

M.O.K.

U. S. DEPARTMENT OF ENERGY
OFFICE OF SCIENCE -- CHICAGO OFFICE

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)
ENVIRONMENTAL EVALUATION NOTIFICATION FORM

To be completed by "financial assistance award" organization receiving Federal funding. For assistance (including a point of contact), see "Instructions for Preparing SC-CH F-560, Environmental Evaluation Notification Form".

Solicitation/Award No. (if applicable): DE-SC0018511

Organization Name: 2W iTech LLC

Title of Proposed Project/Research: Forward Osmosis System for Treatment of Fracking Water

Total DOE Funding/Total Project Funding: \$150,000.00

I. Project Description (use additional pages as necessary):

A. Proposed Project/Action (delineate Federally funded/Non-Federally funded portions)

This program will utilize forward osmosis, an emerging membrane based technology that uses natural osmosis as driving force to treat the highly contaminated produced water. Next generation high flux thin film nanocomposite membrane, fabricated via a proprietary molecular layer-by-layer fabrication method, will be utilized in combination with an award winning switchable polarity solvent draw solute to create a forward osmosis (FO) platform technology that is capable of easily transported and installed at remote sites.

Federally funded portion (\$150,000)/ Non-Federally funded portion (\$0)

B. Would the project proceed without Federal funding?

Yes No

If "yes", describe the impact to the scope:

II. Description of Affected Environment:

The goal of this program is to develop a novel technology for treatment of fracking water.

Securing the supply of water to meet the needs of population growth and increased industrialization is an imminent global challenge. Water recycling and reuse is thus of increasing importance, which should reduce the dependence on the surface and groundwater resources. Most of the water used for drilling and fracturing of O&G wells are currently sources from local water supplies or sent to the site, thus creating a stress for local water resources and supplies. In few cases, produced water from nearby production sites is also used for development of new O&G well. To decrease the consumption of regional fresh water source, it is wise to treat drilling and fracturing waste on site. Thus, it is very critical to invest on new technologies and development that increases that can efficiently increase the sustainable use for produced water for beneficial reuse. Large volume of water that is demanded to supply extensive hydraulic fracturing creates another problem, specially particularly in dry areas where there is growing competition for scarce water supplies, creates a scarcity of water for irrigation, livestock watering, residential use, competing business uses.

III. Preliminary Questions:

- | | Yes | No |
|---|--------------------------|-------------------------------------|
| A. <u>Is the DOE-funded work <i>entirely</i> a "paper study"?</u> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

If "Yes", ensure that the description in Section I reflects this and go directly to Section V.

- | | | |
|---|-------------------------------------|--------------------------|
| B. <u>Will the work to be performed take place <i>entirely</i> in existing buildings?</u> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|---|-------------------------------------|--------------------------|

And NOT:

- | | | |
|---|-------------------------------------|--------------------------|
| 1. Threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Require the siting, construction or major expansion of waste treatment, storage, or disposal facilities? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Disturb hazardous substances, pollutants, or contaminants preexisting in the environment? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Adversely affect environmentally-sensitive resources identified in Section IV.A.? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 5. Be connected to another existing/proposed activity that could potentially create a cumulatively significant impact? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 6. Have an inherent <i>possibility</i> for high consequence impacts to human health or the environment (e.g., Biosafety Level 3-4 laboratories, activities involving high levels of radiation)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

If "Yes" to Question III.B. and ALL six subsequent questions, ensure the descriptions in Sections I and II reflect this and go directly to Section V.

IV. Potential Environmental Effects:

Attach/insert an explanation for each "Yes" response.

- A. Sensitive Resources: Will the proposed action result in changes and/or disturbances to any of the following resources?

- | | Yes | No |
|--|--------------------------|--------------------------|
| 1. Threatened/Endangered Species and/or Critical Habitats | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Other Protected Species (e.g., Burros, Migratory Birds) | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Sensitive Environments (e.g., Tundra/Coral Reefs/Rain Forests) | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Archaeological/Historic Resources | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Important Farmland | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Non-Attainment Areas for Ambient Air Quality Standards | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Class I Air Quality Control Region | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Special Sources of Groundwater (e.g. Sole Source Aquifer) | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Navigable Air Space | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Coastal Zones | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Areas with Special National Designation (e.g. National Forests, Parks, Trails) | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Floodplains and Wetlands | <input type="checkbox"/> | <input type="checkbox"/> |

- B. Regulated Substances/Activities: Will the proposed action involve any of the following regulated items or activities?

- | | Yes | No |
|---|--------------------------|--------------------------|
| 13. Natural Resource Damage Assessments | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Exotic Organisms | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Noxious Weeds | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Clearing or Excavation (indicate if greater than one acre) | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Dredge or Fill (under Clean Water Act, Section 404, indicate if greater than ten acres) | <input type="checkbox"/> | <input type="checkbox"/> |

B. Regulated Substances/Activities: Will the proposed action involve any of the following regulated Items or activities? (continued)

	Yes	No
18. Noise (in excess of regulations)	<input type="checkbox"/>	<input type="checkbox"/>
19. Asbestos Removal	<input type="checkbox"/>	<input type="checkbox"/>
20. PCB's	<input type="checkbox"/>	<input type="checkbox"/>
21. Import, Manufacture, or Processing of Toxic Substances	<input type="checkbox"/>	<input type="checkbox"/>
22. Chemical Storage/Use	<input type="checkbox"/>	<input type="checkbox"/>
23. Pesticide Use	<input type="checkbox"/>	<input type="checkbox"/>
24. Hazardous, Toxic, or Criteria Pollutant Air Emissions	<input type="checkbox"/>	<input type="checkbox"/>
25. Liquid Effluents	<input type="checkbox"/>	<input type="checkbox"/>
26. Underground Injection	<input type="checkbox"/>	<input type="checkbox"/>
27. Hazardous Waste	<input type="checkbox"/>	<input type="checkbox"/>
28. Underground Storage Tanks	<input type="checkbox"/>	<input type="checkbox"/>
29. Radioactive Mixed Waste	<input type="checkbox"/>	<input type="checkbox"/>
30. Radioactive Waste	<input type="checkbox"/>	<input type="checkbox"/>
31. Radiation Exposure	<input type="checkbox"/>	<input type="checkbox"/>
32. Surface Water Protection	<input type="checkbox"/>	<input type="checkbox"/>
33. Pollution Prevention Act	<input type="checkbox"/>	<input type="checkbox"/>
34. Ozone Depleting Substances	<input type="checkbox"/>	<input type="checkbox"/>
35. Off-Road Vehicles	<input type="checkbox"/>	<input type="checkbox"/>
36. Biosafety Level 3-4 Laboratory	<input type="checkbox"/>	<input type="checkbox"/>

C. Other Relevant Information: Will the proposed action involve the following?

	Yes	No
37. Potential Violation of Environment, Safety, or Health Regulations/Permits	<input type="checkbox"/>	<input type="checkbox"/>
38. Siting/Construction/Major Modification of Waste Recovery, or Waste Treatment, Storage, or Disposal Facilities	<input type="checkbox"/>	<input type="checkbox"/>
39. Disturbance of Pre-existing Contamination	<input type="checkbox"/>	<input type="checkbox"/>
40. New or Modified Federal/State Permits	<input type="checkbox"/>	<input type="checkbox"/>
41. Public Controversy	<input type="checkbox"/>	<input type="checkbox"/>
42. Environmental Justice	<input type="checkbox"/>	<input type="checkbox"/>
43. Action/Involvement of Another Federal Agency (e.g. license, funding, approval)	<input type="checkbox"/>	<input type="checkbox"/>
44. Action of a State Agency in a State with NEPA-type law. (Does the State Environmental Quality Review Act apply?)	<input type="checkbox"/>	<input type="checkbox"/>
45. Public Utilities/Services	<input type="checkbox"/>	<input type="checkbox"/>
46. Depletion of a Non-Renewable Resource	<input type="checkbox"/>	<input type="checkbox"/>
47. Extraordinary Circumstances	<input type="checkbox"/>	<input type="checkbox"/>
48. Connected Actions	<input type="checkbox"/>	<input type="checkbox"/>
49. Exclusively Bench-top Research	<input type="checkbox"/>	<input type="checkbox"/>
50. Only a Laboratory Setting	<input type="checkbox"/>	<input type="checkbox"/>

V. Financial Assistance Award Organization Concurrence:

A. Organization Official (Name and Title): Qingwu Wang, President

Signature:  Date: 3/7/18

e-mail: qwang@2witech.com Phone: 858-689-8808

B. Optional Concurrence (Name and Title): _____

Signature: _____ Date: _____

e-mail: _____ Phone: _____

Remainder to be completed by SC-CH

VI. SC-CH Concurrence/Recommendation/Determination:

A. SC-CH Office of Acquisition and Assistance or Office of Safety, Technical & Infrastructure Services:

Project Director or Contract Specialist (Name and Title): Walter Strzepka
John K. O'Keefe, Contract Specialist

Signature: Walter Strzepka Date: 3-22-18

B. SC-CH NEPA Team Review:

Is the project/activity appropriate for a determination or a recommendation to the Head of the Field Organization by the NEPA Compliance Officer (NCO) under Subpart D of the DOE NEPA Regulations?

Yes No

Specific class(es) of action from Appendices A-D to Subpart D (10 CFR 1021): B3.6

Name and Title: _____
Signature: Peter R. Siebach Date: _____

C. SC-CH Counsel (if necessary):

Name and Title: _____
Signature: _____ Date: _____

D. SC-CH NEPA Compliance Officer:

The preceding pages are a record of documentation required under DOE Final NEPA Regulation, 10 CFR 1021.400.

- Action may be categorically excluded from further NEPA review. I have determined that the proposed action meets the requirements for Categorical Exclusion referenced above.
- Action requires approval by Head of the Field Organization. Recommend preparation of an Environmental Assessment.
- Action requires approval by Head of the Field Organization or a Secretarial Officer. Recommend preparation of an Environmental Impact Statement.

Comments/Limitations if necessary:

Signature: Peter R. Siebach Date: 3/22/2018
Peter R. Siebach
SC-CH NEPA Compliance Officer