

# Curriculum Vitae

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### Abbreviation:

CEM = College of Engineering and Mining

DPRI = Daqing Petroleum Research Institute

EOR = Enhanced Oil Recovery

HHSGGE = Harold Hamm School of Geology & Geological Engineering

NDIC= North Dakota Industrial Commission

PREEC = Petroleum Research, Education and Entrepreneurship Center of Excellence

RPSEA =Research Partnership to Secure Energy for America

## **I. EDUCATION BACKGROUND**

**2004~2007:** PhD of Engineering, Oil & Gas Reservoir Engineering, Research Institute Petroleum Exploration & Development, Beijing, China.

**1999~2001:** Master of Engineering, Oil & Gas Development Engineering, Research Institute of Petroleum Exploration & Development, Beijing, China.

**1996~1999:** B.Sc. Computer Science, Changchun Science & Technology University. Changchun, China

**1984~1987:** B.Sc. Computer Program Design, Daqing Petroleum University, Daqing, China.

## **II. PROFESSIONAL EXPERINCE**

### **1. Appointments:**

*August, 2020 ~*

Associate Professor of the Harold Hamm School of Geology & Geological Engineering, University of North Dakota

*August, 2014 ~May, 2020*

Assistant Professor of the Harold Hamm School of Geology & Geological Engineering, University of North Dakota

*October, 2011 ~August, 2014*

Adjunct faculty of Geology in Department of Geology & Geological Engineering, University of North Dakota

*July, 2009 ~June 2011*

Research Associate and Petroleum Engineering Scientist in Department of Geology & Geological Engineering, University of North Dakota

*July, 2007 ~July 2009*

Director of the *Overseas Petroleum Potential Evaluation Center* of Exploration & Development Research Institute of Daqing Oil Company, PetroChina

*July, 2002 ~July 2009*

Chief engineer in *EOR Department* of Exploration & Development Research Institute of Daqing Oil Company, PetroChina

*July, 1987 ~June 2002*

Team leader of the EOR Numerical Simulation in EOR Department of Exploration &

Development Research Institute of Daqing Oil Company, PetroChina

## 2. Professional Experience from Industry:

### *2007-Jul. 2009, in charge of projects:*

- Development Case Design of 1/24 of Greater Unity Field in Sudan.
- Development Case Design of 17 of Greater Unity Field in Sudan.
- Evaluation the Feasibility of EOR method for Heglig Oil Field in Sudan.
- Training of polymer flooding technology for KNOC (Korea National Oil Company).
- Suitable Reservoir Condition Study of Polymer Flooding with High Concentration.
- Introduced EOR Technology Being Performed at Daqing for *Saudi Aramco*.
- Prepared a “PRE-QUALIFICATION DOCUMENT” that initiated collaborative projects between PetroChina, Saudi Aramco, and the Kuwait Oil Company in the areas of EOR, Drilling, and Workovers.

### *2002-2007, supervisor of projects & the head of projects:*

- The Criteria Establishing “Technical Requirements for Development and Project Design for Polymer Flooding”, Criteria Number: SY/T 6683-2007. Implement Date: March 1<sup>st</sup>, 2007. **(This is now the standard for polymer flood design throughout China.)**
- Study of the Approach to Enhance Oil Recovery Further After Polymer Flooding, 2004-2006.
- Investigated Sweep Improvement Options for the Daqing Oil Field (including more concentrated polymers, new polymers, gel treatments, colloidal dispersion gels, foams, as well as others), 2005-2006.
- Study of Effects of Fractures on Sweep Improvement for Polymer Flooding of Eastern Berxi in Daqing, 2005.
- Study of the Approach to Enhance Oil Recovery Further After Polymer Flooding.
- Development of Numerical Simulation Software on Polymer Multi-Molecule Weight Injection and Profile Modification, 2004-2006.
- Feasibility Study for Changing the Direction of Liquid Flow to Explore the Remained Oil near the Areas of the Distribution Lines, 2006.
- Study of Option & Evaluation Techniques for New Polymer, 2004-2005.
- Study of Profile Modification Technique, 2004-2005.
- Study of Polymer Flooding Effectiveness for Secondary & Tertiary Oil Strata, 2004-2005.
- Injection Profile Reversals during Polymer Floods: Characteristics and Counter-measures, 2005-2007.
- The Criteria Establishing “Terms of Oil/Gas Reservoir Engineering”, 2004-2005.
- Economical Evaluation of Chemical Flooding in 12 Pilot Sites in the Daqing and Kalamayi Oil Fields.
- Feasibility Study of Injection Nitrogen Gas to Improve Oil Recovery for 32-6 Well Pattern in Qinquangdao, 2004.

- Analysis of Polymer Flooding Techniques for the Main Oil Strata in Daqing, 2005.
- Patent on “A Numerical Simulator Integrating Lower Concentrations of Surfactant with the Other Phases in ASP Flooding”, Patent Number: **200310101815.0**. Authorization: Feb. 28<sup>th</sup>, 2007.
- Improvement of Polymer Flooding Technical Effectiveness, 2004.
- The EOR Database for the Daqing Oil Field, 2003.
- Pilot Test Research of Thermal Method to Enhance Oil Recover After Polymer Drive, 2003.
- Polymer Flooding Development Case Design Optimize, 2003.
- Polymer Flooding Design for Eastern of Central of Saertu in Daqing, 2002.

***1995-2001, Head of Project:***

- Polymer Flood Design for Eastern of Central Area in Daqing, 2001.
- Re-programming ASP Flood Numerical Simulation Software, 1999.
- Polymer Flood Design for Western 3rd Site of North Daqing, 1998-1998.
- Reservoir Optimization and Development for ASP Flooding in Daqing, 1997-1998.
- Polymer Flooding Numerical Module Development and Application, 1991-1995
- Second Evaluation and Layout for EOR Potential in Daqing, 1996-1998.
- Development of Pre & Post Flood Software for Polymer Flooding Numerical Module, 1991-1995.

***1990-1994, Key technical person:***

- Numerical Simulation Study of Injection of Natural Gas to Enhance Oil Recovery for Eastern Beier, 1994.
- Study of Pilot Test of WAG (water alternating gas) to Improve Oil Recovery for Shanshan Oil Field in XinJiang, 1993.
- Study of the Pilot Test for Injection of Natural Gas to Enhance Oil Recovery from the Fault East of the First North, 1993-1995.
- “SURFPOL” Numerical Module Development, 1990-1992.

***1987-1989, participated:***

- Solution Techniques for Parameters in Chemical Flooding Numerical Simulation Software, 1987-1988.
- “POLYMER Flooding” Numerical Module Development, 1987-1989.

### **III. COURSES TEACH/TAUGHT**

#### **1. Regular Assignments and Continuing Education Advisees**

##### **○ Regular Assignments**

*Fall:*

- GEOE 203, required Earth Dynamics and Lab, on campus and DEDP.

- GEOE 484, required: Senior Design
- GEOE 488, Senior research II
- GEOE 420, elective, graduate and senior level: Geological Modeling and Numerical Simulation of Reservoirs
- GEOE 591, graduate level: Advanced Hydrocarbon Extracting in Engineering
- GEOE 998, graduate thesis for master degree
- GEOE 999, graduate thesis for doctoral degree
- GEOL 590, graduate research

*Spring:*

- GEOE 301, required: PetroPhysics, on campus and DEDP
- GEOE 485, required: Senior Design
- GEOE 493, technical selective: Underground Mining and Excavating, on campus and DEDP
- GEOE 996, graduate thesis for doctoral degree
- GEOL 590, graduate research
- GEOE 590, special topics for graduate level

*Summer:*

- GEOE 410, required: Summer Field Camp worked with South Dakota School of Mines and Technology (2016, 2018)
  - **Continuing Education Advisees (*semester, number of students*)**
    - 2014 fall: 15; 2015 spring: 15
    - 2015 fall: 14; 2016 spring: 15
    - 2016 fall: 16; 2017 spring: 18
    - 2017 fall: 19; 2018 spring: 19
    - 2018 fall: 18; 2019 spring: 14
    - 2019 fall: 12; 2020 spring: 8
    - 2020 fall: 7

**2. Graduate Student Advising (*semester, number of students, role*)**

- 2014 fall: 2, advisor; 3, committee member;
- 2015 spring: 2, advisor; 3, committee member;
- 2015 fall: 2, advisor; 4, committee member;
- 2016 spring: 2, advisor; 5, committee member;
- 2016 fall: 3, advisor; 5, committee member;
- 2017 spring: 3, advisor; 5, committee member;
- 2017 fall: 3, chair; 5, committee member;
- 2018 spring: 3, chair; 4, committee member;
- 2018 fall: 3, chair; 3, committee member;
- 2019 spring: 3, chair; 2, committee member
- 2019 fall: 4, chair; 3, committee member
- 2020 spring: 3, chair; 4, committee member
- 2020 fall: 2, chair; 4, committee member
- 2021 spring, 1 chair; 4, committee member
- 2021 fall, 2 chair, 4, committee member

- 2022 spring, 1 chair, 4, committee member
- 2023 fall, 1 chair, 8, committee member

### 3. Curriculum Development Activities

- GE ABET program participation at fall 2014 and spring 2015
- Lectures and laboratory manuals development for the course GEOE 203/L, GEOE 301/L
- Lectures of the courses of GEOE 493 and GEOE 591 development
- Field trip for the course GEOE 203 arrangement
- Research project idea proposing for the courses of GEOE 203, GEOE 301, and GEOE 484/485
- Lecture of the course of GEOE 420 new course development, 2022 and 2023.

## IV. SERVICE

### 1. Department

- “Academic Program Review” for Geological Engineering program, 2022
- Associate of Student Experience Funding Committee of the School of HHS GGE (2016 fall – 2022 fall).
- GE program and facility tours for the Prospective Students and others participation
  - 10/17/2014; 11/15/201; 02/23/2014;
  - 03/07/2015; 04/24/2015;
  - 01/24/2016;
  - 06/19/2017; 10/28/2017;
  - Oct. 18, 2018.
- Proctor for the UND DEDP student on Sunday
  - Sep. 21, 2017; Nov. 14, 2017 for student Schultz Alyssa, CHEM 122
  - Oct. 13, 2018; Dec. 9, 2018 for students Devin Perkins and Schultz Alyssa, FA 150
- Senior design presentations, graduate student proposals, and thesis proposals participation in each semester (2014 fall – present)

### 2. College

- Chair of Academic Program Committee of CEM (2021 to 2023 spring).
- A curriculum committee member of the college of CEM (2016, 2018, 2019, 2020, 2023 fall).

### 3. University

- An Ambassador for an international FIRST Robotics Competition (March 14-16, 2019)

### 4. Professional Associations

- Associate Editor of the *Society of Petroleum Engineers Journal* (Oct. 2018 – present)
- A Judge of SPE Rocky Mountain Section for Graduate Student paper and Regional Service Award (2022, 2023)

- Student Liaison between Student SPE chapter of UND and the Society of Petroleum Engineers–Williston Section (Feb. 2015 – present)
- A Judge for postures at the 2016 AAPG Annual conference
- A Judge for postures at the 2015 AAPG Annual conference
- Membership Chair of the Society of Petroleum Engineers–Williston Section (Feb 2011–Jan. 2015)
- Technical peer reviewer for the *Society of Petroleum Engineers Journal* (Jan. 2013 – Sep. 2018)
- Technical peer reviewer for the *Society of Journal of Petroleum Science & Engineering* (Jan. 2012 – present)
- Technical peer reviewer for the *Journal of Natural Gas Science and Engineering* (May 2016 – present)

## V. SELECTED PUBLICATIONS

Notes: **(1)** Ranks of Journal or conference are sourced from [www.scimagojr.com](http://www.scimagojr.com) (SJR). **(2)** The first authors with the names of Detwiler, S.; Olatunji, K.; Zhang, J. , Namie Shane, Li Chunxiao were (are) my graduate students; Wang, X. was my visiting Scholar in the papers after 2014. **(3)** The paper was and will be published in April 2019 and in April 2020 was (is) lined up alphabetically in authors' names from various universities and companies for a DOE project.

### *Published in Peer-Reviewed Journals:*

1. **Wang, D.**, Ji, Y., Gosnold, W., Alamooti, M., Namie, S., Oni, O. 2023. Enhanced Sweep Efficiency in EGS Using a Bio-Polymer Supplement from Over fractured Oil/Gas Operations. *Transactions*. Vol, 47, 2023. pp: 2550-2562. October 2023.
2. Seright, R. and **Wang, D.** 2023. Literature Review and Experimental Observations of the Effects of Salinity, Hardness, Lithology, and ATBS Content on HPAM Polymer Retention for the Milne Point Polymer Flood. *SPE Journal*, Volume 27. pp 2864-2881. October 2022. <http://doi:10.2118/209354-PA>
3. Seright, R. and **Wang, D.** 2023. Polymer Flooding: Current Status and Future Directions. *Petroleum Science*. February 2023. <https://www.keaipublishing.com/en/journals/petroleum-science>.
4. **Wang, D.**, Namie, S., and Seright, R. 2022. Pressure Modification or Barrier Issues during Polymer Flooding Enhanced Oil Recovery. *Geofluids*, Volume 2022. <https://doi.org/10.1155/2022/6740531>
5. Seright, R. and **Wang, D.** 2022. Polymer Retention Tailing Phenomenon Associated with the Milne Point Polymer Flood. *SPE Journal*, Volume 27. pp 2864-2881. October 2022. <http://doi:10.2118/209354-PA>
6. Zhang, J. and **Wang, D.** 2022. Aqueous Imbibition Further Investigation on Contact Area Penetration Enhancement for Hydrocarbon Extraction from Tight Rocks. *Journal of Petroleum Science and Engineering*, January, Volume 208, Part B. doi: <https://doi.org/10.1016/j.petrol.2021.109206>.

7. **Wang, D.**, Seright, R.S. 2021. Examination of Literature on Colloidal Dispersion Gels for Oil Recovery. *Petroleum Science*, Volume 18(2021) pp.1097-1114. doi:10.1016/j.petsci.2021.07.009.
8. Li, C., **Wang, D.**, and Kong, L. 2021. Application of Machine Learning Techniques in Mineral Classification for Scanning Electron Microscopy – Energy Dispersive X-ray Spectroscopy (SEM-EDS) Images. *Journal of Petroleum Science and Engineering*. May, Volume 200. doi: <https://doi.org/10.1016/j.petrol.2020.108178>.
9. **Wang, D.**, Li, C., and Seright, R. 2020. Laboratory Evaluation of Polymer Retention in a Heavy Oil Sand for a Polymer Flooding Application on Alaska’s North Slope. *SPE Journal*. February 2020. doi:10.2118/200428-PA.
10. Gosnold, W., Ballesteros, M., **Wang, D.**, and Crowell, J. 2020. Using Geothermal Energy to Reduce Oil Production Costs. *GRC Transactions*. Vol. 44, 2020.
11. Seright, R.S., **Wang, D.**, Lerner, N., Nguyen, A., Sabid, J., and Tochor, R., 2018. Can 25-cp Polymer Solution Efficiently Displace 1,600-cp Oil during Polymer Flooding. *SPE Journal*, December, Volume 23 (6), 2260-2278. ISSN: 1930-0220. doi:10.2118/190321-PA.
12. Olatunji, K., Zhang, J., **Wang, D.** 2018. Effect of the Rock Dimension on Surfactant Imbibition Rate in the Middle Member of Bakken: Creating a Model for Frac Design. *Journal of Petroleum Science and Engineering*, April, Volume 169 (2018), 416-420. doi: 10.1016/j.petro.2018.05.075.
13. Wang, X., Hou, J., Song, S., **Wang, D.**, Gong, L., Ma, K., Yan, L. 2018. Combining pressure-controlled porosimetry and rate-controlled porosimetry to investigate the fractal characteristics of full-range pores in tight oil reservoirs. *Journal of Petroleum Science and Engineering*, December. Volume (171), 353-361. ISSN: 0920-4105. doi: <https://doi.org/10.1016/j.petrol.2018.07.050>.
14. **Wang, D.**, Zhang, J., Butler, R., 2017. Fluid Interaction with Tight Rocks to Induce Energy Recovery. *Oil & Gas Research*, April, Volume 3 (2), 441-449. ISSN: 2472-0158. doi: [10.4172/2472-0158.1000134](https://doi.org/10.4172/2472-0158.1000134).
15. **Wang, D.**, Zhang, J., Butler, R., Olatunji, K., 2016. Scaling Laboratory Data Surfactant Imbibition Rates to the Field in Fractured Shale Formations. *SPE Engineering & Evaluation*, August, Volume 19 (03), 441-449. doi: <http://dx.doi.org/10.2118/178489-PA>.
16. **Wang, D.**, 2015. Surfactants May Boost Bakken Output. *AOGR*, February, Volume 58 (2), 88–91.
17. **Wang, D.**, 2014: Mixing Oil and Water May Keep Bakken Wells Flowing. *Bakken Oil Business Journal*. February, 46-47.
18. **Wang, D.**, Butler R., Zhang, J., Seright, R. 2012. Wettability Survey in Bakken Shale Using Surfactant Imbibition. *SPE Reservoir Evaluation & Engineering*, Volume 15(6), 695-705. doi: <http://dx.doi.org/10.2118/153853-PA>



19. **Wang, D.**, Butler R., Liu, H., Ahmed, S., 2011. Flow Rate Behavior in Shale Rock. *SPE Reservoir Evaluation and Engineering*, Volume 14(4), 505-512. doi: <http://dx.doi.org/10.2118/138521-PA>
20. **Wang, D.**, 2013. Chapter-4: “Polymer Flooding Practice in Daqing”, of the book of “Enhanced Oil Recovery Field Case Studies”. *Elsevier*, ISBN-9780123865458, 83-116.
21. Seright, R., Zhang, G., Akanni, O.O., **Wang, D.** 2012. A Comparison of Polymer Flooding with In-Depth Profile Modification. *Canadian Petroleum Technology*. September, Volume 51(5), 393-402. doi: <http://dx.doi.org/10.2118/146087-PA>
22. **Wang, D.**, Dong, H., Lv, C., Fu, X. Ne, J., 2009. Review of Practical Experience by Polymer Flooding at Daqing. *SPE Reservoir Evaluation and Engineering*, Volume 12(3), 470-476. doi: <http://dx.doi.org/10.2118/114342-PA>
23. **Wang, D.**, Wang, J., Shao, Z., Seright, R., 2008. Key Aspects of Project Design for Polymer Flooding. *SPE Reservoir Evaluation and Engineering*, Volume 11(6), 1117-1124. doi: <http://dx.doi.org/10.2118/109682-PA>
24. **Wang, D.**, Han, P., Shao, Z., Hou, W., Seright, R., 2008. Sweep Improvement Options for the Daqing Oil Field. *SPE Reservoir Evaluation and Engineering*, Volume 11(1), 18-26. doi: <http://dx.doi.org/10.2118/99441-PA>
25. **Wang, D.**, Han, D., Xu, G., Li, Y., 2008. HPAM Affecting Foam Capability with  $\alpha$ -Olefin Sulfonate Surfactant. *PETROLEUM EXPLORATION & DEVELOPMENT*, Volume 35(3), 335-338.
26. **Wang, D.**, Han, D., Shao, Z., Ma, M., 2007. Factors Affecting Follow-up Water Drive during Polymer Flooding. *JOURNAL OF DAQING PETROLEUM INSTITUTE*, April, Volume 31(2), 45-49.
27. **Wang, D.**, Han, D., Hou, W., Cao, R., Wu, L., 2007. The Types and Changing Laws on the Profile Reversal during the Period of Polymer Flooding. *PETROLEUM GEOLOGY & OILFIELD DEVELOPMENT IN DAQING*, August, Volume 26(4), 96-99.
28. **Wang, D.**, Han, P., Gao, S., Li, Y., Seright, R., 2007. Study of the Possibility of Fractures occurring Within a Polymer Flood. *PETROLEUM GEOLOGY & OILFIELD DEVELOPMENT IN DAQING*, October, Volume 26(5), 102-105.
29. Seright, R., Han, P., **Wang, D.** 2006. Current Colloidal Dispersion Gels Are Not Superior to Polymer Flooding. *PETROLEUM GEOLOGY & OILFIELD DEVELOPMENT IN DAQING*, September, Volume 5(5), 71-80.
30. Chen, G., Liao, G., Ma, Y., **Wang, D.**, 2002. The Mathematics Module in the Two-Phase Thin Formula for ASP Displacement Mechanism. *PETROLEUM GEOLOGY & OILFIELD DEVELOPMENT IN DAQING*, February, Volume 21(1), 70-72.

31. Xu, Z., **Wang, D.**, *et al.*, 2001. Evaluation of Polymer Flooding Potential for Daqing Oil Field. *PETROLEUM GEOLOGY & OILFIELD DEVELOPMENT IN DAQING*, April, Volume 20(2), 50-52.
32. Zhao, G., **Wang, D.**, Wang, B., 2001. Methodology of File Accessing in Numerical Simulator of ASP Flooding. *PETROLEUM GEOLOGY & OILFIELD DEVELOPMENT IN DAQING*, April, Volume 20(2), 78-82.
33. Shao, Z., Fu, T., **Wang, D.** 2001. Study of Reasonable Polymer Volume. *PETROLEUM GEOLOGY & OILFIELD DEVELOPMENT IN DAQING*, April, Volume 20(2), 60-62.
34. **Wang, D.**, Hao, Y., Zhu, L., 1999. Analysis of the Reasonable Well-Pattern and Well-Distance for ASP Flooding. *PETROLEUM GEOLOGY & OILFIELD DEVELOPMENT IN DAQING*. June, Volume 18 (3), 60-62.
35. **Wang, D.**, Li, R., Bai, D., 1994. Study of Numerical Simulation for Natural Gas Injection to Enhance Oil Recovery. *PETROLEUM GEOLOGY & OILFIELD DEVELOPMENT IN DAQING*, December, Volume 13 (4), 45-47.

***Published and Presented in the conference***

36. **Wang, D.**, Namie, S., and Seright, R. 2022. Pressure Barrier Applicability to Polymer Flood Design. Paper SPE-209462-MS will be published and presented at the SPE Virtual Improved Oil Recovery Conference. USA, 25-29, April (**International, full paper**).
37. Namie, S., Wang, X., Wang, D. et al. 2021. Challenge Solutions for a Significant Water Cut Reduction History Match on Heavy Oil Polymer EOR. *European Association of Geoscientists & Engineers*, October. doi: <https://doi.org/10.3997/2214-4609.202113247>. (**International, abstract paper**).
38. Dandekar, A., Bai, B., Barnes, J., Cercone, D., Cifemo, J., Edwards, R., Ning, S., Schalper, W., Seright, R., Sheets, B. **Wang, D.**, and Yin, Z. 2021. First Ever Polymer Flood Field Pilot to Enhanced Recovery for Heavy Oils on Alaska's North Slope Pushing Ahead One Year Later. Paper presented at the SPE Annual Technical Conference and Exhibition, September 21–23, 2021. <https://doi.org/10.2118/206228-MS> (**International, full paper**)
39. **Wang, D.**, Li, C., and Seright, R. 2020. Polymer Retention Evaluation in a Heavy Oil Sand for a Polymer Flooding Application on Alaska's North Slope. Paper SPE-200428-MS will be published and presented at the SPE Improved Oil Recovery Conference, Tulsa, Oklahoma, USA, 20-23 April (**International, full paper**)
40. Dandekar, A., Bai, B., Barnes, J., Cercone, D., Ciferno, J., Edwards, R., Ning, S., Schulpen, W., Seright, R., Sheets, B., **Wang, D.**, Zhang, Y., 2020. First Ever Polymer Flood Field Pilot to Enhance the Recovery Of Heavy Oils On Alaska's North Slope - Pushing Ahead One Year Later.

Paper SPE-200814-MS will be presented and published at the SPE Western Regional Meeting, April 27 to May 1, Bakersfield, CA (**Regional, full paper**)

41. Namie, S. and **Wang, D.**, 2020. An Expanded Geological Reservoir Model of the West Sak & Ugnu Heavy Oil Sands: A First Step in Exploring EOR Methods on the Alaska North Slope. It was posted the AAPG Europe Regional Conference, 28-29 January, Athens, Greece (**Regional**)

42. **Wang, D.**, Namie, S., and Li, C. 2019. Impact of Polymer or Surfactant Flooding on permafrost Stability. Paper URTEC 271 was present at the SPE/AAPG/SEG Unconventional Resource Technology Conference, 22-24 July, Denver, CO. doi:10.15530/URTEC-2019-271 (**International, full paper**)

43. Gosnold, W., Abudureyimu, S., Tsiryapkina, I, and **Wang, D.**, 2019. “Geothermal and Electric Power Analysis of Horizontal Oil Well Fields Williston Basin, North Dakota, USA”, the article was present at the AAPG European Region, 3rd Hydrocarbon Geothermal Cross over Technology Workshop, 9-10 April, Geneva, Switzerland. doi:10.1306/80681Gosnold2019. (**International, full paper**)

44. Dandekar, A., Bai, B., Barnes, J., Cercone, D., Ciferno, J., Ning, S., Seright, R., Sheets, B., Wang, D., Zhang, Y., 2019. First Ever Polymer Flood Field Pilot – A Game Changer to Enhance the Recovery of heavy Oils on Alaska’s North Slope. Paper SPE-195257-MS was presented and published at the SPE Western Regional Meeting, 23-26 April, Houston, San Jose, CA (**Regional, full paper**)

45. **Wang, D.**, 2019. How to Keep Hydrocarbon Flowing Using Environmental Friendly Chemical Formulations? Was presented at the Chemistry Department of UND, 12 April, Grand Forks, ND. (**Local**)

46. Zhang, J., **Wang, D.**, 2018. Chemical Stimulation with Driving Process to Extract Oil from Tight Formation. Paper SPE-2903115-MS was presented at the SPE/AAPG/SEG Unconventional Resource Technology Conference, 23-29 July, Houston, TX. doi:10.15530/URTEC-2018-2903115 (**International, full paper**)

47. Detwiler, S., **Wang, D.**, 2018. An Integrated Geological Modeling Approach to Assess Potential of Field Wells for Application of a Surfactant Imbibition Process in an Ultra-Tight Rock Formation. Paper SPE-28860605-MS was presented at the SPE/AAPG/SEG Unconventional Resource Technology Conference, 23-29 July, Houston, TX. doi:10.15530/URTEC-2018-2886060 (**International, full paper**)

48. **Wang, D.**, Zhang, J., 2018. Surfactant Drive Process in Ultra-Tight Fractured Reservoirs for EOR. EAGE-1495 was presented at the SPE Europec Featured at 80<sup>th</sup> EAGE Conference & Exhibition, 11-14 June, Copenhagen, Denmark. doi: 10.3997/2214-4609.201801113 (**International, Abstract**)

49. Seright, R.S., **Wang, D.**, Lerner, N., Nguyen, A., et al, 2018. Beneficial Relative Permeabilities for Polymer Flooding. Paper SPE-190321-MS was presented at the SPE Improved Oil Recovery Symposium, Tulsa, Oklahoma, USA, 14-18 April. doi: <https://doi.org/10.2118/190321-MS> (**International, full paper**)
50. **Wang, D.**, Zhang, J., and Detwiler, S. 2017. Maximizing Oil Production Using Surfactant EOR. Presented at the *The BAKKEN* Conference & EXPO, Bismarck, ND, 17-19 July (**Regional**)
51. **Wang, D.**, Seright, R., Moe Soe Let, K.P., Bhoendie, K., Paidin, W.R. 2017. Compaction and Dilation Effects on Polymer Flood Performance. Paper SPE-185851-MS was presented at the SPE Europec featured at 79<sup>th</sup> EAGE Annual Conference & Exhibition held in Paris, France, 12-15 June 2017. doi: <https://doi.org/10.2118/185851-MS> (**International, full paper**)
52. **Wang, D.**, Dawson, M., Butler, R., Li, H., Zhang, J., 2016. Optimizing Water Chemistry to Improve Oil Recovery from the Middle Bakken Formation. Paper SPE-179541-MS was presented at the SPE IOR International Conference held in Tulsa, OK, USA, 9-13, April. doi: <https://doi.org/10.2118/179541-MS> (**International, full paper**)
53. Zhang, J., **Wang, D.**, Olatunji, K., 2016. Surfactant Adsorption Investigation in Ultra-lower permeable Rocks. Paper SPE-180214-MS was presented at the SPE Low Perm Symposium held in Denver, Colorado, USA, 2-6, May. doi: <https://doi.org/10.2118/180214-MS> (**Regional, full paper**)
54. **Wang, D.**, Zhang, J., Butler, R., Olatunji, K., 2015. Scaling Laboratory Data Surfactant Imbibition Rates to the Field in Fractured Shale Formations, paper URTEC 2137361 was presented in the Unconventional Resource Technology Conference, San Antonio, Texas, July 20-22. doi: <https://doi.org/10.15530/URTEC-2015-213761> (**International, full paper**)
55. **Wang, D.**, Zhang, J. Butler R., 2014. Flow Rate Behavior and Imbibition Comparison between Bakken and Niobrara Formations. Paper URTEC 1920887 was presented at the Unconventional Resource Technology Conference, Denver, Colorado, 25-27, August. doi: <https://doi.org/10.15530/URTEC-2014-1920887> (**International, full paper**)
56. Nguyen, D., **Wang, D.**, Oladapo, A., Zhang, J., 2014. Evaluation of Surfactants for Oil Recovery Potential in Shale Reservoirs. Paper SPE-169085-MS was presented at the SPE Improved Oil Recovery Symposium, Tulsa, Oklahoma, USA, 12-16 April. doi: <http://dx.doi.org/10.2118/169085-MS> (**International, full paper**)
57. Zhang, J., **Wang, D.**, Butler R., 2013. Optimum Salinity Study to Support Surfactant Imbibition into the Bakken Shale. Paper SPE-167142-MS was presented at the SPE Unconventional Resource Canada, Calgary, Alberta, Canada, 5-7 November. doi: <http://dx.doi.org/10.2118/167142-MS> (**International, full paper**)

58. **Wang, D.**, Butler R., Zhang, J., Seright, R. 2012. Wettability Survey in Bakken Shale Using Surfactant Imbibition. Paper SPE-153853 was presented at the SPE Improved Oil Recovery Symposium, Tulsa, Oklahoma, USA, 14-18 April. doi: <http://dx.doi.org/10.2118/153853-MS> (**International, full paper**)

59. **Wang, D.**, Butler R., Liu, H., Ahmed, S., 2011. Surfactant Formulation Study for Bakken Shale Imbibition. Paper SPE-145510-MS was presented at the SPE Annual Technical Conference and Exhibition, Denver, Colorado, USA. 30 October-2 November, doi : <http://dx.doi.org/10.2118/145510-MS> (**International, full paper**)

60. **Wang, D.**, Butler R., Liu, H., Ahmed, S., 2010. Flow Rate Behavior in Shale Rock. Paper SPE-138521-MS was presented at the SPE Eastern Regional Meeting, Morgantown, West Virginia, USA, 13-15 October. DOI: <http://dx.doi.org/10.2118/138521-MS> (**Regional, full paper**)

61. Dong, H., Fang, S., **Wang, D.**, Wang, J., Liu, Z., 2008. Review of Practical Experience by Polymer Flooding at Daqing. Paper SPE-114342-MS was presented at the SPE Improved Oil Recovery Symposium, Tulsa, Oklahoma, USA, 20-23 April. doi:: <http://dx.doi.org/10.2118/114342-MS> (**International, full paper**)

62. **Wang, D.**, Seright, R., Shao, Z., Wang, J., 2007. Key Aspects of Project Design for Polymer Flooding. Paper SPE-109682-MS was presented at the SPE Annual Technical Conference and Exhibition, Anaheim, California, USA, 11-14 November. doi :<http://dx.doi.org/10.2118/109612-MS> (**International, full paper**)

63. **Wang, D.**, Han, P., Shao, Z., Seright, R., 2006. Sweep Improvement Options for the Daqing Oil Field. Paper SPE-99441-MS was presented at the SPE Improved Oil Recovery Symposium, Tulsa, Oklahoma, USA, 22-26 April. doi: <http://dx.doi.org/10.2118/99441-MS> (**International, full paper**)

64. **Wang, D.**, Liao, G., Niu, J., et al, 2003. Evaluation of Numerical Simulation Matching Study on the ASP Field Tests in Daqing Oilfield. Paper was presented in THE INTERNATIONAL SYMPOSIUM OF THE EFFICIENT PRODUCTION OF OIL AND GAS FIELDS, Beijing, China, October. (**International, full paper**)

## **VI. SEMINARS IN RECENT THREE YEARS**

1. A Seminar to the **Universidade Estadual do Norte Fluminense, Brazil** on the topic of “EOR: Theoretical, Experimental and Applications Aspects”, **July 1<sup>st</sup>, 2021**.

2. A Seminar to the **Society of Petroleum Engineering, Brazil** on the topic of “Review of Practical Experience by Polymer Flooding”, **November 10, 2020**.

3. A seminar to the Chemistry Department of UND on the topic of “How to Keep Hydrocarbon Flowing Using Environmental Friendly Chemical Formulations”, **April 12, 2019**.

## **VII. GRANTS AND CONTRACTS FUNDED**

1. PI of the project “Enhanced Sweep Efficiency for Geothermal Renewable Energy Using Bio-Polymer Supplement”, funded by NDIC (01/1/2023 to 12/31/2024). Total Amount: \$942,877

2. Key figure of the project “Geothermal development Consortium for the Williston Basin”, funded by NDIC (06/1/2021 to 05/30/2023).

3. PI of the project “Wettability and Retention Investigation in Fine Rocks Using Bio-Based Material Combined with Surfactant and Rich Gas”, funded by ND EPSCOR (10/16/2019 to 10/15/2020). Total Amount: \$40,000

4. PI of the UND for the project “First Ever Field Pilot on Alaska’s North Slope to Validate the Use of Polymer Floods for Heavy Oil EOR”, collaborate with UAF, NMT, and MS&T, and Hilcorp Alaska, LLC. Funded by DOE (6/1/2018 to 9/30/2022). Total Amount: \$315,000

5. PI of the project “Enhanced Oil Recovery Process Investigation Using Chemical Formulations and Injectivity in Ultra-Tight Sand” funded by Statoil (11/2013 to 10/2017). Total Amount: \$270,000

6. PI of the project “Aqueous Liquid Imbibition Laboratory Study for Stimulating Oil Field Production” funded by CESI (12/ 2014 to 05/2015). Total Amount: \$50,000

7. PI of the project “Surfactant Formulation Study for Enhancing Wattenberg Field Oil Production” funded by Noble Energy (01/2013 to 06/2014). Total Amount: \$191,000

8. PI of the project “Wettability Alteration Investigation Using Surfactant Formulation for Shale” funded by ConocoPhillips (11/2013 2013 to 09/ 2014). Total Amount: \$90,000.

9. PI of the project “Enhanced Oil Recovery from the Bakken Shale Using Surfactant Imbibition Coupled with Gravity Drainage” funded by DOE/RPSEA and NDIC (03/2011-03/2014). Total Amount: \$625,000

10. PI of the project “Fracture Liquid Investigation Using New Chemical Formulations in Ultra-Tight Reservoir” funded by NACOL CHAMPION (4/2012 to 12/2012)

11. CO-PI of the project “Chemical Formulation Study for Oil Extraction and Reuse- Part II” funded by GOLDSTRYK (8/2016 to 12/2016)

12. CO-PI of the project “Chemical Formulation Study for Oil Extraction and Reuse” (10/2013 to 06/2014)

13. CO-PI of the project “A Proposed Fracturing Fluid Study Using Glycerin to Improve Hydraulic Fracturing Treatment Capability” sponsored by Sunrise Education and Research Program (2/2011/ to 12/2011)

## **VIII. PROFESSIONAL EDUCATION**

- 01/2019 – 04/2019: NCFDD Faculty Success Program
- 09/2018 – 04/2019: English Speaking and Writing Skills Improvement, UND Language Department and Clinic Center
- 09/2016: Cap-rock Integrity for Thermal Recovery, Calgary
- 09/2014 – 04/2015: Alice Clark Mentoring Program
- 05/2016 – 06/2006: Administration and Leadership Technology Program, South-East University in Nanjing, China.
- 12/2003: High Molecular Weight Physical and Interfacial Chemical, Department of Training Center of DPRI.
- 06/1998: Reservoir Numerical Simulation Application and Geological Engineering Development, Daqing Oil Company.
- 05/1994 – 06/1991: UNIX Operating System and Network Administration Training, SGI Compute Company, Asia Branch, Hong Kong.
- 10/1989: Application Mathematical for Reservoir Numerical Simulation Software, Harbin Industrial University.

## **IX. AWARDS/HONORS:**

### ***Awards:***

1. “2019 Outstanding Technical Editor for SPE Journal Award of Appreciate”, September, 2019.
2. “2018 Outstanding Technical Editor for SPE Journal Award of Appreciate”, September, 2018.
3. “2017 Outstanding Technical Editor for SPE Journal Award of Appreciate”, September, 2017.
3. “2016 Outstanding Technical Editor for SPE Journal Award of Appreciate”, September, 2016.
4. “2015 Outstanding Technical Editor for SPE Journal Award of Appreciate”, September, 2015.
5. The academic key leader of Polymer flooding technology in EDRI, 2002 to 2006.
6. Outstanding woman scientist in Daqing Oil Field Company, 2004.
7. Outstanding woman scientist of top ten in DPRI, 2003.
8. Outstanding promising scientist nomination of top ten in DPRI, 2002.
9. Outstanding employee of DPRI & backbone of the EOR numerical simulation field, from 1988 to 2001.

### ***Honors:***

1. Sweep Improvement Technologies by Polymer Flooding for 1st Class Oil Strata in Daqing. Award for Outstanding Production Project from DPRI, 2007.

2. Sweep Improvement Technologies by Polymer Flooding for 1st Class Oil Strata in Daqing. Award for Outstanding Research Team from DPRI, 2006.
3. Further Enhance Oil Recovery by Polymer Flooding for 1st Class Oil Strata in Daqing. Award for Special Grade Technology Innovation of “11<sup>th</sup>-5 Years Strategically” from Daqing Oil Company, 2005.
4. Evaluation of Polymer Flooding for Western 3rd Site of North in Daqing. Award for Outstanding Technology Work from DPRI, 2004.
5. Polymer Flooding Design Optimization. Award for Outstanding Production Project from DPRI, 2002.
6. Polymer Flooding Development for Eastern of Central Area. Award for Outstanding Production Project from DPRI, 2001.
7. Re-programming the ASP Flooding Numerical Simulation Software. Award for Technology Innovation from Daqing, 2001.
8. Measuring Parameters for Numerical Simulation Module for ASP Flooding. Award for Technology Innovation from DPRI, 2000.
9. Second Evaluation and Layout for EOR Potential in Daqing. Award for Technology Progress from Daqing, 1998.
10. Development of Pre & Post Flooding Software for Polymer Flooding Numerical Module. Award for Technology Progress from Daqing, 1995.
11. Development of the Polymer Flooding Numerical Module Application. Award for Technology Progress from Daqing, 1995.
12. Development of the Pilot Test for Injection Natural Gas to Enhance Oil Recovery from the Fault East of the First North. Award for Technology Progress from Daqing, 1995.
13. “SURFPO” Numerical Module Development. Award for Technology Progress from Heilongjiang Province, 1992.
14. “Polymer Flooding” Numerical Module Development. Award for Technology Progress from Daqing, 1989.

## **X. PATENT AND CRITERIA ESTABLISHED**



*Patent:*

**Wang, D., Liao, G., Niu, J., Chen, G., Gu, G., Wang, B., 2007.** “A Numerical Simulator Integrating Lower Concentrations of Surfactant with the Other Phases in ASP Flooding”, Patent Number: **200310101815.0**. Authorization: Feb. 28<sup>th</sup>.

*Criteria Established*

**Wang, D., Gao, S., Sun, H., Zhang, J., Cao, R., Ma, M, Hou, W., 2007:** Criteria “Technical Requirements for Development and Project Design for Polymer Flooding”, Criteria Number: SY/T 6683-2007. Implement Date: March 1<sup>st</sup>, 2007. **(This is now the standard for polymer flood design throughout China.)**