

# Environmental Monitoring Report

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#11 Semestral Report  
March 2020

## PRC: Qinghai Delingha Concentrated Solar Thermal Power Project

Prepared by CGN Solar Energy Development Co. Ltd. and CGN Delingha Solar Energy Co. Ltd.  
for the People's Republic of China and the Asian Development Bank.

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The 11<sup>th</sup> Semi-annual Report

第 11 次半年度报告

March 2020

2020 年 3 月

## People's Republic of China: Qinghai Delingha Concentrating Solar Thermal Power Project

## 中华人民共和国：青海德令哈集热式太阳能光热发电 项目

Prepared by CGN DELINGHA SOLAR ENERGY CO., LTD. for the People's Republic of China and the  
Asian Development Bank.

由中广核德令哈太阳能有限公司为中华人民共和国和亚洲开发银行编制

## CURRENCY EQUIVALENTS

### 等价货币

(as of 231 March 2020)

(2020 年 3 月 23 日)

Currency Unit	-	CNY
货币单位		元
CNY 1.00	=	\$0.1409
1.00 元		0.1409 美元
\$1.00	=	CNY 7.0963
1 美元		7.0963 元

## ABBREVIATIONS

### 缩写

ADB – Asian Development Bank

ADB--亚洲开发银行

ASL – above sea level

ASL--海拔

CGN – China General Nuclear Power Group

CGN--中国广核集团

CHP – combined heat and power

CHP--热电联产

CGN – China General Nuclear Power Holding Corporation

CGN--中国广核集团控股公司

CGN-DSE – China General Nuclear Delingha Solar Energy Co., Ltd.

CGN-DSE--中国广核德令哈太阳能有限公司

CNY – Chinese yuan

CNY--人民币元

CSC – construction supervision company

CSC--施工监督公司

CSP – concentrating solar power

CSP--集热式太阳能发电

DI – design institute

DI--设计院

DNI – direct normal irradiance

DNI--直接辐射

EA – executing agency

EA--执行机构

EHS – environment, health and safety

EHS--环境、健康和安

EIA – environmental impact assessment

EIA--环境影响评估

EMP – environmental management plan

EMP--环境管理方案

EMS – environmental monitoring station

EMS--环境监测站

EMU – environmental management unit

EMU--环境管理单位

EPB – Environmental Protection Bureau

EPB--环保局

FSR – feasibility study report

FSR--可行性研究报告

GDP – gross domestic product

GDP--国内生产总值

GHG – greenhouse gas

GHG--温室气体

GRM – grievance redress mechanism

GRM--申诉处理机制

HTF – heat transfer fluid

HTF--导热油

IA – implementing agency

IA--实施机构

IEE – initial environmental examination

IEE--初始环境检查

IT – interim target

IT--临时目标

LFR – linear fresnel reflector

LFR--线性菲涅耳反射器

MEP – Ministry of Environmental Protection

MEP--环境保护部

MSDS – material safety data sheet

MSDS--材料安全数据表

NDRC – National Development and Reform Commission

NDRC--国家发展和改革委员会

PPCU – project public complaint unit

PPCU--项目公众投诉单位

PPE – personnel protective equipment

PPE--个人防护设备

PPTA – project preparatory technical assistance

PPTA--项目准备技术援助

PRC – People’s Republic of China

PRC--中华人民共和国

SCA – solar collector assembly

SCA --太阳能集热器组件

SCE – solar collection element

SCE--太阳能集热元件

SEDC – Solar Energy Development Co., Ltd.

SEDC--太阳能开发有限公司

SPS – Safeguard Policy Statement, ADB

SPS--保障政策说明，亚洲开发银行

TA – technical assistance

TA--技术援助

TES – thermal energy storage

TES--热能存贮

WHO – World Health Organization

WHO--世界卫生组织

## **WEIGHTS AND MEASURES**

### **度量衡**

BOD5 – biochemical oxygen demand, five days

BOD5--生化氧需量，五天

cm – centimeter

cm--厘米

CO<sub>2</sub>– carbon dioxide

CO<sub>2</sub>--二氧化碳

COD – chemical oxygen demand

COD--化学需氧量

dB(A) – A-weighted sound pressure level in decibels

dB(A)--以分贝为单位的 A 加权声压

DO – dissolved oxygen

DO--溶解氧

DOD – dissolved oxygen deficit

DOD--溶解氧不足

GJ – gigajoule

GJ--千兆焦

ha – hectare

ha--公顷

kcal – kilocalorie

kcal--千卡

kg – kilogram

kg--千克

km – kilometer

km--千米

kWh – kilowatt-hour

kWh--千瓦时

m – meter

m--米

m/s – meter per second

m/s--米每秒

m<sup>3</sup> – cubic meter

M<sup>3</sup> --立方米

mg/l – milligram per liter

Mg/l --毫克每升

mg/m<sup>3</sup> – milligram per cubic meter

mg/m<sup>3</sup>--毫克每立方米

MW – megawatt

MW--兆瓦

NO<sub>2</sub>– nitrogen dioxide

NO<sub>2</sub>--二氧化氮

NO<sub>x</sub>– nitrogen oxides

NO<sub>x</sub>--氮氧化合物

°C – degrees celsius

°C--摄氏度

pH – a measure of the acidity or alkalinity of a solution



pH--一种溶液酸度或碱度的量度

PM10 – particulate matter smaller than 10 micrometers

PM10--小于 10 微米的颗粒物

SO<sub>2</sub>– sulfur dioxide

SO<sub>2</sub>--二氧化硫

TN – total nitrogen

TN--总氮

TSP – total suspended particulates

TSP--全部悬浮颗粒物

## NOTE

### 注

- I. In this report, "\$" refers to US dollars.
- I. 本报告中的“\$”指美元。

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**BASIC PROJECT INFORMATION****基本项目信息**

ADB Loan No. ADB 贷款编号	Loan 3075-PRC 贷款 3075-PRC
Project Title 项目名称	Qinghai Delingha Concentrating Solar Thermal Power Project 青海德令哈集热式太阳能光热发电项目
Borrower 借方	People's Republic of China 中华人民共和国
Executing Agency 执行机构	CGN SOLAR ENERGY DEVELOPMENT CO., LTD. 中广核太阳能开发有限公司
Implementing Agency 实施机构	CGN DELINGHA SOLAR ENERGY CO., LTD. 中广核德令哈太阳能有限公司
Total Estimated Cost 总估算成本	USD 384,609,851 384,609,851 美元
ADB Loan ADB 贷款	USD 150,000,000 150,000,000 美元
Counterpart Financing 配套资金	CNY 1,055,355,000 1,055,355,000 元
Loan Approval Date 贷款批准日期	23 January 2014 2014 年 1 月 23 日
Loan Agreement Signed Date 贷款协议签署日期	23 January 2014 2014 年 1 月 23 日
ADB Loan Effectiveness Date ADB 贷款生效日	23 January 2014 2014 年 1 月 23 日
Project Complete Date 项目完成日期	30 November 2017 2017 年 11 月 30 日
Original Loan Closing Date 原始贷款终止日期	31 MAY 2018 2018 年 5 月 31 日

Exchange Rate 汇率	6.486
Date of Latest ADB Loan Review Mission 最近 ADB 贷款评估任务日期	Sept 2017 2017 年 9 月
Type of This Report 本报告类型	Semi-annual Environmental Monitoring Report 半年度环境监测报告
Period Covered by This Report 报告涉及时期	1 July 2019 to 31 December 2019 2019 年 7 月 1 日至 2019 年 12 月 31 日







## I. INTRODUCTION

### I. 导言

#### A. Background

#### A. 背景

1. This report is the 10<sup>th</sup> environmental monitoring report of the Qinghai Delingha Concentrating Solar Thermal Power Project, covering the period between July 2019 and December 2019. It is prepared by CGN DELINGHA SOLAR ENERGY CO., LTD.

1. 本报告为青海德令哈集热式太阳能光热发电项目的第 10 次环境监测报告，时间跨度为 2019 年 7 月至 2019 年 12 月，本报告由中广核德令哈太阳能有限公司编制

2. This environmental monitoring report is prepared in accordance with the project environmental management plan and environmental monitoring framework.

2. 本环境监测报告是根据项目环境管理方案和环境监测框架编制的。

#### B. Project Summary

#### B. 项目概述

3. The concentrating solar thermal power (CSP) project includes (i) 621,300 m<sup>2</sup> of solar field area with 190 solar collector loops; (ii) one 50 MW steam turbine; (iii) two molten salt-tanks with seven hours thermal energy storage capacity; and (iv) a natural gas fired heater for startup, or anti-freezing protection for HTF. Air cooling system will be adopted for the steam condensing system to conserve water.

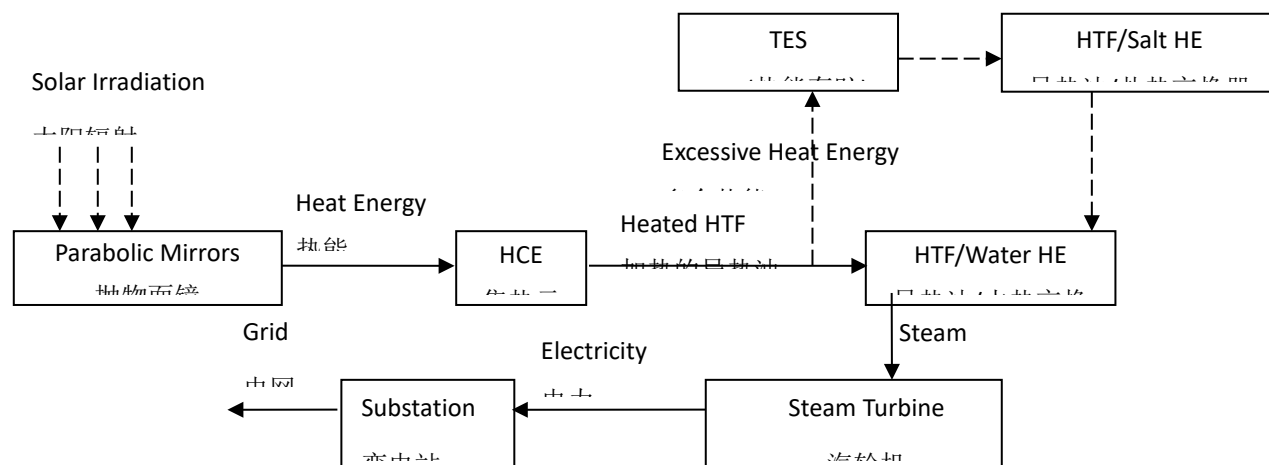
3. 集热式太阳能光热发电（CSP）项目包括（i）621,300 m<sup>2</sup> 的太阳场，配备 190 个太阳能集热器回路；（ii）一个 50 兆瓦的汽轮机；（iii）具有七小时热能储存能力的两个融盐罐；以及（iv）用于启动或导热油防冻保护的天然气加热器。蒸汽冷凝系统将采用空气冷却系统以节约用水。

4. CSP technologies generate electricity in a similar way to conventional power stations by using steam to drive a turbine. The fundamental principle of CSP technologies is to collect the energy carried by sunrays, allowing heat transfer fluid (HTF) to absorb the collected energy and then converting the thermal energy into electricity. Excessive energy will be stored in molten salt tanks and will be used when sunrays are insufficient to generate energy. The process of energy conversion in a CSP plant is illustrated in Figure 1.

4. CSP 发电技术与传统电站类似，通过蒸汽驱动汽轮机。CSP 技术的关键是收集阳光携带的能量，通过导热油（HTF）吸收收集的能量并将热能转化为电力。多余的能量将储存在融盐罐中，以便在阳光不足以产生能量的时候使用。CSP 电厂中能量转化过程见图 1。

Figure 3-1: Major Components of a CSP Plant

图3-1: CSP电厂的主要组成



Note: HCE = heat collection element, HE = heat exchanger, HTF = heat transfer fluid, TES = thermal energy storage.

注: HCE=集热元件, HE=热交换器, HTF=导热油, TES=热能存贮

5. The parabolic trough solar collector system is designed to concentrate the sunrays via parabolic curved solar reflectors (mirrors) onto a thermally efficient linear receiver (absorber tubes). The receiver is located in the optical focal line of the collector. The receiver consists of a specially coated absorber tube embedded in an evacuated glass envelope. Synthetic thermal oil is used as heat transfer fluid (HTF) and is circulated in the absorber tubes. The HTF will be heated to approximately 400° C by the sunrays. Heat exchangers will transfer the collected solar energy to water and this process continues until the temperature of the water is heated sufficiently to generate steam. After passing the pre-heater, kinetic energy will be generated by the operation of the evaporator, super-heater and superheated steam and such kinetic energy will be converted into electrical energy. The cooled HTF will be circulated back to absorber tubes. The exhaust steam leaving the turbine is transported to a condenser, which cools the steam and form water. Then, the water is returned to the heat exchanger. This cycle is repeated.

5. 抛物面槽式太阳能集热系统通过抛物面太阳能发生器（反射镜）将阳光集中在热效率较高的线性接收器上（吸收管）。接收器位于集热器的光学焦线上。该接收器的真空玻璃外壳中嵌入了一个涂有特别涂层的吸收管。将合成导热油用作导热油（HTF），在吸收管中循环。阳光将把导热油加热至接近400℃。热交换器将会把收集的太阳能传递给水，直到经加热的水温高到足以产生蒸汽。在经过预热器后，使用蒸发器、过热器和过热蒸汽来运行产生动能并将动能转化为电能。冷却的导热油将循环回吸收管。将汽轮机排除的蒸汽输送至冷凝器，将蒸汽冷凝成水。接着，将水输送回热交换器。循环完成。

## C. Implementation Organization

### C. 实施组织

6. This project is construction of a concentrating solar thermal plant in Delingha, Qinghai Province, the People's Republic of China (PRC). China General Nuclear Power Holding Co., Ltd. (CGN) is the executing agency (EA) for the project. A project leading group was established under the CGN and is responsible for directing the project and providing policy guidance during project implementation. China General Nuclear Delingha Solar Energy Co., Ltd. (CGN-DSE) is the implementation agency (IA).

6. 本项目在中华人民共和国（PRC）青海省德令哈建设集热式太阳能光热发电厂。中广核控股有限公司（CGN）是本项目的执行机构(EA)。CGN 下设项目领导小组，负责为项目提供指导并在项目实施过程中提供政策指导。中广核德令哈太阳能有限公司（CGN-DSE）是实施机构（IA）。

7. The EA holds the final responsibility of EMP implementation and EMP reporting. It provides guidance to the IA, coordinate with other governmental agencies as necessary, and submit EMP monitoring reports to ADB semi-annually during construction and annually during operation of the project.

7. EA 对 EMP（环境管理方案）的实施和 EMP 报告负有最终责任。它为 IA 提供指导，必要时与其他政府机构协调，并在施工期间每半年向 ADB 提交 EMP 监测报告、在项目运营期间每年向 ADB 提交 EMP 监测报告。

8. The IA is responsible for implementing the EMP, which nominates a qualified environmental manager to undertake effective environmental management activities specified in the EMP. The IA forms an environmental management unit (EMU), established on June 2015, which consists of a leader and 2 staffs to negotiate with CGN on environmental issues. The EMU will be supported by environment consultants and supervised by the local EPB. The IA is responsible for implementing mitigation measures and EMP monitoring. The IA prepares and submits the EMP monitoring reports to the EA who will review the reports and submit them to ADB.

8. IA 负责实施 EMP，指定合格的环境管理者开展 EMP 中规定的有效环境管理活动。IA 组建了一个环境管理单位（EMU），成立于 2015 年 6 月，由一名负责人和 2 名员工组成，旨在与 CGN 就环境问题进行协商。环境顾问将为 EMU 提供支持，当地 EPB（环保局）将对其进行监督。IA 负责实施缓解措施和 EMP 监测。IA 编制 EMP 监测报告并将其提交给将对报告进行评估并提交 ADB 的 EA。

9. IA Environmental Engineers are responsible for the daily internal inspection, monitoring and evaluation of mitigation measures on the construction site, and responsible for implementing relevant mitigation measures specified in EMP during operation.

9. IA 环境工程师负责日常对施工现场缓解措施的内部检查、监测和评估。负责在运行期间实施 EMP 中规定的相关缓解措施。

10. The local EPB and Environment Monitoring Station (EMS) under the EPB will ensure in compliance with the PRC's environmental standards and regulations through regular and random environmental

compliance monitoring and inspection during construction and operation. The EMS will conduct environmental compliance monitoring and inspection at least semiannually on behalf of the EPB.

10. 当地 EPB 和 EPB 下的环境监测站（EMS）将会通过在施工和运营期间进行的定期与随机环境合规性监测和检查环，确保与中华人民共和国的环境标准和规范的一致性。EMS 将代表 EPB 至少每半年监测并检查环境的合规性。

11. ADB is responsible for reviewing the overall environmental performance of the project. ADB will also disclose the EMP monitoring reports on its website. ADB will review the semiannual and annual EMP performance reports submitted by the EA, and conduct due diligence of environment issues during the project review missions. If the EA and IA fail to meet safeguards requirements described in the EMP, ADB will seek corrective measures and advise the EA and IA on items in need of follow-up actions.

11. 亚洲开发银行负责评估项目的总体环境表现。亚洲开发银行还在其网站上公布了 EMP 监测报告。亚洲开发银行将评估 EA 提交的年度和半年度 EMP 业绩报告，并于项目评估任务期间对环境问题进行尽职调查。如果 EA 和 IA 未能实现 EMP 中所述的保卫要求，亚洲开发银行将寻求纠正措施，并对需要采取后续措施的事项对 EA 和 IA 提出建议

## II. IMPLEMENTATION PROCESS

### II. 实施过程

#### A. Overall Project Implementation Progress

##### A. 整体项目实施进程

12. The construction work in the power island has been completed and it is at the test run phase.
12. 电力岛项目施工已完成，处于试运阶段。

#### B. Detailed Engineering Progress

##### B. 详细的工程进展

13. Detailed geological survey work has started since November 2014 and it was finished in January 2015. Preliminary design work has commenced since November 2014, which was completed in February 2015. Table below provides detailed progress.

13. 具体的地理调查工作自 2014 年 11 月开始，并于 2015 年 1 月结束。自 2014 年 11 月开始初步设计工作，于 2015 年 2 月完成。下表提供了具体进程。

Table 1. Summary of Engineering Progress

表 1. 工程进程概述

Project Components 项目组成	Detailed Description of Work 具体工作说明	Contractor/ 承包商/ Implementer 实施方	Implementation Status 实施状态
I. Site Preparation			
1. 场地准备			
	Detailed geological survey work and preliminary design work has commenced since November 2014	Environmental science research and design institute of Qinghai province	Finished
	具体的地理调查工作和初步设计工作已于 2014 年 11 月开始。	青海省环境科学研究设计院	完成
II. Civil Works			
II. 土建工程			

Project Components 项目组成	Detailed Description of Work 具体工作说明	Contractor/ 承包商/ Implementer 实施方	Implementation Status 实施状态
A. SF Civil Works  A. SF 土建工程			
	It was started at Oct. of 2016. The construction was finished at July of 2017.  于 2016 年 10 月开始。于 2017 年 7 月完成施工。	Joint Venture of Beijing Shouhang IHW Resources Saving Technology Co.,Ltd. And Shandong Electrical Power Construction No.2 Company  北京首航艾启威节能技术有限公司合资企业和山东电力建设 2 号公司	Finished  完成
B. BOP Civil Works  B. BOP 土建工程			
	It was started at July of 2015. The construction basement was completed at May 2016.  于 2015 年 7 月开始。施工基地于 2016 年 5 月完工。	Northwest engineering corporation limited  西北工程有限公司	Finished  完成
C. HTF/TES  C. 导热油/热能 存贮			
	It was started at April of 2016. The construction was finished at December of 2017.  于 2016 年 4 月开始。于 2017 年 12 月完成施工。	Shandong Sunway Petrochemical Engineering share Co., Ltd.  山东三维石化工程股份有限公司	Finished  完成
III. Earth Works  III. 土方工程			
	land leveling work  土地平整工作	Changsha Construction Engineering Group and HENAN installation group co., Ltd  长沙建设工程集团与河南安装集团有限公司	Finished  完成
1. Site treatment  1. 现场处理			Start :July of 2014,  开始: 2014 年 7

Project Components 项目组成	Detailed Description of Work 具体工作说明	Contractor/ 承包商/ Implementer 实施方	Implementation Status 实施状态
			月，  Complete: 15 December of 2014  完成: 2014 年 12 月 15 日  Finished  完成  Start :Jan of 2015,  开始: 2015 年 1 月，  Complete: May of 2015  完成: 2015 年 5 月
IV. Equipment Installation			
IV. 设备安装			
	It was started at March of 2016. The installation was finished at December of 2017.  于 2016 年 3 月开始。于 2017 年 12 月完 成安装。	Northwest engineering corporation limited  西北工程有限公司	Finished  完成

### C. Project Cost Associated with the Environmental Management Plan

#### C. 环境管理方案相关项目成本

14. The estimated total budgets for environmental mitigation and monitoring are as follows:

14. 环境缓解和监测的预估总预算如下:

- i) Mitigation cost during construction is estimated at CNY7.85 million or \$1.3 million;
- i) 施工期间的缓解成本估计为人民币785万元或130万美元;

- ii) Annual operating cost for environmental protection is CNY3.68 million or \$594,000;
- ii) 环境保护的年度运营成本估计为368万元人民币或59.4万美元;
- iii) Monitoring cost during construction is estimated at CNY960,000 or \$614,400;
- iii) 施工期间的监测费用估计为人民币96万元或61.44万美元;
- iv) Estimated annual monitoring cost during operation is CNY570,000 or \$92,000; and
- iv) 运营期间的年度监测费用估计为57万元人民币或9.2万美元;且
- v) The estimated budget for capacity building is CNY70,000 or \$11,000.
- v) 能力建设的预算为人民币7万元或1.1万美元。

15. The total environmental investment of the Project of CNY 17.519 million (\$ 1.99 million) is allocated, which accounts 0.63% of the total project investment. During this reporting period, the total cost was CNY1,200,000, which included costs for Hazardous wastes disposal.

15. 为该项目的环境总投资拨款人民币 1751.9 万元（199 万美元），占整个项目投资的 6.85%。在本报告期内，共花费 120 万元，其中包括危险废物处置费。



### III. IMPLEMENTATION OF THE ENVIRONMENTAL MANAGEMENT PLAN

#### III. 环境管理方案的实施

##### A. Background

##### A. 背景

16. The EMP was developed aligning with the ADB safeguards statement policy (2009) and environmental impact assessment (EIA) report of the Qinghai Delingha CSP project approved by the Qinghai EPB on 28 December 2012. The EMP was agreed between the ADB and CGN as a part of the loan agreement.

16. T EMP 是根据青海环保局于 2012 年 12 月 28 日批准的青海德令哈 CSP 项目的亚洲开发银行保障声明政策（2009）和环境影响评估（EIA）报告制定的。经亚洲开发银行与中广核达成一致，EMP 构成贷款协议的一部分。

##### B. Loan Covenants

##### B. 贷款契约

17. The loan covenants of the project stipulate the following agreements on environmental safeguards. Table below provides the compliance status of environment related project covenants during this reporting period.

17. 本项目的贷款协议规定了以下关于环境保护的协定。下表提供了本报告期间关于环境的项目契约的合规性状况。

Table 2 .Environment Related Project Agreements and Compliance Status

表 2.环境相关项目协议与合规性状况

Environment Related Project Agreements 环境相关项目协议	Compliance Status 合规性状况
CGN, CGN-SEDC and CGN-DSE shall ensure, and cause other involved agencies to ensure, that the preparation, design, construction, implementation, operation and decommissioning of the Project, and that all Project facilities comply with (a) all applicable laws and regulations of the Borrower relating to environment; (b) the environmental safeguards; and (c) all measures and requirements set forth in the IEE, the EMP, and any corrective or preventative actions (i) set forth in a Safeguards Monitoring Report, or (ii) as subsequently agreed between ADB and CGN.	Complied 遵守
CGN、CGN-SEDC 和 CGN-DSE 应确保并促使相关机构确保项目的准备、设计、施工、执行、运行和退役，且所有项目设施符合（a）借方与环境相关的所有法律法规；（b）“环境保障”；和（c）IEE、EMP 和所有纠正性或预防性措施的规定和要求，即（i）“保障监测报告”或（ii）ADB 与 CGN	

后续达成的协议。

CGN, CGN-SEDC and CGN-DSE shall ensure that the provisions of the IEE, and EMP as well as any requirements under the Safeguards Policy Statement also apply to the portion of the Project to be financed by CGN, CGN-DSE and EXIM.

Complied

遵守

CGN、CGN-SEDC 和 CGN-DSE 应保证 IEE、EMP 和“保障政策声明”的所有要求适用于 CGN, CGN-DSE 和 EXIM 投资的项目部分。

CGN, CGN-SEDC and CGN-DSE shall make available necessary budgetary and human resources to fully implement the EMP.

Complied

遵守

CGN、CGN-SEDC 和 CGN-DSE 应提供完全执行 EMP 所需要的预算和人力资源。

CGN, CGN-SEDC and CGN-DSE shall ensure that all bidding documents and works contracts contain provisions that require contractors to

Complied.

遵守。

CGN, CGN-SEDC 和 CGN-DSE 应确保所有投标文件和工作合同包含相关条款要求承包商

- (a) comply with the measures relevant to the contractor set forth in the IEE and the EMP(to the extent they concern impacts on respective affected people under Environmental Safeguards during construction), and any corrective or preventative actions (i) set forth in a Safeguards Monitoring Report, or (ii) as subsequently agreed between ADB and CGN;

IEE report is one of attachment of the contract. All the requirements of IEE are included in the contract and require contractor to implement.

IEE 报告是合同的附件之一。IEE 的所有要求都包含在合同中，并要求承包商实施。

- (a) 遵守 IEE 和 EMP 中与承包商相关的条款（与施工期间根据“环境保护”对受影响人员的影响有关）和纠正性或预防措施，即（i）“保障监测报告”，或（ii）ADB 与 CGN 之间后续达成的协议。

- (b) make available a budget for all such environmental and social measures;

- (b) 为所有这些环境和社会措施提供预算；

- (c) provide CGN-DSE with a written notice of any unanticipated environmental, resettlement or social risks or impacts that arise during construction, implementation or operation of the project that were not considered in the IEE, and the EMP; and

- (c) 向 CGN-DSE 提供 IEE 和 EMP 中未考虑，在项目施工、执行或运行过程中无法预见的环境、安置或社会风险或影响的书面通知；以及

- (d) reinstate pathways and other local infrastructure to at least their pre-Project condition as soon as possible and no later than the completion of construction.

- (d) 尽快将道路和其它设施至少恢复到项目开始前的状态，恢复的时间

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不迟于施工完工时间。

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CGN, CGN-SEDC and CGN-DSE shall do, or cause to be done, the following: Being complied.

CGN、CGN-SEDC 和 CGN-DSE 应当实施或促使实施以下工作：遵守中。

- (a) submit Safeguards Monitoring Reports to ADB in respect of implementation of and compliance with Environmental Safeguards and the EMP, annually during construction and the implementation of the Project and the EMP until the issuance of ADB's Project completion report unless a longer period is agreed in the EMP; and disclose relevant information from such reports to respective affected people under Environmental Safeguards, Involuntary Resettlement Safeguards and Indigenous Peoples Safeguards promptly upon submission;
- (a) 在亚洲开发银行项目完成报告发行之之前，除非 EMP 中规定了更长的期限，否则应每年在施工期间以及项目和 EMP 的实施期间，向亚洲开发银行提交关于环境保障和 EMP 的实施和合规性的“保障监测报告”；并在提交时向“环境保障”、“非自愿拆迁保障”以及“当地人员保障”中受影响的人员提供报告中的相关信息；
- (b) if any unanticipated environmental and/or social risks and impacts arise during construction, implementation or operation of the Project that were not considered in the IEE, and the EMP, promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan; and
- (b) 如果在项目的施工、执行或运行过程中产生 IEE 和 EMP 未加以考虑的意外环境和/或社会风险及影响，应立即告知 ADB 出现这些风险或影响，并详细说明事件，提出纠正措施方案；和
- (c) report any actual or potential breach of compliance with the measures and requirements set forth in the EMP promptly after becoming aware of the breach.
- (c) 报告任何实际违反或有可能违反 EMP 规定和要求的情况，应在了解到此种违反情况后立即报告。

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CGN, CGN-SEDC, CGN-DSE, and EXIM shall ensure that no proceeds of the loan are used to finance any activity included in the list of prohibited investment activities provides in appendix 5 of the safeguards policy statement. Complied  
遵守

CGN、CGN-SEDC、CGN-DSE 和 EXIM 应保证任何贷款款项都不得用于“保障政策声明”中“附件 5”内禁止投资清单所列的任何工作。

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18. The following environmental provisions were included in contracts with Northwest engineering corporation limited, which is:

18. 与西北工程有限公司签署的合同中包括以下环境条款：

CGN and CGN-SEDC have signed the ENV agreements with all the subcontractors in accordance with the contracts. The contractors include Northwest engineering cooperation limited. In the agreement, all the ENV responsibilities and obligations have been clarified. The measures include, but are not limited to,

CGN 与 CGN-SEDC 已根据相关合同与所有分包商签订了 ENV 协议。承包商包括西北工程有限公司。在协议中，所有 ENV 的责任和义务都已得到澄清。措施包括但不限于，

- (a) Employer has to provide qualified earplug to employee to avoid the damage to ear when they are working under the circumstance over 85db.
- (a) 业主须向雇员提供合格的耳塞以避免在其在高于 85 分贝的环境中工作时耳朵受到损害。
- (b) Employer has to provide qualified mask to employee to avoid the damage to respiratory system when working under the dusty circumstance
- (b) 业主应为雇员提供合格的面罩,以免其在有灰尘的环境中对其呼吸系统造成损害。
- (c) All the subcontractors have to take measures to use sewage system effectively to avoid polluting the environment.
- (c) 所有分包商应采取措施以有效利用污水系统来避免污染环境。
- (d) All the subcontractors should take measures to prevent oil leakage in accordance with main contractor's ENV requirements.
- (d) 所有分包商应根据主要承包商的 ENV 要求采取措施防止漏油。
- (e) All the employer should buy assurance for the employee in case of any injury of Employee.
- (e) 所有业主应为雇员购买保险,防止雇员受伤。

## **C. Implementation of Environmental Management and Monitoring Plan**

### **C. 环境管理和监测方案的实施**

19. During this reporting period, the following structure for the project health, safety, and environment (HSE) organization was established. The current members of the project HSE organization are four members from CGN-DSE; one member from Beijing Huaxia supervision Co., Ltd.; four members from contractors. Detailed information on the HSE members are tasks are described in table below.

19. 在本报告期间，为项目健康、安全和环境（HSE）组织建立了以下结构。项目 HSE 组织现有成员包括来自 CGN-DSE 的四名成员;北京华夏监理有限公司一名成员;以及来自承包商的四名成员。有关 HSE 成员的详细信息，请参阅下表。

Name 姓名	Title/Role at the Project HSE 在项目 HSE 中的 头衔/身份	Company 公司	Tasks 任务
<b>Ma chunlei</b> 马春雷	<b>HSE manager</b> HSE经理	<b>CGN-DSE</b> CGN-DSE	<b>Responsible for all the HSE issues in the project</b> 负责项目中的所有HSE问题
<b>Yan zhaoping</b> 严昭平	<b>HSE engineer</b> HSE工程师	<b>CGN-DSE</b> CGN-DSE	<b>Responsible for the HSE issues in his own field</b> 负责自己领域的HSE问题
<b>Gao zhizhen</b> 高志祯	<b>HSE manager</b> HSE经理	<b>CGN-DSE</b> CGN-DSE	<b>Responsible for the HSE issues in his own field</b> 负责自己领域的HSE问题
<b>Li wen</b> 李 文	<b>HSE manager</b> HSE经理	<b>CGN-DSE</b>	<b>Responsible for the HSE issues in his own field</b> 负责自己领域的HSE问题
<b>Yang zhimin</b> 杨志民	<b>HSE manager</b> HSE经理	<b>Beijing Huaxia Supervision Co., Ltd.</b> 北京华夏监理有限公司	<b>Responsible for the HSE issues in his own field</b> 负责自己领域的HSE问题
<b>Yang jinwei</b> 杨晋伟	<b>HSE manager</b> HSE经理	<b>Northwest engineering corporation limited</b> 西北工程有限公司	<b>Responsible for the HSE issues in his own field</b> 负责自己领域的HSE问题
<b>Mu hongzhou</b> 穆宏洲	<b>HSE manager</b> HSE经理	<b>Shandong Sunway Petrochemical Engineering share Co., Ltd.</b> 山东三维石化工程股份有限公司	<b>Responsible for the HSE issues in his own field</b> 负责自己领域的HSE问题
<b>Liu liangji</b>	<b>HSE manager</b>	<b>Joint Venture of Beijing Shouhang IHW Resources Saving</b>	<b>Responsible for the HSE</b>

刘良计	HSE经理	Technology Co.,Ltd. And Shandong Electrical Power Construction No.2 Company  北京首航艾启威节能技术有限公司合资企业和山东电力建设2号公司	issues in his own field  负责自己领域的HSE问题
Yang shuai 杨帅	HSE manager  HSE经理	Joint Venture of Beijing Shouhang IHW Resources Saving Technology Co.,Ltd. And Shandong Electrical Power Construction No.2 Company  北京首航艾启威节能技术有限公司合资企业和山东电力建设2号公司	Responsible for the HSE issues in his own field  负责自己领域的HSE问题

20. The EMP indicates the roles and responsibilities of institutions involved in project. Table 3 summarizes the roles and responsibilities of institutions and the progress of their actions in regard to the EMP.

20. EMP 指出了参与项目的机构的身份和责任。表 3 总结了机构的作用和责任，以及他们在 EMP 方面的行动进度。

Table 3 .Summary of Institutional Arrangement and Actions Taken by Institutions

表 3.机构安排与机构采取的措施的相关概述

Roles and Responsibilities	Actions Taken Up To the End of Reporting Period
身份和责任	截止报告末期所采取的行动
<p><b>China General Nuclear Power Holding Co., Ltd. (CGN) (EA)</b> 中国广核控股有限公司（CGN）（EA）</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> The executing agency</li> <li><input type="checkbox"/> 执行机构</li> <li><input type="checkbox"/> Hold a final responsibility on the overall implementation of the EMP and EMP monitoring;</li> <li><input type="checkbox"/> 对 EMP 和 EMP 监测的总体实施承担最终责任;</li> <li><input type="checkbox"/> Provide advice and guidance to the IA;</li> <li><input type="checkbox"/> 为 IA 提供建议和导则;</li> <li><input type="checkbox"/> Review EMP monitoring reports and submit them to ADB.</li> <li><input type="checkbox"/> 评估 EMP 检测报告并将其提交亚洲开发银行。</li> </ul>	<p>The health, safety and environment (HSE) department of CGN provided advice and guidance to the IA in regards to environmental performance during this reporting period, reviewed this environmental monitoring report, and submitted it to ADB.</p> <p>CGN 的健康、安全和环境（HSE）部门在本报告期间为 IA 提供关于环境表现的建议和导则，评估该环境监测报告并将其提交亚洲开发银行。</p>
<p><b>Project Leading Group</b> 项目领导小组</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Direct the project and provide guidance during project implementation;</li> <li><input type="checkbox"/> 指导项目并在项目实施期间提供指导;</li> <li><input type="checkbox"/> Review project implementation progress and take additional measures if necessary.</li> <li><input type="checkbox"/> 评估项目实施进度并在必要时采取其他措施。</li> </ul>	<p>A Project Leading Group was established including team leader/team member/responsibility, The leader is project manager named Liu dayong, and the team members include site manager named Ding hongliang, HSE manager and QC/QA manager Ma chunlei, etc. The summary number is 11 persons. Leader is in charge of the project, and achieves the project goals. All team members should assistant the leader to achieve the project goals, and are responsible for their own fields.</p> <p>成立的项目领导小组包括团队负责人/团队成员/责任。团队负责人为项目经理刘大勇，团队成员包括现场经理丁鸿良、HSE 经理以及 QC/QA（质控/质保）经理马春雷等。总计 11 人。负责人对项目负责，并实现项目目标。所有团队成员都应该帮助负责人实现项目目标，并负责各自领域。</p> <p>The project holds meeting in the end of every month. The number of meeting hold is 6 times. Agenda of safety meeting:</p>

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该项目每月月末召开会议。共召开 6 次会议。安全会议议程：

- ☐ Areas of risk on site
- ☐ 现场风险区域
- ☐ Site Safety accidents and near-misses
- ☐ 现场安全事故和险发事件
- ☐ Site Safety statistics
- ☐ 现场安全统计
- ☐ Compliance achieved for the corrective action plan (CAP)
- ☐ 纠正措施方案（CAP）的达标情况
- ☐ Current site safety issues at site
- ☐ 现场当前安全问题
- ☐ Request for method statements / Risk assessments
- ☐ 要求进行方法说明/风险评估
- ☐ Look ahead to future site works
- ☐ 预测未来的现场工作
- ☐ Review of safety incidents from other sites.
- ☐ 评估其他场地的安全事件。
- ☐ Review of any related CGNSEDG safety communications
- ☐ 评估所有相关的 CGN-SEDG 安全沟通

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**China General Nuclear Delingha Solar Energy Co., Ltd.(CGN-DSE) (IA)**

**中广核德令哈太阳能有限公司 (CGN-DSE) (IA)**

- ☐ Establish EMU;
  - ☐ 成立 EMU（环境管理单位）；
  - ☐ Provide supervision to contractor and CSC,
  - ☐ 为承包商和 CSC 提供监督，
  - ☐ submit monthly report to the EA on the implementation of
- 

EMU has been established including four members. EMU provides daily supervision to contractor and CSC, submits monthly environment report to the EA, and works with design institutes and the tendering companies in preparing bidding documents with environmental protection requirements. This is the first time to submit a full-year environmental monitoring report to EA and ADB.

成立的 EMU 由四名成员组成。EMU 为承包商和 CSC 进行日常监督，为 EA 提供月度环境报告，并与设计机构和招标公司合作编制含有环保要求的招标文件。这是第一次向 EA 和 ADB 提交全年度环境监测报告。



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the EMP;

- ☐ 向 EA 提交关于 EMP 实施的月度报告;
  - ☐ Work with design institutes and the tendering company in preparing bidding documents to ensure environmental protection provisions are included in them;
  - ☐ 与设计机构和招标公司合作编制招标文件，确保其中包含环保条款;
  - ☐ Submit semiannual EMP monitoring reports to the EA and ADB;
  - ☐ 向 EA 和 ADB 提交半年度 EMP 监测报告;
  - ☐ Hire environmental consultants.
  - ☐ 聘请环境顾问。
-

<b>Construction supervision companies (CSCs)</b>	Beijing Huaxia supervision Co., Ltd. is hired as a CSC. It has one HSE manager, who is responsible for the daily inspection, monitoring, and evaluation of the implementation of EMP mitigation measures such as solid waste/wastewater/dust control at construction site.
施工监督公司 (CSCs)	北京华夏监理有限公司被聘为 CSC。该公司有 1 名 HSE 经理, 负责 EMP 缓解措施实施情况的日常检测、监测和评估, 如施工现场的固体废物/废水/灰尘管理。
<ul style="list-style-type: none"> <li><input type="checkbox"/> Responsible for the daily inspection, monitoring, and evaluation of the implementation of EMP mitigation measures at construction site.</li> <li><input type="checkbox"/> 负责施工现场 EMP 缓解措施实施情况的日常检查, 监测和评估工作。</li> </ul>	
<b>Contractors</b>	
承包商	Northwest engineering corporation limited is the Contractor for BOP. The company is responsible for implementing mitigation measures on a daily basis in accordance with the contract conditions and EMP requirements.
<ul style="list-style-type: none"> <li><input type="checkbox"/> Responsible for implementing mitigation measures on a daily basis in accordance with the contract conditions.</li> <li><input type="checkbox"/> 负责根据合同条款每天实施缓解措施。</li> </ul>	西北工程有限公司是 BOP 的承包商。该公司负责根据合同条款和 EMP 要求每天实施缓解措施。
<ul style="list-style-type: none"> <li><input type="checkbox"/> Responsible for implementing mitigation measures on a daily basis in accordance with the contract conditions.</li> <li><input type="checkbox"/> 负责根据合同条款每天实施缓解措施。</li> </ul>	<p>Shandong Sunway Petrochemical Engineering share Co., Ltd. is the Contractor for HTF/TES. The company is responsible for implementing mitigation measures on a daily basis in accordance with the contract conditions and EMP requirements.</p> <p>山东三维石化工程股份有限公司是导热油/热能存贮的承包商。该公司负责根据合同条款和 EMP 要求每天实施缓解措施。</p>
<ul style="list-style-type: none"> <li><input type="checkbox"/> Responsible for implementing mitigation measures on a daily basis in accordance with the contract conditions.</li> <li><input type="checkbox"/> 负责根据合同条款每天实施缓解措施。</li> </ul>	<p>Joint Venture of Beijing Shouhang IHW Resources Saving Technology Co., Ltd. And Shandong Electrical Power Construction No.2 Company is the Contractor for SF. The company is responsible for implementing mitigation measures on a daily basis in accordance with the contract conditions and EMP requirements.</p> <p>北京首航艾启威节能技术有限公司合资企业山东电力建设 2 号公司是 SF 的承包商。该公司负责根据合同条款和 EMP 要求每天实施缓解措施。</p>
<b>Environmental Monitoring Stations (EMS)</b>	
环境监测站 (EMS)	The local Environmental Monitoring Station will conduct

<input type="checkbox"/> Conduct EMP monitoring and provide data to the IA <input type="checkbox"/> 进行 EMP 监测并为 IA 提供数据	<p>EMP monitoring upon the commencement of civil work。The third party named Xi'an jingcheng monitoring technology Co., Ltd. is the designated company for monitoring.</p> <p>当地环境监测站将在土建工程开工时进行 EMP 监测。第三方西安京诚监测技术有限公司是指定的监测公司，每月进行一次环境监测。</p>
<p><b>A loan implementation environmental consultant</b></p> <p>贷款实施环境顾问</p>	<p>Existing environmental consultants</p>
<input type="checkbox"/> Provide technical assistance to the EA and the IA for implementing the EMP; <input type="checkbox"/> 为 EA 和 IA 提供实施 EMP 的技术援助; <input type="checkbox"/> Provide training to the staff of the CGN, IA, contractor and CSC; and <input type="checkbox"/> 为中广核, IA, 承包商和 CSC 的员工提供培训;并 <input type="checkbox"/> Assist the IA in preparing semiannual and annual environmental reports. <input type="checkbox"/> 协助 IA 编制半年度和年度环境报告。	
<p><b>Local EPB</b></p>	
<p>地方环保局 (EPB)</p> <input type="checkbox"/> Inspect the facilities during construction and operation to ensure compliance with the PRC requirements; Enforce applicable environmental laws and regulations. <input type="checkbox"/>	<p>IA has communicated with local EPB named Environmental Protection Bureau of Delingha city according with the EMP requirements to inspect the facilities timely during construction and operation to ensure compliance with the PRC requirements. The inspection was taken in April 2018, and the result is good.</p>
<p><b>Local EMS</b></p>	
<p>地方 EMS (环境监测站)</p> <input type="checkbox"/> Conduct environmental compliance monitoring according to the PRC requirement. <p>根据中华人民共和国的要求进行环境</p>	<p>IA has communicated with local EMS named Xi'an jingcheng monitoring technology CO.,LTD, according with the EMP requirements to inspect the Monitoring Parameter once a month during construction and operation to ensure compliance with the PRC requirements, and the data are below the standard values.</p>

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合规性监测。

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#### **D. Implementation of Mitigation Measures**

##### **D. 缓解措施的实施**

21. The EMP lists measures, including pollution control and mitigation measures for environmental assurance during the project construction and operation. Table 4 presents the EMP during project implementation and the summary of actions taken to mitigate environmental adverse impacts of the project during this reporting period.

21. EMP 中列出了相关措施, 包括在项目施工和运营期间为确保环境的环境控制和缓解措施。表 4 给出了项目实施期间的 EMP 以及本报告期内为减轻项目的环境负面影响而采取的措施概述。

Table 4: The Environmental Management Plan (EMP) and the Implementation Status of the EMP

表 4：环境管理方案（EMP）及其实施状态

Category 类别	Potential Impacts and Issues 潜在影响和问题	Mitigation Measures and/or Safeguards 缓解措施和/或保障	Responsibility 责任		Implementation Status 实施状态
			Implemented by 实施方：	Supervised by 监督方：	
A. Pre-construction Phase					
A.施工前阶段					
Design Mitigation facilities and measures  设计缓解设施与措 施	Land acquisition	The combined land acquisition and ethnic minority development plan was prepared in accordance with relevant law in the PRC and ADBs SPS. Each household will be compensated with the amount that is equivalent to three times of the annual average net household income. In addition to compensation, the affected people are entitled to receive (i) employment opportunities during construction and operation of the project, (ii) portable solar photovoltaic power generation sets, (iii) high insulation yurt (nomad tent), and (iv) trainings on employment skills and grassland management.	IA	CGN	Complied.
	土地征用		IA	CGN	遵守。
					Land acquisition has been completed; Land expropriation compensation has been paid.
					已完成征地并已支付土地征用赔偿金。
		根据中华人民共和国有关法律和亚洲开发银行的保障政策说明（SPS）制定了土地征用和少数民族发展综合方案。每个家庭均会得到等同于其年均净收入三倍的赔偿金。除了赔偿外，受影响人员还有权获得（i）项目施工和运营期间的就业机会，（ii）便携式太阳能光伏发电机组，（iii）高度绝缘蒙古包（游牧帐篷）以及（iv）关于就业技巧和草原管理的培训。			
	Project’s site and routes selection	The site of CSP plant and the layout will be reconfirmed to avoid or minimize potential adverse impacts on the surrounding environments and communities.	DI and IA	CGN	Complied.
	项目场址与路线选择		DI 和 IA	CGN	遵守。
		再次确认 CSP 电厂的场地和布局，以避免或尽量减轻对周			The site of CSP plant and the layout has reconfirmed by the government

Category 类别	Potential Impacts and Issues 潜在影响和问题	Mitigation Measures and/or Safeguards 缓解措施和/或保障	Responsibility 责任		Implementation Status 实施状态
			Implemented by 实施方:	Supervised by 监督方:	
		围环境和社区的潜在不利影响。			department named Environmental Protection Bureau of Delingha city, and the result is that this project meets environment requirements, adverse impacts on the surrounding environments and communities are under control.  CSP 电厂的场地和布局得到了德令哈市环境保护局的再次肯定，结果是该项目符合环境要求，对周围环境和社区的不利影响在控制中。
	Including mitigation measures and monitoring program in engineering designs  包括工程设计中的缓解措施和监测计划	Environmental mitigation measures identified in the IEE and the domestic EIA will be incorporated in the engineering design document and bidding document for the project, and will be included in contract documents for civil constructions and equipment installations. All contractors shall be required to strictly comply with the EMP.  IEE 和国内 EIA 中确定的环境缓解措施将纳入该项目的工程设计文件和招标文件，并将纳入土建施工和设备安装相关的合同文件。所有承包商都必须严格遵守 EMP。  EMP monitoring will be incorporated into the engineering design to ensure that environmental impacts are closely monitored.  EMP 监测将被纳入工程设计，以确保密切监测环境影响。	DI  DI	CGN, IA, local EPB  CGN, IA, 当地 EPB	Complied.  遵守。  At the engineering design phase, environmental mitigation measures were discussed and incorporated. The bidding document and contract documents for civil constructions and equipment installations included the provisions that all contractors shall be required to strictly comply with the EMP.  工程设计阶段讨论并结合了环境缓解措施。招标文件和土建施工及设备安装合同文件规定所有承包商应严格遵守 EMP。
	Fire hazards	Fire protection system will be incorporated in the design of	DI and IA	Local EPB,	Fire protection system is incorporated in the design of the power island

Category 类别	Potential Impacts and Issues 潜在影响和问题	Mitigation Measures and/or Safeguards 缓解措施和/或保障	Responsibility 责任		Implementation Status 实施状态
			Implemented by 实施方:	Supervised by 监督方:	
	火灾	the project. 项目设计中将结合消防系统。	DI 和 IA	CGN 当地 EPB, CGN	project. It was done from July of 2015. And complete at Oct. of 2017. 电力岛的项目设计中结合了消防系统。于 2015 年 7 月开始。于 2017 年 10 月完成。
<b>Bidding and Contracting</b>  招标与签约	Bidding and contract document preparation  标书和合同文件的编制	Incorporate environmental mitigation measures indicated in the EMP in bidding documents and construction contracts for the project.  在项目的招标文件和施工合同中纳入 EMP 中说明的环境缓解措施。	DI and IA  DI 和 IA	CGN, Local EPB  CGNA, 当地 EPB	EMP requirements are included in bidding and contract document  标书和合同文件中包括 EMP 要求
<b>Grievance Redress Mechanism</b>  申诉处理机制 (GRM)	Establishment of operational GRM  GRM 的成立	Establish a Project Public Complaints Unit (PPCU) in IA's office; provide training for PPCU members and GRM access points; Disclose the PPCU's phone number, fax, address, and email to the public.  在 IA 办公室成立一个项目公众投诉单位(PPCU); 为 PPCU 的成员以及 GRM 的切入点提供培训; 向公众公开 PPCU 的电话号码、传真、地址和电子邮箱。	IA  IA	CGN, Local EPB  CGNA, 当地 EPB	Complied  遵守  Project Public Complaints Unit (PPCU) in IA's Delingha project site office has been established, Designated person is Mr. Ma Chunlei, phone number (+8613159511992), which has been disclosed to the public through site information boards.  IA德令哈项目场址办公室已成立了项目公众投诉单位(PPCU);指定的负责人为马春雷先生,电话号码为(+8613159511982),已通过现场信息

Category 类别	Potential Impacts and Issues 潜在影响和问题	Mitigation Measures and/or Safeguards 缓解措施和/或保障	Responsibility 责任		Implementation Status 实施状态
			Implemented by 实施方:	Supervised by 监督方:	
					公告板向公众公开。
Training 培训	Training for the site staff to prevent polluting environment  为现场员工实施的预防 环境污染的培训	Provide environmental awareness and capacity training for construction staff, concerning the prevention of accidental spillage of hazardous chemicals and oil; pollution of water resources (both surface and groundwater), air pollution and litter control and potential identification of archaeological artifacts.  为施工人员提供环境意识和能力培训,包括预防有害化学 品和油的意外泄漏;水资源污染(地表水和地下水);大气污 染和垃圾管理以及对考古文物的识别。			Complied  遵守
		Project Manager shall ensure that the training and capabilities of the Contractor's site staff are adequate to carry out the designated tasks.  项目经理应确保承包商现场员工的接受的培训和拥有的 能力足以执行指定任务。  No operator shall be permitted to operate critical mechanical equipment without having proper certification.  没有相关认证的操纵员不得操作关键机械设备。  Staff should be educated as to the need to refrain from indiscriminate waste disposal and/or pollution of local soil and water resources and receive the necessary safety training.  教育员工应避免不加区分地处理垃圾和/或污染当地土壤 和水资源,并接受必要的安全培训。	IA and CSC  IA 和 CSC	CGN, Local EPB  CGNA, 当地 EPB	During the test run period from July t o December in 2019, IA had conduct ed 6trainings, covering a total of 30 p eople. The new employee can work on site after training. Workers on site should accept the EMP training in accordance with the project HSE training plan. The training contents include the prevention of accidental spillage of hazardous chemicals and oil; pollution of water resources (both surface and groundwater), air pollution and solid waste control. Contractor's site staff have tool box meeting training daily to ensure that they are adequate to carry out the designated task. The HSE engineer or team leader explained and clarified the HSE precautions according to the daily tasks in the tool box meeting, and all the participators should sign on the records. All staffs can execute and meet the requirements.  IA 在 2019 年 7 月到 12 月项目试运 期间,共开展了 6 次培训,培训 30



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			Implemented by 实施方:	Supervised by 监督方:	
					人。新员工在培训后可以在现场工作。根据项目 HSE 培训方案，现场工作人员应接受 EMP 培训。培训内容包括预防有害化学品和油的意外泄漏;水资源污染(地表水和地下水);大气污染和固体废物的管理。承包商的现场员工参与工前安全会议进行日常培训，以确保其足以胜任分配的任务。HSE 工程师或小组负责人在工前安全会议上根据日常任务对 HSE 预防措施进行说明和澄清，所有参与人员均应在记录上签名。所有员工可以执行并满足要求。
<b>B. Construction Phase</b>					
<b>B.施工阶段</b>					
Soil  土壤	Soil erosion and contamination due to construction activities  施工活动造成的土壤 侵蚀和污染	Minimize active open excavation areas during trenching activities and use appropriate compaction techniques for the construction;	Contractors, CSCs  承包商, CSCs	IA, Local EPB, IA  IA, 当地 EPB, IA	Complied
		在挖沟活动期间尽量减少主动的开放性挖掘，并采用适当的压实技术进行施工;			遵守
		The contractor should, prior to the commencement of earthworks, determine the average depth of topsoil. The full depth of topsoil should be stripped from areas affected by construction and related activities prior to the commencement of major earthworks including the building footprints, working areas and storage areas. Topsoil will be reused where			The Contractors take environment protection actions to minimize soil erosion and contamination activities in accordance of EMP requirements. During this reporting period, all the activities related to equipment operation conform to the requirements. The protection measures include drainage measures, temporary

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			Implemented by 实施方:	Supervised by 监督方:	
		<p>possible to rehabilitate disturbed areas.</p> <p>承包商应在土方工程开始前确定表土的平均深度。在主要土方工程开始之前，应从受施工和相关活动影响的区域（包括建筑物占地面积，工作区域和存储区域）剥离全部表层。表土可能重新用于恢复受影响地区。</p> <p>Care will be taken not to mix topsoil and subsoil during stripping.</p> <p>剥离时应注意不要将表土和底土弄混。</p> <p>Removed topsoil should be transported to a designated landfill site or used onsite for landscaping as required.</p> <p>应将去除的表土运输至指定的填埋场或按要求用于现场景观美化。</p> <p>Ensure that the minimum area of soil is exposed to potential erosion at any one time.</p> <p>确保在任何时间，暴露于潜在侵蚀的土壤面积均是最小的。</p> <p>Limit construction and material handling activities during periods of rains and high winds.</p> <p>雨天和强风期间的有限施工与材料处理活动</p> <p>Assess and estimate storm water runoff and prepare a storm water drainage system accordingly to minimize soil erosion.</p>			<p>protection on the slope, watering timely, leveling timely etc.</p> <p>承包商根据 EMP 的要求采取环境保护行动以尽量减少土壤侵蚀和污染活动。在本报告期内，所有设备运行相关活动均符合要求。防护措施包括排水措施斜坡临时防护、及时浇水、及时整平等。</p>

Category 类别	Potential Impacts and Issues 潜在影响和问题	Mitigation Measures and/or Safeguards 缓解措施和/或保障	Responsibility 责任		Implementation Status 实施状态
			Implemented by 实施方:	Supervised by 监督方:	
		<p>评估和估计雨水径流，并相应地制定雨水排放系统，以尽量减少土壤侵蚀。</p> <p>Build temporary detention pond to control topsoil runoff.</p> <p>建造临时滞留池以控制表土流失。</p> <p>Stabilize all earthwork disturbance areas within 14 days after earthwork.</p> <p>土方工程后 14 天内稳定所有土方受影响区域。</p> <p>Plant native trees and grass in the CSP plant to control soil erosion and properly slop or re-vegetate disturbed surfaces.</p> <p>在 CSP 电厂种植本地树木与草，以控制土壤或斜坡侵蚀或使受影响表面重新生长植物。</p> <p>Properly store petroleum products, chemicals and hazardous materials on impermeable surface.</p> <p>将石油产品，化学品和有害物质妥善存放在不渗透的表面上。</p> <p>Use best management practices to prevent spill of oil and chemical to avoid pollution.</p> <p>采用最好的管理措施来防止石油和化学品泄漏以避免污染。</p>			

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			Implemented by 实施方:	Supervised by 监督方:	
		<p>Any planned paving or vegetating of the area will be done as soon as the materials are removed to protect and stabilize the soil.</p> <p>为了保护和稳定土壤，一旦材料被移开，将尽快完成计划对该地区进行的铺设或种植。</p>			
		<p>Appropriately set up temporary construction camps and storage areas to minimize land area required and impact on soil erosion;</p> <p>适当设置临时施工营地和库区，尽量减少所需土地面积和对土壤侵蚀的影响;</p>			
		<p>Build concrete dikes with sealed surfaces underneath storage tanks containing HTF and hazardous materials. The dike walls must be high enough to contain 110% of the total volume of the storage tanks.</p> <p>在含有导热油和有害物质的储罐下方建造带有密封表面的混凝土堤坝。堤坝的墙高必须足以容纳储罐容积的110%。</p>			
		<p>Contaminated soil by HTF and/or other hazardous chemicals must be contained and disposed off-site by a third party with proper certification.</p> <p>被导热油和/或其他有害物质污染的土壤必须由经过相关认证的第三方在场外进行处理。</p>			
		<p>Remove all construction wastes from the site and transport</p>			

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			Implemented by 实施方:	Supervised by 监督方:	
		them to designated spoil disposal site in Delingha.			
		清除现场的所有施工垃圾，并将其运往德令哈的指定弃土场。			
		Provide spill cleanup measures and equipment at the construction site.			
		提供施工现场的泄漏清理措施和设备。			
		Contractors will be required to develop contingency plans for control of oil and other dangerous substances to prevent soil contamination.			
		承包商需要制定应急计划来控制石油和其他危险物质以防止土壤污染。			
Wastewater 废水	Surface and groundwater contamination from construction wastewater, and domestic water  施工废水和生活用水对地表和地下水的污染	Areas where construction equipment is being washed will be equipped with water collection basins and sediment traps.	Contractors, CSC  承包商，CSC	IA, Local EPB, CGN  IA, 当地 EPB, CGN	Complied
		将为清洗施工设备的区域配备集水槽和沉淀池。			遵守
		Wastewater from construction activities will be collected in sedimentation tanks, retention ponds, and filter tanks to remove silts and oil.			At present, concrete batching station site is equipped with water collection basins and sediment traps. The construction wastewater, after sedimentation, was used as the spraying water for fugitive dust control on the construction site. The domestic wastewater from workers camp is equipped with water collection basins and is cleaned up monthly by local designated agency during the project life cycle. The related activities are
		施工活动产生的废水将集中在沉淀池，澄清池和过滤池中，以便去除淤泥和油。			
		Make sure the storm water channels or natural water path			

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			Implemented by 实施方:	Supervised by 监督方:	
		ways are not blocked.			conformance to requirements.
		确保雨水通道或自然水路不堵塞。			目前，混凝土配料站点设有集水槽和沉淀池。沉淀后的施工废水被用作控制施工现场扬尘的喷洒水。工作人员营地的生活用水配有集水槽，在项目期间由当地指定的机构每月清理一次。相关活动符合要求。
		The construction wastewater, after sedimentation, will be used as the spraying water for fugitive dust control on the construction site.			
		沉淀后的施工废水将被用作控制施工现场扬尘的喷洒水。			
		Adequate sanitary facilities and ablutions must be provided for construction workers.			
		应为施工人员提供足够多的卫生设施和洗浴设施。			
		The domestic wastewater from workers camp, after septic treatment, will be utilized for watering vegetation, both planted and natural.			
		来自工作人员营地的生活污水经过腐化处理后，将被用于灌溉植物，包括种植闭合天然生长的植物。			
Noise 噪音	Noise from construction, machinery operation, and transportation activities  施工、机械操作和运输活动产生的噪音	Ensure that noise levels from equipment and machinery conform to the PRC standard of GB12523-2011, and properly maintain construction vehicles and machineries to minimize noise.	Contractors, CSC  承包商, CSC	IA, local EPB  IA, 当地 EPB	Complied  遵守
		确保设备和机械的噪音水平符合 GB12523-2011 中华人民共和国国家标准，并妥善维护施工车辆和机器，以尽量减少噪音。			Equipment and mechanical noise is the main noise source, which is not over 60db during the day and less than 50db at night. The CSP project is located in a sparsely populated area and therefore has no impact on the surrounding communities. The noise conforms to the standard GB12523-2011, etc. Vehicles
		Locate sites for rock crushing, concrete-mixing, and similar activities at least 1 km away from sensitive areas.  岩石破碎、混凝土搅拌和类似活动的场地距离敏感区域至			

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			Implemented by 实施方:	Supervised by 监督方:	
		少 1km。			transporting construction materials or wastes shall slow down and stop honking when passing through or nearby environmentally sensitive locations, such as residential communities, schools and hospitals. Construction activities will be done only in the day from 9 AM to 6 PM. The related activities conform to the requirements.  设备和机械噪声是主要噪声源，白天不超过 60db，夜间低于 50db。该 CSP 项目位于人口稀少的区域，因此对周边的社区没有影响。噪音符合 GB12523-2011 等标准。运输施工材料或废弃物的车辆在通过或靠近环境敏感地点（如住宅社区，学校和医院）时，应减速并停止鸣笛。施工活动仅从早上 9 点到下午 6 点进行。相关活动符合要求。
		Machines in intermittent use should be shut down in the intervening periods between work or throttled down to a minimum.			
		间歇使用的机器在工作间隔期间应关闭，或者减少到最小限度。			
		Place temporary signs or noise barriers around noise sources during construction, if necessary.			
		必要时，施工期间在噪声源周围放置临时标志或隔音屏障。			
		Vehicles transporting construction materials or wastes shall slow down and stop honking when passing through or nearby environmentally sensitive locations, such as residential communities, schools and hospitals.			
		运输施工材料或废弃物的车辆在通过或靠近环境敏感地点（如住宅社区，学校和医院）时，应减速并停止鸣笛。			
		Construction activities, and particularly the noisy ones, are to be contained to reasonable hours during the day and early evening.			
		应规定在白天或傍晚开始施工活动，尤其是嘈杂的施工活动。			
		Provide noise personnel protective equipment (PPE) to workers.			

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			Implemented by 实施方:	Supervised by 监督方:	
		为工作人员提供个人噪音防护设备（PPE）。			
Vibration 振动	Vibration generating by compacting and rolling  压实和滚动产生的振动	Prohibit pilling and compaction operations at night  禁止在夜间进行打桩和压实操作	Contractors, CSC  承包商，CSC	IA and local EPB  IA 和当地 EPB	Yes, the related activities are conformance to requirements. Contractors are prohibited to working at night  是的，相关活动符合要求。禁止承包商在夜间工作
Ambient Air 环境空气	Fugitive dust generated by construction activities worsens ambient air quality  施工活动产生的扬尘 恶化环境空气质量	Spray water on construction sites and earth/material handling routes where fugitive dust is being generated.  在施工现场和产生扬尘的土方/材料处理路线上喷洒水。  Keep transport vehicles at low speed in the construction site to reduce fugitive dust generation.  在施工现场保持运输车辆的低速运转，以减少扬尘的产生。  Stop the construction activities during strong windy days.  在强风天时停止施工活动。  Cover materials during truck transportation, in particular, the fine material, to avoid spillage or dust generation  在卡车运输期间覆盖材料，尤其是细材料，以避免溢出或 产生粉尘  Excavations and other clearing activities must only be done during agreed working times and permitting weather	Contractors, CSC  承包商，CSC	IA, local EPB  IA，当地 EPB	The contractors have water truck to spray recycled water on construction sites, earth/material handling areas and routes every day. Construction materials (sand, gravel, and rocks) and spoil materials transported trucks are covered with tarpaulins. Storage piles are at least 30m downwind of the nearest human settlements. All vehicles (e.g., trucks, equipment, and other vehicles that support construction works) are well maintained and not emit dark, smoky or other emissions in excess of the limits.  承包商每天都有洒水车在施工现场， 土方/材料处理区域和路线上喷洒循环水。 施工材料（沙子，沙砾和岩石）和弃土材料的运输卡车覆盖着防水油布。 存储桩位于居住区下风方向，并至少距离 30m。所有车辆（如卡车，设备和其他支持施



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			Implemented by 实施方:	Supervised by 监督方:	
Air emission from vehicles and construction equipment  车辆和施工设备排放 的空气		conditions to avoid drifting of sand and dust into neighboring areas.			工工程的车辆）维护良好，不会排放超过限值的黑烟或其他排放物。
		挖掘和其他清理活动只能在约定的工作时间内完成，并且实施这一活动时的天气条件不会使沙尘飘入周边地区。			
			Contractors, CSC  承包商，CSC	IA, Local EPB  IA，当地 EPB	The related activities are conformance to requirements.  相关活动符合要求。
		Store petroleum or other harmful materials in appropriate places and cover to minimize fugitive dust and emission.			Petroleum, diesel, paint and other harmful materials are stored in the designated place where the HSE signs and protection measures are in place. Anyone who closes to the storage place must wear proper PPE and work in accordance with the procedures.
		将石油或其他有害物质储存在适当的地方并覆盖，以减少扬尘和排放。			石油，柴油，油漆和其他有害物质储存在 HSE 标志和保护措施到位的指定地点。任何接近存放处的人员必须佩戴合适的个人防护装备，并按照程序进行工作。

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			Implemented by 实施方:	Supervised by 监督方:	
Solid Waste 固体废物	Solid waste from construction activities  施工活动产生的固体废物	Establish temporary storage for solid wastes away from water bodies or other environmental sensitive areas, and regularly haul solid waste to an approved and designed landfill in De lingha;	Contractors, CSC  承包商, CSC	IA, Local EPB  IA, 当地 EPB	A temporary storage has been established for solid wastes on site , Separate hazardous waste from general waste and regularly haul solid waste by local authority designated agency to an approved and designed landfill in Delingha city. The waste on site should be deposited in the corresponding waste storage place where signs and leakage prevention measures are in place. Environment supervisor should contact with the local authority designated agency before it is full. .
		在远离水体或其他环境敏感区的地方为固体废物建立临时存储店，并定期将固体废物运输到德令哈中经批准和指定的填埋场。			
		All rubble must either be used on site as part of the existing development, or must be taken off the reserve and disposed off at the landfill facility in De lingha.			
		所有的瓦砾要么作为现有开发项目的一部分在现场使用，要么必须从存储处移除并在德令哈市的垃圾填埋场处理。			
		Rubble must not be dumped on site but must be placed within a bin for regular removal.			
		不得在现场倾倒瓦砾，但必须将瓦砾放置在垃圾箱内以便定期清除。			
		Provide appropriate waste storage containers at construction sites.			
		在施工现场提供适当的废物储存容器。			
		Recycle the construction waste and excavating waste as much as possible and the rest construction waste will be transported to an approved landfill.			
		尽可能回收施工废弃物和挖掘废弃物，其余施工废弃物将运至经批准的垃圾填埋场。			
		Hire a qualify contractor to remove all non-hazardous wastes			

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			Implemented by 实施方:	Supervised by 监督方:	
		from site to approved waste disposal site, according to appropriate domestic procedures.			
		根据国内相关程序，聘请合格承包商将所有无害废弃物从现场清除至经批准的废物处理场。			
		Hold contractors responsible for proper removal and disposal of any significant residual materials, wastes, and contaminated soils that remain on the site after construction.			
		使承包商负责适当地清除和处理施工后留在现场的任何重要的剩余材料，废物和污染的土壤。			
		Strictly prohibit any waste incineration at or near construction site.			
		严禁在施工现场或附近进行垃圾焚烧。			
<b>Chemicals and Hazardous Material</b> 化学品和有害物质	Hazardous and polluting materials from construction activities 施工活动产生的有害和污染材料	Prepare and implement a protocol for the handling and disposal of hazardous materials during construction including a spill prevention and emergency plan.  在施工期间准备并实施运输和处理有害物质的方案，包括泄漏预防和应急计划。  Build storage facilities for fuels, oil, chemicals and other hazardous materials will be within secured areas on impermeable surfaces, and provided with dikes.  为燃料、石油、化学品和其他有害材料建立的储存设施应位于不渗透表面的安全区域内，并应设有堤坝。	Contractors, CSC  承包商，CSC	IA, Local EPB  IA，当地 EPB	Only few paints and fuels are stored in the warehouse within secured areas on impermeable surfaces. The warehouse is in good ventilation on the top and at the bottom, and together with good waterproof and shading measures. The outside of warehouse will be provided with 6 pieces of fire extinguishers and fire sandboxes. The contractors established an emergency plan and implemented it again in Sep.2019.Vehicles and equipment were properly staged in designated areas to prevent contamination of soil

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			Implemented by 实施方:	Supervised by 监督方:	
		<p>Vehicles and equipment will be properly staged in designated areas to prevent contamination of soil and surface water from chemicals and other hazardous materials.</p> <p>车辆和设备将在指定区域正确装载，以防止化学品和其他有害物质污染土壤和地表水。</p> <p>Vehicle, machinery and equipment maintenance and refueling will be properly carried out so that spilled materials do not seep into the soil.</p> <p>适当地对车辆、机械和设备进行维护和换料，防止材料溅出渗入土壤。</p> <p>Oil traps will be provided for service areas and parking areas; and fuel storage and refilling areas will be located at least 300 m from drainage structures and important water bodies.</p> <p>将在服务区和停车区提供集油槽；燃料储存和换料区将位于排水结构和重要水体至少 300 米远。</p> <p>Suppliers of chemicals and hazardous materials must hold proper licenses. They shall follow proper protocol for transferring fuel and the Operation Procedures for Transportation, Loading and Unloading of Dangerous or Harmful Goods of JT 3145-91.</p> <p>化学品和有害物质供应商必须持有适当的许可证。应遵循相关的燃料运输协议和 JT 3145-91 “危险品或有害物品的运输，装载和卸载操作程序”。</p>			<p>and surface water from chemicals and other hazardous materials.</p> <p>只有少数油漆和燃料储存在仓库内不可渗透表面上的安全区域内。仓库顶部和底部的通风良好，并具备良好的防水和遮阳措施。仓库外面将配备 6 件灭火器和防火沙箱。承包商制定了应急计划，并于 2019 年 9 月再次实施。车辆和设备在指定区域正确装载，防止化学品和其他有害物质污染土壤和地表水。</p> <p>Vehicle, machinery and equipment maintenance and refueling was properly carried out so that spilled materials did not seep into the soil.</p> <p>适当地对车辆、机械和设备进行维护和换料，防止材料溅出渗入土壤。</p> <p>The related activities are conformance to requirements.</p> <p>相关活动符合要求。</p>

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			Implemented by 实施方:	Supervised by 监督方:	
Flora and Fauna 植物群和动物群	Protection of vegetation, re-vegetation of disturbed areas; planting and compensatory planting trees and grass  受干扰地区植被和再 生植被的保护; 种植和 补偿性种植树木与草	Preserve existing vegetation where no construction activity is planned, or temporarily preserve vegetation where activity is planned for a later date.  保护未计划开展施工活动地区已有的植被, 或临时保护日 后计划开展施工活动地区的植被。  The construction activities will be implemented within the land acquisition scope, minimize the damage to the nearby land.  施工活动将在征地范围内实施, 尽量减少对附近土地的破 坏。	Contractors, CSC  承包商, CSC	IA, Local EPB  IA, 当地 EPB	The construction activities will be implemented within the land acquisition scope, Minimize activity to damage the nearby land, such as excavating in accordance with construction drawings, protecting the slope, and spraying recycled water to minimize dust etc.  施工活动将在征地范围内实施, 尽 量减少对附近土地的破坏活动, 如 按施工图挖方, 保护边坡, 喷洒循 环水以尽量减少灰尘等。
		Properly backfill, compact, and re-vegetate piping/cable trenches after construction.  施工后恰当地进行回填、压实并重新在管道/电缆沟渠上种 植植被。			All natural areas impacted during construction were rehabilitated with locally indigenous grasses.  所有在施工过程中受到影响的自然 区域均已采用当地的本土草进行修 复。
		Remove shrubs only as a last resort if they impinge directly on permanent structures.  如果灌木对永久性结构有直接的影响, 别无他法时移除灌 木。			Construction activities were planned carefully so as not to interfere with the calving and lambing season for most animal species.
		All natural areas impacted during construction must be rehabilitated with locally indigenous grasses.  所有在施工过程中受到影响的自然区域必须采用当地的 本土草进行修复。			为了不干扰大多数动物物种的产犊 和产羔期, 对施工活动进行仔细的 规划。
		Construction activities must be planned carefully so as not to interfere with the calving and lambing season for most animal			Training for all new staff working on site which includes basic HSE knowledge and precautions was

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			Implemented by 实施方:	Supervised by 监督方:	
		species.  为了不干扰大多数动物物种的产犊和产羔期，必须对施工活动进行仔细的规划。  Enhance awareness on protection of and prohibition to hunt wild animals, construction workers are forbidden to hunt wild animals in the construction and surrounding areas, in accordance with PRC's Law on Wildlife Protection.  提高保护并禁止猎杀野生动物的意识，根据中华人民共和国野生动植物保护法，施工人员禁止在施工和周边地区猎杀野生动物。  Identify, demarcate and protect sites where small animals, reptiles, and birds of common species live.  识别，划定并保护小动物，爬行动物和普通物种鸟类的生存地点。			completed at July to August of 2015, and the normal training which includes updated HSE knowledge and skills according to the project progress is ongoing, Hunting wild animals were prohibited in the construction and surrounding areas, in accordance with PRC's Law on Wildlife Protection. The related activities are conformance to requirements.  对在现场工作的所有新员工（包括基本的 HSE 知识和预防措施）的培训已于 2015 年 7 月至 8 月完成；涉及根据项目进展更新 HSE 知识和技能的一般培训正在进行中；根据中华人民共和国野生动植物保护法，禁止在施工和周边地区猎杀野生动物。相关活动符合要求。
		Greening facilities for the plant site  厂区绿化设施			Complied.  遵守。
		Vegetate the CSP plant wherever possible.  尽可能在 CSP 电厂种植植被。			Complied.  遵守。
Community Disturbance and Safety  社区干扰和安全	Public safety around the construction site  施工现场周围的公共安全	Implement safety measures around the construction sites to protect the public, including warning signs to alert the public to potential safety hazards, and barriers to prevent public access to construction sites.	Contractors, CSC  承包商，CSC	IA, Local Public Transportation Bureau  IA，地方公共交通局	Complied. 遵守。  The project entrance was secured by guards and barrier so that only authorized personnel can have access

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			Implemented by 实施方:	Supervised by 监督方:	
		在施工现场周围实施安全措施以保护公众，包括设置警示标志以提醒公众潜在的安全隐患，并设置障碍物防止公众进入施工现场。			to premise.  该项目的入口由门卫和障碍物把守，只有经过授权的人员才可以进入厂内。
Occupational health and safety  职业健康和安全	Health damage and accidents during construction activities  施工活动中的健康损害和事故	Identify and minimize the causes of potential hazards to workers.			Complied.
		确定并尽可能减少对工作人员造成潜在危险的原因。			遵守。
		Implement safety measures and work procedures and provide first aid facility onsite.			The contractors have established procedure to identify hazards and risk assessment, implement safety measures and work procedures and provided first aid facility onsite. Preventive and protective measures such as providing proper PPE, compiling HSE procedures, inspecting and monitoring the machines and facilities, and rectifying the hazards and risks on site etc were carefully taken by contractors, Appropriate personal protective equipment (PPE) has been provided to all workers to minimize risks, including ear protection, hard hats and safety boots. Adequate signage in risk areas where the petroleum, paint and diesel are stored, fire working place, high working place, distribution boards, and excavation areas etc has been
		实施安全措施和工作程序，并在现场提供急救设施。			
		Workers should be thoroughly trained on occupational health and safety during construction, especially for using potentially dangerous equipment.	Contractors, CSC	IA, Local EPB, CGN	
		施工期间应对工作人员进行充分的职业健康和安全培训，尤其是对有潜在危险的设备的使用。	承包商，CSC	IA，当地 EPB， CGN	
		Provide preventive and protective measures, including modification, substitution, or elimination of hazardous conditions.			
		提供预防和防护措施，包括对危险条件的修改、替换或消除。			
		Contractors must ensure that all equipment is maintained in a safe operating condition.			

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			Implemented by 实施方:	Supervised by 监督方:	
		承包商必须确保所有设备都处于安全运行状态。			installed. Hold toolbox meeting daily.
		The Contractors will take all the necessary precautions against the spreading of disease.  承包商将采取一切必要的预防措施来防止疾病的传播。			承包商已制定了相关程序以确定危害和风险评估，实施安全措施工作程序，并在现场提供了急救设施。承包商谨慎采取了一系列预防和防护措施，如提供恰当的 PPE、编制 HSE 程序、检测并监测机器和设施，并纠正现场的危害和风险等。已为所有人员提供了相关人员防护设备（PPE）以尽量降低风险，提供的设备包括护耳器、安全帽和安全靴。在储存了石油，油漆和柴油的危险区域、消防工作场所、高空工作场所、配电盘以及挖方区域已充分设置了相关标志。每日召开工前安全会议。
		Material stockpiles or stacks, such as, pipes must be stable and well secured to avoid collapse and possible injury to site workers.  材料的堆放或堆叠（如管道）必须稳固且得到良好的保护，以免料堆崩塌对现场工作人员造成伤害。			
		Provide appropriate personal protective equipment (PPE) to workers to minimize risks, including ear protection, hard hats and safety boots.  为工作人员提供合适的个人防护设备（PPE）以已尽量降低风险，包括护耳器、安全帽和安全靴。			
		Post adequate signage in risk areas.  在风险区域充分张贴标志。			
		Provide procedures for limiting exposure to high noise or heat working environments in compliance with PRC noise standards for construction sites (GB12523-2011).  根据中华人民共和国施工现场噪声标准（GB12523-2011），提供相关程序以限制人员在高噪声和炎热环境中的暴露。			



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			Implemented by 实施方:	Supervised by 监督方:	
		Provide training to workers on the storage, handling and disposal of hazardous wastes.  就危险废物的储存，处理和处置为工作人员提供培训。			
		Provide emergency prevention, preparedness, and response arrangements and training to workers.  为工作人员提供应急预防，准备和响应安排以及培训。			
		Hold safety meetings with staff before each shift.  每值之前为员工召开安全会议。			
Physical Cultural Resources  实体文化资源	Relics may be damaged if proper precaution is not taken.  如果不采取适当的预防措施，遗迹可能会被损坏。	Establish and conduct chance-find procedures for physical cultural resources  为实体文化资源建立并实施非预期发现程序  Relics destroying, damaging, defacing, concealing or otherwise interfering will be strictly prohibited in accordance with PRC regulations.  根据中华人民共和国发箍，严禁摧毁，破坏，玷污，隐藏或以其他方式干扰的遗迹。  If a new site is unearthed, work should be stopped immediately and the IA and local cultural relic bureau will be promptly notified; construction will resume only after a thorough investigation and with the permission of the appropriate authority.  如果出土新址，应立即停止施工，并及时通知 IA 和当地	Contractors, CSC  承包商，CSC	IA and CGN  IA 和 CGN	The contractors have established a procedure to reflect the issue. During the reporting period, there was no any relic founded.  承包商已经制定了反映该问题的程序。在报告期内，没有发现任何遗迹。

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			Implemented by 实施方:	Supervised by 监督方:	
		文物局;只有经过彻底调查并经有关当局许可,才可恢复施工。			
<b>C. Operation Phase</b>					
<b>C.运行阶段</b>					
<b>Dust</b>  灰尘	Fugitive dust will be generated by strong wind and affect local air quality	Use recycled water to the plant area to suppress dust emission.  在电厂区域使用循环水来抑制灰尘的飞扬。	IA	Local EPB	Complied.  遵守。
	强风会产生扬尘,影响当地的空气质量	Use mirror washing water to suppress dust from solar collection field.  使用镜面清洗水来抑制太阳能集热场的灰尘。	IA	地方环保局 (EPB)	Use circulating water to spray the various areas on site for suppressing dust  使用循环水喷洒现场各区域,抑制扬尘。
<b>Noise</b>  噪音	Noise from steam generator system, power generation equipment, additional heating, pump and cooling equipment may impact workers' hearing	Implement restricted access, and provide PPEs such as earmuffs and earplugs to personnel who work in high noise generating areas.  严格控制出入,并为在高噪音工作区域工作的人员提供 PPEs, 如耳罩和耳塞。	IA	Local EPB	Complied.  遵守。
	蒸汽发生器系统、发电设备、额外加热、泵和冷却设备产生的噪音可能会影响工作人员的听力	The latest technology incorporating maximum noise mitigating measures for the CSP plant components will be used.  将采用结合了 CSP 电厂组件最大噪音缓解措施的最新技术。	IA	地方环保局 (EPB)	Set up the entrance control system, and all personnel entering the power plant area shall wear earplugs or ear-muffs.  设置门禁管理,进入电厂区域所有人员佩戴耳塞或耳罩。
		All plant and equipment, including vehicles, will be			

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		properly maintained in order to minimize noise generation.  所有电厂和设备，包括车辆，将得到合理的维护，以尽量减少噪音的产生。			
Solid Wastes 固体废物	Waste generated from the CSP plant and worker	No permanent on-site solid waste disposal will be allowed.  不允许将固体废物永久地存放在现场。			
	CSP 电厂和工作人员产生的废物	All structures and/or components replaced during maintenance activities are recycled as much as possible. None-recyclable parts will be disposed at an designated waste disposal site in Delingha.  尽可能多地回收在维护活动中更换的所有结构和/或组件。不可回收的部件将在德令哈的指定垃圾处理场进行处理。  General waste will be recycled if possible or disposed properly to an appropriate designated landfill facility.  对于一般性废物，尽可能回收，或在指定的相关垃圾填埋场进行处理。  All wastes will be routinely collected by appropriately licensed waste management companies for reuse, recycling or final disposal in a licensed waste facility.  所有废物都将由拥有相关许可证的废物管理公司定期收集，以便在经许可的废物处理厂进行再利用，循环或最终处理。  Waste handling, collection and disposal operations are	IA  IA	Local EPB  地方环保局（EPB）	Complied.  遵守。  The contractor timely transfers the waste generated to the municipal garbage dump in Delingha.  All joints or components that can be recycled on site have been recovered and reused by the contractor.  承包商将产生的废物及时转移至德令哈市市政垃圾场。  现场可回收利用的结合或组件，承包商均已收回再利用。

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		managed and controlled by a waste management contractor  废物的运输，收集和处置操作由废物管理承包商管理和控制  No burning of wastes will be permitted at the plant site.  厂区内不允许燃烧废物。			
HTF  导热油	HTF handling needs special care to protect workers and environment  处理导热油时应特别注意，以保护工作人员和环境	HTF will be transported in spill proof container.  利用防溢容器运输导热油。			Complied.  遵守。
		HTF will be stored in designated areas with impermeable surfaces and protective dikes.  导热油将储存在指定的拥有不渗透表面和防护堰的区域。			Sealed tank truck and HTF barrel are used to HTF to meet overflow prevention requirements. After the HTF is transported to the power plant, it is unloaded to the overflow tank. The overflow tank area is provided with anti-seepage surface and cofferdam. Fire hydrants and fire monitors around the HTF storage area have been put into normal operation. Fire extinguishers are being installed.
		Fire protection and control procedures will be implemented in HTF storage area.	IA	Local EPB	
		在导热油储存区域实施火灾防护和控制程序。	IA	地方环保局（EPB）	使用密闭罐车和导热油桶运输导热油，满足防溢条件。导热油运输至电厂后卸油至溢流罐，溢流罐区域设置了防渗表面和围堰。导热油储存区域周围消防栓、消防炮已正常投运。并在配置了灭火器。

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	HTF leakage may cause soil and water pollution and human health problems.  导热油泄漏可能会导致水土污染和人类健康问题。	HTF system is equipped with automatic pressure monitoring devices. HTF leakage will be automatically detected and alarmed in the control system.  导热油系统配备自动压力监测装置。控制系统会自动检测并报警导热油的泄漏。  The ullage system should be operated at all time when the plant is in operation.  电厂运行时应始终运行罐空系统。  Concrete dikes with enough capacities should be built around the ullage system and other HTF tanks, such as HTF expansion tank, to contain HTF in case of accident.  应在罐空系统和其他导热油储罐（如导热油膨胀罐）周围建造具有足够容量的混凝土堤坝，以便在发生事故时容纳导热油。  Emergency response plan for HTF leakage will be developed and performed by properly trained staffs.  将制定关于导热油泄漏的应急响应计划，并由经过适当培训的人员执行。  Fire protection system is in place in order to quickly respond to the leakage.	IA      IA	Local EPB  地方环保局（EPB）	Complied.  遵守。  The HTF system is provided with a pressure measuring point to monitor the pressure of the HTF system. The ullage system runs continuously and concrete cofferdams are built around it. A special emergency plan for HTF leakage has been formulated and all personnel have been organized for training. The fire-fighting system has been put into normal operation, and the fire extinguisher are equipped at fixed points.  导热油系统设置了压力测点，用以监测导热油系统压力。罐空系统连续运行，并在周围建造了混凝土围堰。制定了导热油泄漏专项应急预案，并组织全员进行培训。消防系统已投运正常，灭火器定点配置。

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		防火系统已到位，以便快速响应泄漏。			
	HTF waste is hazardous waste and cause environmental pollution if not treated properly.	Contaminated soil from HTF will be temporarily stored onsite with impermeable surface. 被导热油污染的土壤将临时存放在现场表面不渗透的区域。			Complied. 遵守。
	导热油废物是危险废物，如果处理不当，会造成环境污染。	HTF waste should be stored using spill proof tanks and treated as hazardous material. 应采用防溢罐储存导热油废物，处理导热油废物应将其看作有害物质。  An identified and certified 3rd party hazardous waste management entity will be contracted before the operation of the plant and they will be responsible for the transportation and treatment of the HTF waste according application laws and regulations of the PRC.  在电厂开始运行前，将会与经确认和认证的第三方危险废物管理机构签订合同，该机构将根据中华人民共和国的适用法律法规负责导热油废物的运输和处理。	IA	Local EPB 地方环保局（EPB）	The generated waste HTF is stored in the HTF barrel. Golmud Environmental Protection Service Company of Qinghai Province has been contacted to sign the Hazardous Waste Treatment Contract.  产生的导热油废物均储存至导热油桶内。已联络青海省格尔木市环保服务公司签订危险废物处理合同。
Chemicals and Hazardous Materials 化学品和有害物质	Hazardous materials or chemicals can lead to soil and water pollution and risks to human health.  有害物质或化学物质会导致水土污染和人	All toxic, hazardous, or harmful materials including petroleum products, solvents and chemicals used for water treatment must be transported in spill proof tanks with filling hoses and nozzles in working order, and stored in designated areas with impermeable surfaces and protective dikes such that spillage or leakage will be contained from affecting soil, surface water or groundwater systems.  所有有毒，危害或有害物质，包括石油产品和用于水处理	IA	Local EPB 地方环保局（EPB）	Complied. 遵守。  Lubricating oil is transported in sealed oil drums, while chemical solvents are transported in sealed high-density polyethylene chemical drums. Anti-seepage measures are

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	体健康风险。	<p>的溶剂和化学品，必须在防溢罐中运输，按正常工作顺序配备装料软管和喷嘴，并将其存放在具有不渗透表面和防护堤的指定区域，以防溢出或渗漏影响土壤，地表水或地下水系统。</p> <p>Material safety data sheets (MSDSs) will be posted for all hazardous materials.</p> <p>为所有有害物质张贴材料安全数据表（MSDSs）。</p> <p>Oil absorbents will be readily accessible in marked containers.</p> <p>在有标记的容器内有可用的吸油剂。</p> <p>Good housekeeping procedures will be established to avoid the risk of spills.</p> <p>将制定完备的清洁程序以避免泄漏风险。</p> <p>Spills will be dealt with immediately, and personnel will be trained and tasked with this responsibility.</p> <p>泄漏情况将得到及时的处理，人员将接受相关培训并承担这一责任。</p>			<p>taken in the placement area.</p> <p>The hazardous substance safety data sheet has been posted in the storage area.</p> <p>The hazardous waste disposal log sheet has been prepared and all activities have been recorded.</p> <p>There is no work related to the treatment of hazardous substances in the power plant.</p> <p>Harmful substances are temporarily stored in the HTF barrel, the barrel opening is closed, and there is no risk of overflow and leakage.</p> <p>The Green Mountain and Green Water Environmental Protection Service Company of Golmud City in Qinghai Province has been contacted for working as a designated treatment contractor.</p> <p>Golmud Green Mountain and Green Water Environmental Protection Service Company has the qualification to handle hazardous waste.</p> <p>Oil and other harmful substances are kept in closed containers and checked every hour, and any overflow or</p>
	<p>Hazardous waste may cause pollution to environment and health issues to workers.</p> <p>有害废物可能造成环境污染和工作人员健</p>	<p>Identify and maintain a register of all activities that involve the handling of potentially hazardous substances, as well as devise and supervise the implementation of protocols for the handling of these substances. This will include all fuels, oils,grease, lubricants, and other chemicals.</p> <p>确定和维护涉及处理潜在有害物质的所有活动的登记册，并制定和监督处理这些物质的方案的实施情况。这将包括</p>			

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	康问题。	<p>所有燃料，油，润滑脂，润滑油和其他化学品。</p> <p>Workers should be properly trained before handling hazardous wastes and have the requisite PPE.</p> <p>工作人员在处理有害物质前应得到适当的培训，并拥有必要的个人防护设备（PPE）。</p> <p>Store hazardous waste temporarily in closed containers away from direct sunlight, wind, water and rain in secure designated areas with impermeable surfaces and protective dikes such that spillage or leakage will be contained.</p> <p>将有害废物暂时存放在封闭的容器内，避免阳光直射、风、水和雨水，并存放在具有防渗表面和防护堤的安全指定区域，以防溢出或泄漏。</p> <p>Oil sludge will be collected and disposed by licensed contractors on as needed basis.</p> <p>根据需要，由经过许可的承包商收集并处置油泥。</p> <p>Separate hazardous waste from general waste and all hazardous waste will be contracted to the identified and certified contractor for transporting and disposal.</p> <p>将有害废物与一般废物分类；所有有害废物的运输和处置将承包个经确认和认证的承包商。</p>			<p>leakage found will be cleaned in time.</p> <p>润滑油使用密闭油桶运输，化学溶剂使用密闭高密度聚乙烯化工桶运输。放置区域均采取防渗措施。</p> <p>有害物质安全数据表已张贴在储存区域。</p> <p>建立危废处置台账，记录所有活动。</p> <p>电厂无处理有害物质相关工作。</p> <p>有害物质暂存在导热油桶内，桶口封闭，无溢出和泄漏风险。</p> <p>已联络青海省格尔木市青山绿水环保服务公司作为制定处理承包商。</p> <p>格尔木青山绿水环保服务公司具备处理危险废物的资质。</p> <p>油和其它有害物质处于封闭容器内，同时每小时查看一次，发现溢出、泄漏及时清理。。</p>



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		<p>Ensure that care is taken at all times to ensure the impact of spillage of oils and other hazardous substances to be limited, and it will be cleaned up immediately.</p> <p>确保始终保持谨慎，以确保油和其他有害物质溢出的影响受到限制，并立即清理。</p>			
Wastewater 废水	Water pollution and reuse in CSP	<p>Wastewater from the chemical treatment facility will be pre-treated before discharging to the onsite wastewater treatment plant (WWTP) for further treatment.</p> <p>化学品处理设施产生的废水在排放至现场废水处理厂（WWTP）进行进一步处理前，将经过预处理。</p> <p>Wastewater collected from other parts of the CSP plant will also be sent to the onsite WWTP.</p> <p>从 CSP 电厂其他部分收集的废水也将被送到现场废水处理厂。</p> <p>Treated water from WWTP will be used for watering plants and dust suppression onsite.</p> <p>经废水处理厂处理过的水将用于浇灌植物和抑制现场扬尘。</p> <p>All runoff water from workshops, vehicles washing areas and other equipment will be collected and send to the onsite WWTP for treatment.</p> <p>所有来自车间，车辆洗涤区域和其他设备的径流水将被收集并送至现场废水处理厂进行处理。</p>	IA	Local EPB 地方环保局（EPB）	<p>Complied.</p> <p>遵守。</p> <p>The power plant is equipped with an industrial wastewater treatment plant, an oily wastewater treatment plant and a domestic wastewater treatment plant, which are used for treating wastewater generated in various areas of the power plant.</p> <p>The treated wastewater is discharged into the evaporation pond for watering plants and sprinkling water to suppress dust.</p> <p>Runoff water from all workshops is collected through underground pipe network to oily wastewater system for treatment.</p> <p>The generated solid waste is stored in the hazardous waste repository, and the environmental protection service company is contacted regularly for</p>
	CSP 中的水污染和再利用				

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		Ensure that solid waste collection and sanitation is managed effectively in order to avoid any chances of ground and surface water pollution.  确保固体废物的收集和卫生得到有效管理，以避免任何污染地面和地表水的可能性。  Oil contaminated water will be directed to the WWTP, which is equipped with an oil/water separator.  油污水将被引导至配备有油水分离器的废水处理厂。  All vehicle loading/unloading points will be within a bounded area to minimize the potential impact of spills to pollute water.  所有车辆的装载/卸载点都将在有限区域内，以尽量减少泄漏对水的污染。  Any run-off that is discharged from the site must be uncontaminated and meet standards for discharge.  从现场排放的任何径流必须未受污染并达到排放标准。			transfer and treatment.  The oily wastewater treatment system is equipped with an oil-water separator.  The vehicle loading and unloading point is limited to the workshop and the leakage will not pollute the water source.  All emissions meet the standards.  电厂配套有工业废水处理装置、含油废水处理装置和生活污水处理装置，用于处理电厂各区域产生的废水。  经处理后的废水排入蒸发塘，用于浇灌植物和洒水抑制扬尘。  所有车间的径流水通过地下管网收集至含油废水系统处理。  将产生的固体废物存放于危废库，定期联系环保服务公司转移处理。  含油废水处理系统配套有油水分离器。  车辆装卸点限定在车间，产生泄漏不会污染水源。  所有排放满足标准。

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Occupational health and safety  职业健康和安全	HTF may present health and safety risks to workers in case of accidental release  如果意外逸出,导热油可能对工作人员的健康和安全带来风险	Occupational heat and safety procedures, including fire prevention and control, will be developed and workers will be trained regularly.  将制定职业健康和安全程序, 包括火灾预防和控制程序, 将对工作人员定期进行培训。  The general arrangement is designed in strict compliance with relevant standards, featuring fire compartments based on fire-resisting levels of process units and buildings to satisfy requirement on fire-prevention space.  总体布置严格按照有关标准设计, 以工艺设备和建筑的防火等级为基础设置防火间, 满足对消防空间的要求。  Storage tank area is surrounded by ring-shaped fire passages for fire-fighting vehicles. Fire compartments are set up based on the fire risk and fire-resisting buildings/structures, including fire-proof doors and windows.  储罐区域周围环绕环形消防通道, 供消防车辆行驶。根据火灾风险和防火建筑/结构设置防火间, 包括防火门窗。  A fire-alarm system will be installed and tested regularly to make sure if functions properly.  计划安装并定期测试火警系统, 以确保其正常工作。  The process control system contains an out-of-limit alarm to ensure all hazardous materials under safety control at all time.  过程控制系统包含一个超限报警器, 确保所有有害物质始终处于安全控制之下。	IA	Local EPB, local LB, local fire station  当地 EPB, 当地 LB, 当地消防站	Complied.  遵守。  Standard operating procedures have been formulated, and protective articles are required to be properly worn. In addition, the temperature of HTF system shall be lowered to 60°C to allow operation.  The overall layout of the power plant is designed and constructed in strict accordance with the <i>Code for Fire Protection Design of Buildings</i> , which meets the fire protection requirements.  Annular fire exits are provided around the storage tank area.  A fire alarm system is installed and tested regularly. The system works normally.  The HTF system is equipped with pressure measuring points to monitor the system pressure.  Staffs are provided with goggles, gloves and safety shoes.  制定标准作业程序, 需穿戴好防护用品, 同时导热油系统温度降低至 60°C 一下允许工作。

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			Implemented by 实施方:	Supervised by 监督方:	
		<p>PPE, including goggles, gloves, safety shoes, will be provided to workers.</p> <p>计划为工作人员提供 PPE，包括护目镜、手套和安全鞋。</p>			<p>电厂总体布局严格按照《建筑设计防火规范》设计、建设。满足消防要求。</p> <p>储罐区域周围设有环形消防通道。</p> <p>安装有 1 套火警系统，定期测试，系统工作正常。</p> <p>导热油系统配套有压力测点，用于监控系统压力。</p> <p>工作人员配发护目镜、手套、安全鞋。</p>
	<p>Natural gas and other flammable gas are fire hazards</p> <p>天然气和其他易燃气体属于火灾隐患</p>	<p>Naked fire, hot surface, electric sparks, electrostatic spark and ignition sources like impulsive force and friction shall be strictly controlled, especially near HTF, nitrogen gas and natural gas.</p> <p>应严格控制明火，热表面，电火花，静电火花以及冲击力和摩擦等点火源，特别是在导热油，氮气和天然气附近。</p> <p>Control measures will also be strictly taken to ensure the discharge, exhaust and safety relief of flammable fuels in an enclosed system.</p> <p>还计划严格采取控制措施，确保在封闭系统中易燃燃料的排放、抽出和安全释放。</p> <p>The fire monitoring system will be installed to ensure safety in production and operation and provide early warning to plant personnel.</p>			<p>Complied.</p> <p>遵守。</p> <p>Hot work order is required for hot work in the power plant area and fire prevention measures shall be taken.</p> <p>Flammable fuel emissions in the closed system are absorbed by activated carbon to meet safe release requirements.</p> <p>The power plant is equipped with a set of fire control monitoring system, and the main engine is arranged in</p>

Category 类别	Potential Impacts and Issues 潜在影响和问题	Mitigation Measures and/or Safeguards 缓解措施和/或保障	Responsibility 责任		Implementation Status 实施状态
			Implemented by 实施方:	Supervised by 监督方:	
		计划安装消防监测系统，确保生产和运行安全，为电厂人员提供预警。			the centralized control room.
		Important monitoring areas must have a combustible gas test detector of catalytic combustion kind which are able to make an acousto-optic alarm, and a poisonous gas test detector of electrochemistry kind capable of making an acousto-optic alarm.			Combustible gas detectors are provided in areas where combustible gas may be generated.
		重要的监测区域必须有能够发出声光报警的催化燃烧式可燃气体检测探测器和能够发出声光报警的电化学类毒气检测探测器。			电厂区域明火作业需办理动火作业票，做好防火措施。
					封闭系统中易燃燃料排放通过活性炭吸附，满足安全释放。
					电厂配套有 1 套消防监控系统，主机设置在集中控制室。
					在可能产生可燃气体区域配套有可燃气体检测探测器。
	Molten salt tanks are very hot and it may present some burn hazardous to workers  熔盐罐非常热，可能会对工作人员造成一些危害	Unauthorized personnel should not be around the molten salt storage tanks.			Complied.
		未经授权的人员不应该在熔盐罐周围。			遵守。
		Authorized personnel must have PPE at all times to prevent burn hazards.			The outer wall of the molten salt tank is wrapped with thermal insulation materials, and the temperature of the outer wall is approximate to the ambient temperature, thus there is no danger of burns.
		授权人员必须始终佩戴 PPE 以防止灼伤危险。			熔盐罐外壁包覆有保温材料，外壁温度近似环境温度，不会产生灼伤危险。
Emergency	HTF, other hazardous	An emergency response plan will be prepared before the plant	IA	Local EPB and	Complied.

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			Implemented by 实施方:	Supervised by 监督方:	
<b>Response Plan</b>  <b>应急响应计划</b>	<p>chemicals, and gas may create health risks to worker and pollute the environment</p> <p>导热油, 其他危险化学品和气体可能会对工作人员造成健康风险并污染环境</p>	<p>is operational and the plan must meet the requirements according to National Environmental Emergency Plan (24 January 2006) and relevant laws, regulations and standards.</p> <p>在电厂投入运行之前将制定应急计划, 计划必须符合国家环境应急计划(2006年1月24日)和相关法律, 法规和标准的要求。</p> <p>Procedures for responding to different types of emergency situations will be identified in the response plan.</p> <p>响应计划中将确定对不同类型的紧急情况作出响应的程序。</p> <p>Emergency exercises will be conducted and they should include different emergency scenarios.</p> <p>计划实施应急演练, 应包括不同的应急场景。</p> <p><b>Training requirements.</b> Appropriate operating and maintenance employees will be trained to ensure that they are knowledgeable of the requirements of the written emergency response procedures. Training will be provided as follows:</p> <p><b>培训要求。</b> 计划对相关运行和维护人员进行培训, 确保其了解书面应急响应程序的要求。培训规定如下:</p> <p>II. Initial training to all employees before the CSP plant is put in operation;</p> <p>II. 在CSP电厂投入运行之前对所有员工进行初始培训;</p> <p>III. When new equipment, materials, or processes</p>		<p>Local Fire Department</p> <p>当地 EPB 和当地消防部门</p>	<p>遵守。</p> <p>A special emergency plan for HTF leakage has been prepared.</p> <p>There are response procedures for different types of situations in the emergency plan.</p> <p>Carry out emergency drills for HTF leakage once a year.</p> <p>Emergency plan training is conducted for operation and maintenance personnel once a year.</p> <p>The emergency plan specifies the emergency procedures and contents of reporting after the leakage.</p> <p>Through emergency drills, the first responder will assess the emergency situation and clean up all occupied buildings; eliminate potential fire sources; locate and isolate the places where problems occur as required, and shut down natural gas; determine the scope of hazardous areas and establish a restricted area.</p> <p>The person in charge of response shall notify the dispatcher to carry out emergency treatment according to the emergency situation.</p> <p>The person in charge of response</p>

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			Implemented by 实施方:	Supervised by 监督方:	
		are introduced.			shall set up the site command in the safe place of the accident site.
		III. 引入新的设备，材料或工艺时。			
		IV. When emergency response procedures have been updated or revised.			Dedicated personnel shall be assigned to the on-site command station to take charge of the on-site emergency response command and keep the communication unblocked.
		IV. 对应急响应程序进行更新或修订时。			
		<b>Annual emergency simulation.</b> Exercise of simulated emergencies will be conducted at least annually.			After the accident expands, the safety and quality department will contact the local police department to assist in handling it.
		<b>年度应急模拟。</b> 至少每年进行一次模拟应急演练。			
		Simulated emergencies exercises should be documented.			The local fire department is responsible for directing emergency rescue after participating.
		应记录模拟应急演练。			
		<b>Receiving notification of a possible emergency.</b> When a supervisor receives a report of a possible emergency situation, he/she should obtain at least the following information from the reporting person:			The person in charge of response will report the emergency rescue situation to the fire department officials and authorities at any time and keep in touch with them at any time.
		<b>收到可能发生紧急情况的通知。</b> 当负责人收到可能出现紧急情况的报告时，他/她至少应该从报告人那里获得以下信息：			After the emergency rescue team arrived on site, the site command station will report and accept the task.
		V. Name of person reporting emergency;			Key personnel are responsible for supervising emergency personnel to carry out emergency treatment.
		V. 报告紧急情况的人的姓名;			
		VI. Nature of Emergency - leak, fire, interruption of service if leak, place where odor is present, how long has odor been noticed.			A call list has been drawn up and included in the comprehensive emergency plan for unexpected
		VI. 紧急情况的性质--泄漏、火灾、泄漏造成的服			

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			Implemented by 实施方:	Supervised by 监督方:	
		务中断、出现异味的地方、发现异味多久了。			accidents.
		VII. Details of emergency: location, amount, how long has the odor been noticed, what actions have been taken, etc.			编制了导热油泄漏专项应急预案。
		VII. 详细的紧急情况：地点、数量、发现异味到现在多久了、采取了哪些措施，等等			应急预案中针对不同类型情况制定有响应程序。
		VIII. Leaks or other emergencies require prompt investigation.			每年开展 1 次导热油泄漏应急演练。
		VIII. 对于泄漏和其他紧急情况，需要及时调查。			每年对运行维护人员进行 1 次应急预案培训。
		<b>Immediate on-site action.</b> The first responder will assess the nature of the report.			应急预案对发生泄漏后的紧急报告程序和内容进行了规定。
		<b>立即采取现场行动。</b> 第一响应者将评估报告的性质。			通过开展应急演练，第一响应者对紧急状况进行评估，并采取清理所有有人的建筑；消除潜在的火源；根据需要对出现问题的地方进行定位并隔离，并关闭天然气；确定危险区域的范围并建立一个限制区域的措施。
		This assessment should include the status of the emergency, an estimation of how the incident might progress, and an evaluation of the manpower, equipment, and materials needed to adequately cope with the situation.			响应负责人根据紧急状况，通知调度员开展应急处置。
		该评估应包括紧急情况状况，对事件可能的发展进程的估计，以及对应对这种情况所需的人力，设备和材料的评估。			在事故发生现场安全地点，由响应负责人成立现场指挥部。
		If there is a strong odor or any measurable reading of gas detected inside a structure,			现场指挥站由专人负责现场应急处置指挥，保持通讯畅通。
		如果在结构内部检测到强烈的气味或可测量的气体读数，			事故扩大后，由安全质量部联系当
		IX. Clear the building of all occupants;			



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			Implemented by 实施方:	Supervised by 监督方:	
		IX. 清理所有有人的建筑;			地警察部门协助处理。
		X. Eliminate potential ignition sources.			当地消防部门参与后，负责指挥应急救援。
		X. 消除潜在的火源。			
		XI. Localize or isolate the problem and shut off gas as needed.			响应负责人将应急救援情况随时向消防部门官员和当局汇报，随时保持联络。
		XI. 根据需要对出现问题的地方进行定位并隔离，并关闭天然气。			应急救援队伍抵达现场后，项现场指挥站报告，并领取任务。
		XII. Determine the extent of the hazardous area and establish a restricted area.			关键人员负责监督应急人员开展应急处置。
		XII. 确定危险区域的范围并建立一个限制区域。			已制定呼叫清单，清单列入突发事件综合应急预案中。
		The responding supervisor shall determine the extent of the emergency and inform the dispatcher of the condition at the site.			
		响应负责人应确定紧急情况的程度，并通知调度员该现场的状况。			
		If emergency procedures are put into effect, the supervisor should select a location and establish an emergency command post.			
		如果应急程序生效，负责人应选择一个地点并建立应急指挥站。			
		The responding supervisor will assign one person to remain at the command post to maintain communications until the			

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			Implemented by 实施方:	Supervised by 监督方:	
		emergency is over.  响应负责人将指派一名人员留在指挥站，在紧急情况结束前保持通讯束。  When necessary, the command post will be coordinated with the local emergency responders.  必要时，指挥站将与当地应急人员协调。  When local emergency responders are involved, they will be in charge of incident.  如果当地应急人员参与，他们将负责事件。  The responding supervisor will make himself known to fire and/or police department officials, or other authority having jurisdiction, and will remain with them during the emergency.  响应负责人将向火灾和/或警察部门官员或其他有管辖权的当局报告，并将在紧急情况期间与他们保持联络。  All employees reporting to the scene of the emergency will report to the command post for identification and instructions.  所有向紧急情况现场报告的员工都将向指挥站报告，以便识别其身份并给出指示。  Key personnel will be alerted, and it will be their responsibility to keep the emergency personnel under their supervision informed and available for emergency call out.			

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			Implemented by 实施方:	Supervised by 监督方:	
		<p>关键要人员将会收到警报，他们有责任监督应急人员并能够响应紧急出动。</p> <p>When a system failure cannot be made safely by normal procedures, emergency shutdown procedures should be implemented.</p> <p>当一般程序无法安全地处理系统故障时，应执行应急关闭程序。</p> <p>Reduce system pressure or segmenting a section before repair procedures are implemented.</p> <p>在实施修理程序之前，降低系统压力或进行分段。</p> <p>Well trained and qualified personnel will be dispatched to monitor system pressure and repair work.</p> <p>训练有素的合格人员将被派去监测系统压力和执行维修工作。</p> <p><b>Communication with Public Officials.</b> When an emergency resulting in a hazard to the public safety occurs, the local fire department, police, the city medical emergency center and other relevant public officials should be notified.</p> <p><b>与公职人员沟通。</b> 发生危害公共安全的紧急事件时，应通知当地消防部门，警察，市医疗急救中心和其他相关公职人员。</p> <p>An emergency call list will be prepared and make it available</p>			

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			Implemented by 实施方:	Supervised by 监督方:	
		at the plant control room.			
		计划制定一份应急呼叫清单，置于电厂控制室以供使用。			
DI = design institute, EIA = environment impact assessment, EMP = environment monitoring plan, EMS = environment monitoring station, EPB = environment protection bureau, GRM = grievance redress mechanism, CSP =concentrated solar thermal plant, IA = implementing agency, km = kilometer, LB = labor bureau, m = meter, mg = milligram, m³ = square meter, PRC = the Peoples Republic of China, SO <sub>2</sub> = sulfur dioxide.					
DI =设计院，EIA =环境影响评估，EMP =环境监测计划，EMS =环境监测站，EPB =环保局，GRM =申诉处理机制，CSP =集热式太阳能光热电厂，IA =实施机构，km =公里，LB =劳动局，m =米，mg =毫克，m³ =立方米，PRC =中华人民共和国，SO <sub>2</sub> =二氧化硫。					

## IV. ENVIRONMENTAL MONITORING

### IV. 环境监测

22. This section presents the progress of environmental monitoring framework in details and the summary of environmental monitoring results.

22. 本章节将详细介绍环境监测框架的进展情况以及环境监测结果的概述。

#### A. Implementation of Environmental Monitoring Program

##### A. 环境监测计划的实施

23. An environment monitoring plan (see Table 6) is developed to monitor the environmental impacts of the project, particularly assessing (i) the extent and severity of actual environmental impacts against the predicted impacts and baseline data collected before the project implementation, (ii) performance or effectiveness of environmental mitigation measures or compliance with pertinent environmental rules and regulations, (iii) trends in impacts, (iv) overall effectiveness of EMP implementation, and (v) the need for additional mitigation measures and corrective actions if non-compliance is observed. The EMP monitoring plan covers air, wastewater, solid waste, and noise parameters during construction as well as operation of the project.

23. 环境监测计划（见表 6）的制定旨在监测该项目的对环境的影响，尤其用于评估（i）相比项目实施前预估的影响和收集的基本数据，实际环境影响的范围和严重程度（ii）环境缓解措施的表现或有效性或其与相关的环境规则和规范的一致性，（iii）影响趋势，（iv）EMP 实施的整体有效性，以及（v）如果观察到违规情况，采取额外的缓解措施和纠正措施的需求。EMP 监测计划涵盖了项目施工和运营期间的空气，废水，固体废物和噪声参数。

24. Table 5 shows the environmental monitoring results during reporting period.

24. 表 5 显示了本报告期间的环境监测结果。

#### a. Wastewater

##### a. 废水

25. Wastewater collection basins and sediment traps are equipped in concrete batching station area. The construction wastewater, after sedimentation, has been used as the spraying water for fugitive dust control on the construction site. The domestic wastewater from workers camp is equipped with water collection basins and is cleaned up timely by local environment monitoring station. The water quality (pH, SS, oil) of the project area was monitored by the Xi'an jingcheng monitoring technology Co., Ltd., during construction phase monthly.

25. 混凝土配料站配备废水集水槽和沉淀池。沉淀后的施工废水被用作控制施工现场扬尘的喷洒水。为工作人员营区的生活废水配备集水槽，该废水由当地环境监测站及时清理。该项目区域的水质（pH，SS，油）由西安京诚监测技术有限公司在施工期间每月进行监测。

## **b. Ambient air**

### **b.环境空气**

26. The ambient air quality of the project area was monitored monthly. The contractors have water trucks to spray water on construction sites and earth/material handling routes every day. Construction materials (sand, gravel, and rocks) and spoil materials are transported trucks covered with tarpaulins. Storage piles are at least 30m downwind of the nearest human settlements. All vehicles (e.g., trucks, equipment, and other vehicles that support construction works) are well maintained and not emit dark, smoky or other emissions in excess of the limits.

26. 每月对项目区域的空气质量进行监测。承包商每天都有洒水车在施工现场，土方/材料处理路线上喷洒水。施工材料（沙子，沙砾和岩石）和弃土材料的运输卡车覆盖着防水油布。存储桩位于居住区下风方向，并至少距离 30m。所有车辆（如卡车，设备和其他支持施工工程的车辆）维护良好，不会排放超过限值的黑烟或其他排放物。

## **c. Noise**

### **c.噪音**

The noise from equipment and machinery was main noise resource, and was no more than 60db in the daytime, and below 50db at night. This CSP project locates in a depopulated zone, so it has no influence on surrounding communities. Its noise complied with the standard GB12523-2011, etc. The noise data of the project area will be monitored by Xi'an jingcheng monitoring technology Co., Ltd.

设备和机械噪声是主要噪声源，白天不超过60db，夜间低于50db。该CSP项目位于人口稀少的区域，因此对周边的社区没有影响。噪声符合GB12523-2011等标准。项目区噪声数据由西安京诚监测技术有限公司监测。

(三) 噪声监测结果:

The monitoring result of noise

监测日期 Monitoring Date	监测点位 Monitoring Site	采样时间 Sampling Time	监测项目 Monitoring Item
			噪声 Noise dB(A)
2019-12-23	1#东厂界 East of boundary	昼间 (08:55) Day time	40.5
		夜间 (22:14) Night time	45.3
	2#南厂界 South of boundary	昼间 (09:18) Day time	37.5
		夜间 (22:31) Night time	43.2
	3#西厂界 West of boundary	昼间 (09:35) Day time	45.3
		夜间 (22:48) Night time	41.2
	4#北厂界 North of boundary	昼间 (09:52) Daytime	45.8
		夜间 (23:06) Night time	43.7
2019-12-24	1#东厂界 East of boundary	昼间 (09:44) Day time	37.8
		夜间 (22:03) Night time	43.5
	2#南厂界 South of boundary	昼间 (10:07) Day time	44.4
		夜间 (22:20) Night time	43.6
	3#西厂界 West of boundary	昼间 (10:24) Day time	43.6

d. Construction spoil disposal

d. 施工弃土处置

Spoils are safely disposed and managed with minimum environmental damage because the Environmental Protection Administration of Delingha has inspected the site and gave a good result in Oct 2015. Designated temporary areas where set up HSE signs for spoil disposal on site and re-use of excavated materials for landfill.

由于德令哈环保局已于2015年10月对该场址进行了检测并给出了良好的结果,因此弃土得到了安全的处置和管理,对环境造成的损害最小。指定临时区域,其中为在现场处置的弃土和用于填埋的挖方材料设置HSE标志。

Table 5: Monitoring Parameters and Methods

表5: 监测参数和方法

Media	Monitoring Parameter	Standard Limits
媒介	监测参数	标准限制

Media	Monitoring Parameter	Standard Limits
媒介	监测参数	标准限制
Air 空气	TSP (mg/m <sup>3</sup> )	0.30
	总悬浮颗粒物 (TSP) (mg/m <sup>3</sup> )	
	PM10 (mg/m <sup>3</sup> )	0.15
	PM <sub>10</sub> (mg/m <sup>3</sup> )	
	NOx (mg/m <sup>3</sup> )	0.12
	NO <sub>x</sub> (mg/m <sup>3</sup> )	
Noise 噪音	Equivalent Continuous A Sound (Leq)	60 (day)/
		60 (天) /
	等效持续A声级 (Leq)	50 (night)
		50 (晚)
Surface water 地表水	pH value	6-9
	pH值	
	CODMn(mg/L)	6
	COD <sub>Mn</sub> (mg/L)	
	Petroleum (mg/L)	0.05
	石油 (mg/L)	
	SS (mg/L)	250
	SS (mg/L)	
	Total coliforms (no./L)	10,000
	总大肠菌群 (no./L)	

COD = chemical oxygen demand, mg/L = milligram per liter, mg/m<sup>3</sup> = milligram per cubic meter, PM10 = particulate matter smaller than 10 micrometers, SS = suspended solid, TSP = total suspended particulate.

COD =化学需氧量, mg / L =毫克每升, mg/ m<sup>3</sup> =毫克每立方米, PM<sub>10</sub>=小于 10 微米的颗粒物, SS=悬浮固体, TSP=总悬浮颗粒物。

Source: PRC standards.

来源：中华人民共和国标准。



Table 6: Environmental Monitoring Plan

表 6：环境监测方案

Subject	Parameter	Location	Frequency	Implement ed by	Supervise d by	Implementation Status
主题	参数	位置	频度	实施方：	监督方：	实施状态
A. Construction Phase						
A.施工阶段						
Wastewater generated from construction  施工产生的废 水	Inspection of wastewater mitigation measures (water collection basins and sediment traps, etc.)	The construction site	Waste water effluent sites, Daily	Contractors, IA and CSC,	IA and CGN	Complied.
	对废水缓解措施(集 水槽和沉淀池等)的 检测	施工现场	废水排水站，每日	承包商， CSC，	IA 和 CGN	遵守。
	pH, SS, oil	The construction site	One sampling each day each time, monthly	Local EMS 地方 EMS	IA, Local EPB	Complied.
Ambient air  环境空气	pH, SS, 油	施工现场	每天取样一次, 按月	(环境监 测站)	IA, 当地 EPB	遵守。
	Ambient air monitoring; Inspection of dust mitigation measures (water spraying, cover transport vehicles, etc); and Inspection of maintenance and condition of vehicles and construction equipment.	The construction site and nearby areas	Monthly; 月度; Daily when there are construction activities.	IA, Contractors, CSCs	IA, Local EPB	Complied.
	环境空气监测;灰尘 缓解措施的检测(喷 水, 覆盖运输车辆 等);车辆和施工设 备的维护和状况检 测。	施工现场和附 近地区	有施工活动时每天。	IA, 承包 商, CSCs	IA, 当地 EPB	遵守。

Subject 主题	Parameter 参数	Location 位置	Frequency 频度	Implement ed by 实施方:	Supervise d by 监督方:	Implementation Status 实施状态
Noise 噪音	Leq dB(A)	All sensitive receivers nearby construction site 施工现场附件的所有敏感接收器	Monthly: a day each time and two samples; once during daytime, once during nighttime. 月度: 每天一次, 取两个样本; 白天一个, 晚上一个。	IA, Contractors, CSCs IA, 承包商, CSCs	Local EPB 地方环保局 (EPB)	Complied. 遵守。
Construction spoil disposal 施工弃土处置	Spoil waste 废土	Construction waste disposal sites. 施工废物处置场所。	At the onsite of construction; Once a year; and once after completion of spoil disposal 在现场施工; 一年一次; 在完成弃土处置后一次	Local EPB 地方环保局 (EPB)	CGN	Complied. 遵守。
B. Operation Phase						
B.运行阶段						
Noise from CSP CSP 产生的噪音	Leq dB(A)	1m outside of the CSPs' boundary CSP 边界 1m 开外	Monthly 月度	IA	Local EPB, CGN 当地 EPB, CGN	Being complied. 遵守中。
Wastewater and sludge from CSP <sup>a</sup> CSP <sup>a</sup> 产生的废水和污泥	Quantity generated and discharged, SS, BOD 产生和排放的数量, SS, BOD	Discharging point 排放点	Monthly 月度	IA	Local EPB, CGN 当地 EPB, CGN	Being complied. 遵守中。
Solid waste 固体废物	Solid waste generated from the plant 电厂产生的固体废物	Waste disposal site 废物处置场所	Monthly 每月	IA	Local EPB 地方环保局 (EPB)	Being complied. 遵守中。

Subject 主题	Parameter 参数	Location 位置	Frequency 频度	Implemented by 实施方:	Supervised by 监督方:	Implementation Status 实施状态
Leakage of hazardous Materials and Wastes 有害物质和废物的泄漏	Leakage of the HTF and natural gas 导热油和天然气泄漏	CSP	Real time control 实时控制	IA	Local fire station, local EPB, CGN 当地消防局, 当地EPB, CGN	Being complied. 遵守中。

CNY = Chinese yuan, CSC = construction supervision company, CSP = concentrated solar thermal plant, dB = decibel, EMS = environment monitoring station, EPB = environment protection bureau, IA = implementing agency, Leq = equivalent continuous noise level, NO2 = nitrogen dioxide, pH = potential hydrogen, PM = particulate matter, SO2 = sulfur dioxide.

CNY = 人民币元, CSC = 施工监理公司, CSP = 集热式太阳能光热电厂, dB = 分贝, EMS = 环境监测站, EPB = 环境保护局, IA = 实施机构, Leq = 等效连续噪声等级, NO2 = 二氧化氮, pH = 潜在氢气, PM = 颗粒物, SO2 = 二氧化硫。

aDuring the detailed engineer designing phase, all the features of the wastewater facility will be confirmed. Based on the confirmation, the monitoring location and frequency will be reviewed and revised if necessary.

a在具体的工程师设计阶段, 废水处理设施的所有功能将得到确认。根据确认情况, 如有必要, 将对监测地点和频率进行评估和修订。

Source: Domestic environment assessment report and TA consultants estimate.

来源: 国内环境评估报告和技术援助顾问估算。



Page 1: Monitoring Report

第 1 页: 监测报告

Page2: Ambient Air Monitoring

第 2 页: 环境空气监测

Page3: Ambient Air and Wastewater Monitoring

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项目	2014 年 12 月 31 日	2014 年 12 月 31 日	2014 年 12 月 31 日	2014 年 12 月 31 日	2014 年 12 月 31 日
资产	资产	资产	资产	资产	资产
流动资产	流动资产	流动资产	流动资产	流动资产	流动资产
货币资金	货币资金	货币资金	货币资金	货币资金	货币资金
应收账款	应收账款	应收账款	应收账款	应收账款	应收账款
预付款项	预付款项	预付款项	预付款项	预付款项	预付款项
其他流动资产	其他流动资产	其他流动资产	其他流动资产	其他流动资产	其他流动资产
非流动资产	非流动资产	非流动资产	非流动资产	非流动资产	非流动资产
长期股权投资	长期股权投资	长期股权投资	长期股权投资	长期股权投资	长期股权投资
固定资产	固定资产	固定资产	固定资产	固定资产	固定资产
无形资产	无形资产	无形资产	无形资产	无形资产	无形资产
其他非流动资产	其他非流动资产	其他非流动资产	其他非流动资产	其他非流动资产	其他非流动资产
负债	负债	负债	负债	负债	负债
流动负债	流动负债	流动负债	流动负债	流动负债	流动负债
短期借款	短期借款	短期借款	短期借款	短期借款	短期借款
应付账款	应付账款	应付账款	应付账款	应付账款	应付账款
预收款项	预收款项	预收款项	预收款项	预收款项	预收款项
其他流动负债	其他流动负债	其他流动负债	其他流动负债	其他流动负债	其他流动负债
非流动负债	非流动负债	非流动负债	非流动负债	非流动负债	非流动负债
长期借款	长期借款	长期借款	长期借款	长期借款	长期借款
应付债券	应付债券	应付债券	应付债券	应付债券	应付债券
其他非流动负债	其他非流动负债	其他非流动负债	其他非流动负债	其他非流动负债	其他非流动负债
所有者权益	所有者权益	所有者权益	所有者权益	所有者权益	所有者权益
实收资本	实收资本	实收资本	实收资本	实收资本	实收资本
资本公积	资本公积	资本公积	资本公积	资本公积	资本公积
盈余公积	盈余公积	盈余公积	盈余公积	盈余公积	盈余公积
未分配利润	未分配利润	未分配利润	未分配利润	未分配利润	未分配利润

**Page 4: Noise Monitoring**

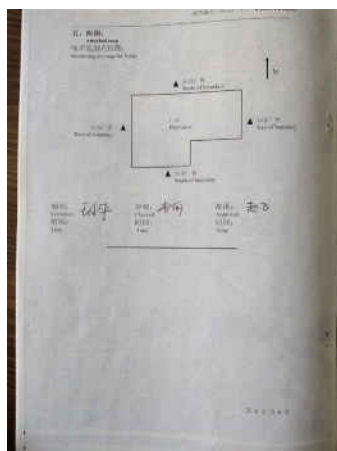
第 4 页：噪音监测

## Page 5: Monitoring Standards

第 5 页：监测标准

**Page 6: Monitoring Statistics Table**

第 6 页：监测统计表



**Page 7: Attachment**

第 7 页：附件

## V. GRIEVANCE REDRESS MECHANISM

### V. 申诉处理机制

27. A project-level grievance redress mechanism (GRM) was developed in accordance with the ADB's SPS requirement so to receive and facilitate resolution of affected person's concerns and complaints about the project's environmental performance during construction as well as operation phase of the project. The project GRM includes a procedure for receiving grievances, recording/ documenting key information, and evaluating and responding to the complainants in a reasonable period of time. Any concerns raised through the GRM will need to be addressed promptly and transparently.

27. 根据亚洲开发银行的“保障政策说明”要求制定了项目级申诉处理机制（GRM），以便接收受影响人员在施工和项目运营阶段对项目环境表现的担忧和投诉并促进对相关问题的处理。该项目 GRM 包括接收申诉，记录关键信息并编制成文以及在合理的时间内对投诉人进行评估和回复的程序。所有通过 GRM 提出的问题均需得到迅速透明地解决。

28. A fundamental goal of the GRM is to solve problems early at the lowest level. Therefore, the IA, through the person assigned to receiving, recording and documenting grievances, will attempt to address grievances at the first instance and in a pro-active manner to preclude elevating grievances to higher level.

28. GRM 的根本目标是在较低水平时尽快解决问题。因此，通过负责接收，记录和编制申诉的人员，IA 将先解决申诉并采取积极主动的方法避免使申诉发展到更高水平。

29. Procedures and time frames for GRM are described as follows (also see Figure 2):

29. GRM 的程序和时间框架如下所述（另见如 2）：

**Step 1:** If a concern arises, the affected person tries to resolve the issue of concern directly with the contractor/operator and/or the project manager. The contractor/operator and/or the project manager shall provide a response within seven working days. If the concern is resolved successfully, no further follow-up is required. Yet, the contractor/operator and/or the project manager shall record any complaint and actions taken to resolve the issues and report the results to ADB residence mission office in the PRC;

**步骤1:** 如果出现问题，受影响人员试图直接与承包商/运营商和/或项目经理解决有关问题。承包商/运营商和/或项目经理应在七个工作日内提供答复。如果成功解决问题，则不需要进一步跟进。然而，承包商/运营商和/或项目经理应记录所有投诉以及为解决问题而采取的任何行动，并将结果报告给亚洲开发银行驻中华人民共和国的代表处；

**Step 2:** If no solution is found, the Project Public Compliant Unit (PPCU) must properly assess the eligibility of the complaint, identify a solution, give a clear reply within 14 working days, and timely convey to the complainant and to the implementing agency, or contractor the suggested solution. The contractor, during construction, and the implementing agency, during operation, shall implement the redress solution and convey the outcome to the PPCU within seven working days;

**步骤2:** 如果没有找到解决方案，项目公众投诉单位（PPCU）必须正确评估申诉的资格，确定解决方案，在14个工作日内给出明确答复，并及时将建议的解决方案传达给投诉人和实施机构或承包商。承包商在施工期间，以及实施机构在运营期间，应实施处理方案并在七个工作日内将结果传达给PPCU；

**Step 3:** If no solution is identified by the PPCU or if the complainant is not satisfied with the suggested solution under Step 2, the PPCU will organize, within two weeks, a multi-stakeholder hearing (meeting) where all relevant stakeholders, including the complainant, the IA, contractor/operator, and local EPB will be invited. The meeting will aim to find in a solution acceptable to all, and identify responsibilities and an action plan. The contractor during construction and the IA during operation will implement the agreed-upon redress solution and convey the outcome to the PPCU within seven working days;

**步骤3:** 如果PPCU未找到解决方案，或者如果投诉人对步骤2中提出的解决方案不满意，PPCU将在两周内组织一次多方听证会（会议），其中所有利益相关方，包括投诉人，IA，承包商/运营商和当地环保局都将被邀请。会议的目标是找到一个所有人都能接受的解决方案，并确定责任和行动计划。承包商在施工期间，以及实施机构在运营期间，将实施达成一致的解决方案并在七个工作日内将结果传达给PPCU；

**Step 4:** If the multi-stakeholder hearing process is not successful, the PPCU, through the IA, will inform the EA and provincial EPB accordingly. The EA with the consultation from the EPB and ADB will deliver alternative approaches to resolve the issues.

**步骤4:** 如果多方听证会未取得成功，PPCU将通过IA来通知相应的EA和省级EPB。EA在咨询EPB和ADB后将给出解决这个问题的其他方法。

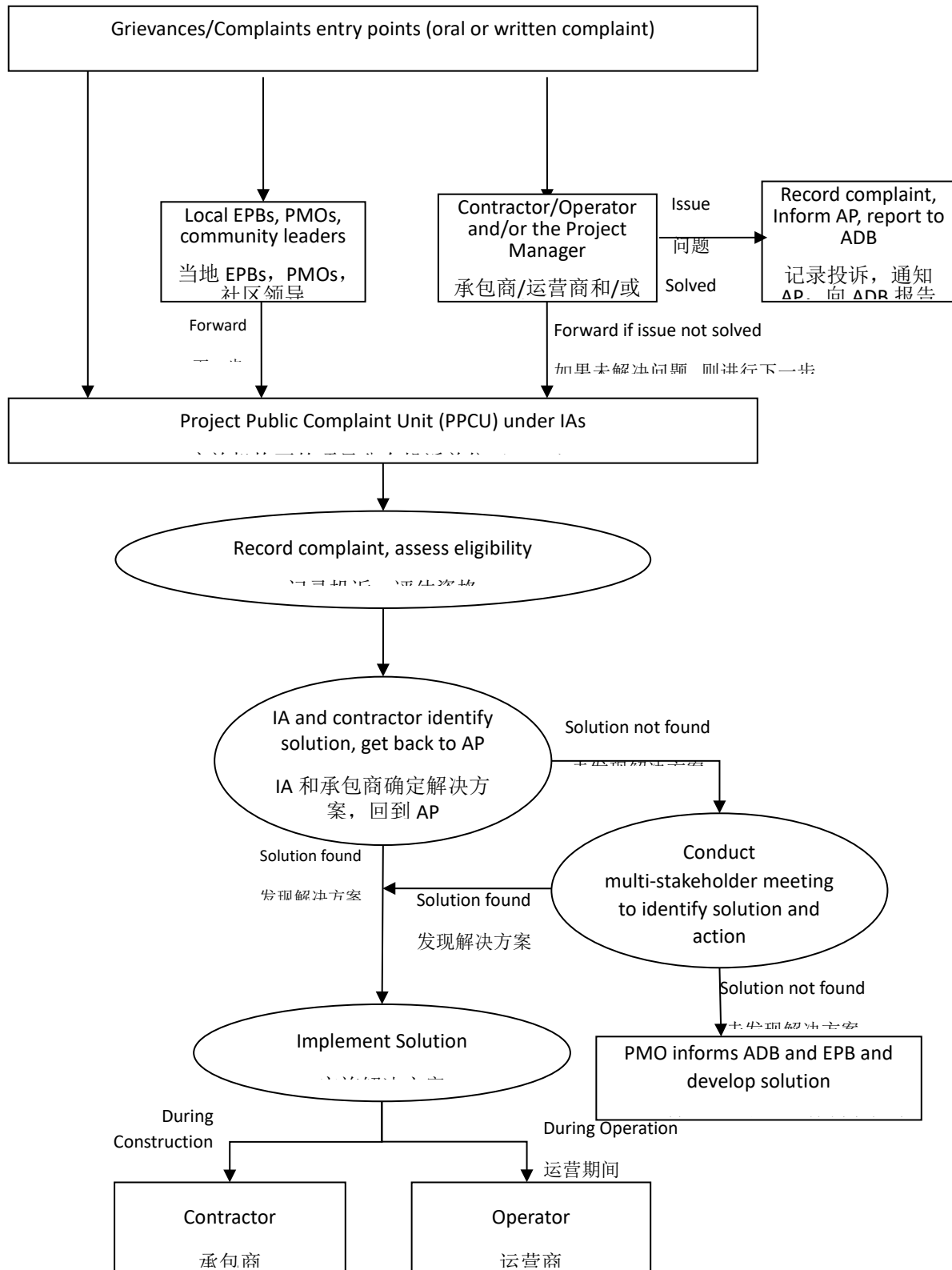
**Figure 2: Project-Level GRM**

**图 2：项目级 GRM**

ADB = Asian Development Bank, AP = affected person, EA = executing agency, EPB = environmental protection bureau, IA = implementation agency.

ADB=亚洲开发银行，AP=受影响人员，EA=执行机构，EPB=环保局，IA=实施机构。

30. Mr. Ma chunlei, has been designated as a focal person of the project GRM. His contact number is +8613159511992. His contact information has been posted on site information boards. During this reporting



period, no complaint was received.

30. 马春雷先生被指定为 GRM 项目的焦点人物。他的联系电话是+8613159511992。他的联系信息已发布在现场信息板上。在本报告期间，未收到任何投诉。



## VI. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

### VI. 公众咨询和信息公开

31. The project information including the project layout drawing, process flow diagram, values and signification of project, project HSE goals, etc., is disclosed for public, sign boards is provided on-site to guide public understanding that CSP project will bring positive environmental benefits locally as well as globally by generating electrical power with zero emission solar energy and clean natural gas instead of by traditional coal-fired power plants. The project will save 70,000 tons of standard coal or 122,554 tons of raw coal annually. The associated annual avoided emission of CO<sub>2</sub> is 154,446 tons.

31. 该项目信息，包括项目布局图，工艺流程图，项目价值与重要性，项目 HSE 目标等，已向公众公开；现场提供标示牌，引导公众了解，CSP 项目通过零排放太阳能和清洁天然气，代替传统的燃煤发电厂，将在当地和全球范围内带来积极的环境效益。该项目每年将节约 7 万吨标准煤，或 122554 吨原煤。每年避免排放的 CO<sub>2</sub> 为 154,446 吨。



管理人员名单及联系电话牌		
管理人员	姓名	联系电话
总经理助理	刘大勇	18566281173
安全总监	马春雷	13159511992
项目总工	王恩涛	13621190667
采购经理	吴永琼	18600407067
土建经理	丁鸿良	18997473567
机务经理	张 志	18627883463
环境顾问	邢文博	17868885710

Project information including the project layout drawing, process flow diagram, values and signification of project, project HSE goals etc

项目信息包括项目布局图，工艺流程图，项目价值和重要性，项目 HSE 目标等

## VII. INSTITUTIONAL STRENGTHENING AND TRAINING

### VII. 机构强化与培训

32. To strengthen the capacity of the EA and IA for EMP implementation, the following training programs were developed. Environmental consultants will be responsible for developing training materials and providing training along with technical experts. Table 7 shows the details of training programs conducted since the commencement of the project. However, during this reporting period, the site entering HSE training was conducted, and all of the new workers on site have accepted the HSE training and pass the examination. The same job will be done in the future, and the normal training for workers on site will be done by HSE engineer according to the progress of project.

32. 为加强 EA 和 IA 对 EMP 实施的能力，制定了以下培训计划。环境顾问将负责制定培训材料并与技术专家一起提供培训。表 7 展示了自项目开始以来具体实施的培训计划。在本报告期间，对现场进行了 HSE 培训，现场所有新员工均已接受 HSE 培训并通过考试。之后这项工作还会继续开展；HSE 工程师将根据项目进度进行对现场工作人员进行一般培训。

**Table 7: Institutional Strengthening and Training Program**

**表 7：机构强化与培训计划**

Training 培训	Attendees 参与者	Trainers 教员	Contents 内容	Time s 时间	Period (days) 期限 (天 数)	Number of Person 人数
ADB's and PRC's environmental	IA, contractors		ADB's safeguard policy statement	4	2	30

laws, regulations and policies	IA, 承包商		ADB 的保障政策说明			
亚洲开发银行和中华人民共和国的环境法律, 法规和政策		Environmental consultant 环境顾问	Project applicable PRC's environmental laws, policies, standards and regulations  项目适用的中华人民共和国环境法律, 政策, 标准和法规  International environmental management practice in civil constructions  国际土建环境管理实践			
Grievance Redress Mechanism 申诉处理机制 (GRM)	IA, Local EPB, residential communities, and Stakeholders  IA, 当地 EPB, 住宅社区和利益相关者	Environmental consultant 环境顾问	GRM structure, responsibilities, and timeframe  GRM 结构, 职责和期限  Types of grievances and eligibility assessment  申诉类型和资格评估	1	1	20
Implementation of environment monitoring plan 环境监测方案的实施	IA, contractor, CSC  IA, 承包商, CSC	Environmental consultant 环境顾问	Impacts and mitigation measures during construction and operation  施工和运营期间的影响和缓解措施  Monitoring and auditing mechanism  监测和审计机制  Reporting requirements  报告要求  Corrective actions for EMP  EMP 相关纠正措施	2	1	30
The latest regulations on Environmental	IA IA	Environmental	New requirements for environmental management	1	2	40

Management	consultant			
	环境顾问			
<b>Total</b>		<b>8</b>	<b>6</b>	<b>120</b>
<b>总计</b>				

ADB = Asian Development Bank, CSC = construction supervision company, GRM = grievance redress mechanism, IA = implementing agency, PRC = People's Republic of China.

ADB=亚洲开发银行，CSC=施工监理公司，GRM=申诉处理机制，IA=实施机构，PRC=中华人民共和国。

## **VIII. KEY ENVIRONMENTAL ISSUES**

### **VIII. 关键环境问题**

#### **A. Key Issues Identified**

##### **A. 发现的关键问题**

None

无

#### **B. Action Taken to Mitigate Environmental Issues**

##### **B. 缓解环境问题所采取的措施**

None

无

#### **C. Action Required**

##### **C. 要求采取的措施**

None

无

## IX. CONCLUSIONS

### IX. 结论

33. Due to the implementation of mitigation measures for this project, there is no environmental issue.

33. 由于该项目缓解措施的实施，未发生环境问题。

34. Any adverse environmental impacts associated with the project are prevented, reduced, minimized.

34. 与项目相关的任何不利环境影响均已被预防，降低和最小化处理。

35. With the implementation of the mitigation measures defined in the IEE, the adverse impacts are reduced to acceptable levels, and zero environment incident at present.

35. 随着 IEE 中所确定的缓解措施的实施，不利影响已被降至可接受的水平，目前无环境事件。



162721340317  
有效期至2022年01月22日

# 监测报告

Monitoring Report

项目名称  
Project Name

青海德令哈 50MW 光热电站环境监测项目  
Environment Monitoring of Delingha 50MW Solar thermal  
power plant, Qinghai Province

委托单位  
Client

陕西兴华环保科技有限公司  
Shanxi Xinghua Environment Protection Technology Co.Ltd.

报告日期  
Report Date

2019 年 12 月 03 日  
Jul 03, 2019

西安京诚检测技术有限公司

Xi'an Best Justicial Testing Technology CO., Ltd.

(加盖报告专用章)



## 一、项目信息:

## Project Information

项目名称 Project Name	青海德令哈 50MW 光热电站环境监测项目 Environment Monitoring of Delingha 50MW Solar thermal power plant, Qinghai Province		
委托单位 Client	陕西兴华环保科技有限公司 Shanxi Xinghua Environment Protection Technology Co., Ltd.		
单位地址 Client Add	西安市长安区长安花园 Chang'an Garden, Chang'an District, Xi'an		
监测地址 Monitoring Add	青海省德令哈市 Delingha City, Qinghai Province		
监测日期 Monitoring Date	2019-11-20~2019-11-26	监测类别 Monitoring Category	委托监测 Delegated Monitoring

## 二、监测结果:

## Monitoring Result

## (一) 环境空气监测结果:

The monitoring result of ambient air

监测日期 Monitoring Date	监测点位 Monitoring Site	采样时间 Sampling Time	监测项目 Monitoring Item		
			二氧化氮 1h 平均值 Nitrogen dioxide hourly value $\mu\text{g}/\text{m}^3$	PM <sub>10</sub> 24h 平均值 Daily mean value $\mu\text{g}/\text{m}^3$	TSP 24h 平均值 Daily mean value $\mu\text{g}/\text{m}^3$
2019-11-20	1#办公楼 No.1 Office Building	02:00	10	34	40
		08:00	11		
		14:00	10		
		20:00	16		
2019-11-21	1#办公楼 No.1 Office Building	02:00	12	35	42
		08:00	15		
		14:00	10		
		20:00	16		
2019-11-22	1#办公楼 No.1 Office Building	02:00	12	42	45
		08:00	10		
		14:00	9		
		20:00	15		
2019-11-23	1#办公楼 No.1 Office Building	02:00	11	37	48
		08:00	15		
		14:00	14		
		20:00	17		



(一) 环境空气监测结果:

The monitoring result of ambient air

监测日期 Monitoring Date	监测点位 Monitoring Site	采样时间 Sampling Time	监测项目 Monitoring Item		
			二氧化氮 1h 平均值 Nitrogen dioxide hourly value $\mu\text{g}/\text{m}^3$	PM <sub>10</sub> 24h 平均值 Daily mean value $\mu\text{g}/\text{m}^3$	TSP 24h 平均值 Daily mean value $\mu\text{g}/\text{m}^3$
2019-11-20	1#办公楼 No.1 Office Building	02:00	15	36	45
		08:00	17		
		14:00	14		
		20:00	16		
2019-11-21	1#办公楼 No.1 Office Building	02:00	17	32	43
		08:00	14		
		14:00	16		
		20:00	16		
2019-11-22	1#办公楼 No.1 Office Building	02:00	13	36	42
		08:00	16		
		14:00	10		
		20:00	10		

(二) 污水监测结果

The monitoring result of sewage

监测日期 Monitoring Date	监测点位 Monitoring Site	采样时间 Sampling Time	监测项目 Monitoring Item				
			PH 值 PH Value	悬浮物 Suspended Solids $\text{mg}/\text{L}$	石油类 Petroleum $\text{mg}/\text{L}$	化学需氧量 COD $\text{mg}/\text{L}$	粪大肠菌群 Fecal coliforms 个/L
2019-11-20	1#生活污水 出口 NO.1 sewage outlet	14:30	6.76	34	0.04	51	195
2019-11-21	1#生活污水 出口 NO.1 sewage outlet	14:30	6.76	32	0.05	49	185

(三) 噪声监测结果:

The monitoring result of noise

The monitoring result of noise

监测日期 Monitoring Date	监测点位 Monitoring Site	采样时间 Sampling Time	监测项目 Monitoring Item
			噪声 Noise dB(A)
2019-11-20	1#东厂界 East of boundary	昼间 (08:55) Day time	37.8
		夜间 (22:14) Night time	43.5
	2#南厂界 South of boundary	昼间 (09:18) Day time	44.4
		夜间 (22:31) Night time	43.5
	3#西厂界 West of boundary	昼间 (09:35) Day time	41.6
		夜间 (22:48) Night time	44.4
	4#北厂界 North of boundary	昼间 (09:52) Daytime	38.8
		夜间 (23:06) Night time	39.8
2019-11-21	1#东厂界 East of boundary	昼间 (09:44) Day time	44.4
		夜间 (22:03) Night time	41.6
	2#南厂界 South of boundary	昼间 (10:07) Day time	37.5
		夜间 (22:20) Night time	43.2
	3#西厂界 West of boundary	昼间 (10:24) Day time	42.3
		夜间 (22:37) Night time	41.6
	4#北厂界 North of boundary	昼间 (10:41) Day time	38.8
		夜间 (22:55) Night time	40.5
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### 三、监测技术规范、依据、使用仪器及检测人员:

Technical specification, basis, instrument& inspector for monitoring

样品类别 Sample type	分析项目 Test content	分析方法 Analysis method	方法依据 Standard	仪器设备及编号 Instrument & Number	检出限 Detection limit
环境空气 Ambient air	二氧化氮 Nitrogen dioxide	Saltzman 法 Saltzman method	GB/T 15435-1995	分光光度计 Spectrophotometer	1h 平均值: 5 $\mu$ g/m <sup>3</sup> Hourly value 24h 平均值: 3 $\mu$ g/m <sup>3</sup> Daily mean value
	PM <sub>10</sub>	重量法 Gravimetric method	HJ 618-2011	分析天平 Analytical balance	10 $\mu$ g/m <sup>3</sup>
	TSP	重量法 Gravimetric method	GB/T 15432-1995	分析天平 Analytical balance	1 $\mu$ g/m <sup>3</sup>
	PH 值 PH value	玻璃电极法 Glass electrode method	GB 6920-1986	PH Meter PH 计	
污水 Sewage	化学需氧量 COD	重铬酸钾法	HJ828-2017		4mg/L
	粪大肠菌群 Fecal coliforms		GB/T5057-2006	生化培养箱 Biochemical incubator 生物显微镜 Biomicroscope	—
	悬浮物 Suspended solids	重量法 Weighing method	GB 901-1989	电子天平 Electronic balance	5mg/L
	石油类 Petroleum	红外分光光度法 Infrared spectroscopic measurement	HJ637-2012	红外分光测 Infrared spectroscopic measurement	0.04mg/L
噪声 Noise	噪声 Noise	声环境质量标准 Environmental quality standard for noise	GB 3096-2008	多功能声级计 Multifunctional sound level meter	—



四、附表:

Attached list

(一) 环境空气监测期间参数统计表:

Ambient air Parameter statistic table during monitoring

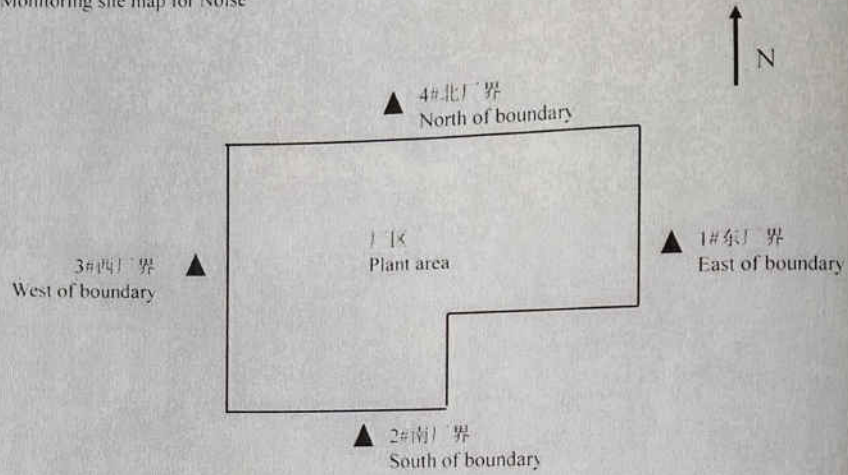
监测日期 Monitoring Date	采样时间 Sampling Time	气温 Temperature (℃)	气压 Air pressure (kPa)	风速 Wind speed (m/s)	风向 Wind direction
2019-11-20	02:00	5.0	71.2	--	--
	08:00	4.0	70.8	--	--
	14:00	23.0	70.8	1.1	W
	20:00	15.0	70.8	2.0	SW
2019-11-21	02:00	6.0	71.0	1.4	W
	08:00	5.0	70.9	--	--
	14:00	24.0	70.1	--	--
	20:00	8.0	71.2	--	--
2019-11-22	02:00	5.0	71.0	1.2	W
	08:00	7.0	71.1	--	--
	14:00	23.0	70.3	--	--
	20:00	16.0	70.5	1.6	S
2019-11-23	02:00	10.0	70.8	--	--
	08:00	6.0	70.9	--	--
	14:00	24.0	70.9	--	--
	20:00	18.0	70.3	--	--
2019-11-24	02:00	10.0	70.9	--	--
	08:00	8.0	70.7	--	--
	14:00	23.0	70.3	1.6	W
	20:00	10.0	70.9	1.6	W
2019-11-25	02:00	7.0	71.2	1.8	S
	08:00	8.0	70.8	--	--
	14:00	24.0	70.7	--	--
	20:00	18.0	71.1	1.0	W
2019-11-26	02:00	12.0	70.6	2.3	W
	08:00	10.0	70.7	2.5	W
	14:00	24.0	70.7	2.0	W
	20:00	15.0	71.5	--	--
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五、附图:

Attached map

噪声监测点位图:

Monitoring site map for Noise



编制:  
Compiled  
时间:  
Time

孙平

审核:  
Checked  
时间:  
Time

李明

批准:  
Approved  
时间:  
Time

赵飞