

DOE supports both FRA and SDSTA in carrying out their distinct but related scopes of work. FRA is supported by DOE for many activities; the relevant one for this MOU is the construction of LBNF/DUNE. SDSTA is supported by DOE to operate the Sanford Underground Research Facility (SURF) in Lead, South Dakota. SURF has been selected to be the far site of LBNF/DUNE, and this creates a relationship between FRA and SDSTA.

DOE has a relationship with FRA through a Management and Operations contract to run Fermi National Accelerator Laboratory (Fermilab). DOE has a relationship with SDSTA via a Cooperative Agreement for financial assistance for SURF operations. The Cooperative Agreement provides that that DOE has a right to substantial involvement in the operation of SURF (within the scope of the Cooperative Agreement).

Given these relationships, it is appropriate for DOE to participate in the discussion of how FRA and SDSTA will cooperate on making LBNF/DUNE successful and to mediate any significant issues that may arise. However, the Parties recognize DOE expects that FRA and SDSTA will develop an effective partnering relationship and will use this MOU to document the processes they will use to work together on the common goal of the successful and safe construction and operation of LBNF/DUNE at SURF. The Parties also recognize DOE further expects that most issues can be resolved without direct mediation by DOE.

FRA Roles and Responsibilities

- FRA is responsible for executing the scope of work defined in the Management and Operations contract with the DOE for Fermilab.
- FRA is responsible for the successful execution the LBNF/DUNE Project.
- FRA, through LBNF/DUNE is the largest tenant of SURF.

- FRA is responsible to ensure its employees, users, and contractors follow the applicable policies to ensure compliance with all applicable DOE regulations, including but not necessarily limited to those made applicable by the Management and Operating Agreement with DOE.
- FRA is responsible to ensure its employees, users, and contractors follow SDSTA policies when they apply.
- FRA currently has and will continue to have separate contracts where SDSTA is FRA's subcontractor. Those contracts define the relationship between the parties. Nothing in this MOU in any way modifies or supersedes any of the language in those contracts.

SDSTA Roles and Responsibilities

- SDSTA is the owner and operator of SURF.
- SDSTA is responsible for operating SURF in accordance with the Property Donation Agreement between the Homestake Mining Company and SDSTA and the SDSTA Risk Transfer Protocols.
- SDSTA is responsible for operating and maintaining SURF in accordance with the Cooperative Agreement with DOE.
- SDSTA is responsible to ensure its employees, users, and contractors follow the applicable policies to ensure compliance with all DOE regulations.
- SDSTA currently has and will continue to have separate contracts where SDSTA is FRA's subcontractor in support of LBNF/DUNE. Those contracts define the relationship between the parties. Nothing in this MOU in any way modifies or supersedes any of the language in those contracts.

Key Stakeholder Roles and Responsibilities

FRA Board

- On behalf of FRA members, Universities Research Association (URA) and The University of Chicago provide oversight and guidance to Fermilab leadership.
- Advise and support for Fermilab mission.

FRA Deputy Director for LBNF

- Ensure DOE and Fermilab mission success at SURF.
- Direct and advocate for LBNF/DUNE Project.
- Communicate with and be responsive to FRA Board, Fermilab Director and DOE.

FRA South Dakota Services Division Head

- Serve as a single point of contact for any matters concerning FRA related to this MOU.
- Coordinate FRA and DOE-sponsored LBNF activities at SURF.
- Arrange and support DOE and FRA-related visits including DUNE collaborators.

FRA LBNF/DUNE ESH Manager

- Coordinate with DOE and SDSTA to establish ESH requirements and to the extent possible maintain common standards for worker safety at SURF.
- Oversee and assure LBNF/DUNE ESH performance to the Deputy Director for LBNF.
- Foster a strong culture of safety and continuous improvement.
- Liaise with DOE and FRA ESH assurance programs.
- Report all incidents to SDSTA in accordance with this MOU.

SDSTA Board of Directors

- Oversee activities of SDSTA ED.
- Report to South Dakota Governor's Office and Legislature.
- Advise and support SDSTA mission.

SDSTA Executive Director (ED) and SURF Laboratory Director

- Ensure SDSTA performance and alignment in support of this MOU and all other agreements between/among SDSTA, FRA, and/or DOE.
- Resolve conflicting priorities at SURF to ensure the execution of LBNF/DUNE, while recognizing the needs of other experiments hosted at SURF.
- Communicate with and be responsive to local governments, state officials, SDSTA Board of Directors, and DOE.

SDSTA ESH Director

- Coordinates with DOE and FRA to establish ESH requirements and to the extent possible maintain common standards for worker safety at SURF.
- Oversee and assure ESH performance to SDSTA ED.
- Foster a strong culture of safety and continuous improvement.
- Develop and implement the ESH Program in support of SDSTA line managers.
- Report incidents in accordance with contractual requirements and this MOU.

F. Joint Coordination Team

In order to ensure the necessary robust communication and coordination, this MOU establishes the Joint Coordination Team (JCT). The JCT shall ensure the efforts of SDSTA and FRA remain coordinated by establishing a formal communication channel and timely resolution of issues.

FRA members of the JCT:

- FRA LBNF Project Director
- FRA South Dakota Services Division Head
- FRA LBNF/DUNE ESH Manager

SDSTA members of the JCT:

- SDSTA Executive Director
- SDSTA Science Director
- SDSTA ESH Director

Each member of the JCT will endeavor to attend each meeting but may from time-to-time designate another person to appear in their stead. Either party may from time-to-time bring in subject matter experts as necessary to facilitate discussion and resolution of the issue at hand.

Meetings

The primary way that the JCT will fulfill its charge is through periodic meetings. An agenda will be established in advance of each meeting, and minutes will be kept and distributed to members. Formal action items will be documented and tracked through the meeting minutes.

The JCT shall meet via teleconference every two weeks. The goal of these meetings is to discuss and resolve current and emerging issues. The standard agenda for the bi-weekly meetings will include the following:

- Emergent issues,
- ESH issues,
- Access issues, including shaft utilization (personnel and materials),
- 1-month look-ahead schedule of activities from both SDSTA and FRA perspective,
- Proposed changes to infrastructure,
- Other changes by either party that may affect any part or use of SURF,
- Any outstanding or unresolved issues, and
- Review of open action items.

The JCT shall meet every two months in person, preferably at SURF. The goal of these meetings will be to discuss longer-term planning and coordination. The standard agenda will include the following issues:

- Proposed SDSTA ESH policies that may affect LBNF/DUNE,
- Proposed FRA ESH policies that may affect leased space at SURF,
- Proposed operational changes that may affect the other entity,
- Access issues, including planned shaft utilization (personnel and materials) expected in the upcoming quarter ,
- A report on current and future or potential experiments from SDSTA,
- LBNF/DUNE schedule status,
- Status on infrastructure projects managed by SDSTA and planned schedules,
- VIP visits and major events,
- Risk management and insurance,
- Incidents, and
- Communications among the Fermilab Director, Chairperson of the SDSTA Board, and DOE Associate Director of Science for High Energy Physics, including arranging for and providing a draft agenda for periodic meetings as described below.

For proposed policies and changes that affect the other organization, both FRA and SDSTA members must agree to the change in order for it to be implemented.

Once per year, the JCT shall meet in person and include in its agenda the following issues:

- Review the MOU and determine if any changes are necessary.
- Update the General Services Agreement between SDSTA and FRA based on upcoming or planned activities.
- Review JCT membership and agendas.

Communication and Coordination

The JCT is responsible for ensuring SDSTA and FRA remain coordinated in the execution of LBNF/DUNE. The scheduled JCT meetings are intended by SDSTA and FRA to ensure this coordination. JCT members are responsible for communicating to their respective organizations the issues discussed and decisions of the JCT. However, in order to achieve broader organizational alignment, the JCT will facilitate a regular meeting between the Fermilab Director, Chairperson of the SDSTA Board, and Associate Director of Science for High Energy Physics. The JCT will provide an agenda of items for the meeting to include the following:

- Issues that have arisen since the last meeting,
- Anticipated issues,
- LBNF/DUNE schedule status, and
- Other outstanding issues.

Issue Resolution

If an issue raised at a JCT meeting requires coordinated action from both FRA and SDSTA and cannot be resolved in that meeting, a separate JCT meeting will be called and dedicated to addressing that issue. The members of the JCT will use best efforts to arrive at agreed upon accommodations, which will be considered at the dedicated meeting. If after the dedicated meeting, a solution cannot be agreed to by both parties, the parties will identify the issues at impasse.

When an issue is at impasse, the Executive Director of SDSTA and the LBNF Project Director will draft a joint statement explaining the issue, FRA's and SDSTA's respective positions, and agreed upon accommodations considered by the JCT. This joint statement will be sent by email to the HEP Director of Scientific Facilities Division. This email will also be sent to the Fermilab Director and the Chairperson of SDSTA. After guidance or resolution of the issues at impasse is received from the HEP Director of Scientific Facilities Division, the JCT members will communicate the outcome to their respective organizations and seek any additional approvals necessary to implement HEP's guidance.

G. Advisory Resources

SDSTA employs many subject matter experts whose expertise will be required to plan and execute LBNF/DUNE. Within available resources, SDSTA will provide experts to serve on committees or workgroups that FRA convenes to plan execution of the LBNF/DUNE project.

H. Insurance and Risk Management

SDSTA will work with DOE in order to explore a holistic solution to insurable risk that addresses required liability insurance to perform work at SURF. Work at SURF requires certain insurance liability thresholds that stem from the Property Donation Agreement between SDSTA and Barrick that accompanied the original transfer of the SURF site. The JCT shall periodically review the progress of this charge.

The parties acknowledge that risk management is a key component of the successful delivery of the LBNF/DUNE Project, and commit to working together, including with the various third-party stakeholders, to facilitate risk analysis and management. Without limiting the generality of the foregoing, the parties recognize that the Property Donation Agreement among SDSTA, Homestake Mining Company of California and others (the “PDA”) imposes certain insurance and other risk management requirements as a condition to SDSTA’s ongoing occupancy and operation of SURF. The Parties will work diligently to ensure compliance with all insurance and other risk management requirements of the PDA and DOE, as well as the applicable corporate and/or site-specific requirements of SDSTA and FRA, provided those requirements are in writing.

I. Culture

DOE, FRA and SDSTA recognize the importance of diversity, equity and inclusion at SURF and will strive for a workforce that is reflective of the cultures that inhabit the Black Hills region. The Parties recognize the Black Hills are sacred ground to Native Americans of the region and will treat the land and the people with dignity and respect.

J. General Communications

The Parties will collaborate on communications and public affairs activities that relate to LBNF/DUNE. SDSTA recognizes that FRA must follow certain requirements and protocols – including Prime Contract Clause I.72, DEAR 952.204-75 and related procedures and processes from the Department of Energy – that also flow to SDSTA as subcontractor for LBNF-specific activities. FRA recognizes that SDSTA must comply with certain statutory requirements, such as SDCL 1-16H-38 (informational budget and other reporting to the Governor's Office of Economic Development), SDCL Ch. 1-25 (open meetings), and SDCL Ch. 1-27 (open records), as well as reporting to the appointing authority (Office of the Governor) and keeping the Legislature, citizens of South Dakota, and other stakeholders informed concerning its activities. The Parties agree to work in good faith to accommodate their respective obligations, and to establish a separate communications and public affairs protocol to implement these obligations and other processes.

K. Ethics and Compliance — Conflicts of Interest

The Parties maintain and execute robust ethics and compliance programs and acknowledge the criticality of such programs to the success of LBNF/DUNE. The Parties further acknowledge that existing and anticipated agreements that provide funding through the Prime Contract and CA

require compliance with ethics and compliance rules applicable to federal government contractors and grantees.

The Parties acknowledge the potential for conflicts of interest related to participation in delivery of the LBNF/DUNE Project or in supporting operational activities at SURF and commit to work diligently to identify apparent or actual conflicts, and develop mitigation plans as appropriate and each in accordance with their respective policies. The Parties' ethics and compliance programs are designed, in part, to facilitate the management of conflicts as they arise.

L. Environment, Safety, and Health Integration

LBNF/DUNE subcontract activities will follow 10 CFR 851, except for the reliability projects located in non-leased space, and Fermilab Environmental Safety and Health Manual (FESHM) and South Dakota Science and Technology Authority (SDSTA) Surface and Underground Access requirements. Other regulatory requirements may be used to support specific work activities, e.g. explosives management, ventilation, etc.

SDSTA will provide for regularly scheduled workshops to facilitate open, and transparent communications with FRA Environmental Health and Safety (ESH) personnel. Fermi Research Alliance (FRA) and SDSTA Work Planning and Control Documents will be accessible and notifications will be made if planned activities could affect operations or safety systems.

FRA will provide daily written notification for active work areas defining the location of personnel.

FRA and SDSTA will follow the interorganizational Crisis Communication Plan with defined roles and responsibilities.

SDSTA Emergency Response Team (ERT) input on activities is required to ensure appropriate staffing and rescue equipment. FRA shall provide SDSTA with early notification of the construction means and methods for non-standard access and egress scenarios.

SDSTA is responsible for response, initial treatment and extrication in all emergency situations and will deliver the casualty to a paramedic, ambulance or the nearest clinic as necessary. All Environmental, Safety, Security or Health unintended outcomes at SURF will be communicated between onsite FRA and SDSTA ESH personnel.

SDSTA is responsible for the SURF ESH Manual contents, the review process and the development and upgrade of ESH requirements. FRA will be included in the review/comment process.

Environmental Management requirements shall meet or exceed existing procedures set forth by SURF.

For activities that will impact SDSTA operations or facilities, FRA will include SDSTA in the following:

- project scoping,
- design review,
- authorization for use and possession, and
- operational readiness clearance.

The manufacturer specifications, “as-built” drawings and commissioning documents shall be provided to SDSTA for equipment and facilities installed at SURF.

FRA shall provide SDSTA a detailed explanation of any intended alternative method, equivalency or variance to applicable SDSTA standard(s) on SURF property. These changes shall be submitted to SDSTA for review and final written approval. In the event an outside resource is deemed necessary by SURF to provide subject matter expert guidance, cost shall be absorbed by the requester of the change.

Accessibility to Refuge Chambers and escapeways:

- The 4850 Refuge Chamber shall be readily available to all personnel. Maintenance shall be scheduled and performed by SDSTA and its service providers.
- Access to the Refuge Chamber, primary and secondary egress routes and associated travel ways shall be maintained and made readily available for emergency purposes. It is understood that travel ways include leased and unleased space and it is the responsibility of individual stakeholders and contract owners to abide by these requirements.
- If an escape route is encumbered for any reason, those responsible for that impediment shall ensure that travel ways are made safe and access opened to all personnel, without undue delay.
- Shaft activities shall be planned and scheduled to ensure that at least one shaft and the Refuge Chamber is available for emergency use.
- All activities which may impair the use or impede access to the Refuge Chamber shall be risk assessed by the responsible party and scheduled with SDSTA before engaging in impairment activity.

M. General Services Agreement

Contemporaneously herewith, the parties have entered into a non-binding General Services Agreement (“GSA”) establishing their expectations concerning services to be provided by each Party in relation to LBNF/DUNE. A copy of the GSA for the fiscal year beginning October 1, 2019, is attached hereto as Exhibit B. Prior to the beginning of each fiscal year during the term of this MOU, the Parties will meet and agree upon updated terms for the GSA. The updated GSA will then be attached to this MOU as an updated Exhibit B.

N. Decommissioning

The parties recognize the need for the prompt adoption of a LBNF/DUNE decommissioning plan, keeping in mind the requirement to avoid unfunded obligations. Any such plan must take into account the need to remove or abandon in place (as appropriate and safe) experiment infrastructure, safely secure the relevant portions of SURF, and address any ongoing security, monitoring or other requirements. The Parties decommissioning plan will be consistent with the latest version of the *LBNF/DUNE Preliminary Decommissioning Plan*.

O. Duration

The initial term of this MOU shall *be five years*, with the option to renew upon mutual written agreement of the Parties for additional terms of one year per renewal.

Upon expiration of the term of this MOU and any subsequent renewal term, the conclusion of civil construction of LBNF/DUNE, the cessation or material reduction of funding for LBNF/DUNE, or other substantial change in circumstances, whichever occurs first, the Parties will as appropriate given the circumstances in good faith renegotiate the terms of this MOU.

During the term of this MOU, including any renewal terms, the Parties will at least annually review and update the terms hereof, including any necessary and appropriate updates to Addenda or Exhibits.

Anything in the foregoing notwithstanding, this MOU shall terminate upon sixty (60) days written notice given by either Party to the other of any of the following events:

- FRA is no longer the Maintenance and Operation prime contractor for Fermilab National Accelerator Laboratory;
- SDSTA no longer has ownership or control of SURF;
- Permanent cessation of funding for LBNF/DUNE; or
- Any other change in circumstances so substantial as to affect the underlying nature and purpose of this MOU.

P. Other

This MOU supersedes the Memorandum of Understanding previously executed by the Parties on June 28, 2018.

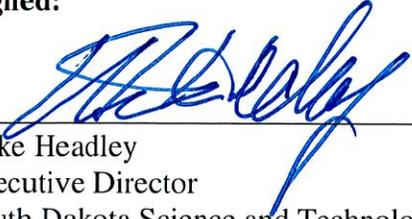
This MOU does not create any legally binding obligations between the Parties.

The conduct of cooperative activities contemplated by this MOU is subject to the availability of funding, personnel, and other resources.

The Parties are each responsible for their respective costs incurred in participating in cooperative activities under this MOU unless otherwise stated in this document or the General Services Agreement.

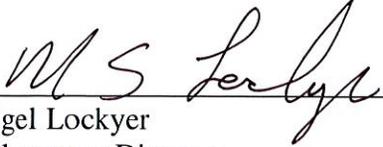
Any activities agreed to under this MOU, activities agreed to in addenda under this MOU, or agreements developed as a result of this MOU will be in accordance with applicable laws, regulations, and agreements to which each party is subject, as well as with the Property Donation Agreement (PDA) between and among Homestake Mining Company of California, the State of South Dakota, and SDSTA.

Signed:



Mike Headley
Executive Director
South Dakota Science and Technology Authority

9-25-19
Date



Nigel Lockyer
Laboratory Director
Fermi Research Alliance, LLC

9/20/2019
Date