



**Monitoring report form**  
**(Version 05.1)**

*Complete this form in accordance with the Attachment "Instructions for filling out the monitoring report form" at the end of this form.*

**MONITORING REPORT**

<b>Title of the project activity</b>	Ningxia Shapotou Hydropower Project of Yellow River	
<b>UNFCCC reference number of the project activity</b>	1284	
<b>Version number of the monitoring report</b>	01	
<b>Completion date of the monitoring report</b>	17/08/2016	
<b>Monitoring period number and duration of this monitoring period</b>	The 12 <sup>nd</sup> Monitoring period: 04/11/2014-30/06/2016 (Both days incl.)	
<b>Project participant(s)</b>	Ningxia Shapotou Water Control Co., Ltd.	
<b>Host Party</b>	China	
<b>Sectoral scope(s)</b>	Sectoral Scope 1: Energy industries (renewable - / non-renewable sources)	
<b>Selected methodology(ies)</b>	Methodology: ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version16.0)	
<b>Selected standardized baseline(s)</b>	/	
<b>Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD</b>	553,633tCO <sub>2</sub> e	
<b>Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period</b>	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	0	461,102

## SECTION A. Description of project activity

### A.1. Purpose and general description of project activity

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Ningxia Shapotou Hydropower Project of Yellow River (hereinafter referred to as the project) is a run-of-river hydro power project located in Ningxia of western China. The Project Owner is Ningxia Shapotou Water Control Co., Ltd. Ningxia is a poverty-stricken minority region with a total population of 5.78 million in 2004, 819,000 of which are living in poverty. Ningxia is droughty and rainless, and its annual average precipitation is only 200mm.

The project is located in Yellow River, Zhongwei City, Ningxia. The total installed capacity is 120.3MW and the electricity supplied to the power grid is 578.022GWh/yr. The power density is 29.48W/m<sup>2</sup>. The electricity is connected to the Northwest Power Grid (NWPG) via Ningxia Power Grid.

The hydropower station of the project consists of riverbed power station, two canal head power stations on the north and south main canal respectively.

The riverbed power station uses four bulb tubular turbine units. The unit capacity of the turbines which lie in riverbed is 29MW.

The canal head power station on the north main canal adopts bulb tubular turbine units and the power station on the south main canal adopts tube type water turbine-generator units, and the total installed capacity of these two stations is 4.3MW (i.e. 3.1MW+1.2MW).

The project could replace partial electricity of NWPG and reduce GHG emission of NWPG which is dominated by fossil fuel power generation. The emission reductions generated in this monitoring period is 461,102tCO<sub>2</sub>e.

### A.2. Location of project activity

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The project is located in Zhongwei City, Ningxia Hui Autonomous Region in the northwest of China. It is 200 km away from Yinchuan, the capital of Ningxia. The coordinates of the project location are 104°17' -105°37' east longitude, 36°59'-37°43' north latitude.

### A.3. Parties and project participant(s)

Party involved (host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate whether the Party involved wishes to be considered as project participant (yes/no)
China (host)	Ningxia Shapotou Water Control Co., Ltd.	No

### A.4. Reference of applied methodology and standardized baseline

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The approved Large-scale Consolidated Methodology applied in the project is ACM0002 "Grid connected electricity generation from renewable sources" (Version 16.0, EB81, 2014).

The project activity also refers to:

"Tool to calculate the emission factor for an electricity system" (Version 05.0, EB87, 2015).

Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period" (Version 3.0.1, EB66)

More information on the methodology and tools listed above is available at the following website:

<http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>

#### **A.5. Crediting period of project activity**

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Renewable crediting period is chosen for the project. There is no post-registration change to the start date of the crediting period. The second crediting period of the project is from 4/11/2014-3/11/2021.

#### **A.6. Contact information of responsible persons/entities**

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 Ding Yaole      Ningxia Shapotou Water Control Co., Ltd. / nxspt001@foxmail.com

Ningxia Shapotou Water Control Co., Ltd. is a project participant.

### **SECTION B. Implementation of project activity**

#### **B.1. Description of implemented registered project activity**

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1. The installed technology, technical processes and equipments

The key technical data for the project are summarized in the following table.

Items	Features
Installed capacity	120.3MW
Expected annual electricity supplied to the grid	578.022GWh
Normal water level	1240.5m
Hydraulic head	8.9m

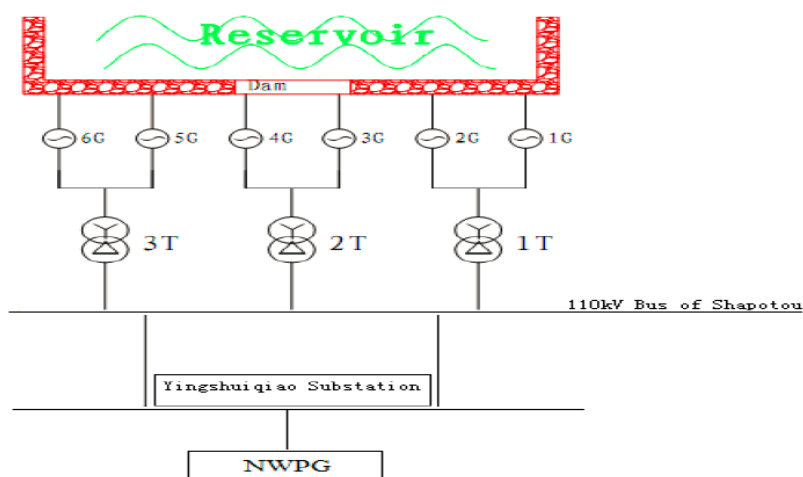
The total installed capacity of the project is 120.3MW and the expected electricity supplied to the power grid is 578.022GWh/yr, and the electricity is connected to the Northwest Power Grid (NWPG) via Ningxia Power Grid. The estimated annual CO<sub>2</sub> emission reductions of the project activity are 461,102 tCO<sub>2</sub>e.

The hydropower station of the project consists of riverbed power station, two canal head power stations on the north and south main canal respectively.

The riverbed power station uses four bulb tubular turbine units. The unit capacity of the turbines which lie in riverbed is 29MW.

The canal head power station on the north main canal adopts bulb tubular turbine units and the power station on the south main canal adopts tube type water turbine-generator units, and the total installed capacity of these two stations is 4.3MW (i.e. 3.1MW+1.2MW).

The technical process can be illustrated as following:



## 2. The implementation and actual operation of the project activity

The implementation of the project is in strict accordance with the description in the registered PDD.

The detailed implementation status of the project is as follows:

Events	Date
Date on which all the generating units were put into test run	03/06/2005
Registration date (Start date of crediting period)	04/11/2007
The 1 <sup>st</sup> monitoring period	04/11/2007-29/02/2008
The 2 <sup>nd</sup> monitoring period	01/03/2008-31/08/2008
The 3 <sup>rd</sup> monitoring period	01/09/2008-31/01/2009
The 4 <sup>th</sup> monitoring period	01/02/2009-31/07/2009
The 5 <sup>th</sup> monitoring period	01/08/2009-31/12/2009
The 6 <sup>th</sup> monitoring period	01/01/2010-30/06/2010
The 7 <sup>th</sup> monitoring period	01/07/2010-31/12/2010
The 8 <sup>th</sup> monitoring period	01/01/2011-30/06/2011
The 9 <sup>th</sup> monitoring period	01/07/2011-31/12/2011
The 10 <sup>th</sup> monitoring period	01/01/2012-31/12/2012
The 11 <sup>st</sup> monitoring period	01/01/2013-03/11/2014

## 3. The events or situations that occurred during the monitoring period

Over this monitoring period, the hydro turbine and generator units as well as monitoring equipments have operated normally. There is no other events occurred during this monitoring period that may impact the applicability of the methodology.

### B.2. Post-registration changes

#### B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

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Not applicable.

#### B.2.2. Corrections

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Not applicable.

#### B.2.3. Changes to start date of crediting period

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Not applicable.

**B.2.4. Inclusion of a monitoring plan to the registered PDD that was not included at registration**

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Not applicable.

**B.2.5. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline**

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Not applicable.

**B.2.6. Changes to project design of registered project activity**

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Not applicable.

**B.2.7. Types of changes specific to afforestation or reforestation project activity**

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Not applicable.

**SECTION C. Description of monitoring system**

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**1. Monitoring of electricity supplied to the grid**

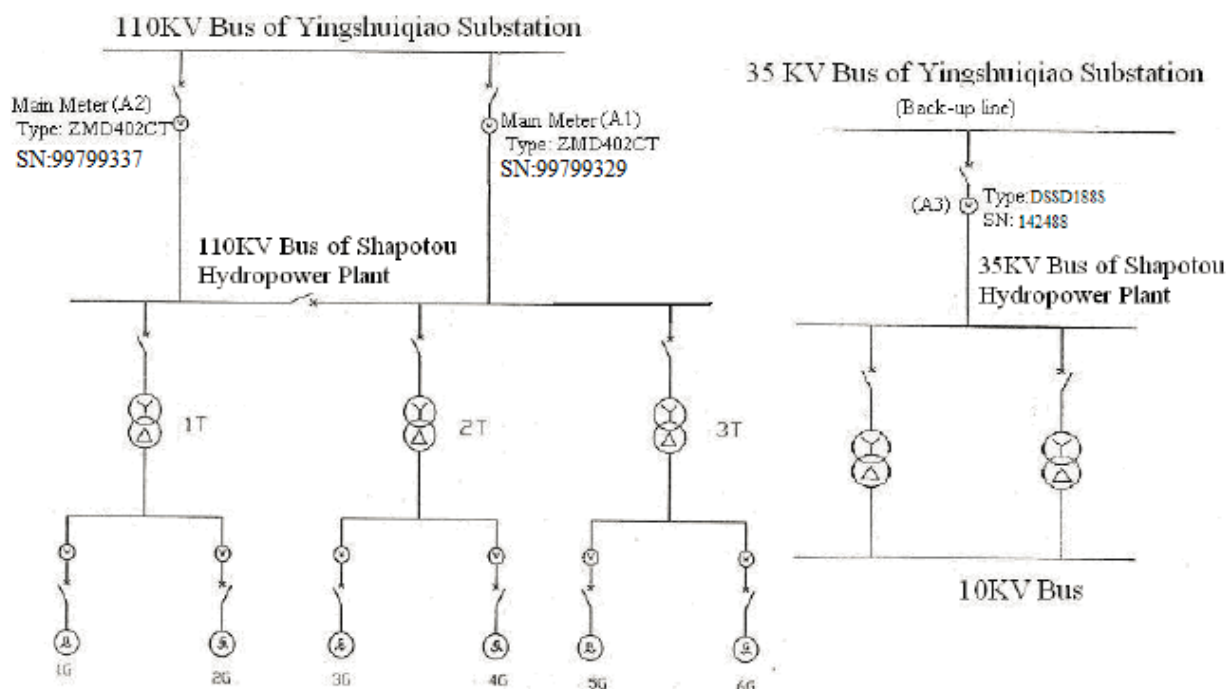
The electricity delivered to the grid by the project can be accurately measured by the main meters (bidirectional) in the Yingshuiqiao Substation.

For electricity delivered to the grid and electricity imported from the main transmission line, at 24:00 hour on the last day of each month, staff from the Grid Company read the meter readings and recorded them into the Monthly Reading Records, and then issued the Electricity Transaction Notes to the hydropower company for confirmation. After confirming the data in the ETNs, for the electricity delivered to the grid by the project, the hydropower company issued the sales receipts to the Grid Company; for the electricity imported by the project from the main line, the Grid Company issued sales receipts to the hydropower company.

For electricity imported from the back-up line, at the designated time by the grid company staff from the Grid Company read the meter readings and recorded them into the Monthly Reading Records, and then issued the Electricity Transaction Notes to the hydropower company for confirmation. After confirming the data in the ETNs, the Grid Company issued sales receipts to the hydropower company.

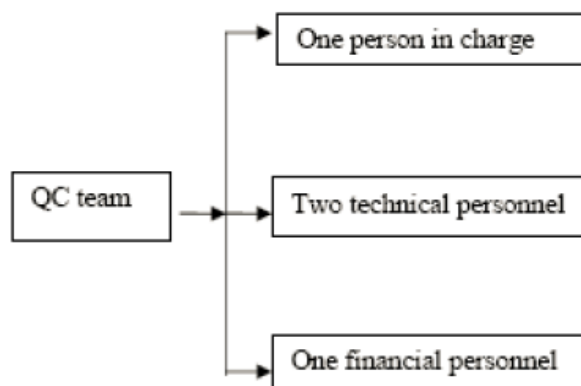
The project imports electricity from the grid. To be conservative, imported electricity from the grid by the project ( $EG_{im,y}$ ) is deducted from the electricity supplied to the grid by the project ( $EG_{out,y}$ ) to get the net electricity delivered to the grid by the project ( $EG_{facility,y}$ ) for CERs calculation. Electricity imported from the grid by the project is measured by the main meters (for electricity imported from the main transmission line) as well as the meter on the back-up line (for electricity imported from the back-up line).

The diagram of wire connection and the meters location is shown as follows:



## 2. Roles and responsibilities

As described in the Monitoring Plan of the registered PDD, the project owner has established a CDM QC team to do the monitoring work. The organizational structure is as follows:



The team leader has the overall responsibility for the monitoring system on the project. All the other CDM monitoring staff has clearly defined roles and responsibilities. The CDM QC team leader together with the project developer manages the training of new staff. The CDM QC team leader ensures that only trained staff is involved in the operation of the monitoring system.

The CDM QC team leader is responsible for ensuring that the procedures are followed on site and for continuously improving the procedures to ensure a reliable monitoring system is established.

## 3. Meter calibration

In accordance with the registered PDD, the meters had been periodically and properly calibrated and checked for accuracy. The calibration and metering had been carried out by Ningxia Electric Power Measurement Centre, a qualified institute for measurement.

The meters had been calibrated in accordance with relevant national standards (JJG596-2012 Verification Regulation of Electrical Energy Meters with Electronics). The calibration records showed that the meters had sufficient accuracy level and any error resulting from such equipment did not exceed 0.5% of full-scale rating during this monitoring period.

#### 4. QA/QC procedures

The meters are used to measure mentioned variables on a continuous basis. Accumulated data were transcribed into Monthly Reading Records on a monthly basis. The meters are owned and maintained by the local power grid company.

Electricity sales receipts for the electricity delivered to the grid by the project are used for the purpose of double check.

#### 5. Emergency procedures

Should any reading of the Meter be inaccurate by more than the allowable error, or otherwise functioned improperly, the electricity delivered to the grid shall be determined by:

1) Day-to-day data handling will be done by CDM QC team and any malfunctions of the Meter will be detected immediately. The local power grid company will be responsible to repair or replace the malfunctioning Meter within 10 working days.

2) The electricity during the 10 working days will be determined as follows: an appropriate and reasonable estimation method will be designed by local power grid company. Evidence will be provided to DOE for the verification to show the estimation is reasonable and conservative.

### SECTION D. Data and parameters

#### D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data/parameter:	EF <sub>grid,CM,y</sub>
Unit	tCO <sub>2</sub> /MWh
Description	Combined margin CO <sub>2</sub> emission factor for grid connected power generation in year y
Source of data	Bulletin about determining the Emission factors of Chinese Power Grids in 2014 <a href="http://cdm.ccchina.gov.cn/archiver/cdmcn/UpFile/Files/Default/20150204155537627092.pdf">http://cdm.ccchina.gov.cn/archiver/cdmcn/UpFile/Files/Default/20150204155537627092.pdf</a>
Value(s) applied)	0.57785
Choice of data or measurement methods and procedures	Official public data
Purpose of data	To calculate the baseline emissions.
Additional comments	Fixed for the 2 <sup>nd</sup> crediting period.

#### D.2. Data and parameters monitored

Data/parameter:	EG <sub>out,y</sub>
Unit	MWh
Description	The quantity of electricity supplied by the project plant/unit to the NWPG in year y
Source of data	Measured
Value(s) applied)	798,216.700
Choice of data or measurement methods and procedures	Continuously measured/Monthly reading/Monthly recorded
Purpose of data	Baseline emission calculations
Additional comments	–

<b>Data/parameter:</b>	EG <sub>im,y</sub>
Unit	MWh
Description	The quantity of electricity delivered to the project plant/unit from the NWPG and is expected to be 0 for the purpose of ex-ante calculation
Source of data	Measured
Value(s) applied)	254.940
Choice of data or measurement methods and procedures	Continuously measured/Monthly reading/Monthly recorded
Purpose of data	Baseline emission calculations
Additional comments	–

### D.3. Implementation of sampling plan

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Not applicable.

## SECTION E. Calculation of emission reductions or GHG removals by sinks

### E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

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The baseline emission BE<sub>y</sub> (tCO<sub>2</sub>) during the monitoring period results from:

$$EG_{\text{facility},y} = EG_{\text{out},y} - EG_{\text{im},y}$$

Where:

EG<sub>out,y</sub> = The quantity of electricity supplied by the project plant/unit to the NWPG in year y (MWh/yr)  
 EG<sub>im,y</sub> = The quantity of electricity delivered to the project plant/unit from the NWPG and is expected to be 0 for the purpose of ex-ante calculation (MWh/yr).

Period		Electricity		
		EG <sub>out,y</sub>	EG <sub>im,y</sub>	EG <sub>facility,y</sub> = EG <sub>out,y</sub> - EG <sub>im,y</sub>
From	To	MWh	MWh	MWh
4/11/2014	30/11/2014	44,201.700	-	44,201.700
1/12/2014	31/12/2014	38,930.000	-	38,930.000
<b>Subtotal(4/11/2014-31/12/2014)</b>		<b>83,131.700</b>	<b>-</b>	<b>83,131.700</b>
1/1/2015	31/1/2015	35,423.000	17.640	35,405.360
1/2/2015	28/2/2015	27,854.000	29.820	27,824.180
1/3/2015	31/3/2015	33,107.000	33.180	33,073.820
1/4/2015	30/4/2015	38,958.000	17.640	38,940.360
1/5/2015	31/5/2015	47,497.000	4.620	47,492.380
1/6/2015	30/6/2015	47,435.000	4.410	47,430.590
1/7/2015	31/7/2015	56,221.000	5.250	56,215.750
1/8/2015	31/8/2015	46,361.000	4.200	46,356.800
1/9/2015	30/9/2015	42,423.000	4.620	42,418.380
1/10/2015	31/10/2015	47,799.000	3.990	47,795.010
1/11/2015	30/11/2015	42,161.000	3.990	42,157.010
1/12/2015	31/12/2015	32,677.000	68.040	32,608.960
<b>Subtotal(1/1/2015-31/12/2015)</b>		<b>497,916.000</b>	<b>197.400</b>	<b>497,718.600</b>
1/1/2016	31/1/2016	30,158.000	27.930	30,130.070
1/2/2016	29/2/2016	25,560.000	3.990	25,556.010
1/3/2016	31/3/2016	28,303.000	13.440	28,289.560



Period		Electricity		
		EG <sub>out,y</sub>	EG <sub>im,y</sub>	EG <sub>facility,y</sub> = EG <sub>out,y</sub> - EG <sub>im,y</sub>
From	To	MWh	MWh	MWh
1/4/2016	30/4/2016	36,776.000	3.780	36,772.220
1/5/2016	31/5/2016	46,520.000	4.410	46,515.590
1/6/2016	30/6/2016	49,852.000	3.990	49,848.010
<b>Subtotal(1/1/2016-30/6/2016)</b>		<b>217,169.000</b>	<b>57.540</b>	<b>217,111.460</b>
<b>Total(4/11/2014-30/6/2016)</b>		<b>798,216.700</b>	<b>254.940</b>	<b>797,961.760</b>

The electricity delivered to the grid and imported from the grid has been cross checked with the related sales receipts, and the conservative data were used. The calculation process has been provided in the ER calculation spreadsheet.

Net electricity delivered to the grid during the period of 04/11/2014- 30/06/2016: 797,961.760MWh  
 $BE_y = EG_{facility,y} * EF_{grid,CM,y} = 797,961.760MWh * 0.57785tCO_2/MWh = 461,102tCO_2$

## E.2. Calculation of project emissions or actual net GHG removals by sinks

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In accordance with the requirements of the methodology, the surface area at full reservoir level of the project has been measured at the start of the project. It is 4.081 million m<sup>2</sup>, based on which the power density is calculated as 29.48W/m<sup>2</sup>, greater than 10W/m<sup>2</sup>. According to the methodology: PE<sub>y</sub> = 0

This information has been verified during the first monitoring period.

## E.3. Calculation of leakage

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As a renewable energy project, leakages from the project are considered to be zero.

**E.4. Summary of calculation of emission reductions or net GHG removals by sinks**

Item	Baseline emissions or baseline net GHG removals by sinks (t CO <sub>2</sub> e)	Project emissions or actual net GHG removals by sinks (t CO <sub>2</sub> e)	Leakage (t CO <sub>2</sub> e)	GHG emission reductions or net GHG removals by sinks (t CO <sub>2</sub> e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
<b>Total</b>	461,102	0	0	0	461,102	461,102

**E.5. Comparison of actual emission reductions or net GHG removals by sinks with estimates in registered PDD**

Item	Values estimated in ex ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO <sub>2</sub> e)	553,633	461,102

According to the registered PDD of the project, the annually expected emission reduction of the project is 334,010tCO<sub>2</sub>. This monitoring period covers 04/11/2014-30/6/2016 which is 605 days in total. Then the estimated emission reduction for this monitoring period should be:  
 $334,010/365 \times 605 = 553,633 \text{ tCO}_2$

**E.6. Remarks on difference from estimated value in registered PDD**

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There was no increase in the actual emission reductions achieved during the monitoring period compared to the registered CDM-PDD.

## Appendix 1. Contact information of project participants and responsible persons/entities

The project owner

<b>Project participant and/or responsible person/ entity</b>	<input checked="" type="checkbox"/> Project participant <input type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
<b>Organization name</b>	Ningxia Shapotou Water Control Co., Ltd.
<b>Street/P.O. Box</b>	23 <sup>rd</sup> , Floor, Block A, International Trade New Tiandi, Jinfeng District, Yinchuan, Ningxia, China
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