approved

Operations director \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# **«\_\_\_» \_\_\_\_\_\_\_\_\_\_ 20\_\_**

# **Organization of production drilling operations**

## Introduction

## This Procedure was developed basing on Production and Technical Policy of \_\_\_\_\_ Company. This Procedure regulates the conduct of production drilling operations on the Company licensed territories.

## Purpose

This procedure outlines the requirements to conduct of production drilling operations on the Company territories.

## Scope of application

This procedure is applied to all the drilling departments, conducting their activities on the contract territories of \_\_\_\_\_\_, including contracting organizations.

## References

Safety rules in oil and gas producing industry of the Republic of Kazakhstan.

Rules for Oil and gas fields development .

Instruction on prevention of open well flowing during construction, production and workover of oil and gas wells.

Regulation on conservation of wells on oil and gas fields, underground gas storages and thermal water deposits.

The Law of the Republic of Kazakhstan on subsurface resources.

International standards in oil and gas industry (API).

## Preparatory works for well construction

## A decision for commencement of production drilling is to be taken by the Company management upon completion of exploration drilling; confirmation of commercial hydrocarbons reserves, as well as after the production license and land allocation were obtained on the operator's licensed territory. The list of works over the period of production drilling shall be given in the annual work program and estimated in the company annual budget. After the aforementioned documents were approved, the preparatory works shall be started, which include:

### Preparatory works

* + 1. Place an order for development of drilling project in the specialized design organization, which holds a license for conduct of such types of works.
    2. Approve the project of wells construction with controlling organization \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
    3. Obtain the land allocation for construction of wells.
    4. Obtain permission for special water use.
    5. Determine coordinates of wells spud point.
    6. Conduct tenders to the contractors, according to the tender procedure FIN.01.07, for the following types of works:
  1. Provision of drill rig for onshore drilling works;
  2. Conduct of geophysical research on wells during drilling;
  3. Core sampling;
  4. Selection of specifications and vendors of chemical agents, cement, casing and cementing;
  5. Selection of formulation, delivery of chemicals and control over preparation of drilling mud;
  6. Well completion;
  7. Well surveys;
  8. Gas logging (where necessary).
     1. Obtain from the drilling contractor a layout of drilling equipment location (OPS.03.01.04) with overall dimensions, and requirements to construction of the drill site and location of dug-up earthen pits. (Waste pits, Water pits, settling pits and septic pits)
     2. Sign contract with drilling contractor and service companies according to the contracts signing procedure GEN.11.01.
     3. Conduct the tender for selection of suppliers of:

1. Wellhead equipment;
2. Casing and tubing;
3. Casing mounting (shoe, valve, stabilizers, etc.);
4. Equipment for liners;
5. Subsurface equipment for wells completion;
6. Drill bits;
7. Materials and chemical agents for preparation and treatment of drilling mud;
   * 1. Place orders for delivery of equipment and materials according to the FIN.04.01 procedure.
     2. Tender and select contractors for the following works:
   1. Drill site construction;
   2. Access roads construction;
   3. Construction of cellar pit;
   4. Construction of cuttings pits;
      1. Determine the layout of water supply for drilling of wells on the field (water conduit, water reservoirs or pits for keeping of water stock, water intake structure and technique/equipment for its delivery).
      2. Ensure that drilling contractor obtained permission from «Sanoatkontechnazorat» on assembly of drilling equipment.
      3. Ensure that drilling contractor obtained registration and certification of vessels working under pressure, and hoisting devices from «Sanoatkontechnazorat».
      4. Design and approve with \_\_\_\_\_\_\_\_\_\_\_\_\_\_ the scheme of connection of BOP equipment (OPS.03.01.05).
      5. Before the drilling work commenced, possess the remnant stock of equipment and materials for minimum of four wells.
      6. Before a drilling rig is mobilized to a dedicated site; ensure the necessary stock of water, fuel, equipment and materials are in place on the allocated sites.

### Assembling works

* + 1. Upon mobilization of the drill rig to the first well drilling site, drilling contractor shall perform rig up works, observing the HSE rules and instructions for assembly of main and auxiliary equipment:
    2. Test all equipment and execute the following documents:

1. Act on testing of downstream line of drill pumps (OPS.03.01.07);
2. Act on testing of pneumatic system (OPS.03.01.08);
3. Act on testing of traveling-block limit switch (OPS.03.01.09);
4. Act on inspection of drill rig (OPS.03.01.10);
5. Act on testing of electric equipment and grounding devices (OPS.03.01.06);
   * 1. After completion of rig up, all equipment should be function tested without loading.
     2. Issue a resolution on foundation of commission on acceptance of drill rig after rig up. Invite the representatives of inspecting organizations \_\_\_\_\_\_\_\_\_\_ for participation in the commission work.
     3. Putting of the drill rig in operation shall be done after complete assembly, testing and running of all the equipment and under the condition of existence of complete rig crew upon the decision of accepting commission.
     4. The commission shall sign the «Act on putting of the drill rig into operation» (OPS.03.01.11), which should include the conclusion (permission) of the representative of \_\_\_\_\_\_\_\_\_\_\_\_\_ (OPS.03.01.03). The company should present the following documents to the commission:
6. Well construction project duly approved (OPS.03.01.01);
7. Geological and engineering program (OPS.03.01.02).
8. Main technical documentation for drilling equipment (OPS.03.01.26).
9. Acts on testing, conducted after completion of construction and assembling works (OPS.03.01.07-10).
10. Act of check of electric equipment and grounding devices (OPS.03.01.06).
    * 1. Only employees having special education or right to conduct of drilling operations are allowed to supervise and conduct the grilling works.

## Drilling

### In the process of drilling, it is necessary to be governed by the following documents and recommendations:

* 1. Project on production wells construction on the field (OPS.03.01.01).
  2. Geological and engineering program (OPS.03.01.02).
  3. Well drilling and completion program.
  4. Drill mud program.
  5. Hydraulic program.
  6. Casing program.
  7. Instruction on prevention of blowouts in construction of oil and gas wells.
  8. Work plans for all types of operations (OPS.03.01.22, OPS.03.01.27, OPS.06.01).

### Drilling operations shall be conducted in accordance with International Standards in Oil and Gas industry, regulatory documents of the Republic of Kazakhstan and Policies and Procedures of \_\_\_ on labor protection, safety and environment protection.

### After the BOP equipment installed on wellhead, a regular drills shall be conducted in emergency actions in case of blowout with every shift crew until rig crew qualifies in identification of signs of blowout and in securing the well.

### A set of casing with necessary fitting should be stored on drill site for installation in each well section under which drilling shall be conducted.

### Before running of casing, the necessary amount of cement should be prepared on site as well as cementing equipment in operational condition.

### Before cementing of a pipe, a laboratory test of cement, made in the conditions similar to conditions of cementing of this given pipe, should be available on wells.

### Drilling supervisor shall submit to the drilling manager of \_\_\_\_\_ the daily reports on drilling operations.

### Section 171/2” hole section

### Drill a hole of 171/2” diameter up to target depth.

### Before running of 133/8” string, the following should be done:

* 1. A range of electromagnetic surveys, necessary for planning of well casing program.
  2. Prepare well hole.
  3. It is prohibited to run casing into a well with the following complications; mud loss, with fluid shows, caving, bridge-over, drag or jamming on drill pipe before rectifying such complications.

### Run 13 3/8" casing to target depth and cement according to well fitting and cementing program (OPS.03.01.22).

### After cementing of 133/8” string and WOC, to perform the following works:

1. Wellhead connections with casing head and BOP equipment according to the scheme approved (OPS.03.01.05).
2. Execute the Acts on run and cementing of casing (OPS.03.01.13). Execute plugging document (OPS.03.01.23).
3. After assembly of BOP preventers on wellhead, make pressure test of this equipment together with casing with rated pressure. Pressure test should be conducted with participation of \_\_\_\_\_ representative. Make the Acts on the results of casing and BOP equipment pressure test (OPS.03.01.15, OPS.03.01.16).

### The register should be made for the BOP equipment and casing head installed (OPS.03.01.24) with the following information:

* 1. Manufacturer's and inventory numbers of the equipment;
  2. Type of equipment (preventers, casing head, hydraulic control unit, etc.), year of manufacture;
  3. Choke diameter;
  4. Working pressure;
  5. Proof pressure (in workshop) (OPS.03.01.14);
  6. Inside diameter of cross tee branches and discharge pipeline;
  7. Inside diameter, wall thickness, steel mark and length of pipe where the casing head is installed;
  8. Type, working pressure and diameter of valves installed; proof pressure of BOP and casing;
  9. Sizes of rams, installed on preventers;
  10. Pressure test of cement bridge pressure;
  11. Drill spool adapters sizes;
  12. Flanges connection sizes;
  13. A copy of certificate to oil in fluid drive;
  14. List of parts and units of BOP, manufactured in workshop plus drawings, and acts of defectoscopy and quality conformance of manufactured parts and units to current technical norms;
  15. Description of gaseous agent in accumulator bottle;
  16. Proof pressure of back valves, ball cocks, emergency valve;
  17. Proof pressure of gas outlet flow line;

### Develop the scheme of wellhead connections mentioning vertical connection sizes and shaft sizes (OPS.03.01.05).

### Have the necessary stock of mud.

### Draw up the act of well readiness (OPS.03.01.18) and obtain permission of \_\_\_\_\_\_\_ representative for further well deepening (OPS.03.01.03).

### Section 12 1/4” hole section

### Drill out the string shoe and leak test the formation (OPS.03.01.17).

### Drill well hole of 121/4” diameter to target depth.

### Before running of 95/8” casing, the following works should be done:

1. Electromagnetic surveys;
2. Prepare well bore for run of casing.

### Run 9 5/8” casing and cement according to well casing and cementing program (OPS.03.01.22).

### Execute the Acts on run and cementing of casing. Execute plugging document (OPS.03.01.13, OPS.03.01.23).

### Record cement-bond acoustic logging.

### After WOC, the following works shall be done:

1. Dismantle BOP.
2. Hang 95/8” casing on casing head wedges.
3. Cut 95/8” casing, set packing unit and casing spool.
4. Assemble BOP.
5. Pressure test BOP and 95/8” casing with pressure rating with participation of \_\_\_\_\_\_\_\_\_\_ representative.

### Make the acts of BOP and casing pressure test, and register of the equipment assembled (OPS.03.01.15, OPS.03.01.16, OPS.03.01.24).

### Have the necessary stock of mud with characteristics according to geological and engineering program.

### Draw up the act of well readiness (OPS.03.01.18) and obtain permission of \_\_\_\_\_\_\_\_\_\_\_ representative for further well deepening (OPS.03.01.03).

### Section 8 1/2” hole section.

### Deliver 7” liner лайнер-хвостовик on well site equipped with accessories including packer and hanger.

### Drill out shoe of 95/8” casing, deepen the well to 1-3 meters and pressure test the cement ring. Make up the acts basing on the pressure test results (OPS.03.01.17).

### Drill 81/2” hole to target depth according to preset technology.

### Before run of 7” liner conduct the following works:

1. Rig up logging station and log the well in accordance with the program.
2. Prepare the well bore for run of liner.
3. Run gage ring of 5” drilling bit.

### Run, cementing and setting of 7” liner shall be conducted at the presence of service company representative. Upon completion of works, make up acts on setting of 7” liner, cementing and draw plugging document (OPS.03.01.13, OPS.03.01.23).

### Rig down spare drilling equipment and assemble the necessary sizes and quantity of the drilling equipment. Further deepening shall be conducted with use of combination/tapered drill string. BOP rams must be installed to accompany tapered drill string.

### Run drilling instrument and pressure test of 95/8” string jointly with 7” liner and BOP, and pressure test annulus 133/8” for 95/8”, at the presence of \_\_\_\_\_\_\_\_\_\_\_ representative. Draw acts on the results of pressure testing (OPS.03.01.15, OPS.03.01.16, OPS.03.01.17).

### Have 5” drill pipe with sub for 31/2” available on drilling floor.

### Prepare the necessary work and spare stock of drilling mud with parameters according to the geological and engineering program.

### Before drilling in the pay horizon, the following documents and instructions shall be available on well site:

1. The approved work plan of drilling-in pay horizon (OPS.03.01.27).
2. Emergency response plan (OPS.06.01).
3. Act of casing and BOP pressure test (OPS.03.01.15).
4. Register of BOP equipment assembled (OPS.03.01.24).
5. Actual scheme of wellhead and BOP connection (OPS.03.01.05), mentioning the vertical connection size and shaft sizes.
6. Act of leak test of back valves, ball cocks, emergency was valve, pumps downstream lines with standpipe, mud hoist, swivel and Kelly stem (OPS.03.01.17).
7. Technical passports of drilling pipes, Kelly stem and drill collar, technical passports for crossover shoe, weight indicators, certificate for drill line, drawing of drill string assembly.
8. The duty roster of responsible technical engineer personnel, approved with \_\_\_\_\_\_\_\_.
9. Instruction «On immediate response of drill shift in case of gas, oil or water shows».

### The commission of the enterprise shall execute the Act of well readiness for drilling-in pay horizon (OPS.03.01.18).

### Obtain permission of \_\_\_\_\_\_\_\_\_ representative for drilling-in the pay horizon (OPS.03.01.03).

### Section of 6” diameter

### Before commencement of drilling to have prepared, set of tubing and necessary fittings for well completion.

### While drilling this interval, loss of circulation is possible. Before commencement of works the stock of loss-circulation additive should be checked (LCM) and it parameters, as well as stock of service water.

### Drill out shoe of 7” drill string on the mud, prepared for drilling-in to pay horizon and pressure test the cement bridge. Make the respective Act (OPS.03.01.17).

### When entering and drilling the pay horizon the requirements of work plan for drilling-in of pay horizon and drilling technology should be strictly observed. Special attention should be paid to the requirements of blowout safety.

### In case of unmonitored loss of circulation or depletion of drilling mud and water reserve, drilling operations should be suspended and the plan of further actions revised.

### Mud logging crew should provide for round the clock supervision over drilling operations, including determination of volume (total) of gas, H2S content, elution analysis, lithologic description of cuttings, well progress and monitoring the level of drilling mud.

### Drill 6” hole up to target depth.

### Conduct logging in accordance with program approved and prepare the hole for run of well completion assembly.

### With participation of well completion service company, and in accordance with the program, conduct the following:

1. Assemble well equipment package for completion and run to the depth according to the program.
2. Execute the register of tubing (length and type), and also bottom hole assembly and depth of installation of it (OPS.03.01.25).
3. Dismantle BOP and assemble production tree. Proof test of production tree with participation of \_\_\_\_\_\_\_\_\_\_\_ representative and draw the respective Act (OPS.03.01.17). Obtain permission from \_\_\_\_\_\_\_ representative for well development (OPS.03.01.03).

### Rig down the rig and conduct works on re-cultivation of land, allocated for well construction.

### Develop the well in sequence, envisaged by the completion works program.

### The commission, appointed by Company resolution jointly with representatives of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ shall check the site readiness (OPS.03.01.18). Transfer of well and technical documentation should be fixed by the Act of established form. After the Act is signed and respective permission obtained (OPS.03.01.03), the well is placed to production.

### When putting the well into production, contractor shall pass to the Customer The following documents:

* 1. Well stake Act;
  2. Drilling project (typical geological and engineering program);
  3. Acts on commencement and completion of drilling (OPS.03.01.12, OPS.03.01.21);
  4. Act on measuring of casing head altitude;
  5. Materials on all geophysical surveys with conclusions;
  6. Calculations of casing, length, diameter, wall thickness, steel mark and other necessary parameters;
  7. Acts on cementing of casing, cementing calculations, laboratory analysis of cement quality and measurement of cement density while cementing, data on cement egress on wellhead or on top of cement (cement bond log sonde diagram), tubing length, string assembly, data on drill mud specific weight in well before cementing;
  8. Acts on leak test of casing;
  9. Work plan for testing or development for every object;
  10. Acts on perforation of casing with perforation intervals, method of perforation, smp;
  11. Acts on testing or development of each object with well survey data attached (production rates, pressures, analyses of oil, water and gas);
  12. Length and type of tubing with information on bottom hole assembly, depth of kickoff valves (shots);
  13. Geological log with description of the whole drilling process and well development;
  14. Description of core;
  15. Well passport including information on drilling process, design and oil-gas shows;
  16. Acts on straining of drill string;
  17. Act on transfer of geological documents on well.

### In case it is impossible to place the completed well into production, by reason of field un-readiness, the well shall be suspended and the respective documents drafted in accordance with «Regulation on conservations of wells on oil and gas fields, subsurface gas storage facilities and thermal water deposits».

## Exceptions

Any exceptions in this Procedure are allowed only upon decision of the Project manager.

## Reporting

There are no requirements to reporting under this Procedure.

## Effective date

This procedure becomes effective on \_\_\_\_\_\_\_ 20\_\_.

## Revision term

This procedure shall be revised once a year.

## Supervisor

Drilling manager

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| OPS.03.01.01 |  | Well construction project |
| OPS.03.01.02 |  | Geological and engineering program |
| OPS.03.01.03 |  | Permission of governmental authorities and agencies |
| OPS.03.01.04 |  | Layout of drilling equipment location |
| OPS.03.01.05 |  | BOP hookup scheme |
| OPS.03.01.06 |  | Act on testing of electric equipment and grounding devices |
| OPS.03.01.07 |  | Act on testing of downstream lines of drill pumps |
| OPS.03.01.08 |  | Act on testing of compressed-air system |
| OPS.03.01.09 |  | Act on testing of traveling block limit switch |
| OPS.03.01.10 |  | Act on testing of drill rig |
| OPS.03.01.11 |  | Act on placing of drill rig in operation |
| OPS.03.01.12 |  | Act on commencement of drilling |
| OPS.03.01.13 |  | Act on cementing of casing |
| OPS.03.01.14 |  | Act on leak-off test of BOP set before installation |
| OPS.03.01.15 |  | Act on leak-off test of casing together with BOP |
| OPS.03.01.16 |  | Act on casing pressure test |
| OPS.03.01.17 |  | Act on leak-off test |
| OPS.03.01.18 |  | Act on well readiness for works |
| OPS.03.01.19 |  | Act on drilling instrument check analysis |
| OPS.03.01.20 |  | Act on measuring of spacing interval between the upper flange to the rotary table |
| OPS.03.01.21 |  | On well completion by drilling |
| OPS.03.01.22 |  | Act of casing works |
| OPS.03.01.23 |  | Record on well cementation |
| OPS.03.01.24 |  | Record of BOP equipment and casing head installed |
| OPS.03.01.25 |  | Record on length of tubing and list of subsurface equipment run in well |
| OPS.03.01.26 |  | Engineering documentation for drilling equipment |
| OPS.03.01.27 |  | Work plan for stripping of producing horizon |
| OPS.03.01.28 |  | Daily drilling report |

Attachment