



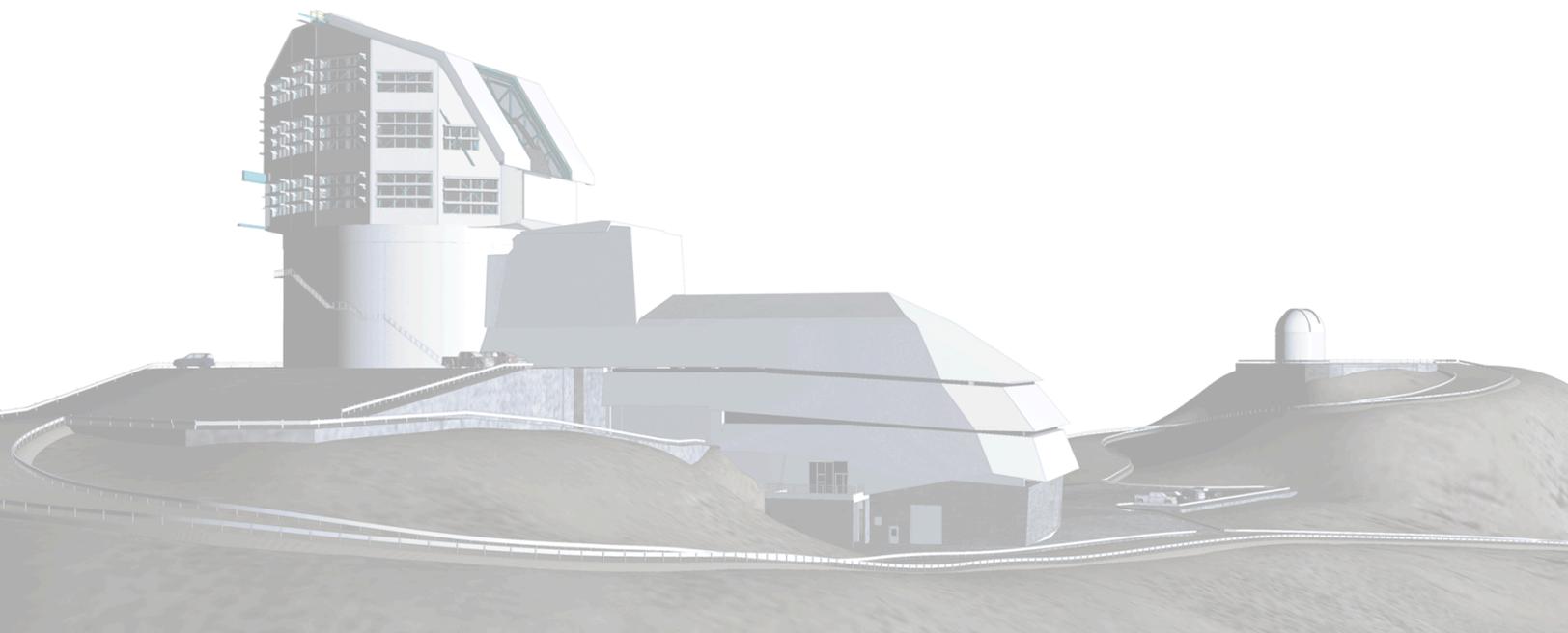
Environmental, Health and Safety Plan

Chuck Gessner

LPM-114a

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Change Record

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Table of Contents

Change Record	i
Summary	ix
Acronyms and Definitions of Terms	ix
Reference Documents	xiii
Submittal and Review	xiv
1 Environmental, Health and Safety Plan	1
1.1 Applicable Jurisdictions and Code of Compliance	1
1.2 Rubin Project Safety and Health Statement	1
1.3 Worker Responsibilities	2
1.4 Rubin Site Manager	3
1.5 Rubin Staff Safety and Health Responsibilities	4
2 General Locations, Altitude and Climatic Information	4
2.1 Summit Site Location	4
2.2 Altitude	5
2.3 Climate	5
2.4 Base Facility–Recinto	6
2.4.1 Recinto Location	6
2.4.2 Recinto Climate	7
3 Medical Facilities and On-Site First Response Capabilities	7

This document is under change control. Its contents may not be changed, altered or their provisions waived without approval via the Rubin Observatory change control process.

3.1	Medical Facilities at the Summit Site	7
3.2	Medical Procedures at the Base Facility–Recinto	8
3.3	Communication and Language	9
4	Security	9
4.1	Access to the Sites and Adjacent Areas	9
4.2	Rubin Construction Site Security and Safety	10
4.3	Motor Vehicle Access	10
4.4	Trespassing	10
4.5	Advertising and Publications	11
5	Safety and Health Administration	11
5.1	Competent Persons	11
5.2	Corrective Action	12
5.3	Imminent Danger	12
5.4	Stop Work Authority	13
5.4.1	How to Stop Work	13
5.4.2	Stop Work Authority Conflict Resolution	14
5.4.3	Stop Work Authority Reporting	14
5.4.4	Stop Work Authority Follow-up	15
5.5	Alcohol and Substance Abuse	15
5.6	Medical Evaluations	15
5.7	Safety and Health Orientation	15

5.7.1	Fitness for Duty	16
5.8	Supervisor’s Safety Meetings	16
5.9	Obligation to Inform, (Obligación De Informar) (ODI)	17
5.9.1	Minimum Requirements of an ODI	18
5.9.2	Worker Training	19
5.10	Daily Activity Briefings including EHS Topics	19
5.10.1	Plan of the Day Meeting	20
5.10.2	Weekly “Tool Box” Safety Meetings	21
5.10.3	Monthly EHS Meetings	21
5.10.4	Pre-Job/Task Safety Orientation and ODI	22
6	Safety Inspections	22
6.1	Daily Inspections	22
6.2	Weekly Inspection Reports	23
6.3	Gang Box Inspections	23
6.4	AURA, Rubin PO, or Government Mandated Inspections	23
7	Accident, Incident, and Unsafe Condition Reporting	24
7.1	Incident and Accident Record Keeping	25
7.2	Unsafe Condition Reporting	25
8	Emergency Preparedness and Evacuation	26
9	Site Specific Requirements	26

9.1	Altitude and Climate at the Summit	27
9.2	Blood-borne Pathogens	27
9.3	Compressed Gas Cylinders	27
9.3.1	Compressed Gas Cylinder Storage	28
9.4	Confined Space Entry	28
9.4.1	Procedure Details	29
9.5	Cranes	31
9.6	Electrical Work	31
9.6.1	Flexible Cords and Cables	32
9.6.2	Electrical Equipment Safety	32
9.6.3	Two Worker Rule	32
9.6.4	Energy Isolation - Equipment Lockout and Tagout (LOTO)	32
9.7	Excavations and Trenches	36
9.8	Exits and Exits Access	36
9.9	Fall Protection–Working at Height	36
9.10	Firearms	37
9.11	Fire Prevention and Protection	37
9.12	Flammable and Combustible Liquids Storage	38
9.13	Floor and Roof Openings	38
9.14	Hazardous Materials	39
9.15	Hearing Conservation	39

9.16	Hot Work - Welding, Cutting, Grinding	39
9.17	Housekeeping	40
9.18	Hoisting and Rigging	41
9.18.1	Operator Training and Certification	42
9.18.2	Hoisting Planning	42
9.18.3	Pre-Lift Meeting	44
9.18.4	Communication	44
9.18.5	Area Access Control	44
9.18.6	Rated Load Capacity	44
9.18.7	Electrical Distribution Lines	45
9.18.8	Environmental Factors	45
9.18.9	Daily Pre-Operational Inspections	46
9.18.10	Idle Equipment	46
9.18.11	Rated Load Test	47
9.18.12	Storage and Maintenance	47
9.18.13	Rigging Safe Work Practices	47
9.18.14	Rigging Hardware Inspections	48
9.18.15	Damaged or Counterfeit Rigging and Hoisting Components	48
9.18.16	Workers Hoisting	48
9.19	Occupational Health	49
9.20	Painting	49

9.21	Personal Protective Equipment	49
9.21.1	Eye and Face Protection	50
9.21.2	Head Protection	50
9.21.3	Foot Protection	50
9.21.4	Hearing Protection	50
9.21.5	Respiratory Protection	51
9.21.6	Gloves and Hand Protection	51
9.21.7	Clothing	51
9.22	Portable Electric Heaters	51
9.23	Portable Electrical/Power Tools	52
9.24	Portable Ladders	53
9.25	Powder Actuated Tools	53
9.26	Powered Industrial Vehicles (Cranes, Forklifts, and other Mobile Equipment)	54
9.27	Radiation	54
9.28	Sanitation – Water	55
9.29	Scaffolding	55
9.30	Steel Erection	55
9.31	Sun Radiation	56
9.32	Silica Exposure	56
9.33	Vehicle Safety	56
9.33.1	Licensing of Vehicle Drivers	57

This document is under change control. Its contents may not be changed, altered or their provisions waived without approval via the Rubin Observatory change control process.

9.34	Waste Management	57
10	Contact Information	57
11	EHS Administrative Requirements for Non-AURA Organizations	58
11.1	Requirements Specific to Chilean Laws and Standards	58
11.2	General Requirements	59
11.3	Safety and Health Management Plans	60
11.4	Review of Safety and Health Management Plan	61
11.5	Specific Requirements to be Included in the Safety and Health Management Plan	61
11.5.1	Project Description	61
11.5.2	Emergency Contacts and Worker Lists	62
11.5.3	Safety and Health Policy	62
11.5.4	Organization	62
11.5.5	Safety and Health Representative(s)	63
11.5.6	Hazard Communication	64
11.5.7	Stop Work Authority	64
11.5.8	Alcohol and Substance Abuse Plan	64
11.5.9	Safety and Health Representative Status	65
11.5.10	Non-Compliance	66
11.5.11	Conflicts and Clarification with Regulations, Contract, or Agreement	66
12	Attachment	67

12.1 List of Medical Centers

67

Environmental, Health and Safety Plan

Summary

The purpose of this document is to familiarize all entities (Responsible Parties) that work or plan to work at Rubin sites with the specific environmental, health and safety requirements. Failure to comply with the requirements of this document shall be considered a breach of contract, agreement, or a serious infraction; and depending on the violation, can result in termination of the contract, agreement, employment or other sanctions at the discretion of Rubin Project Office (Rubin PO) management. This plan complies with and augments the requirements detailed in the Rubin Safety Policy (LPM-18), the "Safety, Hygiene and Environment Regulations for Contractors and Subcontractors by AURA-O" and other AURA Observatory (AURA-O) safety procedures. This document, "The Rubin Environmental, Health and Safety Plan" or LPM-114 applies only to activities at Rubin locations and transportation to and from the Rubin sites.

Management shall ensure a safe and healthful workplace for their workers. Management and workers are responsible for ensuring compliance with all applicable requirements that govern their work at the Rubin sites, including any consensus standards incorporated therein by reference.

Acronyms and Definitions of Terms

Rubin-wide:

- Glossary of Acronyms and Abbreviations (**Document-11921**)
- Glossary of Definitions (**Document-14412**).

The following definitions provide additional, specific clarification of terms as they

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apply to this document:

- **ACHS** – Asociación Chilena de Seguridad. One of four worker’s compensation insurance institutions in Chile. AURA-O is contracted with ACHS. ACHS provides worker compensation-like insurance for Chilean Nationals and other services including EHS compliance assistance, safety information, training, health monitoring, medical assistance and other related services. ACHS also provides Emergency Medical Assistants and services on Cerro Pachón.
- **Accident** – an undesired event that results in harm to people, damage to property or the environment, or loss to process. Accidents result from contact with a substance or source of energy above the threshold limit of the body structure.
- **AURA (Association of Universities for Research in Astronomy)** – A consortium of US institutions and international affiliates that operates world-class astronomical observatories. AURA is the legal entity responsible for managing what it calls independent operating Centers, including NOAO, Gemini, and the Rubin Project Office (Rubin PO) under respective cooperative agreements with the National Science Foundation. AURA assumes fiducial responsibility for the funds provided through those cooperative agreements. AURA is the legal owner of the AURA Observatory properties in Chile and is the managing entity for the Facilities Service Provider in Chile (NOAO-South Facilities and Operations).
- **AURA-O** – AURA Observatory in Chile (AURA-O) is the official representative for all AURA entities in Chile and the legal entity responsible for all AURA-related activities in Chile¹. For specific roles and relationships to parties described in this document, refer to Charter for the Operation and

¹ Although the official (registered) legal designation in Chile is “AURA, Inc.,” herein we use “AURA-O” to distinguish AURA’s operations in Chile (under AURA-O) from its operations at other sites in other countries, which have very different legal environments.

Management of AURA's Observatory in Chile (hereafter "the Charter"). AURA-O is also a Client of the NOAO-South Facilities Service Provider as the AURA offices and staff housing managed by AURA-O are located on property managed by the Service Provider AURA-O has compliance oversight for all activities on AURA property inclusive of Rubin locations.

- **CFR** – United States Code of Federal Regulations.
- **Contract** – any contract, agreement, partnership, or memorandum of understanding to provide services to, for, or with the Rubin Project Office represented by a company, institution, individual or any legal entity that is responsible for its own account and on its own risk.
- **Hazard Analysis Spreadsheets** – The Rubin PO uses a common spreadsheet to contain the identification, the hazard assessment, and mitigation plans and approaches as defined in the Rubin Hazard Analysis Plan (LPM-49). Each of the main subsystems, using dedicated worksheets maintains this hazard spreadsheet.
- **Incident** – an undesired event, which under slightly different circumstances, could have resulted in harm to people, damage to property or the environment, or loss to process.
- **Rubin** – Vera C. Rubin Telescope, for the purposes of this document Rubin will be a telescope (Telescope and Camera) and has related summit and base support facilities including the operations in the U.S. and Chile, Telescope Building, Dome, Service and Operations Building, and areas surrounding the facilities on the mountain top of Cerro Pachón.
- **Rubin Project Office (Rubin PO)** – The official name of the stand-alone AURA operating Center responsible for the management and execution of the Rubin construction project.
- **Rubin Head of Safety - Safety Manager** – The person who manages, executes, and verifies compliance with the Rubin Safety Policy (LPM-18), an

employee of the Rubin PO who reports to the Rubin project manager.

- **Rubin Safety Representative** – an employee of the Rubin PO who has responsibilities related to the activities at Rubin.
- **Rubin Site Manager** – the Rubin PO delegated representative authorized to approve and accept work, provide technical liaison, monitor safety, and interpret Rubin construction plans and specifications on behalf of the Rubin PO.
- **Rubin site, work site, sites** – Any place where work is being performed for Rubin.
- **Management** – the management of a Responsible Party that is responsible for workers under their direction and supervision.
- **NOAO** – National Optical Astronomy Observatory, a center managed by the Association of Universities for Research in Astronomy (AURA) under contract to the National Science Foundation (NSF) of the United States. NOAO has facilities in North and South America.
- **NOAO–South** – is the National Optical Astronomy Observatory operation in Chile, South America, and is the service provider of Facilities and Operations of common-use facilities on AURA Observatory properties such as dormitories, dining facilities, equipment enclosures, Operations shops, Operations offices, common warehouses, roads, emergency medical facilities and other buildings.
- **Chilean Regulations** – in relation to this document, Chilean laws governing work in Chile including laws related to the safety, health of workers and environmental laws such as the Safety Law No 16.744, Supreme Decree No. 44, Regulation on Preventive Management of Occupational Risks for a Safe and Healthy Work Environment and Supreme Decree 594.
- **Responsible Party or Responsible Parties** – Any entity such as AURA, Rubin PO, NOAO, DOE, SLAC, Contractors and its subcontractors,

consultants, scientists, committee members, visitors, guests, and other institutions or companies that work or plan to work on Rubin locations. In addition, a Responsible Party is inclusive of any individual or legal entity that on basis of a contract, partnership, agreement, or memorandum of understanding provides services to the Rubin PO for its own account and on its own risk.

- **Work-Working** – for the purpose of the document any and every person physically on or at a Rubin location is considered at work or working.
- **Worker(s)** – Employee(s), Personnel, Person(s), visitors, any and every person(s) working on Rubin locations or represented by a Responsible Party, including subcontractors and subcontractor workers. A means to standardize the title of people working at Rubin locations and is intended to mean anyone working at Rubin locations.
- **Safety** – the control of accidental loss.
- **EHS** – Environmental, Health and Safety.

Reference Documents

“Rubin Safety Matrix”

“Rubin Safety Policy” (LPM-18)

“Rubin Hazard Analysis Plan” (LPM-49)

“Rubin Site Environmental and Cultural Plan” (LPM-52) “Rubin Summit Environmental Conditions” (LTS-54) “NOAO/NSO Risk Management Manual Rev 4”

“NREL Construction Environment, Health and Safety Manual Version 2 (0112)”

“Reglamento Interno de Orden Higiene y Seguridad para los Contratistas de AURA-O REV-0” “AURA-O’s most current Winter Operations Plan”

“Plan de Emergencias Y Contingencias en las Instalaciones de AURA” (Emergency Procedures)

“AURA-O Responsibilities of Safety Personnel in Chile”

Submittal and Review

This document is an AURA’s Rubin Project Office controlled document and shall be reviewed yearly by AURA’s Rubin Project Office and submitted to the NSF Program Manager as required by AURA’s Rubin Project Office Cooperative Support Agreement for the Construction of Rubin (CSA-1202910) under the umbrella Cooperative Agreement (CA-125833).

Environmental, Health and Safety Plan

1 Environmental, Health and Safety Plan

1.1 Applicable Jurisdictions and Code of Compliance

This Plan establishes and defines Rubin's minimum Environmental, Health and Safety (EHS) requirements and procedures consistent with United States and Chilean laws and regulations. The objective of the plan is to make environmental, health and safety management an integral part of the effort from initial planning and design, to construction, commissioning, and finally throughout the operation and decommissioning of Rubin. This document LPM-114 applies to activities at the Rubin locations and transportation to and from the Rubin locations.

AURA and Rubin PO management expects that Responsible Party EHS plans comply with all applicable United States and Chilean environmental, health and safety regulations and requirements. In particular, EHS plans shall comply with Title 29 of the U.S. Code of Federal Regulations (CFR) including Part 1910 "OSHA Safety and Health Standards for General Industry," Part 1926 "Safety and Health Regulations for Construction," 49 CFR Federal Motor Carrier Safety Administration, and 40 CFR Protection of Environment and others that may apply. The Rubin PO considers the above CFRs as minimum standards. Plans governing work in Chile will comply with the requirements of this document and Chilean laws such as Safety Law No 16.744, Supreme Decree 594, Supreme Decree No. 44, Regulation on Preventive Management of Occupational Risks for a Safe and Healthy Work Environment. and other applicable Chilean Standards (Normas Chilenas). The Responsible Party is obligated to keep current with all laws, ordinances, statutes, rules, and regulations as they become promulgated.

1.2 Rubin Project Safety and Health Statement

Rubin PO management is committed to achieving the highest performance in environmental, health and safety management practices, with the aim of creating and maintaining a safe and healthy working environment. The Rubin Safety Plan (LPM-18) provides specific details; the following is an excerpt of the policy:

- a) promote a work environment based on continuous improvement, employee involvement, ownership, teamwork, education, and leadership;
- b) build self-esteem, empowerment, pride, enthusiasm, optimism, and encourage innovation;
- c) reinforce the need for people to care about the people they work with;
- d) promote the philosophy that safety is not a priority that can be reordered, it is a value associated with everything we do;
- e) recognize, reward, and reinforce our environmental, health and safety achievements, innovations, and behaviors;
- f) address all known risks to people, property, the environment and mission assurance, in addition to budget and schedule risks;
- g) exercise vigilance to ensure compliance with all applicable, laws, regulations, and best management practices;
- h) integrate environmental, health and safety considerations into project planning, design, construction, and operations to minimize loss;
- i) conduct sustainable programs to minimize pollution to the environment, to protect our material resources, honor cultural resources, and minimize our impact to biota.

1.3 Worker Responsibilities

All workers at Rubin are responsible to manage their personal safety, for integrating safety into their work, and supporting the EHS Plan as established in

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this document. All workers are encouraged and empowered to understand the work environment and to identify designs, procedures, and conditions that are considered unsafe, whether specifically addressed in this EHS plan or otherwise occurring. Every worker has the authority, without fear of reprimand or penalty, to stop work and seek technical assistance from the safety managers and representatives for guidance, resolution of safety issues or disputes involving activities at Rubin.

1.4 Rubin Site Manager

The Rubin site manager is assigned by the Rubin PO and is responsible for the technical and safety aspects of the contracts or agreements and monitors the progress of the work performed at Rubin. The Rubin site manager is the contact person for all technical and safety matters on the site. The Rubin site manager informs those working at the site about specific risks concerning the work site and their services provided. He or she ensures the following:

- a) The construction site complies with necessary sanitary conditions to protect health and safety of workers;
- b) Workers have access to potable water for personal use and hygiene;
- c) Waste disposal is coordinated;
- d) Workers have access to bathrooms, change rooms, lockers, and showers;
- e) Workers have access to dining areas if the work requires staying at the work site;
- f) Working conditions meet legal requirements (such as adequate lighting and ventilation) and that machinery and equipment used complies with national or international standards;
- g) Fire protection and housekeeping at the work site complies with national or international standards;

- h) Risks of external agents such as hazardous materials, noise, vibrations, thermal, and/or lasers are properly evaluated and protective measures meet national or international standards;
- i) Responsible Parties are in compliance with this Plan; and
- j) Activities are coordinated with AURA- O, Rubin PO, Gemini, NOAO, SOAR and other tenants' staff.

1.5 Rubin Staff Safety and Health Responsibilities

Related to the Rubin locations, the Rubin safety manager and safety representatives have the authority and responsibility to report environmental, health and safety issues and to make recommendations to management and workers. Responsibilities of the safety manager and safety representatives include:

- a) Prepare the safety program and other deliverable documents,
- b) Review and approve selected procedures,
- c) Coordinate and verify adequate emergency response plans and systems,
- d) Coordinate environmental, health and safety activities,
- e) Provide safety leadership to site workers and oversee critical tasks,
- f) Prepare safety related documentation for the Rubin PO and NSF,
- g) Supports the site management in the duties concerning supervision of EHS management,
- h) Verify EHS compliance at the site, and
- i) Liaise with AURA safety staff, mutuals, and other safety personnel.

Additional details can be found in the Rubin Safety Policy (LPM-18) and the AURA-O Responsibilities of Safety Personnel in Chile.

2 General Locations, Altitude and Climatic Information

There are several different work locations for Rubin, the two primary locations are listed below. Work related to Rubin at other AURA locations even though not listed must comply to this plan.

2.1 Summit Site Location

The observatory site is located in Chile on the Cerro Pachón mountain ridge in the north-central region IV (latitude 30.2° South and longitude 70.7° West). The entire Cerro Pachón area is within a tract of land owned by AURA. The telescope sites are inland and approximately 100 km by road from the support town of La Serena, where the Rubin Base Facility will be located. The road is composed of approximately 50 km of paved public highway from La Serena to the entrance of the AURA property. The road then changes to a maintained dirt and gravel road for 40 km from the AURA security gate to the Cerro Pachón summit with occurrences of deep curves and steep grades along the way. Authorization is required to enter the guarded gate to the AURA property.

2.2 Altitude

The altitude of the Rubin Summit site is 2650m (8694ft) above mean sea level. Some workers working at the Rubin summit may experience Acute Mountain Sickness. Symptoms might include throbbing headache, sleep disturbance, fatigue, and shortness of breath, dizziness, loss of appetite or vomiting. If any of these symptoms occur, relief can be obtained by descending to a lower elevation, drinking fluids, resting, and taking pain medication. If workers have concerns about working at this elevation, they should discuss it with their personal health care provider.

2.3 Climate

The potential natural hazards at the summit are high winds; rain, ice, and snow due to storms; and earthquakes due to the site's position within a seismically active zone. Incidence of naturally occurring events including severe weather conditions has the potential to affect the site and the health and safety of workers. When conditions become critical and serious enough to warrant protection of human life, Rubin PO site management will take precautionary measures to prevent or minimize the impacts of natural hazards by stopping work and/or closing the AURA mountain roads during severe weather events.

Temperatures at the site commonly range between -10° Celsius to +30° Celsius (14° Fahrenheit to 86° Fahrenheit). Freezing temperatures are possible any time of year but are most probable between June and August. Wind chill factor also should be considered when working outside. Prevailing winds are from the North East at an average speed of less than 12 m/s or 27 mph. Maximum wind speed recorded is 54 m/s or 121 mph. Detailed climate information can be found in the Rubin Summit Environmental Conditions document (LTS-54). Additional AURA-O requirements related to climate and weather can be found in the most current AURA-O Winter Operations Plan.

2.4 Base Facility–Recinto

2.4.1 Recinto Location

The AURA La Serena Recinto is located in the city of La Serena, Region IV, Chile, 472 kilometers north of Santiago (capital of Chile). The city of La Serena is connected to the rest of the country by Route 5 and by air through the airport La Florida which receives national flights on a daily basis. The AURA property is located between the streets of Juan Cisternas and Rodolfo Wagenknecht. The

AURA Recinto is an administrative and residential location comprising of the facilities for AURA, NOIRLab and Rubin as well as warehouses, maintenance workshops, instrument workshops, electronic laboratory, optical laboratory, data storage, and residences. In addition to these facilities, the AURA Recinto has amenities for use by AURA employees such as a pool, squash court, basketball court and a park. There are two access ways to the Recinto for vehicles and pedestrians including Juan Cisternas Street and an alternative access by Raul Bitran Street which is normally closed. All roadway in the Recinto are paved with appropriate signs. Parking lots for employees and visitors are provided.

2.4.2 Recinto Climate

The weather at La Serena where the Aura Recinto is located has defined seasons. The seasons in Chile fall at opposite times of year from the Northern Hemisphere. Thus, the summer months are December, January and February, while June, July and August are the winter months. Summer in La Serena is normally characterized by the absence of rainfall despite having morning clouds and drizzling rain that dissipate around noon with warm temperatures between 66 ° and 78 ° F (19 ° and 26 ° C). In winter the temperature is usually between 37 and 53 ° F (3 to 12 ° C). La Serena is located in a coastal area of the Pacific Ocean. Average rainfall is 104 millimeters annually. During the winter months La Serena may experience frequent precipitations and considerable wind gusts.

The potential natural hazards of the area of the Recinto are the possibility of earthquakes as the Recinto which is located in an active seismic area. The Aura Recinto is signposted for emergency evacuation routes and the Emergency meeting areas. For effects of potential hazards of tsunamis the Aura Recinto is geographically located at a higher elevation of the city on an area called "Colina El Pino" (El Pino Hill) therefore it is in a safe zone in case of tsunamis.

3 Medical Facilities and On-Site First Response Capabilities

3.1 Medical Facilities at the Summit Site

NOIRLab; provides basic on-site emergency first response capabilities, including medical assistants and an ambulance for operations working on AURA property. Site emergency medical dispatch service is provided, managed, and controlled by NOIRLab under contract with the Asociación Chilena de Seguridad (ACHS). A first-aid treatment facility is provided by NOIRLab within the vicinity of the Rubin Summit site. All injuries that require first aid or treatment must be reported to the first-aid treatment facility. All costs, beyond normal operating costs for the medical assistant service, incurred by the Responsible Party for emergency services shall be the responsibility of the Responsible Party.

The Responsible Party shall ensure they are staffed or provided (in the case of visitors) with qualified (American Red Cross or equivalent training) first-aid person(s) at their work site at all times during performance of the work. The Responsible Party and Rubin PO site management shall consider and plan for potential daily conditions, including but not limited to:

- a) Provision for emergency response workers on-site,
- b) Emergency reporting and call-out procedures,
- c) Rescue provisions for working at heights and other situations, and
- d) Safety zones or emergency meeting areas.

The closest medical facility to the Rubin summit site is the Vicuña Hospital, located approximately 45 minutes away in the town of Vicuña. The Vicuña Hospital provides urgent care and limited rural emergency care on a 24-hour, 7-day a week basis, and offers a basic laboratory and X-ray services. Full- service hospitals are located approximately 90 minutes away in La Serena. See **Attachment** for a

complete listing of area medical centers.

3.2 Medical Procedures at the Base Facility–Recinto

At the La Serena Base Facility, emergency medical response services in case of illness or an accident is through the use of government operated emergency mobile health care services (SAMU, emergency telephone 131). This service is provided for visitors and the general public and would apply to most people travelling to Chile.

Chilean nationals or employees that work under a Chilean employment contract with their company have an assistance network of one of the Mutual's (law 16,744) that will provide work related emergency response and medical services. In La Serena, two Mutuals have emergency response, rescue, and treatment capabilities and they are the Mutual de Seguridad (emergency phone 1407) and the Chilean Safety Association, ACHS (emergency phone 1404). These emergency services will respond via telephone and assistance on site when necessary, It's important to note that the Mutual telephone operators may not be bilingual; if the injured person or the person requesting emergency services does not speak Spanish, then follow the emergency protocol for non-Spanish speaking people must be activated.

3.3 Communication and Language

Management is responsible for ensuring that its workers who are not fluent in English or Spanish (depending on the circumstances) understand all project, site requirements, and environmental, health and safety requirements. All management must also be able to communicate emergency instructions to its workers.

4 Security

4.1 Access to the Sites and Adjacent Areas

AURA property is gated and attended by contracted security guards. Posted signs at the entrance indicate that access to the area is restricted and off-limits to unauthorized personnel. The only people who would typically occupy AURA property are authorized workers, contractors, and visitors of the various Program facilities such as Rubin, NOIRLab. Access to other Program observatory locations like CTIO, Gemini, and SOAR shall be by invitation only.

The Rubin site manager or other assigned authority will be identified to all Responsible Parties. Responsible Parties' workers must enter AURA property via the AURA entrance gate. Responsible Parties are required to provide an attendance list of on-site workers or visitors to the Rubin site manager. The attendance list will include arrival and departure times for the workers and visitors, as well as details about late arriving or early departing workers or visitors. The attendance list will be provided for the next day's attendance to the Rubin site manager. The Rubin site manager will provide this list to the security guards to verify authorized workers. Appropriate personal identification shall be presented to the guards when requested.

The Responsible Party shall not arrange for inspection, touring, or visiting AURA property or Rubin sites by visitors without the prior advanced notice and approval by the Rubin site manager.

4.2 Rubin Construction Site Security and Safety

The perimeter of work areas or the construction site shall be demarcated and controlled.

4.3 Motor Vehicle Access

Vehicles authorized by the Rubin site manager to travel on AURA property and will be on Rubin locations shall be in good mechanical order, have seat belts for all passengers, and have if in Chile a Chilean government required vehicle documentation in the vehicle. All vehicles shall be subject to authorization after inspection by the Rubin site manager and shall comply with regulations established by AURA.

Vehicles shall be parked at designated locations. Responsible Parties shall be responsible for the safety and security of their rented, leased or owned and operated vehicles (including private vehicles) on the premises. The driver of the vehicle shall be responsible for complying with all Chilean and AURA driving regulations.

4.4 Trespassing

Workers shall not trespass anywhere outside the limits of their designated work areas as defined by the Rubin site manager. To avoid damage to sensitive archaeological and biological resources, all workers must stay on the roadways and designated walkways within AURA property and not wander off the roads or designated walkways unless authorized.

4.5 Advertising and Publications

The sole right of advertising on Rubin locations or of the construction work itself is reserved to AURA. Responsible Parties shall not, without written consent of AURA, erect or display any notice or advertisement on AURA property.

5 Safety and Health Administration

5.1 Competent Persons

Competent person(s) shall be designated to ensure safe work practices are being followed in areas such as excavations, scaffolding, permit required confined space, and others as detailed in OSHA standards or Normas Chilenas. A competent person has been shown to be capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to workers, and who has written authorization from management to take prompt, corrective measures to eliminate unsafe conditions or actions. It is the responsibility of management to determine if the workers meet qualifications based on guidelines defined in OSHA 29 CFR 1926.32 (d) (f) (I) (m). If requested by AURA or Rubin PO, a competent person shall be capable of demonstrating the knowledge that matches their competent person designation. The competent person must be on site at all times during the performance of the work that requires the competent person job duties.

5.2 Corrective Action

Management is required to implement corrective actions to control poor performance, misconduct (including but not limited to fighting, horseplay, and practical jokes), negligence, and safety violations by its workers. Safe behavior is expected for all tasks, not just high hazard tasks. AURA or Rubin PO may issue verbal or written warnings to its workers or the Responsible Party for safety infractions, which the Responsible Party shall correct.

The Responsible Party shall remove from the site any worker employed by the Responsible Party if the Responsible Party and/or AURA and Rubin PO deems that the presence of such worker is detrimental to the performance of the work, to

operations of others working in the area, or if in AURA and Rubin PO's sole judgment, such worker lacks appropriate qualifications or exhibits improper conduct.

5.3 Imminent Danger

Imminent Danger is a condition or practice that could reasonably be expected to cause death or serious injury, severe property damage, or environmental impairment unless immediate actions are taken to mitigate the effects of the hazard created.

When a worker is observed by other workers to be involved in a situation that places him/her or others in imminent danger of being seriously injured or killed, the situation shall be made safe, then stopped. An investigation shall be conducted and the findings shall be reviewed by the Rubin safety manager and project manager. If it is found that there was a violation, the Rubin safety manager and the Rubin project manager shall determine the appropriate discipline.

5.4 Stop Work Authority

Stop Work Authority establishes the responsibility and authority of any worker to stop work if unanticipated/unsafe conditions are identified or non-compliant practices are observed at Rubin, workers shall be instructed to stop the work immediately and notify their supervisor(s), safety and health representative(s), and the Rubin site manager of this action. Disagreements or differences of opinion about the need to terminate an activity shall be discussed only after the activity is stopped and workers are removed from the hazard. All workers at the site have the authority to stop work. Work may not proceed until the circumstances are investigated and deficiencies corrected and it has been determined that it is safe to proceed.

5.4.1 How to Stop Work

When a worker identifies a perceived unsafe condition, act, error, omission, or lack of understanding that could result in an undesirable event, they must immediately initiate a stop work intervention with the worker(s) potentially at risk.

If the affected worker(s) are not in immediate risk and the supervisor is readily available, the stop work action should be coordinated through the supervisor. If the supervisor is not readily available or the affected worker(s) are at immediate risk, the stop work intervention should be initiated directly with those at risk.

Stop work interventions should be initiated in a positive manner by briefly introducing yourself and starting a conversation with, "I am using my stop work authority because..." Using this phrase will clarify the user's intent and set proper expectations.

Notify affected workers and supervision of the stop work issue. If necessary, stop associated work activities, remove worker(s) from the area, stabilize the situation, and make the area as safe as possible.

Affected parties shall discuss and gain agreement on the stop work issue.

If determined and agreed that the task or operation is okay to proceed as is (i.e., the stop work initiator was unaware of certain facts or procedures), the affected workers should thank the initiator for their concern and proceed with the work.

If determined and agreed that the stop work issue is valid, then work is only resumed after everyone is satisfied, or it has gone to the next step detailed below.

If the stop work issue cannot be resolved immediately, work shall be suspended until proper resolution is achieved. When opinions differ regarding the validity of the stop work issue or adequacy of the resolution actions, the Rubin site manager

and Rubin safety representative shall make the final determination. Details regarding differences of opinion and resolution actions should be included in a documented report.

Positive feedback should be given to affected workers regarding resolution of the stop work issue. Under no circumstances should retribution be directed at any worker(s) who exercise in good faith their stop work authority as detailed in this plan.

5.4.2 Stop Work Authority Conflict Resolution

When opinions differ regarding the validity of a stop work intervention or the decision to resume work, workers with proper authority (e.g. next level of management, safety representative or manager) who are not party to the conflict should be identified to resolve such issues, such as the Rubin PO Head of Safety.

5.4.3 Stop Work Authority Reporting

Report stop work intervention using the incident reporting processes. When opinions differ regarding the validity of the stop work issue or adequacy of the resolution actions, the Rubin site manager and the Rubin safety representative shall make the final determination.

5.4.4 Stop Work Authority Follow-up

Stop work interventions that identified environmental, health and safety concerns should be addressed to the satisfaction of all involved workers prior to the resumption of work. Although most issues can be adequately resolved in a timely manner at the job site, occasionally additional investigation and corrective actions may be required to identify and address root causes.

5.5 Alcohol and Substance Abuse

It is Rubin PO policy to maintain a drug-free workplace. Possession of illegal drugs, alcoholic beverages, and drug paraphernalia is prohibited at sites when work is being performed. Workers possessing medications that might be needed in an emergency or taking drugs that might affect emergency medical treatment shall inform their Human Resources department to determine if the immediate supervisor should be informed. Workers found with illegal substances in their possession shall immediately be denied access to the site. Management shall seek to utilize Rubin PO or Responsible Parties drug counselling, rehabilitation, and group health insurance benefits for its workers.

5.6 Medical Evaluations

Responsible Parties are encouraged, and in some cases required by law (Chilean Nationals), to have a pre- placement job capability medical examination plan for its workers that may include audiogram, pulmonary, respiratory tests, and others.

5.7 Safety and Health Orientation

Management shall develop a site-specific safety and health orientation for its workers. Topics of the training shall include a review of this EHS plan, specific safety and health requirements and rules related to the type of work being performed, and a review of items pertaining to worker requirements detailed in this document. At a minimum, the EHS orientation shall address the following:

- a) Incident and Accident Reporting
- b) Reporting unsafe conditions and acts
- c) Stop Work Authority
- d) How to obtain first-aid and medical help

- e) Hazard communications
- f) Personal protective equipment use
- g) Safety and health rules and responsibilities
- h) Fire protection and egress procedures

5.7.1 Fitness for Duty

"Fitness for Duty" assessments should be built into each Responsible Party's daily routine, it is recommended that management makes this assessment for its workers during the Plan of the Day (POD) meeting. A stretch and bend plan tailored to the work to be performed is an effective approach to reduce strains and to determine that workers are fit for duty. Exercises or procedures should be developed and management shall determine if a worker is not fit for duty and what to do, whether its reassignment or rehabilitation.

5.8 Supervisor's Safety Meetings

Weekly supervisors' safety meetings shall be scheduled to discuss new activities and/or changes in the working conditions at the site. Meeting topics shall be related to the work being performed and ultimately assist supervisors to manage safety and health aspects of the job. Attendance at these meetings shall be mandatory for site supervisors and the topics and attendance records shall be kept on file for review by AURA and Rubin PO. Other interested parties such as other tenants are welcome to attend and participate. If a site supervisor fails to attend such meetings, the supervisor will be required to meet with the Rubin site manager prior to continuing work at the site.

5.9 Obligation to Inform, (Obligación De Informar) (ODI)

Obligation to Inform is a method to understand worker's risks and inform workers of those risks. ODI is required by Chilean law and is equivalent to an Activity

Hazard Analysis (AHA) or sometimes called a Job Hazard Analysis (JHA). For the purpose of this document any variation of these analysis is referred to as a ODI.

For each separately definable construction activity (e.g., blasting, excavations, foundations, structural steel, roofing, electrical, mechanical, etc.), an ODI shall be developed far enough in advance of the commencement of the associated work/definable feature to be able to implement all of the requirements defined in section 5.9.1 below. A definable work activity is a task that is separate and distinct from other tasks, and has separate control requirements. A definable work activity may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Within each definable work activity there may be sub-phases of work that warrant separate ODIs. It will be the responsibility of management to determine the best break-down of separately definable activities and the subsequent work steps in order to produce clear, concise, and effective ODIs. ODIs shall be kept at the worksite and available for review.

ODI's shall be developed in sufficient detail to preclude confusion and misunderstanding and shall be commensurate with the size, complexity and risk level of the construction project. When used appropriately, the ODI will incorporate the level of rigor for implementing the work planning and control attributes based on the importance/significance of the activity in relation to the associated hazards and consequences.

5.9.1 Minimum Requirements of an ODI

The analyses shall contain and/or meet the following elements as applicable to the activity

- a) Identification of the definable work activity
- b) Identification of the job steps for each work activity
- c) Identification of the foreseeable hazards for each step/activity and the

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- planned protective measures to include appropriate protective devices and/or equipment as needed
- d) Identification of competent persons required for workplace inspections of the construction activity, where required by governmental standards
 - e) Identification of Emergency Response Action relative information (e.g., gas shutoff valve location, etc.)
 - f) Identification of project-required hold-points (activity put on hold until an inspection is passed) or other logistical requirements.
 - g) Address additional hazards revealed by supplemental site information (e.g., site characterization data, as-built drawings)
 - h) Provided with drawings and/or other documentation of protective measures for which applicable legal EHS standards require preparation by a Professional Engineer or other qualified professional
 - i) Review and approval of the ODI by the Responsible Party's management
 - j) Made available for review by the Rubin site manager and Rubin safety representative prior to the start of work activities.
 - k) Places for signatures of the involved workers to signify that they have been briefed on and understand the requirements of the ODI, and acknowledge their intended compliance with the ODI. Attach additional signature pages as needed.

A pre-task/phase meeting shall be conducted that discusses the corresponding ODI, the work tasks, and associated procedures and hazards with all affected parties to identify and coordinate logistics, controls and communications required for the activity. Each worker involved in that work must sign the ODI prior to performing work.

If, while working, it is discovered that the controls addressed in the ODI will not/do not provide adequate protection, then the task at hand shall be stopped and not

be conducted until the hazards have been re-assessed, the ODI updated, and adequate controls implemented. In these instances, management may utilize field changes (i.e., red line, pen/ink changes) as needed to reflect changing conditions associated with the activity. All affected workers involved in the work being performed shall review each ODI and subsequent updates/changes. The updated ODI shall be made available for review to the Rubin site manager and Safety representatives.

5.9.2 Worker Training

Management shall ensure that affected workers have had the specific training required to perform the work and are made aware of the foreseeable hazards and the protective measures described within the activity analysis prior to beginning work on the affected activity.

5.10 Daily Activity Briefings including EHS Topics

Daily activity briefings shall be held each day prior to the start of work activities. The flexibility exists for Rubin PO and each Responsible Party to integrate these requirements into their existing environmental, health and safety plan formats as long as the required information is effectively provided to workers and documentation for these briefings and/or meetings is maintained. This may be accomplished through daily construction meetings, plan of the day (POD) meetings, pre-task activity reviews, weekly safety meetings or other means that prove to be effective in the dissemination of the required information and has been accepted by AURA and Rubin PO. Records for these briefings, documenting the meeting content and attendance, shall be maintained and made available when requested. All workers shall acknowledge the information disseminated, by signing the attendance roster.

The briefing content shall include at a minimum the following topics

- a) EHS pre-task planning for the day's work activities
- b) Changes in work practices or environmental conditions
- c) Required equipment/system daily inspections
- d) Previous days incidents, near misses, lessons learned and/or other relevant issues as applicable
- e) Other ongoing activities that may have EHS implications
- f) New or modified summit site-wide procedures or requirements
- g) Review of ODI for new activities and/or revised existing ODI's

5.10.1 Plan of the Day Meeting

The plan of the day process (POD) is utilized to coordinate all work, but especially high hazard work, Rubin construction interface and/or during complex operations where positive control and a high level of communication are required, or as directed by Rubin site manager. This meeting is generally for site management and supervisors.

Stop Work Authority will be reiterated to each new supervisor. With each new supervisor, it will be emphasized that safe behavior is expected for all tasks, not just high hazard tasks. Management, engineering, safety representatives are to notify supervisors of issues requiring immediate action. Other issues can be collected for discussion at the next POD or other opportune meeting.

All planned tasks shall be identified on a POD document. The level of detail must be appropriate to define all tasks' that may present a hazard to people, property or environment. The listed task(s) shall include the corresponding previously approved ODI or reference the applicable section from a current EHS plan. If the task proposed does not have a corresponding ODI, then a new ODI will need to be developed and reviewed prior to the work moving forward.

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5.10.2 Weekly “Tool Box” Safety Meetings

Site management and/or supervisors shall conduct and document Weekly “Tool Box” meetings (15 to 30 minutes) for all workers at the site under the Responsible Party’s control, to emphasize project environmental, health and safety protection, and fire prevention and emergency procedures. Worker attendance shall be required, and records shall be kept on file for review by AURA and Rubin PO. In addition, meeting minutes or discussion topics must be posted on the Responsible Party’s bulletin board for a period of one month following the meeting. Minutes shall include the date, person conducting the meeting, subjects covered and signatures of attendees.

5.10.3 Monthly EHS Meetings

A monthly construction EHS meeting shall be held and shall include attendance by all site Responsible Party workers. AURA or Rubin PO reserves the right to increase the frequency of these meetings based upon project complexity, risk and/or Responsible Party EHS performance. Supervisors or other designated workers shall conduct these meetings. Meetings can be held for the entire project or smaller breakout meetings can be held for each Responsible Party and/or craft. A record of each meeting, documenting the meeting content and attendance shall be maintained.

5.10.4 Pre-Job/Task Safety Orientation and ODI

Supervisors are required, when making work assignments, to provide a pre-job/task-specific safety orientation as related to the ODI to all of their workers that informs the crew involved of the safety and health practices, emergency response procedures and contact information, work methods, and personal protective equipment required. Reference to the Rubin PO Hazard Analysis spreadsheets may be required for process or subsystem hazards review. Each

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supervisor shall be responsible for determining that each worker has the proper protective equipment and suitable tools for the work assignment. Each worker shall sign the ODI to indicate having received the orientation. The signature list shall be available to AURA or Rubin PO for review.

6 Safety Inspections

6.1 Daily Inspections

The Responsible Party shall conduct daily safety and health inspections of the Responsible Party's work area. Items and/or actions found to be out of compliance shall be immediately corrected, removed and tagged out from service, and removed from the site by the Responsible Party at the end of that work shift.

The Responsible Party's competent person(s) shall perform daily inspections that may include trenching and excavation, fall protection, confined spaces, aerial lifts, hot work permitting, scaffold inspections, crane inspections, equipment inspections, and others. The Responsible Party shall document each inspection with the signature of the inspector, date, time, and conditions found. Documentation shall be available for review by AURA or Rubin PO for the duration of the project.

6.2 Weekly Inspection Reports

A weekly safety and health inspection report that includes corrective actions and dates corrected shall be submitted to Rubin site manager. The Rubin site manager or safety representative will make recommendations to the Responsible Party if safety violations persist and can make recommendations to remove the violator(s) from the project site.

Rubin PO has implemented a process for its own daily inspections through which

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all hazardous conditions not corrected on the spot are documented and emailed to the Responsible Party's management and safety, along with Rubin site manager and safety representatives. Additionally, weekly summaries are submitted to Rubin PO.

6.3 Gang Box Inspections

Prior to arriving on site, each Responsible Party shall perform inspections of all equipment, tools and materials stored in the gang boxes. Defective tools and equipment shall be removed from the box prior to arriving on the site. All gang boxes located on the site shall receive weekly documented inspections of equipment, tools and materials in the gang box. The inspection must be performed by a Responsible Party designated competent person. Written inspection records shall be maintained within the gang box signed by the competent person performing the inspection. All tools and equipment brought onto the site for use and/or stored in the gang box shall be new or like new condition. During the gang box inspection(s) any identified defective or unsafe equipment, tools or materials shall be immediately corrected, tagged or removed from the jobsite.

6.4 AURA, Rubin PO, or Government Mandated Inspections

The Responsible Party shall participate through designated representative(s), acceptable to AURA and the Rubin PO including its safety and health representative(s), in periodic general safety and health inspection tours conducted by a member or members of AURA, Rubin PO, or a Government Agency. During these inspections, the Responsible Party's safety and health representative(s) must identify and record safety violations and concerns, and list such items for correction by the Responsible Party. If the Responsible Party has subcontractors, a representative of each subcontractor shall accompany the inspection. The Responsible Party must provide to the Rubin site manager, AURA, Rubin PO, and

the Government Agency with the list of items designated for correction and the date completed.

7 Accident, Incident, and Unsafe Condition Reporting

All near misses, incidents, and accidents occurring at the site must be reported verbally immediately to the Rubin site manager. The Rubin site manager shall notify the AURA safety manager and Rubin PO managers. In addition, an initial accident investigation report must be submitted to the Rubin site manager within 24 hours. The report will be submitted to the Rubin PO project manager and the Rubin PO head of safety. The report minimum contents are to include:

1. Company name, Center and Project if applicable
2. Location of the serious incident or accident
3. Time of the serious incident or accident
4. Supervisor(s) name(s)
5. Number and names of any injured workers
6. Description of the injury(s)
7. Description of the incident or accident and emergency response
8. Estimate of property damage in excess of \$25,000 (to AURA and NSF only)
9. Recommendations to prevent reoccurrence
10. Company contact person and his or her phone number

The types of occurrences that must be reported include, but are not limited to, fire, explosions, worker injuries, work-related illnesses, near misses that had a potential for serious injury or death, security incidents, property damage, toxic or flammable material spills or releases, or environmental damage or degradation.

The immediate supervisor is required to actively participate in the investigation of an accident resulting in personal injury and/or equipment or property damage, and

near misses in that supervisor's area of responsibility.

Each supervisor is required to notify all workers under his or her supervision of their obligation to report all accidents or incidents immediately in accordance with the above instructions.

7.1 Incident and Accident Record Keeping

Accurate incident and accident reports shall be maintained and furnished first to the Rubin site manager, then to Rubin PO and AURA by monthly summary of work-related injuries/illness, number of restricted work days due to injury or illness, number of lost workday due to injury or illness, near misses, property damage, spills, and hours worked.

7.2 Unsafe Condition Reporting

Workers are allowed to report unsafe conditions and/or unsafe acts without retribution. Management and workers shall immediately correct all unsafe conditions and unsafe acts under their control and authority. Supervisors are required to be familiar with the conditions of the project site. Supervisors shall correct unsafe conditions that exist in the work area before work begins. If the problem cannot be solved by the supervisor, the problem shall be brought to the attention of the next higher level of supervisor and then to the Rubin site manager for resolution.

8 Emergency Preparedness and Evacuation

First aid supplies shall be provided on site for workers and workers(s) trained in basic first aid and Cardio- Pulmonary Resuscitation (CPR) who can render immediate care when needed shall be on-site. The name of the designated first aid and CPR provider(s) and a copy of training documentation shall be provided to

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AURA or Rubin PO on request.

Management shall provide transportation to the medical facility for injured workers with minor injuries. When needed and specifically related to the summit site, seriously injured workers can be transported in the site emergency evacuation vehicle. Base Facilities staff should understand and use the municipal emergency response services. Management shall not permit an injured worker to drive to the medical facility or home, unless approved by a medical assistant or medical professional.

All supervisors shall be familiar with the emergency procedures so they may provide the leadership required to manage events including incidents and accidents, fires, evacuations, and similar situations. Management is required to train all workers on emergency response procedures at least yearly.

Mitigation plans for all emergencies are included in the latest version of the Plan de Emergencias Y Contingencias en las Instalaciones de AURA (Emergency Procedures).

9 Site Specific Requirements

The Responsible Party shall be obligated to comply with all statutory safety and health requirements, Rubin PO, and AURA requirements. These combined safety and health requirements constitute the minimum acceptable safety and health performance. The following are considered site-specific requirements and the Responsible Party shall comply with these requirements as it pertains to the types of work being performed.

9.1 Altitude and Climate at the Summit

Section 2, General Location and Climatic Information, provides details about

altitude-related conditions at the summit of Cerro Pachón. All summit workers shall be provided with the necessary attention and advice to prevent altitude-related illnesses, and make provision available to those workers that become affected by altitude. During the EHS Compliance training for summit workers (see Section 5.7 above) given by management, precautions for altitude and climate safety will be addressed and will describe such topics as: hypoxia or altitude illness, dehydration, hunger, weather, sun protection, and safe driving on the mountain road. High winds can pose a hazard to body parts if doors are opened and the wind closes them.

9.2 Blood-borne Pathogens

Workers who may reasonably be expected to be exposed to blood or other body fluids shall be trained to minimize exposure to pathogens. All human blood and certain human body fluids are treated as if known to be infectious for the human immunodeficiency virus, the Hepatitis B and C Viruses, and other blood borne pathogens. First aid kits shall contain “Universal Precautions” items, including chemical splash goggles, medical gloves, cardiopulmonary resuscitation (CPR) masks (with one-way valve), antiseptic hand cleaner, drying cloths, and red bags labelled “BIOHAZARD.” Medical waste generated as a result of first aid response shall be placed in labelled red bags, and disposal coordinated through local medical services.

9.3 Compressed Gas Cylinders

Pressure vessel certificates per OSHA 29 CFR 1926.29 shall be maintained subject to review by Rubin site manager. All gas cylinders shall have a suitable truck with chain or other secure form of fastening to keep cylinders from being knocked over.

9.3.1 Compressed Gas Cylinder Storage

The following guidelines shall be used:

- a) Store cylinders upright.
- b) Group cylinders by compatible gases.
- c) Separate full and empty cylinders and label empties.
- d) Store gases so that old stock is used first.
- e) Secure cylinders with chains or cables or special holders designed for that purpose such as cylinder carts or wall holders. Securing cylinders to conduit carrying electrical current is prohibitive.
- f) Fire extinguishers near cylinder storage area shall be appropriate for the types of gases being stored.
- g) Store oxygen cylinders at least 20 feet from flammables or combustibles or separate them by a 5- foot high, fire resistant barrier.
- h) Keep oil and grease away from oxygen cylinders, valves, and hoses. If your hands, gloves or clothing are oily, do not handle oxygen cylinders. Oxygen and compressed air are not the same thing. Do not use them interchangeably.

9.4 Confined Space Entry

When applicable, there shall be a confined space entry procedure included in an ODI. The ODI shall include posting of a permit, testing, monitoring, and recordkeeping. Site safety representative(s) and/or the competent person for confined space shall be responsible for oversight of the confined space entry(s). All workers, materials, and equipment necessary for rescue shall be detailed in the ODI.

The condition of a confined space should always be determined in advance of entry

and appropriate action taken to safeguard workers in the area. A confined space is defined as an area that has adequate size and configuration for worker entry, has limited means of access or egress, is not designed for continuous worker occupancy, and is most likely an enclosed space into which air is not being changed continually by natural circulation. Generally, doorways and other portals through which a worker can walk are not to be considered limited means for entry or exit. However, a space containing such a door or portal may still be deemed a confined space if an entrant's ability to escape in an emergency would be hindered.

The hazards in a confined space may be lack of oxygen or asphyxiating atmospheres, explosive or toxic gases, vapor or dust, engulfment from small particles or exposure to temperature extremes, which may cause immediate health or safety risks; these are classified as "permit-required" confined spaces. All permit-required spaces must be identified to prevent unauthorized entry and to protect trained authorized workers from hazards through a permit confined space program.

9.4.1 Procedure Details

The following should be considered and included, if applicable, in an ODI to safeguard entering or working in confined spaces:

- a) Workers should not enter any confined space without knowing what was in it, what is in it now, how long it has been closed, and what precautions should be taken.
- b) Remove, depressurize, disconnect, or block energized systems that are connected with the operation of the confined space to prevent accidental introduction of contaminants, live steam, hot water, or starting of equipment within the space when it is occupied. Closing and locking valves is consider

not sufficient because of the possibility of cross-seat leaks in valves.

- c) Test the atmosphere in the area with direct-reading airborne gas/vapor analyser, or combustible gas detector, and an oxygen deficiency indicator. Purge an explosive or flammable atmosphere, taking extreme care to avoid all sources of ignition. Ground purging lines and use non-sparking tools and explosion-proof electrical equipment and lighting. Retest the atmosphere after purging.
- d) Purge the area, as necessary, with steam, water, compressed air or fresh air. Retest the atmosphere after purging. If the area cannot be purged, inform workers of the hazards and tell them what procedures must be followed.
- e) A means of communication between the worker and the outside should be provided since the worker may suddenly begin to feel distress and not be able to summon help. Monitor the space with appropriate instruments while work continues. A worker entering a hazardous atmosphere should wear a supplied-air respirator or self-contained breathing apparatus, a safety harness, a lifeline, and a hoisting device if needed. A lifeline should be constantly held by another worker in a back-up position who is also equipped with self-contained breathing apparatus, safety harness and lifeline. This second worker should constantly watch the worker in the confined space. A worker, within sight and hearing of the area, should be told that others are entering the confined space.
- f) The two standby workers should be well trained in rescue techniques, first aid and resuscitation. Respirators, of either the supplied-air or self-contained type, must be immediately available for use by the rescue workers. If the worker in the confined space does not normally use a respirator, one should be available for him as well.
- g) A qualified tester should determine that the area is free of any combustible gas before any welding or cutting is done. All regulations for welding or

cutting should be followed. Use mechanical ventilation to remove vapors from the space.

- h) Avoid the possibility of heat exposure by providing adequate ventilation or by cooling with portable air conditioning or by periods of rest in cooler air outside the space.

9.5 Cranes

On-site documentation shall be maintained of third party annual certification for each crane and associated rigging equipment brought onto the site. Certification must be kept current; re-certification shall occur if the crane is damaged or the certification period is exceeded.

The crane's operator, safety and health representative, or the competent person shall conduct a daily inspection of the crane, prior to use, to ensure that the crane is safe for operation. This inspection shall be documented and available for examination by the Rubin site manager. Failure to maintain current inspections shall result in shutdown of the equipment. Under no circumstances will anyone be allowed to ride the suspended load, hook, or ball. Under no circumstances will anyone be allowed to conduct work or walk beneath a suspended load.

9.6 Electrical Work

Only workers who have received training in and have demonstrated skills and knowledge in the construction and operation of electric equipment and installations and the hazards involved, or are under such supervision as is necessary for the work undertaken shall be permitted to perform electrical work.

Safe electrical work practices shall be included in electrical work ODIs to minimize the possibility of electric shock, burns, arc flash or other injuries that could result from either direct or indirect electrical contact. This may include specialized

training, observing required approach distances, and the use of appropriate personal protective equipment (PPE) consistent with the requirements of NFPA 70E and applicable standards or requirements.

9.6.1 Flexible Cords and Cables

Use UL-listed (or equivalent standard) flexible cords suitable for conditions and location of use. Flexible cords used with grounding-type equipment shall contain an equipment grounding conductor. Protect flexible cords and cables from damage. When possible, hang extension cords appropriately overhead to avoid tripping hazards and damage caused by foot traffic and equipment. Avoid sharp edges, pinching, or wet, damp, or cold storage. Flexible cords that are damaged shall be removed and discarded or repaired by a qualified electrical worker.

9.6.2 Electrical Equipment Safety

All temporary and permanent electrical work and installations shall comply with the National Electrical Code NFPA 70E (or equivalent standard) as a minimum. Only qualified electricians shall be allowed to work on electrical systems. Non double insulated Alternating Current (AC) electric powered tools and extension cords must be grounded. Ground Fault Circuit Interrupters (GFCI) shall be used whenever electrical tools or extension cords are used. Use of metal ladders at the site is prohibited.

9.6.3 Two Worker Rule

A second worker shall be present when hazardous energized electrical work is performed. The second worker functions as a safety observer and does not participate in the actual work. This worker shall be trained in cardiopulmonary resuscitation and be prepared to initiate other emergency response procedures.

9.6.4 Energy Isolation - Equipment Lockout and Tagout (LOTO)

A procedure shall be made to render inactive any equipment or operating system(s), including electrical, mechanical, pneumatic, chemical, thermal, compressed gases, gravity, or hydraulic, when equipment is being installed, tested, or repaired. When working on equipment or operating systems, the equipment shall be de-energized, and lockout and tag procedures shall be used to ensure that the equipment remains de-energized. Workers shall use insulating protective equipment and maintain a safe distance from exposed energized equipment or systems.

9.6.4.1 *Energized Electrical Work*

Work on energized systems at Rubin site must be strenuously avoided unless it is being determined by an appropriate Rubin PO authority that there is no reasonable alternative course of action. If energized electrical work must be performed on hazardous circuits or if energized work must be performed on any other type of energy system, the Responsible Party shall submit an ODI for the work to be performed and obtain authorization from the Rubin safety manager prior to performing any energized electrical work.

Exception: Taking voltage, current measurements and verification of zero energy using standard test equipment such as voltmeters and current probes is permitted on non-Arc Flash potential energized electrical systems. If a general ODI has been developed for this type of work and kept on file by the Responsible Party; this type of work does not require the Rubin safety manager's authorization. All other hazard identification, control and PPE requirements including arc flash protection continue to apply and shall be documented in a ODI.

9.6.4.2 Systems Lockout/Tagout

Prior to conducting any work which requires lockout/tagout or that interfaces with an existing utility system, the Responsible Party shall first notify the Rubin site manager. This includes lockout/tagouts that occur with temporary and/or permanent electrical power tie-ins at the point of supplied power distribution. The Rubin site manager shall control, coordinate and approve lockout/tagout work being conducted on these equipments/systems and shall ensure that the Responsible Party is aware of and complies with the requirements of the lockout/tagout program. The Responsible Party shall ensure that the Rubin site manager is provided with the provisions of the Responsible Party lockout/tagout program/procedures if it is different from Rubin PO lockout/tagout program. When equipment/system specific procedures are available, they shall be provided to the Responsible Party and utilized as part of the lockout/tagout procedure.

When work is performed downstream of the area power distribution point for temporary or permanent power tie-in, is downstream of an existing lockout/tagout, or is completely independent of existing building equipment/systems, the lockout/tagout shall be performed in accordance with an RUBIN's lockout/tagout program.

9.6.4.3 Tagout Only Requirements

During the design of Rubin, engineers worked to provide physical lockout provisions for all equipment and systems. If, however, it is discovered that equipment or a system cannot physically be locked out and a tagout is applied to equipment/system in place of lockout, all feasible measures to renovate or modify the equipment shall be attempted to accept a lockout device of the energy-isolating device(s). When this cannot be accomplished, the following shall be done:

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- a) Implement additional measures to provide the equivalent level of safety (i.e., remove isolating circuit element, or valve handles) and document the additional measures in the ODI,
- b) Apply a properly completed tag at the energy-isolating device and at the control panel,
- c) Verify that energy sources are eliminated,
- d) Check the tag frequently when working under a tagout to verify that it is still in place, and
- e) Inform the workers on the site of the tagout

9.6.4.4 Equipment Specific Lockout/Tagout Procedures

When written lockout/tagout procedures are required, the Responsible Party may elect to utilize their own procedure format or the ODI format. If the Responsible Party elects to use their own procedure format, then the procedures shall meet the requirements of 29 CFR 1910.147.

9.6.4.5 Lockout/Tagout Inspection Procedures

Weekly documented inspections shall be made for all active lockout/tagout applications. These inspections shall be kept at the jobsite and made available for review by AURA or Rubin personnel.

Daily informal (undocumented) inspections shall be performed to verify lockout/tagouts remain in place.

9.6.4.6 Training Requirements

Workers that have been trained in accordance with the requirements identified in 29 CFR 1910.147, Control of Hazardous Energy (Lockout/Tagout) (or the Chilean equivalent) will be considered as meeting the necessary LOTO training

requirements for working at the Rubin sites. Proof shall be provided of such training as requested by the Rubin PO. Qualified and competent persons shall be provided at the job site.

9.6.4.7 Applying Lockout/Tagout

Each exposed worker shall apply their own lock and a properly completed tag to secure the energy source(s) prior to beginning work activities. When more than one worker is working on the same piece of equipment or project, a group lock box or multi-lock hasps (gang hasp) or other acceptable means shall be used, and each worker shall apply his or her lock. Workers shall not rely on another worker's lockout for protection. Supervisory controlled lockout/tagouts are prohibited at Rubin.

9.7 Excavations and Trenches

No excavation shall commence without first obtaining approval from the Rubin site manager. When excavations are necessary across roadways, approval shall be sought from the Rubin site manager. Where necessary, detour notices and detour routes shall be provided. Warning signs and or delineator cones shall be placed in suitable positions to warn any workers approaching the area of the location and extent of any excavation.

Workers shall report any unusual conditions that may be found, such as underground power lines, pipe lines, sewers or inconsistent materials, immediately to their supervision. If a risk to worker's safety is involved, stop all work until approval to continue is granted by the Rubin site manager.

Responsible Parties conducting trenching shall provide a trenching and shoring plan to the Rubin site manager before work begins. All trenching and shoring operations will be performed under the direction of a designated competent

person. The designated competent person will be present at the excavation site during all trenching and shoring activities.

9.8 Exits and Exits Access

A clear path of at least 44 inches shall be maintained to exits on indoor projects. Exits shall be marked by a readily visible sign. Access to exits shall be marked by readily visible signs in all cases where the exit or the way to reach the exit is not immediately visible to the occupants.

9.9 Fall Protection–Working at Height

Workers working at unprotected heights above four feet (1.219 meters) shall be protected from falls by guardrails, safety nets, or personal fall protection. Ladders and OSHA compliant platforms are excluded from this requirement. Full-body harnesses with two shock absorbing lanyards that are at the length to protect the worker or Dynamic Braking System Lanyards (preferred) meeting OSHA and ANSI standards shall be provided and shall be used by all workers working at heights. Lanyards will have double locking snap hooks. 100% fall protection is required. At no time shall a worker be exposed to the potential of a fall hazard exceeding four feet without required fall protection and that rescue plans have been made. Safety harnesses, lanyards and lifelines shall be inspected daily prior to use. The systems are to be inspected monthly and the results are to be documented. Components that are damaged or incomplete shall be removed from service. All fall protection systems shall be used strictly within the manufacturers' specifications. Workers shall be trained in the proper use, care, and inspection of fall protection equipment. Training shall be documented and available to AURA or Rubin PO for review. Appropriate work platforms with proper guardrails or the use of exterior and interior safety nets, which remove such fall exposures, shall be considered adequate substitutes. The use of the "Leading Edge," "Safety Monitoring System,"

or the “Warning System” shall not be utilized at the site.

9.10 Firearms

Firearms are prohibited on the site, except when political dignitaries are protected by armed security or law enforcement visits.

9.11 Fire Prevention and Protection

Supervisors shall maintain a constant awareness of the fire potential of accumulated materials in their area of responsibility as fire suppression and fire-fighting capabilities are limited. As much as practical, materials shall have flame resistant and fireproof characteristics. Specific materials in this category include fuels, solvents and coatings, tarps, plastic covering material, construction lumber, scaffold planks, paper, boxes and crating materials.

Open burning fire barrels or other open-flame heating devices having exposed fuels below the flame are prohibited. Flashback preventers are required on oxygen/fuel hoses. All engines shall be shut off before refuelling. Smoking is PROHIBITED in buildings and especially around all volatile fuels, vapor, or combustible materials. Only approved containers and portable tanks shall be used. Smoking is only permitted in designated smoking areas.

9.12 Flammable and Combustible Liquids Storage

Flammable and combustible liquids shall be stored in approved containers and cabinets, such as those that are UL or FM listed, and quantities shall be limited to minimize fuel loading in accordance with NFPA Codes. Rags used to apply flammable liquids are to be disposed of in a self-closing approved safety containers designed for that use.

9.13 Floor and Roof Openings

All handrails and fencing shall comply with OSHA regulations and shall be provided by the group that is doing the work. Handrails or fencing shall be provided around all holes or openings to prevent any worker being injured because of a fall. Where it is impracticable to provide fixed guard railing, effective removable barriers shall be provided at all unguarded openings in guard railings or floors, and shall be maintained in position at all times until the hazard no longer exists. Such barriers shall be rigid and of sufficient strength to prevent physical access. Reflective or warning tape is not an acceptable barrier and shall be used only in conjunction with an acceptable barrier.

9.14 Hazardous Materials

Safety Data Sheets (SDS) formally known as Material Safety Data Sheets (MSDS) or equivalent documents shall be maintained on site of hazardous materials, including a list with the common chemical name, quantity, and location at the site. SDS's for all products and materials brought on site shall be made available for review by all workers on the site.

Labels or markings shall not be removed or defaced on the containers of materials delivered to the site. Hazardous materials containers shall be marked with the appropriate hazard classification label.

9.15 Hearing Conservation

very feasible effort shall be made to "engineer out" noise exposures greater than or equal to an 8-hr time-weighted-average (TWA) sound level of 85 decibels (dBA) on the A-weighted scale prior to using personal hearing protection as a noise attenuation device. When controls are not feasible or fail to reduce noise to below

these levels, hearing protection shall be required. Additionally, if work is to be performed in an environment that is suspected to exceed the allowable noise exposures, mandatory hearing protection and hearing conservation requirements shall be implemented. Suspected high noise areas shall be surveyed and evaluated. Workers may observe surveys and evaluations, and the results shall be made available to workers. Maximum allowable noise exposure shall not exceed the permissible noise exposures shown in 29 CFR 1910.95 or the ACGIH TLV's. Noise exposure shall be determined without regard to hearing protection provided.

9.16 Hot Work - Welding, Cutting, Grinding

At least one (1) 10-pound (4.54 kg) ABC-rated fire extinguisher shall be within 25 feet (7.6 m) of operating power tools (gasoline or electric), when welding, cutting, grinding, or other friction or spark generating work is being done, and any time paint or cleaning solutions are being used. Floor areas under and at least 6 feet (1.83m) around the cutting/welding operation must be clean of any combustible and flammable materials. Fire-resistant shields (fire retardant plywood, flameproof tarpaulin, metal, etc.) must cover combustible floors. Spark/slag catchers (fire retardant plywood, flameproof tarpaulins, metal, etc.) must be suspended below any elevated cutting/welding operation. All floor and wall openings within 11m from the work must be covered to prevent sparks/slag from traveling to other, unprotected areas. Containers in or on which cutting, welding and hot work will take place must be purged of flammable vapor. Suitable fire resistant protection will be provided for any other potentially combustible surfaces or flames.

A fire watch shall be utilized any time welding, cutting, grinding, or other spark generating work is being done after work is completed. The work area and all adjacent areas to which sparks and heat might spread (including floor levels above and below and on opposite side of walls) shall be inspected thirty (30) minutes

after the cutting welding or other hot work operations cease for the day and found to be fire safe. A Hot Work Permit shall be completed and approved by the Rubin site manager before the work begins.

Welding/cutting electric arcs can cause eye damage from the radiation as far as 50 feet (15.2m) away reflecting off shiny surfaces, concrete, or unpainted metals. To counteract this reflection, shielding curtains shall be installed where practical or require that all workers in the area must wear appropriate eye protection.

9.17 Housekeeping

Housekeeping crews shall be assigned to assist in maintaining a clean and safe work area. Duties of the housekeeping crew shall include ensuring work areas, stairs, and passageways are kept clear of debris daily. Scrap and unwanted materials shall be gathered and stacked or contained in an orderly manner. Items such as power cords, hoses, tools, equipment, and other items shall be safely and securely routed and/or stored. All items that must be located outside shall be positioned and secured to prevent tipping, falling over, or from becoming airborne and scattered from potential high winds.

Containers shall be provided for the collection and separation of waste, trash, oily or used rags, and other refuse. Containers used for garbage and other oily, flammable, or hazardous wastes (such as caustics, acids, harmful dusts or similar materials) shall be equipped with covers. Chemical agents or substances, which might react to create a hazardous condition, shall be stored and disposed of separately.

Should the Rubin site manager in his or her sole judgment determine that an inadequate standard of housekeeping has developed that compromises cleanliness and safety, he or she has the right to instruct the cessation work until the area is

cleaned and made safe. Neither additional costs nor extension of time shall be allowed because of such a stoppage.

9.18 Hoisting and Rigging

The equipment covered under this procedure includes hoisting and rigging devices and associated equipment such as slings, ropes, and chains, which provide mechanical assistance in raising and lowering a load. This includes either power or manually operated equipment.

Hoisting and rigging equipment shall be undamaged, properly maintained, and in safe operating condition per manufacturers recommendations. Operators shall be experienced and qualified.

Material shall not be hoisted to a structure unless it is ready to be put into place and secured. When loads are being hoisted, walking under the lift or allowing a worker to be exposed to the swing of the lift is prohibited, unless the load is supported by cribbing, jacks, or a solid footing that safely supports the entire weight. All workers shall remain clear of moving and shifting loads. No one shall be allowed to ride the load under any circumstances. Riding of crane hook, ball or load is strictly prohibited; a tag line shall be used to control all loads. For the protection of other workers on the project, barricades and signs shall be posted around the erection area, stating: "Danger People Working Overhead".

9.18.1 Operator Training and Certification

The Responsible Party shall provide proof of training for the crane type that workers will be operating (i.e., Mobile Crane Operator, Tower Crane Operator) when requested. Crane operators shall complete a medical certification examination at least every three years. A valid medical card shall be provided to document this requirement.

9.18.2 Hoisting Planning

A competent person shall identify the hazards and determine the controls necessary to maintain an acceptable level of risk before the lift. A Critical Lift Plan or equivalent is required for complex and critical lifts and shall be included with the ODI.

9.18.2.1 Critical and Complex Lifts

A Critical Lift Plan or an accepted equivalent plan shall be used to document critical and complex lifts. All critical and/or complex lift plans require the review and concurrence of the Rubin site manager and site safety representative(s).

Critical lifts are defined as lifts for which any of the following conditions exist:

- a) The weight of the lift exceeds 90 percent of the crane's rated capacity in the configuration that will be used during the lift.
- b) During steel erection, a critical lift is defined as a lift that exceeds 75 percent of the crane's rated capacity.
- c) Lifts requiring the use of more than one crane.
- d) Lifts requiring the use of Helicopters.
- e) Lifts involving non-routine or difficult rigging arrangements or where loads will require exceptional care in handling because of size, weight, close-tolerance installation or high susceptibility to damage.
- f) Hoisting of workers with a crane or derrick.
- g) If the item being lifted were to be damaged or upset, it could result in a release of hazardous material into the environment or the release of airborne concentrations that could exceed established occupational exposure limits.
- h) The item being lifted is unique and, if damaged, would be irreplaceable or not repairable and is vital to a system, facility, or project operation.

- i) The cost to replace or repair the item being lifted, or the delay in operations of having the item damaged, would have a negative impact on the facility, organization, or construction project to the extent that it would affect project commitments.
- j) The item, although non-critical, is to be lifted above or in close proximity to a critical item or component.

Complex Lifts are defined as lifts that present logistical difficulties or lift coordination complications, thus requiring a higher level of planning and execution. Complex lifts may involve the following:

- a) A lift involving multiple cranes,
- b) Axial rotation of an object in the vertical plane or other complex movement of the load, or
- c) A lift where the behavior of the load while in suspension is questionable.

9.18.3 Pre-Lift Meeting

Prior to performing any lift, a pre-lift meeting with workers involved in the work activity shall be conducted. The following items shall be reviewed:

- a) Scope and sequence of work.
- b) Roles and responsibilities.
- c) Hazards and controls.
- d) Other relevant information identified in the Critical Lift Plan.

When performing lifts designated as critical and/or complex lifts, this meeting shall be documented.

9.18.4 Communication

The use of ANSI B30.5 standard hand signals or voice/radio communications shall

be used during the course of crane operations.

9.18.5 Area Access Control

The lift area shall be cordoned off or manually controlled to prevent access by unauthorized workers by deploying barricades and warning signs and/or utilizing workers to monitor and control access to the area. The swing radius area for mobile cranes shall be cordoned off with warning tape or other barricade apparatus, such as cones.

9.18.6 Rated Load Capacity

The rated load capacity of monorails and other hoisting and rigging structural elements, such as jibs, shall match, at a minimum, the rated load capacity of a hoist placed upon it. The weight of the object being lifted shall be known or determined by the use a dynamometer or load cell. If the weight of the load is unknown, the crane or hoist, slings, and rigging hardware shall have twice the capacity of the estimated load. Outriggers shall be fully extended or the crane's rated load capacity shall be reduced as directed by the crane manufacturers operating manual.

9.18.7 Electrical Distribution Lines

A safe working clearance of at least 10 feet (3.05m) or more shall be maintained from energized electrical lines. Any overhead line shall be considered to be an energized line unless the Rubin site manager or the electrical utility authorities have indicated lines are not energized.

9.18.8 Environmental Factors

Environmental factors, such as weather and terrain can adversely affect a lift. When performing outdoor lifts, the following environmental factors shall be

considered.

9.18.8.1 High Winds

Loads shall not be suspended if prevailing wind conditions may adversely affect the lift. As a general rule, this applies to wind speeds of 25 miles per hour (40.2 km/h) or more. However, based on the nature of the load—such as size, surface area, or fragility—a lower wind speed limit may warrant suspension of the lift. The hoisting and rigging operator and/or lift master shall evaluate behaviour of the load and the lifting equipment to determine if the lift can be safety done.

9.18.8.2 Freezing Surfaces

Do not use hoisting and rigging equipment to “break loose” a load that is frozen to the ground.

9.18.8.3 Ground Conditions

Ground conditions around the hoisting equipment shall be checked for proper support, including settling under and around outriggers, ground water accumulation or other similar conditions.

9.18.9 Daily Pre-Operational Inspections

Hoisting and rigging workers shall visually inspect and document the following items each day or prior to first use if the hoist has not been in regular service.

- a) Functional operating mechanisms for maladjustment interfering with proper operation
- b) Deterioration or leakage in lines, tanks, valves, drain pumps, and other parts of air systems
- c) Hooks for cracks, deformation, latch engagement, and damage from

chemicals

- d) Hoist rope for significant wear, kinking, crushing, bird-caging, corrosion, or broken strands or wires
- e) Hoist chains, including end connections, for excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations
- f) Primary hoist upper-limit device for proper operation

The hoisting and rigging workers or a competent person shall examine deficiencies and determine whether the equipment should be removed from service or if a more detailed inspection is required.

9.18.10 Idle Equipment

Hoisting and rigging equipment that is idle for a period of greater than one month (fully operational but not used) does not require monthly inspections. Idle hoisting and rigging equipment shall be removed from service and tagged with an administrative "CAUTION – Do Not Operate" label to alert potential users of the start-up inspection requirements to include the requirements contained in the daily and monthly inspections. Documentation of these inspections shall be available at the site.

9.18.11 Rated Load Test

Prior to initial use, all cranes in which load sustaining parts have been modified, replaced, or repaired shall be load-tested by a qualified inspector or under the direction of that inspector. Load tests shall be performed in accordance with manufacturer's recommendations.

9.18.12 Storage and Maintenance

Rigging equipment shall be stored and maintained in accordance with the manufacturer's recommendations. Protect rigging hardware from weathering and harsh environments.

9.18.13 Rigging Safe Work Practices

The following safe work practices shall be performed when rigging a load.

- a) The weight of the load shall be determined, and the weight shall be within the rated load capacity of the rigging. The center of gravity and balance behavior shall be determined before the load is lifted to its destination.
- b) Slings shall be selected so that the rated load capacity is adequate and when the appropriate de-ratings are applied depending on the sling angle and/or hitch angle.
- c) Shouldered eyebolts shall be installed in accordance with the manufacturer's recommendations. Eyebolts shall be de-rated when subject to side loads. Use safety hoist rings (swivel eyes) when possible.
- d) Pad sharp and small diameter edges to protect slings and equipment.
- e) Keep the attachment points of rigging accessories as far above the center of gravity as possible. Never use attachment points located below the center of gravity.
- f) Place blocks beneath loads prior to setting down the load to allow removal of the sling, where applicable.

9.18.14 Rigging Hardware Inspections

At the beginning of each shift or prior to use, if it has not been in regular service, the competent person shall visually inspect the rigging equipment (slings, below the hook devices and rigging hardware) in accordance to the manufacturer.

9.18.15 Damaged or Counterfeit Rigging and Hoisting Components

Shackles must be marked with raised or stamped letters on the bow and display the manufacturer's name or trademark, its size, and its safe working load or working load limit. Hooks are required to have the manufacturer's identification forged, cast, or die-stamped on a low-stress or non-wearing area of the hook. Hoisting and rigging components shall be taken out of service if the following are found on the site:

- a) Original markings have been ground off and re-stamped,
- b) Identification tags have altered markings,
- c) Part appears used or if metal is flaking or cracked,
- d) Parts have no markings or are identified only as "China," "Korea," "Mexico," "Thailand," or "India",
- e) Documentation does not exist or is incomplete for the equipment,
- f) Red hooks are not labeled with Crosby Group markings ("Crosby" or "CG"),
or
- g) Parts have been cut, welded, brazed, or otherwise modified

9.18.16 Workers Hoisting

The use of hoisting and rigging equipment to hoist workers is generally prohibited, except when the use of a conventional means of reaching the work area, such as a ladder, scaffold, or man lift, would be more hazardous or is not possible because of structural design or worksite conditions. The Rubin site manager shall authorize this type of activity in advance of the lift by approving a critical lift plan. Additional considerations shall be included in the critical lift plan including the use of engineered and third party approved personnel cage, life lines, fall protection, preplanned rescue procedures, and detailed communication methodology.

9.19 Occupational Health

All reasonable steps and precautions shall be taken to protect the health of the workers. Workers shall be provided with the applicable personal protective equipment and trained in its use. When applicable, there shall be written procedures and occupational health monitoring and/or sampling shall be conducted as required to determine the levels of exposure of workers to hazardous or toxic substances or environmental conditions.

9.20 Painting

Painting work shall be carried out in such a manner that airborne particles of paint are contained to the immediate work area. Any damage caused by such paint particles to privately owned equipment or vehicles parked or passing adjacent to the site shall be the Responsible Party's responsibility and all cost involved in repairing and making good such damage shall be charged to Responsible Party's account.

9.21 Personal Protective Equipment

Management shall be responsible for providing and ensuring use of the required personal protection equipment. Personal Protective Equipment Hazard Assessments shall be used to determine if the job/task requires additional protection for its workers. The following paragraphs related to personal protective equipment establish the minimum requirements at the site.

9.21.1 Eye and Face Protection

All workers shall wear safety glasses with rigid side shields at all times at the construction site unless a higher level of eye protection is required for special hazards. Eye protection is not required in when doing office work in enclose office

spaces, eating in dining areas, attending meetings in conference rooms, or using the restroom. All eye protection must meet the requirements of 29 CFR 1926.102. Safety glasses must be ANSI approved and must be marked with the ANSI designation "Z87.1".

9.21.2 Head Protection

Hard hats shall be worn at all times at the site. Hard hats shall be non-conductive (aluminium hardhats are prohibited) and shall meet the ANSI Z89.1 standard as defined by 29 CFR 1926.100 and bear the "Z89.1" designation. High voltage exposure work requires hard hats that meet ANSI Z89.2 standards and bear the "Z89.2" designation.

9.21.3 Foot Protection

Hard-soled work boots providing ankle protection are a minimum requirement. Any work that presents a greater hazard to the feet or toes requires the use footwear that complies with the provisions detailed in OSHA 1910.136. Canvas, tennis, opened toed, or deck shoes that are not designated with the above foot protection standard are not permitted at the construction site.

9.21.4 Hearing Protection

Approved hearing protection, a hearing protection plan including audiogram testing shall be provided by management to its workers when they are exposed to noise levels greater than 85 dB. Noise levels shall be monitored in the work area, and signs shall be as required by OSHA Noise Exposure 29 CFR 1926.52.

9.21.5 Respiratory Protection

When respiratory hazards exist, a written respiratory protection plan that complies with OSHA Respiratory Protection 29 CFR 1926.103 shall be provided. The plan

shall include worker physicals, fit testing, and training in selection and proper use and care of respirators. Respiratory protection devices approved by the National Institute of Occupational Safety and Health (NIOSH) shall be provided and worn by workers exposed to hazardous concentrations of toxic dust, fumes, or mists.

9.21.6 Gloves and Hand Protection

Appropriate gloves shall be provided and worn when handling hazardous objects or substances that could cut, tear, burn, or be absorbed through the skin.

9.21.7 Clothing

All workers shall wear clothing suitable for the work and weather conditions. The minimum shall be a short (1/4 length) sleeve shirt and long trousers with a high visibility shirt vest or coat. Additional protective equipment and clothing shall be worn as specific work assignments require, including high temperature work, handling corrosive liquids, brazing and welding, and others.

9.22 Portable Electric Heaters

The following requirements apply to potable electric heaters used on the site.

- a) Portable electric heaters shall be equipped with a tip-over switch
- b) Locate portable electric heaters in areas that minimize fire hazards
- c) Do not use portable electric heaters near flammable materials/liquids
- d) Follow manufacturer's literature for clearance of listed portable electric heaters from combustible materials
- e) Never place portable electric heaters on an unstable surface
- f) Use only portable electric heaters approved by Underwriters Laboratories, Inc. (UL) or another nationally recognized test laboratory
- g) Portable electric heaters shall not be used with extension cords, as most

extension cords are not rated for the higher power demands of portable heaters and may become overloaded and catch fire.

9.23 Portable Electrical/Power Tools

Workers shall comply with the following the site minimum requirements.

- a) Power tools shall not be used if safety equipment such as shields, tool rests, hoods, and guards- have been removed or otherwise rendered inoperative.
- b) Workers using tools under conditions that expose them to hazards of flying objects, harmful dusts, and/or noise shall be provided with the required personal protective equipment.
- c) All electrically powered tools shall be properly grounded. Outlets for standard voltage tools shall be protected by ground fault circuit interruption devices and assured grounding plan is utilized. Double-insulated electrical hand tools are recommended. Positive locking or trigger lock devices shall be removed.
- d) Gasoline or diesel powered tools shall not be used in unventilated areas. Gasoline and other flammable liquids shall be dispensed only from United Laboratories (UL) listed safety cans. Cans are required to have a flash screen in place and a self-relieving vent. All cans and containers must be properly labelled depicting the contents of the can or container. Safety cans and drums shall be grounded when dispensing.
- e) Portable grinders will be provided with hood type guards with side enclosures that cover the spindle and at least 50% of the wheel. All wheels will be inspected regularly for signs of fracture.
- f) Bench grinders shall have deflector shields and side cover guards. Tool rests shall have a maximum clearance of 1/8 inch (3.3mm) from the wheel.
- g) Hoses supplying pneumatic tools shall have couplings secured to prevent

accidental disconnection.

- h) Air supply lines will be protected from damage, inspected regularly and maintained in good condition.
- i) Air sources supplying hoses exceeding 1/2 inch (1.27cm) internal diameter shall be protected by excess flow valves to prevent whipping in the event of hose separation or failure.
- j) The pressure of compressed air used for cleaning purposes shall be reduced to 30 psi (2.07 bar) or less (this does not apply to cleaning of forms, etc.). Hose extensions will always be used. At no time shall compressed air be directed toward a person.

9.24 Portable Ladders

Ladders shall not be damaged, loosely fitted, or have missing parts. Ladders shall be set at the correct angle of 75 degrees and on firm ground with at least 1m above the landing place. Workers using a ladder shall have three points of contact on the ladder two feet and one hand, or two hands and one foot. Work platforms shall be considered a better alternative than ladders at any time. For activities taking more than two hours work platforms shall be used rather than ladders.

9.25 Powder Actuated Tools

Each powder actuated tool operator must be certified in accordance with OSHA CFR 29 1926.302(e) requirements and the tools shall meet all applicable requirements of ANSI-A10.3-1970. Only trained, certified workers shall be allowed to operate a powder-actuated tool. If a powder-actuated tool is to be used, an ODI or a safe work procedure shall be submitted to the Rubin site manager before the work.

9.26 Powered Industrial Vehicles (Cranes, Forklifts, and other Mobile Equipment)

All mobile cranes, forklifts, front-end loaders, backhoes, elevated platforms, personnel lifts, augers, suspended scaffolds, spreader beams, and lifting devices, road vehicles or mechanical equipment of any kind, which shall be used at the site, shall comply with the requirements of OSHA 29 CFR 1926, Subpart N and Department Of Transportation (DOT) regulations prior to that equipment being brought onto the site, including but not limited to annual certifications and daily inspections of equipment whether owned, rented, or borrowed.

Only authorized, properly trained workers shall operate powered industrial vehicles per the manufacturer's instructions. Only the operator shall ride on any equipment unless specifically designed to carry more people. Elevated platforms designed to carry people shall only be used on even and compact ground and shall be protected against tipping.

9.27 Radiation

Radioactive materials, sealed radioactive sources, or devices that generate ionizing radiation shall not be brought on the site without express written permission of the Rubin site manager. Any Responsible Party needing to bring radioactive material, sources or radiation-generating devices onto the Rubin site shall allow sufficient lead time in their schedule for the Rubin PO to review their program, documentation, training records, other submittals, etc.

Radiological activities shall have an ODI or safe operating procedure as required by all applicable regulations.

9.28 Sanitation – Water

Adequate supplies of potable water shall be provided for the workers. Portable containers shall be tightly closed and equipped with a tap. Water shall not be dipped from containers, and common drinking cups are prohibited. Any container used to distribute drinking water shall be clearly marked as to its contents and not used for other purposes. Water containers will be sanitized and inspected weekly.

9.29 Scaffolding

Scaffolds shall be designed, erected, moved, disassembled, altered, and inspected by a competent person and according to the manufacturer's instructions. Strict adherence to the OSHA standard is required. Prior to use, the erected scaffold shall be certified and labelled with a tag, identifying name of company, maximum load, and name of competent person. No changes shall be done to an erected scaffold unless the competent person has authorized the changes. The competent person shall be notified immediately if there is damage made to the scaffold. Appropriate access inside the scaffolding shall be provided.

9.30 Steel Erection

Permanent floors shall be installed as soon as practical following the erection of structural members. The erection floor shall be solidly planked over its entire surface except for access openings. Planking shall not be less than 2 inches (5.08 cm) thick, full size undressed, and shall be laid tight and secured against movement by a positive means. Access openings will be guarded with standard guardrail. A 42-inch (106.68 cm) high safety railing shall be installed around the periphery of all temporary planked or decked floors during structural steel erection. Railing shall be at least 3/8-inch (9.65 mm) cable with at least 3 cable clamps at each connection with turnbuckles installed in all continuous runs.

When structural steel is set, each piece shall be secured with not less than two bolts at each connection and drawn up wrench tight before the load is released. At no time shall a worker be exposed to the potential of a fall exceeding 4 feet (1.219m) without required fall protection. Appropriate work platforms with proper guardrails, static lines, or the use of safety nets, which remove such fall exposure, shall be considered adequate.

9.31 Sun Radiation

Exposure to the sun's ultraviolet (UV) radiation at the site is high. UV radiation is a known cause of sunburn, skin cancer, skin aging, eye damage, and may affect the immune system. Overexposure to the sun might also lead to heat exhaustion and/or heatstroke, mainly from dehydration. Workers shall protect themselves by working under shades, covering exposed skin with loose fitting clothes, wearing sunglasses, wearing a hat that shades the face and neck, applying sunscreen to unprotected body parts, and staying hydrated.

9.32 Silica Exposure

Worker exposure to silica shall be at or below, the ACGIH TLVs, or the limits as calculated in OSHA's 1910.1000, Table Z-3, whichever is lower. In general, engineering controls such as wet methods or ventilation should be employed whenever dust-producing activities are anticipated.

9.33 Vehicle Safety

Vehicle drivers shall observe all site traffic rules, ensure that vehicle loads are properly secured and not overloaded, not divert from designated routes, and obey all instructions given by Rubin, NOAO-South or AURA.

9.33.1 Licensing of Vehicle Drivers

Unlicensed workers shall not be permitted to control vehicles on the premises. Management shall not permit any worker to operate equipment or mobile equipment without appropriate certification.

9.34 Waste Management

Trash, and non-hazardous waste receptacles with lids (dumpsters) at the site for collection of waste materials shall be provided. No material shall be abandoned on the site. If material is found on the site, the Responsible Party leaving the material will be responsible for all expense involved in collecting, moving, cleaning and disposal of all material in the area where the material was abandoned. No waste haulers, disposers, recyclers, or scavengers will be allowed on the site without the permission from the Rubin site manager. No workers shall be allowed to eat, drink or smoke where chemicals, hazardous material or waste material is present. No waste may be removed from the site by any worker without authorization from the Rubin site manager. No waste may be brought onto the site and disposed of using AURA's or the site's systems or facilities.

Management shall advise the Rubin site manager of any hazardous waste, as defined in the Chilean standards, or other toxic substance, which is present in or which may be encountered or generated by the Responsible Party. All hazardous waste shall be stored in areas designated for that purpose.

10 Contact Information

A list of contact information for supervisory personnel of all Responsible Parties engaged in the Rubin Project shall be provided to the Rubin site manager, including cellular phone numbers, on- and off-site office phone numbers, and

after-hours contacts. Emergency contact information will be available at Rubin locations.

11 EHS Administrative Requirements for Non-AURA Organizations

11.1 Requirements Specific to Chilean Laws and Standards

Before starting activities on Rubin's Chilean locations, the following documents are required by Chilean Law and shall be delivered by the Responsible Party, preferably in electronic form, translated into Spanish, to the AURA Contract Coordinator and/or to the Rubin site manager.

1. An up-to-date version of the Responsible Party's safety policy and/or plan.
2. A list of workers who will be working on the site. The list shall include names, worker numbers (RUT or employee numbers), occupations, telephone numbers, addresses, and emergency contact information for each worker.
3. Statistics of occupational accidents and illnesses for the past 36 months, including the rate of total claims, monthly frequency and severity rates, rate of claims or Insurance Experience Rate Modifier (EMR), and the costs of the losses or provide an insurance loss run.
4. A list or risk matrix of anticipated hazards and related risk assessment for the work to be done.
5. Copies of Obligation to Inform (ODI) or Job Hazard Analysis (JHA) for each particular task or occupation.
6. Registry or a list of worker safety training records including safety-risk prevention, fire safety, first aid, environmental care and, if applicable, defensive driving, working at height, handling of dangerous materials,

material handling, and others related to the worker's tasks.

7. Registry or list of worker names indicating personal protective equipment issued to them.
8. Copies of the worker skill certifications as required. Specific licenses such as forklift, crane operator, and others (if applicable).
9. Proof of worker medical examinations (if applicable).
10. List of drivers, specifying license type and expiration date, and types of vehicles authorized to operate.
11. An inventory of equipment and vehicles with make, model, year, license plate number, load-carrying capacity, and proof of compulsory insurance.
12. Certificate of affiliation with an accident insurance carrier (mutualidad) or equivalent worker's compensation insurance company.
13. Names, contact information, current registration from the Ministry of Health of the Responsible Party safety representatives if applicable.

The Responsible Party shall provide updated information in a timely matter to the AURA Contract Coordinator and/or to the Rubin site manager if there are changes to the above information including the addition of new workers or termination of workers.

11.2 General Requirements

The Responsible Party has overall accountability for the safety of its part of the project and shall allocate the resources necessary for implementing all required safety-related codes, contract, or agreement requirements. In addition to the above Chilean requirements, the Responsible Party shall:

- a) Follow all AURA and Rubin site specific environmental, health and safety requirements as defined by this document,
- b) Establish EHS requirements for its subcontractors, if applicable,

- c) Develop, implement, and/or adhere to activity hazard ODI and other pre-job planning documents required by this manual,
- d) Provide training to workers in safe-work practices,
- e) Provide required personal protective equipment (PPE), train workers on how to use the equipment, and enforce its use in the field,
- f) Monitor the workplace for unsafe conditions and take immediate action to correct unsafe conditions, acts, and other deficiencies identified during inspections,
- g) Perform necessary personal exposure monitoring,
- h) Coordinate and conduct pre-job planning with subcontractors, field supervisors, affected lab managers, and others, as required,
- i) Conduct a daily walk-around safety inspection and document this inspection, and
- j) Instruct all workers, initially and periodically, on matters pertaining to worker safety and health rights, protections, obligations, and responsibilities.

11.3 Safety and Health Management Plans

The Responsible Party shall develop, submit to the Rubin site manager, and implement a project and site specific Safety and Health Management Plan (“the Plan”) that includes the Responsible Party’s commitment to provide safe and healthful working conditions for its workers, subcontractor(s), AURA workers, Rubin workers, other workers, and members of the public that may be affected by the Responsible Party’s work. Mandatory subjects are described below in Section 11.5–Specific Requirements to be Included in Responsible Party’s Safety and Health Management Plan.

The Responsible Party shall ensure that all of its workers are aware of and follow their Safety and Health Management Plan. The Plan, signed by one or more of

Responsible Party's officers, shall be submitted to the Rubin site manager no later than ten (10) days following the execution of the contract or agreement, if applicable, and prior to initiation of work on site. Upon the submission of the Plan to the Rubin site manager, the Plan shall be deemed incorporated by reference into the contract or agreement if applicable. The Responsible Party shall comply with all of the terms and conditions of the Plan (and all such other documents incorporated by reference into a Contract or agreement), as though the same were fully set forth herein.

This EHS Plan (LPM-114) is the governing document and must be utilized when completing the Plan to ensure that Rubin site specific requirements are being met and incorporated into the project planning process.

11.4 Review of Safety and Health Management Plan

The Plan shall be reviewed by the Rubin PO safety manager or designate for compliance with the requirements established in this document. The Plan shall address the hazards with the type(s) of work to be performed by the Responsible Party. The Rubin PO safety manager or designate shall return the Plan to the Responsible Party with comments on areas that do not appear to address the hazards and work to be performed, if applicable. Work shall begin only after Rubin PO has reviewed the Plan and the Responsible Party has satisfactorily responded to any questions or clarifications. Any revisions subsequent to the initial review shall be submitted to Rubin PO safety manager prior to the Responsible Party's implementation of those revisions.

11.5 Specific Requirements to be Included in the Safety and Health Management Plan

At a minimum, the Plan shall include safety and health requirements and/or

procedures relevant to the Responsible Party's scope of work, including but not be limited to the following subjects.

11.5.1 Project Description

The Plan shall provide a general description of the work or activity the Responsible Party plans to do on the site.

11.5.2 Emergency Contacts and Worker Lists

A list of workers who will be working on the site is required. The list shall include names, worker numbers, occupations, telephone numbers, addresses, and emergency contact information for each worker working on the site. Other worker related requirements may be included with this list.

11.5.3 Safety and Health Policy

The Plan shall include the Responsible Party's environmental, health and safety Policy, including management commitment, expectations, goals, and details of worker participation including hazard recognition and control, stop work authority, corrective action, as well as defined accountabilities and responsibilities for managers, supervisors, workers, and subcontractors. Worker's rights and responsibilities regarding a safe and healthful work environment shall be including in the policy. Reference can be made to worker safety and health laws and other applicable codes and standards.

11.5.4 Organization

As part of the Plan, the Responsible Party shall provide the Rubin site manager with an updated detailed organization chart showing the positions, job descriptions, reporting relationships, telephone numbers, and emergency telephone contact numbers for all workers associated with the project.

If managerial or supervisory workers are substituted during the project, provisions shall be made to replace the position with equivalent fitness and skill for the required work, and only with the Rubin site manager's approval. The Responsible Party shall submit updated information as detailed in this section for the substitutions.

The Responsible Party shall provide details of each sub-program's name, address, representatives, telephone numbers, and emergency contact telephone numbers.

11.5.5 Safety and Health Representative(s)

The Responsible Party shall designate competent safety and health representative(s) whose duty shall be the implementation of the safety and health management plan on the site. The safety and health representative(s) must be knowledgeable of the project's hazards and have the authority to correct unsafe conditions or behaviour. The Responsible Party shall submit the names and qualifications of the safety and health representative(s) and alternates to the Rubin site manager for review prior to assignment of duties.

The Responsible Party's safety and health representative(s) shall be present at all times when the Responsible Party's work is being performed at the site. If a safety and health representative must be off site, the Responsible Party shall notify the Rubin site manager of an alternate.

Duties of the Responsible Party safety and health representative(s) include, but are not limited to enforcing safety and health requirements, providing and coordinating job-specific safety and health orientations and/or materials, leading incidents/accidents investigations, conducting daily inspections and reporting safety related information. The safety and health representative must have the authority to stop work and change the operation to correct any deficiencies or to eliminate any hazards observed.

The safety and health representative(s) shall have taken, as a minimum, training equivalent to the OSHA 10-hour training course in construction safety before work at the site begins. Documented evidence of attendance, signed by the OSHA certified inspector or equivalent, shall be submitted to the Rubin site manager for confirmation.

11.5.6 Hazard Communication

Hazardous chemicals (as defined in 29 CFR 1910.1200) to be brought or used on-site are to be identified and managed appropriately. The Responsible Party is responsible for maintaining an up-to-date chemical inventory (only of those chemicals brought on site), and copies of Safety Data Sheets (SDS) or equivalent documentation of all hazardous materials must be maintained at the task or project support facilities and made available for review by site workers.

The Responsible Party shall inform the Rubin site manager and others on the site of any precautionary measures that need to be taken to protect everyone during normal operating conditions and in foreseeable emergencies.

The Responsible Party shall identify the methods they will use to inform other affected workers of their labelling system if the labelling system is not readily understandable.

11.5.7 Stop Work Authority

The Responsible Party shall have the same responsibility and authority as company workers to stop work if unanticipated/unsafe conditions are identified or non-compliant practices are observed at the site. The Rubin site manager shall be immediately notified that work has stopped and be given the reasons for stopping of the work. The management involved shall work together to resolve any issues, and reach consensus to resume work. Appropriate measures shall be taken to

abate the imminent hazard and coordinate efforts to mitigate the potential for recurrence.

11.5.8 Alcohol and Substance Abuse Plan

It is the Rubin PO policy to maintain a drug-free workplace. Possession of illegal drugs, alcoholic beverages, and drug paraphernalia is prohibited at the site. Workers taking medications that might be needed in an emergency or might affect emergency medical treatment shall inform their Human Resources department to determine if the immediate supervisor should be informed. Workers found with illegal substances in their possession shall immediately be denied access to the site.

The Responsible Party is encouraged to have an established drug and alcohol policy including post-accident testing, pre-placement testing, and testing for cause. Workers testing positive may be permanently banned from any AURA property including Rubin locations and the employing Responsible Party's contract could be terminated. The Responsible Party is encouraged to have resources available to Responsible Party workers for drug counselling, rehabilitation, and/or group health insurance for counselling and rehabilitation benefits. The cost of such testing shall be at the Responsible Party's expense.

11.5.9 Safety and Health Representative Status

The Responsible Party's supervisors and/or safety and health representative(s) may receive citations for failure to enforce safety requirements from a governmental entity. Any supervisor and/or safety and health representative who received a citation of any kind will not be allowed to continue in his/her capacity until reinstated by the Responsible Party and the advisement of the Rubin site manager. Any suspension evoked by the citation will start on the day following the citation in order to allow the Responsible Party time to arrange for a replacement,

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unless the seriousness of the violation warrants immediate removal from the site. The Responsible Party is responsible for submitting to the Rubin site manager for approval the name and qualifications of the supervisor and/or the safety and health representative before work will continue. If the disciplinary action results in suspension of Responsible Party worker, the Responsible Party shall make no claim for extension of time or for compensation for damages because of, or in connection with, this disciplinary action.

11.5.10 Non-Compliance

The Rubin site manager shall notify the Responsible Party, in writing, of any safety and health noncompliance and the corrective action to be taken, which may include suspension of workers from the site. After receipt of such notice, the Responsible Party shall immediately take corrective action. In the event the Responsible Party fails to comply with regulations and requirements, The Rubin site manager under the advisement of Rubin PO project manager and the Rubin PO safety manager may without prejudice to any other legal and contractual rights, issue an order stopping all or any part of the work. Thereafter, a start order to resume the work shall be issued by the Rubin site manager under the advisement of Rubin PO project manager and the Rubin PO safety manager. The Responsible Party shall make no claim for an extension of time or for compensation for damages because of, or in connection with, such work stoppage.

11.5.11 Conflicts and Clarification with Regulations, Contract, or Agreement

Requests for exceptions from these Rubin safety and health requirements, the Responsible Party's Safety and Health Management Plan, or the Responsible Party's reviewed ODI's must be submitted in writing to the Rubin site manager under the advisement of the Rubin PO project manager and the Rubin PO safety

manager. Exceptions shall not be implemented without prior written approval.

12 Attachment

12.1 List of Medical Centers

Medical Center	Address	Phone Number
Hospital San Juan de Dios (Vicuña)	Arturo Prat 591	512333176
Hospital de La Serena (La Serena)	Av. Balmaceda 916	512333424
Clinica RedSalud Elqui (La Serena)	Av. El Santo 1475	600 718 6000
Hospital San Pablo de Coquimbo (Coquimbo)	Av. Pedro Nolasco Videla	512321119