

<b>PATENT ASSIGNMENT COVER SHEET</b>
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Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT8256651

<b>SUBMISSION TYPE:</b>	CORRECTIVE ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	Corrective Assignment to correct the PROPERTY TYPE: APPLICATION NO. previously recorded on Reel 065268 Frame 0033. Assignor(s) hereby confirms the ASSIGNMENT.

**CONVEYING PARTY DATA**

Name	Execution Date
SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY	09/23/2023

**RECEIVING PARTY DATA**

<b>Name:</b>	SAUDI ARABIAN OIL COMPANY
<b>Street Address:</b>	P.O. BOX 5000
<b>City:</b>	DHAHRAN
<b>State/Country:</b>	SAUDI ARABIA
<b>Postal Code:</b>	31311

**PROPERTY NUMBERS Total: 1**

Property Type	Number
<b>Application Number:</b>	17157209

**CORRESPONDENCE DATA****Fax Number:**

*Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.*

**Email:** mclaughlin@obwbip.com

**Correspondent Name:** BENJAMIN MCLAUGHLIN

**Address Line 1:** 1100 LOUISIANA ST

**Address Line 4:** HOUSTON, TEXAS 77002

<b>NAME OF SUBMITTER:</b>	THOMAS K. SCHERER
<b>SIGNATURE:</b>	/Thomas K. Scherer/
<b>DATE SIGNED:</b>	11/02/2023

**Total Attachments: 32**

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## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
Stylesheet Version v1.2

EPAS ID: PAT8227860

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT

## CONVEYING PARTY DATA

Name	Execution Date
SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY	09/23/2023

## RECEIVING PARTY DATA

<b>Name:</b>	SAUDI ARABIAN OIL COMPANY
<b>Street Address:</b>	P.O. BOX 5000
<b>City:</b>	DHAHRAN
<b>State/Country:</b>	SAUDI ARABIA
<b>Postal Code:</b>	31311

## PROPERTY NUMBERS Total: 56

Property Type	Number
Application Number:	17155803
Application Number:	17141783
Application Number:	17644119
Application Number:	17644346
Application Number:	17409271
Application Number:	17038345
Application Number:	17455128
Application Number:	17644845
Application Number:	17167501
Application Number:	17155735
Application Number:	17644103
Application Number:	<del>17157209</del> **17157290**
Application Number:	17648034
Application Number:	17649505
Application Number:	17647416
Application Number:	17647428
Application Number:	17490348
Application Number:	17316280
Application Number:	17724132
Application Number:	17644450

PATENT

<b>Property Type</b>	<b>Number</b>
Application Number:	17394547
Application Number:	18046351
Application Number:	17121044
Application Number:	17454539
Application Number:	17144677
Application Number:	17650804
Application Number:	17165372
Application Number:	17157340
Application Number:	17069080
Application Number:	17143583
Application Number:	17011285
Application Number:	17091402
Application Number:	16901620
Application Number:	17371736
Application Number:	17375417
Application Number:	14644832
Application Number:	17643487
Application Number:	17363326
Application Number:	18342487
Application Number:	18326986
Application Number:	18343668
Application Number:	17814170
Application Number:	18344666
Application Number:	18345113
Application Number:	17937309
Application Number:	18325777
Application Number:	17814447
Application Number:	18324857
Application Number:	63516754
Application Number:	17150142
Application Number:	17644697
Application Number:	17645330
Application Number:	17470796
Application Number:	17197696
Application Number:	17372161
Application Number:	18306013

**CORRESPONDENCE DATA**

**Fax Number:**

*Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.*

**Email:** mclaughlin@obwbip.com

**Correspondent Name:** BENJAMIN MCLAUGHLIN

**Address Line 1:** 1100 LOUISIANA ST

**Address Line 4:** HOUSTON, TEXAS 77002

<b>NAME OF SUBMITTER:</b>	SEEMA M. MEHTA
<b>SIGNATURE:</b>	/Seema M. Mehta/
<b>DATE SIGNED:</b>	10/18/2023

**Total Attachments: 23**

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PATENT ASSIGNMENT

THIS AGREEMENT, to be effective as of September 14, 2023, is by and between SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY, a corporation having a place of business at P.O. BOX 62 Building 2297, Room GA-313 Dhahran, Saudi Arabia 31311 and SAUDI ARABIAN OIL COMPANY, a corporation having a place of business at P.O. BOX 5000 Dhahran, Saudi Arabia 31311.

WITNESSETH:

WHEREAS, SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY is the owner of a 100% interest in and to the patent listed in Exhibit A attached hereto ("the Patent Rights"); and

WHEREAS, SAUDI ARABIAN OIL COMPANY desires to obtain, and SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY is willing to assign 100% of its interest in the Patent Rights to SAUDI ARABIAN OIL COMPANY, the Patent Rights;

NOW, THEREFORE, for good and valuable consideration, the sufficiency and receipt of which are hereby acknowledged, the parties hereby agree as follows:

SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY does hereby sell, assign, transfer, and set over unto SAUDI ARABIAN OIL COMPANY 100% of its right, title, and interest in, to, and under (i) the patent listed in Exhibit A attached hereto, (ii) all patents which may issue from such patent including any continuations, divisionals, and continuations-in-part thereof, and (iii) the inventions claimed in such patents.

IN WITNESS WHEREOF, SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY and SAUDI ARABIAN OIL COMPANY have each caused their duly authorized representative to execute this Assignment.

SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY

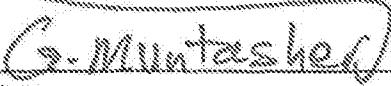
SAUDI ARABIAN OIL COMPANY


Name: Ghaithan A. Muntasheri

Name: Kwadjo Adusei-Poku

Title: Chief Executive Officer

Title: Chief IP Counsel, Saudi Aramco

Signature 

Signature 

Date 9/23

Date 14 Sept, 2023

## EXHIBIT A

- 1. Application No.:** 17/155,803

**Inventor:** Yanhui Han

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY

**Title:** METHOD FOR DETERMINING IN-SITU MAXIMUM HORIZONTAL STRESS

**Filed:** January 22, 2021

**Attorney Docket No:** 18733-282001
  
- 2. Application No.:** 17/141,783

**Inventor:** Hasmukh A. Patel

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY

**Title:** IN-SITU POLYPHOSPHAZENE GENERATION IN CEMENT FOR IMPROVED ELASTIC PROPERTIES

**Filed:** January 5, 2021

**Attorney Docket No:** 18733-208001
  
- 3. Application No.:** 17/644,119

**Inventors:** Fakuen Frank Chang  
Wenwen Li  
Feng Liang

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY

**Title:** BLOWING AGENT INCORPORATED RESIN SYSTEMS FOR CONSOLIDATING SUBTERRANEAN OIL AND GAS BEARING FORMATIONS

**Filed:** December 14, 2021

**Attorney Docket No:** 18733-457001

- 4. Application No.:** 17/644,346  
**Inventor:** Mohammed Ali Ibrahim Sayed  
Rajesh Saini  
**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY  
**Title:** FOAMED WETTABILITY ALTERATION TREATMENT FOR  
DEEP CONDENSATE AND WATER BLOCKAGE IN GAS  
RESERVOIRS

**Filed:** December 15, 2021

**Attorney Docket No:** 18733-460001

- 5. Application No.:** 17/409,271  
**Inventor:** Wei Wang  
**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY  
**Title:** MODIFIED CARBON NANOMATERIALS AS TRACERS  
FOR RESERVOIR MONITORING

**Filed:** August 23, 2021

**Attorney Docket No:** 18733-376001

- 6. Application No.:** 17/038,345  
**Inventor:** Hsieh Chen  
Martin E. Poitzsch  
**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY  
**Title:** WATERFLOOD FRONT IMAGING USING  
SEGMENTALLY INSULATED WELL LINERS AS ON-  
DEMAND ELECTRODES





**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** METHOD AND SYSTEM FOR DRILLING FLUID  
CONDITION MONITORING

**Filed:** February 4, 2021

**Attorney Docket No:** 18733-162001

**10. Application No.:** 17/155,735

**Inventor:** Mohammad H. Haque  
Rajesh K. Saini

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** DOWNHOLE COUPON HOLDER

**Filed:** January 22, 2021

**Attorney Docket No:** 18733-207001

**11. Application No.:** 17/644,103

**Inventors:** Seth Busetti

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** A METHOD FOR QUADRIMODAL FAULT PREDICTION  
USING STRAIN TENSOR CYCLIDES

**Filed:** December 14, 2021

**Attorney Docket No:** 18733-406001

**12. Application No.:** ~~17/157,299~~ \*\*17157290\*\*

**Inventor:** Mahmoud F. Abughaban  
Ashok Kumar Santra

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES

COMPANY

**Title:** AUTOMATED RECYCLED CLOSED-LOOP WATER  
BASED DRILLING FLUID CONDITION MONITORING  
SYSTEM

**Filed:** January 25, 2021

**Attorney Docket No:** 18733-178001

**13. Application No.:** 17/648,034

**Inventor:** Younane N. Abousleiman  
Yanhui Han  
Chao Liu  
Dung T. Phan

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** METHOD FOR THE DETERMINATION OF MUD WEIGHT  
WINDOW IN N-POROSITY N-PERMEABILITY  
FORMATIONS

**Filed:** January 14, 2022

**Attorney Docket No:** 18733-456001

**14. Application No.:** 17/649,505

**Inventor:** Wenwen Li  
Fakuen Frank Chang  
Feng Liang

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** POROUS POLYURETHANE PARTICLE COMPOSITION  
AND METHODS THEREOF

**Filed:** January 31, 2022

**Attorney Docket No:** 18733-637001



**Filed:** September 30, 2021

**Attorney Docket No:** 18733-534001

**18. Application No.:** 17/316,280

**Inventor:** Simone Musso

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** SYSTEM AND METHOD FOR TESTING CEMENT

**Filed:** May 10, 2021

**Attorney Docket No:** 18733-079002

**19. Application No.:** 17/724,132

**Inventors:** Nicole Shimek

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** ACID CORROSION INHIBITORS

**Filed:** April 19, 2022

**Attorney Docket No:** 18733-9197002

**20. Application No.:** 17/644,450

**Inventor:** Wenwen Li  
Rajesh Saini

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** SALT TOLERANT FRICTION REDUCER

**Filed:** December 15, 2021

**Attorney Docket No:** 18733-215002

**21.**           **Application No.:** 17/394,547  
                  **Inventor:** Desmond E. Schipper  
  Amy J. Cairns  
  Katherine L. Hull  
                  **Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
  COMPANY  
                  **Title:** METHODS FOR DELAYING IN SITU ACID GENERATION  
  
                  **Filed:** August 5, 2021  
**Attorney Docket No:** 18733-9173002

**22.**           **Application No.:** 18/046,351  
                  **Inventor:** Amy J. Cairns  
  Frank F. Chang  
  Mohammed Sayed  
                  **Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
  COMPANY  
                  **Title:** METHOD TO ACCELERATE ACID REACTIVITY DURING  
  RESERVOIR STIMULATION  
  
                  **Filed:** October 13, 2022  
**Attorney Docket No:** 18733-375002

**23.**           **Application No.:** 17/121,044  
                  **Inventors:** Daniele Colombo  
  Weichang Li  
  Diego Rovetta  
                  **Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
  COMPANY  
                  **Title:** PHYSICS-CONSTRAINED DEEP LEARNING JOINT  
  INVERSION

**Filed:** December 14, 2020

**Attorney Docket No:** 18733-299002

**24. Application No.:** 17/454,539

**Inventor:** Wei Wang  
Hooisweng Ow  
Sehoon Chang

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** POLYMER NANO-CLAYS AS MULTIFUNCTIONAL MUD  
LOGGING BARCODE TRACERS

**Filed:** November 11, 2021

**Attorney Docket No:** 18733-455001

**25. Application No.:** 17/144,677

**Inventor:** Hui-Hai Liu  
Jilin Zhang  
Huseyin Onur Balan  
Feng Liang

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** DETERMINATION OF STIMULATED RESERVOIR  
VOLUME AND ESTIMATED ULTIMATE RECOVERY OF  
HYDROCARBONS FOR UNCONVENTIONAL RESERVOI

**Filed:** Janaury 8, 2021

**Attorney Docket No:** 18733-206001

**26. Application No.:** 17/650,804

**Inventor:** Peter J. Boul

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** EMULSION SHEAR BOND ENHANCED CEMENT

**Filed:** February 11, 2022

**Attorney Docket No:** 18733-372001

27. **Application No.:** 17/165,372

**Inventors:** Murtadha J. AlTammar  
Khalid Mohammed Alruwaili  
Dung T. Phan

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** METHOD AND SYSTEM FOR AUTONOMOUS FLOW  
RATE CONTROL IN HYDRAULIC STIMULATION  
OPERATIONS

**Filed:** February 2, 2021

**Attorney Docket No:** 18733-251001

28. **Application No.:** 17/157,340

**Inventor:** Chao Liu  
Dung T. Phan  
Younane N. Abousleiman

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** TWO METHODS OF DETERMINING PERMEABILITIES  
OF NATURALLY FRACTURED ROCKS FROM  
LABORATORY MEASUREMENTS

**Filed:** January 25, 2021

**Attorney Docket No:** 18733-266001





**Title:** RESERVOIR DRILLING FLUIDS CONSIST OF CATIONIC HETEROCYCLIC POLYMERS, SYNTHESIS, FORMULATION, AND APPLICATIONS

**Filed:** September 3, 2020

**Attorney Docket No:** 18733-216001

**32. Application No.:** 17/091,402

**Inventor:** Miguel Gonzalez  
Subhash Chandrabose Ayirala  
Lyla Maskeen  
Abdulkarim Sofi

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY

**Title:** DEVICE AND METHOD TO OBTAIN THE VISCOSITY OF POLYMER FLUIDS USED FOR ENHANCED OIL RECOVERY

**Filed:** November 6, 2020

**Attorney Docket No:** 18733-267001

**33. Application No.:** 16/901,620

**Inventor:** Shannon Lee Eichmann  
Gary Eppler  
Joshua Brothers  
David Jacobi

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY

**Title:** SAMPLE HOLDER FOR USING MOUNTED SEM SAMPLES IN UPRIGHT AND INVERTED OPTICAL MICROSCOPES AND SPECTROMETERS

**Filed:** June 15, 2020

**Attorney Docket No:** 18733-039001

**34. Application No.:** 17/371,736  
**Inventor:** Wenwen Li  
Rajesh Saini  
Shawn Rimassa  
**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY  
**Title:** HIGH VISCOSITY FRICTION REDUCER FOR  
FRACTURING FLUID  
  
**Filed:** July 9, 2021  
**Attorney Docket No:** 18733-112002

**35. Application No.:** 17/375,417  
**Inventors:** Chengzhe Gao  
Shitong Sherry Zhu  
Marta Antoniv  
Nouf AlJabari  
**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY  
**Title:** DEGRADABLE TAGS FOR DEPTH CORRELATION MUD  
LOGGING  
  
**Filed:** July 14, 2021  
**Attorney Docket No:** 18733-048002

**36. Application No.:** 14/644,832  
**Inventor:** Khalid AlRuwaili  
Murtadha J. AlTammar  
Yanhui Han  
**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY  
**Title:** THICK-WALL CYLINDER EXPERIMENT SETUP FOR  
WELLBORE STABILITY ANALYSIS

**Filed:** December 17, 2021

**Attorney Docket No:** 18733-592001

**37. Application No.:** 17/643,487

**Inventor:** Damian Pablo San Roman Alerigi  
Adrian Cesar Cavazos Sepulveda  
Sameeh Issa Batarseh  
Jose Oliverio Alvarez

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** DEFORMATION MONITORING MECHANISM WITH  
MULTI-PIXEL ANGLE-SENSITIVE LASER RANGING

**Filed:** December 9, 2021

**Attorney Docket No:** 18733-747001

**38. Application No.:** 17/363,326

**Inventor:** Murtadha J. AlTammar  
Khalid M. Alruwaili  
Osman Hamid  
Weichang Li

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** METHOD AND SYSTEM FOR CORRECTING AND  
PREDICTING SONIC WELL  
LOGS USING PHYSICS-CONSTRAINED MACHINE  
LEARNING

**Filed:** June 30, 2021

**Attorney Docket No:** 18733-458001

**39. Application No.:** 18/342,487

**Inventors:** Yanhui Han  
Rima T. Alfaraj  
Khaqan Khan  
Dung Phan  
Chao Liu  
Khalid AlRuwaili  
Murtadha J. AlTammar

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** CAPTURING MOST SEVERE FAILURE REGIONS  
AROUND BOREHOLE IN ANALYTICAL POROELASTIC  
ANALYSIS

**Filed:** June 27, 2023

**Attorney Docket No:** 18733-110001

**40. Application No.:** 18/326,986

**Inventor:** Yahhui Han  
Dung T. Phan  
Chao Liu  
Khaqan Khan  
Rima Taqi AlFaraj  
Khalid M. Alruwaili  
Murtadha J. AlTammar

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** AN INTEGRATIVE WORKFLOW OF CONSTRUCTING  
MECHANICAL EARTH MODEL (MEM) FOR WELLBORE  
DRILLING

**Filed:** May 31, 2023

**Attorney Docket No:** 18733-1108001

**41. Application No.:** 18/343,668

**Inventor:** Vladimir Kazei  
Aleksi Titov

Andrey Bakulin

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** DAS DEPTH CALIBRATION WITH MULTI-GAUGE  
LENGTH INTERROGATION

**Filed:** June 28, 2023

**Attorney Docket No:** 18733-947001

**42. Application No.:** 17/814,170

**Inventor:** Jin-Hong Chen  
Stacey M. Althaus  
Mohammed Boudjatit  
Gary Eppler

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** A METHOD TO DETERMINE AN UNCORRUPTED  
NUCLEAR MAGNETIC RESONANCE RESPONSE FROM  
A SAMPLE

**Filed:** July 21, 2022

**Attorney Docket No:** 18733-879001

**43. Application No.:** 18/344,666

**Inventors:** Rabah Mesdour  
Jilin Jay Zhang  
Hui-Hai Liu  
Faisal F. Almalki

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** METHOD AND SYSTEM FOR PREDICTING  
HYDROCARBON DATA FOR UNCONVENTIONAL  
RESERVOIRS USING MACHINE LEARNING

**Filed:** June 29, 2023

**Attorney Docket No:** 18733-1106001

**44. Application No.:** 18/345,113

**Inventor:** Mokhles M. Mezghani  
Tao Lin  
Chicheng Xu  
Weichang Li

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** SYSTEM AND METHOD FOR AUTOMATED AND  
ACCURATE CORE PHOTOS LABELING IN MACHINE  
LEARNING BASED CORE PROPERTIES PREDICTION

**Filed:** June 30, 2023

**Attorney Docket No:** 18733-1418001

**45. Application No.:** 17/937,309

**Inventor:** Jin-Hong Chen  
Stacey M. Althaus  
Mohammed Boudjatit  
Houzhu Zhang

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** A METHOD TO DETERMINE A MASS OF AN ABSORBED  
GAS AND A MASS OF A PORE GAS IN A SAMPLE

**Filed:** September 30, 2022

**Attorney Docket No:** 18733-880001

**46. Application No.:** 18/325,777

**Inventor:** Jilin Zhang  
Hui-Hai Liu  
Feng Liang

Moemen A. Abdelrahman

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** PREDICTING WELL PERFORMANCE FROM  
UNCONVENTIONAL RESERVOIRS WITH THE  
IMPROVED MACHINE LEARNING METHOD FOR A  
SMALL TRAININ

**Filed:** May 30, 2023

**Attorney Docket No:** 18733-1176001

**47. Application No.:** 17/814,447

**Inventors:** Chicheng Xu  
Tao Lin  
Yuchen Jin  
Weichang Li  
Mohamed Larbi Zeghlache

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** SYSTEM AND METHOD FOR RAPID WELL LOG  
VALIDATION

**Filed:** July 22, 2022

**Attorney Docket No:** 18733-877001

**48. Application No.:** 18/324,857

**Inventor:** Hui Hai Liu  
Jilin Zhang  
Mohammed Boudjatit  
Gary Eppler

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** SYSTEMS AND METHODS TO DETERMINE  
PERMEABILITY OF ROCK UNDER ANISOTROPIC  
STRESS



**Filed:** May 26, 2023

**Attorney Docket No:** 18733-1104001

**49. Application No.:** 63/516,754

**Inventor:** Martin E. Poitzsch  
Chicheng Xu  
Shouxiang Ma

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** USING ARTIFICIAL INTELLIGENCE METHODS TO  
EXPLOIT WELL LOGGING DATA

**Filed:** July 31, 2023

**Attorney Docket No:** 18733-1102001

**50. Application No.:** 17/150,142

**Inventor:** Yanhui Han  
Dung Phan  
Khalid AIRuwaili

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** A HYBRID PROCEDURE FOR EVALUATING STRESS  
MAGNITUDE AND DISTRIBUTION ON A LINER

**Filed:** January 15, 2021

**Attorney Docket No:** 18733-209001

**51. Application No.:** 17/644,697

**Inventors:** Yanhui Han  
Kaiming Xia

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** SYSTEM AND METHOD FOR DETERMINING A  
DIRECTION FOR DRILLING A WELL

**Filed:** December 16, 2021

**Attorney Docket No:** 18733-489001

**52. Application No.:** 17/645,330

**Inventor:** Yanhui Han  
Feng Liang  
Khalid Mohammed Alruwaili

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** A WORKFLOW FOR OPTIMIZING ENGINEERING  
PROCEDURE TO REDUCE BOREHOLE BREAKDOWN  
PRESSURE BY COMBINATION OF ORIENTED....

**Filed:** December 21, 2021

**Attorney Docket No:** 18733-491001

**53. Application No.:** 17/470,796

**Inventor:** Constantin Sandu  
Ibrahim Atwah

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** SYSTEM AND METHOD FOR RESERVOIRED OIL  
PRODUCTION BASED ON CALCULATED COMPOSITION  
OF NATURAL TRACERS

**Filed:** September 9, 2021

**Attorney Docket No:** 18733-194002

**54. Application No.:** 17/197,696

**Inventor:** Stacey Marie Althaus  
Jing-Hong Chen  
Mohammed Boudjatit

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** NUCLEAR MAGNETIC RESONANCE METHOD  
QUANTIFYING FRACTURES IN UNCONVENTIONAL  
SOURCE ROCKS

**Filed:** March 10, 2021

**Attorney Docket No:** 18733-292001

**55. Application No.:** 17/372,161

**Inventors:** Jing-Hong Chen  
Stacey Marie Althaus  
Houzhu Zhang  
Hui-Hai Liu  
Mohammed Boudjatit

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** DETERMINATION OF ESTIMATED MAXIMUM  
RECOVERABLE (EMR) HYDROCARBONS IN  
UNCONVENTIONAL RESERVOIRS

**Filed:** July 9, 2021

**Attorney Docket No:** 18733-461001

**56. Application No.:** 18/306,013

**Inventors:** Vijay Ramakrishnan  
Alejandro Vera  
Muhammad Arsalan  
Sakethraman Mahalingam

**Assignee:** SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

**Title:** MEASUREMENT OF BULK FLOW VELOCITY AND  
MIXTURE SOUND SPEED USING AN ARRAY OF

DYNAMIC PRESSURE SENSORS

**Filed:** April 24, 2023

**Attorney Docket No:** 18733-1112001

1085861-1

**RECORDED: 10/18/2023**

**PATENT**  
**REEL: 065447 FRAME: 0389**



## UNITED STATES PATENT AND TRADEMARK OFFICE

UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND  
DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

OCTOBER 20, 2023

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BENJAMIN MCLAUGHLIN  
1100 LOUISIANA ST  
HOUSTON, TX 77002

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RECORDATION DATE: 10/18/2023

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BRIEF: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

ASSIGNOR:

SAUDI ARAMCO UPSTREAM TECHNOLOGIES  
COMPANY

DOC DATE: 09/23/2023

ASSIGNEE:

SAUDI ARABIAN OIL COMPANY  
P.O. BOX 5000  
DHAHRAN, SAUDI ARABIA 31311

APPLICATION NUMBER: 14644832

FILING DATE: 03/11/2015

PATENT NUMBER:

ISSUE DATE:

TITLE: HIGH-THROUGHPUT CULTURE AND TRANSFER DEVICE AND METHOD

APPLICATION NUMBER: 16901620

FILING DATE: 06/15/2020

PATENT NUMBER: 11719923

ISSUE DATE: 08/08/2023

TITLE: SAMPLE HOLDER FOR USING MOUNTED SEM SAMPLES IN UPRIGHT AND  
INVERTED OPTICAL MICROSCOPES AND SPECTROMETERS

APPLICATION NUMBER: 17011285

FILING DATE: 09/03/2020

PATENT NUMBER: 11685852

ISSUE DATE: 06/27/2023

TITLE: RESERVOIR DRILLING FLUIDS CONSIST OF CATIONIC HETEROCYCLIC  
POLYMERS, SYNTHESIS, FORMULATION, AND APPLICATIONS

APPLICATION NUMBER: 17038345 FILING DATE: 09/30/2020  
 PATENT NUMBER: ISSUE DATE:  
 TITLE: WATERFLOOD FRONT IMAGING USING SEGMENTALLY INSULATED WELL LINERS  
 AS ON-DEMAND ELECTRODES

APPLICATION NUMBER: 17069080 FILING DATE: 10/13/2020  
 PATENT NUMBER: 11719092 ISSUE DATE: 08/08/2023  
 TITLE: SYSTEMS AND METHODS FOR DRILLING A WELLBORE USING TAGGANT  
 ANALYSIS

APPLICATION NUMBER: 17091402 FILING DATE: 11/06/2020  
 PATENT NUMBER: 11714039 ISSUE DATE: 08/01/2023  
 TITLE: DEVICE AND METHOD TO OBTAIN THE VISCOSITY OF POLYMER FLUIDS USED  
 FOR ENHANCED OIL RECOVERY

APPLICATION NUMBER: 17121044 FILING DATE: 12/14/2020  
 PATENT NUMBER: ISSUE DATE:  
 TITLE: PHYSICS-CONSTRAINED DEEP LEARNING JOINT INVERSION

APPLICATION NUMBER: 17141783 FILING DATE: 01/05/2021  
 PATENT NUMBER: ISSUE DATE:  
 TITLE: IN-SITU POLYPHOSPHAZENE GENERATION IN CEMENT FOR IMPROVED  
 ELASTIC PROPERTIES

APPLICATION NUMBER: 17143583 FILING DATE: 01/07/2021  
 PATENT NUMBER: 11598711 ISSUE DATE: 03/07/2023  
 TITLE: METHOD AND APPARATUS FOR MEASURING STRESS DEPENDENCY OF SHALE  
 PERMEABILITY WITH STEADY-STATE FLOW

APPLICATION NUMBER: 17144677 FILING DATE: 01/08/2021  
 PATENT NUMBER: 11702924 ISSUE DATE: 07/18/2023  
 TITLE: DETERMINATION OF STIMULATED RESERVOIR VOLUME AND ESTIMATED  
 ULTIMATE RECOVERY OF HYDROCARBONS FOR UNCONVENTIONAL RESERVOIRS

APPLICATION NUMBER: 17150142 FILING DATE: 01/15/2021  
 PATENT NUMBER: ISSUE DATE:  
 TITLE: HYBRID PROCEDURE FOR EVALUATING STRESS MAGNITUDE AND  
 DISTRIBUTION ON A LINER

APPLICATION NUMBER: 17155735 FILING DATE: 01/22/2021  
 PATENT NUMBER: ISSUE DATE:  
 TITLE: DOWNHOLE COUPON HOLDER

APPLICATION NUMBER: 17155803 FILING DATE: 01/22/2021  
 PATENT NUMBER: ISSUE DATE:  
 TITLE: METHOD FOR DETERMINING IN-SITU MAXIMUM HORIZONTAL STRESS

\*\*17157290\*\*

APPLICATION NUMBER: 17157209 FILING DATE: 01/25/2021  
 PATENT NUMBER: 11773704 ISSUE DATE: 10/03/2023  
 TITLE: METHODS FOR TIGHT OIL PRODUCTION THROUGH SECONDARY RECOVERY  
 USING SPACED PRODUCER AND INJECTOR WELLBORES

APPLICATION NUMBER: 17157340 FILING DATE: 01/25/2021  
 PATENT NUMBER: 11519879 ISSUE DATE: 12/06/2022  
 TITLE: TWO METHODS OF DETERMINING PERMEABILITIES OF NATURALLY FRACTURED  
 ROCKS FROM LABORATORY MEASUREMENTS

APPLICATION NUMBER: 17165372 FILING DATE: 02/02/2021  
PATENT NUMBER: 11680469 ISSUE DATE: 06/20/2023  
TITLE: METHOD AND SYSTEM FOR AUTONOMOUS FLOW RATE CONTROL IN HYDRAULIC  
STIMULATION OPERATIONS

APPLICATION NUMBER: 17167501 FILING DATE: 02/04/2021  
PATENT NUMBER: ISSUE DATE:  
TITLE: METHOD AND SYSTEM FOR DRILLING FLUID CONDITION MONITORING

APPLICATION NUMBER: 17197696 FILING DATE: 03/10/2021  
PATENT NUMBER: 11579326 ISSUE DATE: 02/14/2023  
TITLE: NUCLEAR MAGNETIC RESONANCE METHOD QUANTIFYING FRACTURES IN  
UNCONVENTIONAL SOURCE ROCKS

APPLICATION NUMBER: 17316280 FILING DATE: 05/10/2021  
PATENT NUMBER: ISSUE DATE:  
TITLE: SYSTEM AND METHOD FOR TESTING CEMENT

APPLICATION NUMBER: 17363326 FILING DATE: 06/30/2021  
PATENT NUMBER: ISSUE DATE:  
TITLE: METHOD AND SYSTEM FOR CORRECTING AND PREDICTING SONIC WELL LOGS  
USING PHYSICS-CONSTRAINED MACHINE LEARNING

APPLICATION NUMBER: 17371736 FILING DATE: 07/09/2021  
PATENT NUMBER: 11732185 ISSUE DATE: 08/22/2023  
TITLE: HIGH VISCOSITY FRICTION REDUCER FOR FRACTURING FLUID

APPLICATION NUMBER: 17372161 FILING DATE: 07/09/2021  
PATENT NUMBER: 11740381 ISSUE DATE: 08/29/2023  
TITLE: DETERMINATION OF ESTIMATED MAXIMUM RECOVERABLE (EMR)  
HYDROCARBONS IN UNCONVENTIONAL RESERVOIRS

APPLICATION NUMBER: 17375417 FILING DATE: 07/14/2021  
PATENT NUMBER: 11697755 ISSUE DATE: 07/11/2023  
TITLE: DEGRADABLE TAGS FOR DEPTH CORRELATION MUD LOGGING

APPLICATION NUMBER: 17394547 FILING DATE: 08/05/2021  
PATENT NUMBER: ISSUE DATE:  
TITLE: METHODS FOR DELAYING IN SITU ACID GENERATION FOR ACID DELIVERY  
TO A SITE

APPLICATION NUMBER: 17409271 FILING DATE: 08/23/2021  
PATENT NUMBER: ISSUE DATE:  
TITLE: MODIFIED CARBON NANOMATERIALS AS TRACERS FOR RESERVOIR  
MONITORING

APPLICATION NUMBER: 17454539 FILING DATE: 11/11/2021  
PATENT NUMBER: 11692440 ISSUE DATE: 07/04/2023  
TITLE: POLYMER NANO-CLAYS AS MULTIFUNCTIONAL MUD LOGGING BARCODE  
TRACERS

APPLICATION NUMBER: 17455128 FILING DATE: 11/16/2021  
PATENT NUMBER: ISSUE DATE:  
TITLE: METHOD AND SYSTEM FOR DETERMINING GAMMA-RAY MEASUREMENTS USING A  
SENSITIVITY MAP AND CONTROLLED SAMPLING MOTION

APPLICATION NUMBER: 17470796 FILING DATE: 09/09/2021  
PATENT NUMBER: ISSUE DATE:  
TITLE: SYSTEM AND METHOD FOR RESERVOIRED OIL PRODUCTION BASED ON  
CALCULATED COMPOSITION OF NATURAL TRACERS

APPLICATION NUMBER: 17490348 FILING DATE: 09/30/2021  
PATENT NUMBER: ISSUE DATE:  
TITLE: IN-SITU MONITORING OF CHEMICAL FINGERPRINTS IN OILFIELD APPLICATIONS

APPLICATION NUMBER: 17643487 FILING DATE: 12/09/2021  
PATENT NUMBER: ISSUE DATE:  
TITLE: DEFORMATION MONITORING MECHANISM WITH MULTI-PIXEL ANGLE-SENSITIVE LASER RANGING

APPLICATION NUMBER: 17644103 FILING DATE: 12/14/2021  
PATENT NUMBER: ISSUE DATE:  
TITLE: METHOD FOR QUADRIMODAL FAULT PREDICTION USING STRAIN TENSOR CYCLIDES

APPLICATION NUMBER: 17644119 FILING DATE: 12/14/2021  
PATENT NUMBER: ISSUE DATE:  
TITLE: BLOWING AGENT INCORPORATED RESIN SYSTEMS FOR CONSOLIDATING SUBTERRANEAN OIL AND GAS BEARING FORMATIONS

APPLICATION NUMBER: 17644346 FILING DATE: 12/15/2021  
PATENT NUMBER: ISSUE DATE:  
TITLE: FOAMED WETTABILITY ALTERATION TREATMENT FOR DEEP CONDENSATE AND WATER BLOCKAGE IN GAS RESERVOIRS

APPLICATION NUMBER: 17644450 FILING DATE: 12/15/2021  
PATENT NUMBER: ISSUE DATE:  
TITLE: SALT TOLERANT FRICTION REDUCER

APPLICATION NUMBER: 17644697 FILING DATE: 12/16/2021  
PATENT NUMBER: ISSUE DATE:  
TITLE: SYSTEM AND METHOD FOR DETERMINING A DIRECTION FOR DRILLING A WELL

APPLICATION NUMBER: 17644845 FILING DATE: 12/17/2021  
PATENT NUMBER: ISSUE DATE:  
TITLE: METHOD AND SYSTEM FOR GENERATING FORMATION PROPERTY VOLUME USING MACHINE LEARNING

APPLICATION NUMBER: 17645330 FILING DATE: 12/21/2021  
PATENT NUMBER: ISSUE DATE:  
TITLE: WORKFLOW FOR OPTIMIZING ENGINEERING PROCEDURE TO REDUCE BOREHOLE BREAKDOWN PRESSURE BY COMBINATION OF ORIENTED NOTCHING/PERFORATION AND FLUID CHEMICAL CONDITIONING PROCESS IN OPEN AND CASED HOLE

APPLICATION NUMBER: 17647416 FILING DATE: 01/07/2022  
PATENT NUMBER: ISSUE DATE:  
TITLE: SYNTHESIS AND USE OF GRAFTED GRAPHENE IN AQUEOUS DRILLING FLUIDS AS LOW SHEAR RATE VISCOSITY ENHANCER

APPLICATION NUMBER: 17647428 FILING DATE: 01/07/2022  
PATENT NUMBER: ISSUE DATE:  
TITLE: SYNTHESIS AND USE OF GRAFTED GRAPHENE IN OIL BASED DRILLING FLUIDS AS LOW SHEAR RATE VISCOSITY ENHANCER

APPLICATION NUMBER: 17648034 FILING DATE: 01/14/2022  
PATENT NUMBER: ISSUE DATE:  
TITLE: METHOD FOR THE DETERMINATION OF MUD WEIGHT WINDOW IN N-POROSITY N-PERMEABILITY FORMATIONS



APPLICATION NUMBER: 17649505 FILING DATE: 01/31/2022  
PATENT NUMBER: ISSUE DATE:  
TITLE: POROUS POLYURETHANE PARTICLE COMPOSITION AND METHODS THEREOF

APPLICATION NUMBER: 17650804 FILING DATE: 02/11/2022  
PATENT NUMBER: 11739247 ISSUE DATE: 08/29/2023  
TITLE: EMULSION SHEAR BOND ENHANCED CEMENT

APPLICATION NUMBER: 17724132 FILING DATE: 04/19/2022  
PATENT NUMBER: ISSUE DATE:  
TITLE: ACID CORROSION INHIBITORS

APPLICATION NUMBER: 17814170 FILING DATE: 07/21/2022  
PATENT NUMBER: ISSUE DATE:  
TITLE: METHOD TO DETERMINE AN UNCORRUPTED NUCLEAR MAGNETIC RESONANCE  
RESPONSE FROM A SAMPLE

APPLICATION NUMBER: 17814447 FILING DATE: 07/22/2022  
PATENT NUMBER: ISSUE DATE:  
TITLE: SYSTEM AND METHOD FOR RAPID WELL LOG VALIDATION

APPLICATION NUMBER: 17937309 FILING DATE: 09/30/2022  
PATENT NUMBER: ISSUE DATE:  
TITLE: METHOD TO DETERMINE A MASS OF AN ABSORBED GAS AND A MASS OF A  
PORE GAS IN A SAMPLE

APPLICATION NUMBER: 18046351 FILING DATE: 10/13/2022  
PATENT NUMBER: ISSUE DATE:  
TITLE: METHOD TO ACCELERATE ACID REACTIVITY DURING RESERVOIR  
STIMULATION

APPLICATION NUMBER: 18306013 FILING DATE: 04/24/2023  
PATENT NUMBER: ISSUE DATE:  
TITLE: MEASUREMENT OF BULK FLOW VELOCITY AND MIXTURE SOUND SPEED USING  
AN ARRAY OF DYNAMIC PRESSURE SENSORS

APPLICATION NUMBER: 18324857 FILING DATE: 05/26/2023  
PATENT NUMBER: ISSUE DATE:  
TITLE: SYSTEMS AND METHODS TO DETERMINE PERMEABILITY OF ROCK UNDER  
ANISOTROPIC STRESS

APPLICATION NUMBER: 18325777 FILING DATE: 05/30/2023  
PATENT NUMBER: ISSUE DATE:  
TITLE: PREDICTING WELL PERFORMANCE FROM UNCONVENTIONAL RESERVOIRS WITH  
THE IMPROVED MACHINE LEARNING METHOD FOR A SMALL TRAINING DATA  
SET BY INCORPORATING A SIMPLE PHYSICS CONSTRAIN

APPLICATION NUMBER: 18326986 FILING DATE: 05/31/2023  
PATENT NUMBER: ISSUE DATE:  
TITLE: INTEGRATIVE WORKFLOW OF CONSTRUCTING MECHANICAL EARTH MODEL  
(MEM) FOR WELLBORE DRILLING

APPLICATION NUMBER: 18342487 FILING DATE: 06/27/2023  
PATENT NUMBER: ISSUE DATE:  
TITLE: CAPTURING MOST SEVERE FAILURE REGIONS AROUND BOREHOLE IN  
ANALYTICAL POROELASTIC ANALYSIS

APPLICATION NUMBER: 18343668 FILING DATE: 06/28/2023  
PATENT NUMBER: ISSUE DATE:  
TITLE: DAS DEPTH CALIBRATION WITH MULTI-GAUGE LENGTH INTERROGATION

APPLICATION NUMBER: 18344666 FILING DATE: 06/29/2023  
PATENT NUMBER: ISSUE DATE:  
TITLE: METHOD AND SYSTEM FOR PREDICTING HYDROCARBON DATA FOR  
UNCONVENTIONAL RESERVOIRS USING MACHINE LEARNING

APPLICATION NUMBER: 18345113 FILING DATE: 06/30/2023  
PATENT NUMBER: ISSUE DATE:  
TITLE: SYSTEM AND METHOD FOR AUTOMATED AND ACCURATE CORE PHOTOS  
LABELING IN MACHINE LEARNING BASED CORE PROPERTIES PREDICTION

APPLICATION NUMBER: 63516754 FILING DATE: 07/31/2023  
PATENT NUMBER: ISSUE DATE:  
TITLE: USING ARTIFICIAL INTELLIGENCE METHODS TO EXPLOIT WELL LOGGING  
DATA

ASSIGNMENT RECORDATION BRANCH  
PUBLIC RECORDS DIVISION