

FINAL REPORT OF GRANT UIC 161003

**BIO-COAGULANT AND SMART SYSTEM
FOR SUSTAINABLE WATER
TREATMENT**

NAMA : MOHD NAJIB BIN RAZALI

**FAKULTI : FAKULTI KEJURUTERAAN
KIMIA DAN SUMBER ASLI**

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LAPORAN GERAN UIC 161003

BIO-COAGULANT AND SMART SYSTEM FOR
SUSTAINABLE WATER TREATMENT

NAMA : MOHD NAJIB BIN RAZALI
FAKULTI : FAKULTI KEJURUTERAAN
KIMIA DAN SUMBER ASLI

PROJECTS INFORMATION

PROJECTS SUMMARY

Title:

MNRg-Treat: An Innovative Green Technology Wastewater Treatment



MNRg-Treat is a bio-coagulant treatment for oily wastewater from industries. This product had been developed from 2012 by Mr Mohd Najib Bin Razali and his team. It is able to treat polluted water according to the Department of Environment standards. This project was funded by The Bumiputera Entrepreneurs Start-up Scheme (SUPERB), Agensi Peneraju Bumiputera (Teraju) which provides a grant of RM500,000.00 to support innovative and creative business ideas. MNRg-Treat is commercialized by MNR Multitech Sdn Bhd. MNRg-Treat is a safe green technology product compared to other existing chemicals in the industry. The wastewater treated by MNRg-Treat will comply with The Standard B Effluent Discharge Environmental Quality Act 1974 imposed by the Department of Environment, Malaysia.

1- State the name of the project involved and the duration of the project

MNRg-Treat: An Innovative Green Technology Wastewater Treatment
(Duration: 5th Mac 2018 – 4th September 2019)

2- State the objectives and background for each project.

MNRg-Treat is a system to treat wastewater from various industries by using coagulation agent to separate residue oil and water. This is the research results from 2012, which is able to treat polluted water to safer and cleaner water according to the Department of Environment standards. MNRg-Treat is a safe green technology. Product compared to existing chemicals in the market. It's acts to treat water from oily waste up to 95% and fast in action to separate the oil from water in a timely manner.

Advantages:

- i. Comply with Environmental Quality (Sewage & Industrial Effluent) Regulations 2009
- ii. Use Natural Bio-Coagulant
- iii. Environmental friendly since low pH, low temperature (no heating) and low pressure.
- iv. Easy to install, maintenance and service the system.
- v. Low Production & Maintenance Cost

3- State the achievement of high impact projects. State also how industry / community partners have contributed towards achieving the objectives, impact and success of the projects.

1. Superb Winner – Commercialization Startup Fund (Superb Grant) TERAJU Q1 2017 RM 500,000.00 For G-TREAT
2. Gold Medal, Creation, Innovation, Technology & Research Exposition (CITREX 2017) UMP, Malaysia.
3. Gold Medal, International Conference and Exposition on Inventions by Institutions of Higher Learning (PECIPTA 2017) Ministry of Higher Education, Malaysia.
4. Silver Medal, Seoul International Invention Fair 2017 (SIIF 2017). Title: G-Treat: Smart System for Water Sustainability

List of Clients

- Puting Jaya Enterprise
- Halliburton Energy Services (M) Sdn Bhd
- Isnas Services Sdn Bhd

4- State the form of income generated in the form of cash or in-kinds

Explain:

Manpower contribution or financial contribution / significant in kind

1. Superb Winner – Commercialization Startup Fund (Superb Grant) TERAJU Q1 2017
RM 500,000.00 For G-TREAT
 2. Technology Licensing Fee between MNR Multitech Sdn Bhd and Universiti Malaysia
Pahang (RM 50,000.00)
 3. Water Sampling Analysis RM 10,370.00
- 5- History of industry / community network prior to high-impact projects along with industry / community partners nominated.
Explain: sharing of expertise / knowledge that enhances project impact to the community.

Technology Park Malaysia (TPM) is the agency that assigned by Teraju to monitor commercialization work of MNRg-Treat Product by MNR Multitech Sdn Bhd.

List of Clients

- Puting Jaya Enterprise
- Halliburton Energy Services (M) Sdn Bhd
- Isnas Services Sdn Bhd



Ruj. Kami: TERAJU/SUPERB/S1/2017/MNRMULTITECH

Sulit & Persendirian

Tarikh: 03 MAR 2018

Mohd Najib Bin Razali
MNR MULTITECH SDN. BHD.
1249959-T
No.8, Lorong Sri Damai Aman 31,
Perumahan Sri Damai Aman,
25150 Kuantan, Pahang



MELALUI TANGAN

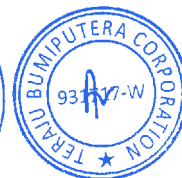
السَّلَامُ عَلَيْكُمْ وَرَحْمَةُ اللَّهِ وَبَرَكَاتُهُ

Tuan/Puan,

TAWARAN GERAN DI BAWAH PROGRAM SKIM USAHAWAN PERMULAAN BUMIPUTERA (SUPERB) UNTUK MNR MULTITECH SDN. BHD. ("Syarikat")

Perkara di atas dengan hormatnya adalah dirujuk.

2. Kami dengan sukacitanya ingin memaklumkan bahawa Unit Peneraju Agenda Bumiputera ("TERAJU") melalui Mesyuarat Jawatankuasa Pemantauan SUPERB (*Monitoring Committee*) BIL 2/2017 telah meluluskan Cadangan Jadual Pelaksanaan dan Butiran Perbelanjaan Geran SUPERB sebanyak **RM500,000** bagi kegunaan Projek SUPERB Tuan/Puan.
3. Bersama-sama dengan surat ini dilampirkan **DUA (2) SALINAN ASAL** Terma-Terma Dan Syarat-Syarat ("**Perjanjian**") bersama jadual-jadual dan lampiran untuk ditandatangani ringkas (*initial*) di setiap mukasurat oleh pihak Syarikat Tuan/Puan dan untuk disempurnakan (disetemkan).





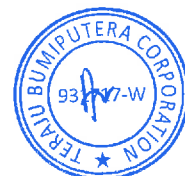
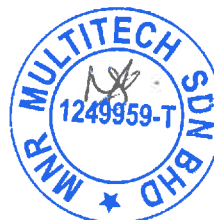
4. Jadual-jadual dan lampiran yang perlu dilengkapkan oleh pihak Syarikat adalah seperti berikut:

**JADUAL-JADUAL STANDARD PERJANJIAN YANG PERLU DISERAHKAN
DENGAN PERJANJIAN KEPADA TERAJU**

Jadual	Perkara	Status
1	Butir-Butir Penerima Geran SUPERB	Telah dilengkapkan
2	Jumlah Geran SUPERB, tempoh Geran dan Perbelanjaan	Telah dilengkapkan
3	Projek SUPERB	Telah dilengkapkan
4	Jadual Perlaksanaan	Telah dilengkapkan
5	Pecahan Pembayaran Geran SUPERB	Telah dilengkapkan
7	Surat Kebenaran Pemprosesan Maklumat Peribadi di Bawah Akta Perlindungan Data Peribadi 2010	Perlu diisikan oleh Syarikat di atas Kepala Surat Syarikat sebelum ditandatangani (<i>initial</i>)

**LAMPIRAN PERJANJIAN YANG PERLU DISERAHKAN
DENGAN PERJANJIAN KEPADA TERAJU**

Lampiran	Perkara	Status
A	Bahagian A Akuan Setuju Terima	Perlu ditandatangani (<i>initial</i>) oleh Syarikat
	Bahagian B Perakauan Agensi Pemantau	Akan diperakui oleh Agensi Pemantau selepas Akuan Setuju Terima ditandatangani oleh Syarikat





JADUAL-JADUAL PERJANJIAN YANG PERLU DILENGKAPKAN OLEH SYARIKAT

Jadual	Perkara	Status
6	Notis Pembayaran	Perlu diisikan oleh Syarikat di atas Kepala Surat Syarikat bagi tujuan tuntutan bayaran geran mengikut Jadual Pelaksanaan (Milestones) Projek Tuan/Puan seperti yang telah diluluskan oleh Mesyuarat Jawatankuasa Pemantauan SUPERB (Monitoring Committee) dan hendaklah diserahkan kepada Agensi Pemantau

5. Sekiranya Syarikat bersetuju dengan terma-terma dan syarat-syarat yang terkandung dalam Surat Tawaran ini, sila tandatangani **Lampiran A - Bahagian A (Akuan Setuju Terima)** dan salinan kedua **Perjanjian** (bersertakan jadual-jadual) yang perlu disempurnakan (disetemkan) dan diserahkan dalam tempoh **EMPAT BELAS (14) HARI** dari tarikh surat ini dikeluarkan kepada:

Untuk Perhatian:

Dzarul Farhan Dzahar
Eksekutif, Pembangunan Sektor
Unit Peneraju Agenda Bumiputera (TERAJU),
Aras 5, Menara Surian, No. 1, Jalan PJU 7/3,
Mutiara Damansara,
47810 Petaling Jaya,
Selangor Darul Ehsan.

6. Sekiranya TERAJU tidak menerima **Perjanjian** tersebut yang telah dilengkapi bersama-sama dengan Lampiran A - Bahagian A (Akuan Setuju Terima) dan jadual-jadual di dalam tempoh yang dinyatakan di atas, surat kelulusan ini adalah terbatal dengan serta merta. Penyerahan **Perjanjian** yang tidak lengkap atau yang tidak ditandatangani (initial) dan tidak disempurnakan (disetemkan) tidak akan dianggap sebagai penerimaan **Perjanjian** tersebut oleh TERAJU.





7. Semua keputusan yang dibuat oleh Jawatankuasa Pemantauan SUPERB (Monitoring Committee) adalah muktamad dan segala kos yang terlibat termasuklah duti setem bagi **Perjanjian** hendaklah ditanggung sepenuhnya oleh Syarikat
8. Sebarang pertanyaan lanjut boleh diajukan dengan menghubungi Sekretariat SUPERB melalui e-mel atau talian seperti di bawah:

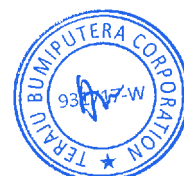
(i) Encik Dzarul Farhan Dzahar
E-mel: dzarul@teraju.gov.my & Tel: 03-7839 8096

Sekian, terima kasih.

Yang benar
UNIT PENERAJU AGENDA BUMIPUTERA

DATO' HUSNI SALLEH
Ketua Pegawai Eksekutif

s.k. Technology Park Malaysia Corporation Sdn Bhd



1. TERMA-TERMA DAN SYARAT-SYARAT

1.1 Penawaran Geran SUPERB ini adalah tertakluk kepada hasil daripada *due diligence* yang dilaksanakan oleh TERAJU bahawa:-

- (a) tidak ada apa-apa tindakan mahkamah, siasatan atau aduan ("complaint") sedia ada yang dikenakan terhadap Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB dan tidak ada tindakan mahkamah (yang diketahui) oleh Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB akan diambil terhadapnya;
- (b) Penerima Geran SUPERB dan semua pemegang saham syarikat Penerima Geran SUPERB bukan individu yang muflis;
- (c) Penerima Geran SUPERB berusia di antara 18 hingga 40 tahun (hendaklah berusia 41 tahun ke bawah pada tarikh permohonan);
- (d) Penerima Geran SUPERB adalah seorang Bumiputera. Bumiputera bermaksud warganegara Malaysia yang merupakan:-
 - i) orang Melayu seperti yang didefinisikan di dalam Artikel 160(2) Perlembagaan Persekutuan;
 - ii) orang asli seperti yang didefinisikan di dalam Akta Orang Asli 1954; atau
 - iii) pribumi negeri Sarawak atau Sabah seperti yang didefinisikan di dalam Artikel 161A(6) dan 161A(7) Perlembagaan Persekutuan Malaysia.
- (e) Sekurang-kurangnya 60% saham dalam syarikat Penerima Geran SUPERB adalah dimiliki oleh Bumiputera;
- (f) majoriti daripada pengarah dan pengurusan syarikat Penerima Geran SUPERB adalah Bumiputera;
- (g) syarikat Penerima Geran SUPERB ditubuhkan tidak lebih daripada tiga (3) tahun dari tarikh Surat Tawaran ini dan merupakan sebuah syarikat yang solven; dan
- (h) Projek SUPERB yang dikemukakan oleh Penerima Geran SUPERB adalah berdasarkan idea yang asli dan tidak pernah didaftarkan di bawah permohonan hakmilik harta intelek oleh mana-mana pihak.

Bagi tujuan mengelak sebarang keraguan, hasil *due diligence* yang dinyatakan dalam Klausula 1.1(a) - (h) di atas adalah tepat pada tarikh Surat Tawaran ini atau tarikh sebenar *due diligence* tersebut dijalankan (mana-mana yang kemudian). TERAJU berhak mengambil tindakan di bawah Klausula 12.1 sekiranya terdapat sebarang perkembangan selepas tarikh tersebut yang bercanggah dengan hasil *due diligence* tersebut.

1.2 Melainkan dinyatakan sebaliknya, sebarang obligasi dan hak berhubung Geran SUPERB yang terkandung dalam Surat Tawaran ini hendaklah merujuk kepada obligasi dan hak Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB.



2. GERAN SUPERB

- 2.1 Geran SUPERB yang ditawarkan kepada Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB adalah dalam jumlah, bagi tempoh dan untuk perbelanjaan yang dinyatakan dalam **Jadual 2** ("**Geran SUPERB**", "**Tempoh Geran SUPERB**" dan "**Perbelanjaan Geran SUPERB**").
- 2.2 Sekiranya Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB tidak dapat menyelesaikan Projek SUPERB mengikut Tempoh Geran SUPERB seperti dalam **Jadual 2**, Agensi Pemantau berhak menggunakan budibicara untuk melanjutkan tempoh Perbelanjaan Geran SUPERB kepada Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB bagi tempoh tidak melebihi tiga (3) bulan. Agensi Pemantau hendaklah dengan serta-merta memaklumkan kepada TERAJU secara bertulis sebarang perlanjutan masa yang diberikan kepada Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB.
- 2.3 Sekiranya Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB memerlukan perlanjutan masa melebihi tiga (3) bulan, Agensi Pemantau hendaklah terlebih dahulu memperolehi kebenaran daripada TERAJU sebelum sebarang perlanjutan masa diberikan kepada Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB. Sebarang perlanjutan masa hendaklah tidak melebihi tempoh enam (6) bulan.
- 2.4 Sebarang perlanjutan masa melebihi tempoh yang diberikan di bawah Klausula 2.3 di atas, adalah tertakluk kepada pembentangan semula oleh Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB dan kuasa budibicara Jawatankuasa Pemantau SUPERB.
- 2.5 Sekiranya Geran SUPERB tidak dibayar sepenuhnya kepada Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB dalam Tempoh Geran SUPERB dan tempoh lanjutan di bawah Klausula 2.2 dan 2.3 di atas, Geran SUPERB adalah dianggap terbatal dan ditamatkan serta-merta.
- 2.6 Sebarang permohonan perlanjutan masa oleh Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB, hendaklah disokong dengan penyerahan maklumat dan dokumen yang berkaitan.
- 2.7 Geran SUPERB hanya boleh digunakan untuk tujuan pelaksanaan projek seperti yang dinyatakan secara terperinci dalam **Jadual 3** ("**Projek SUPERB**"). Sebarang pindaan atau perubahan penggunaan Geran SUPERB untuk tujuan-tujuan lain adalah tertakluk kepada persetujuan Jawatankuasa Pemantau SUPERB.

3. STRUKTUR PEMILIKAN SAHAM SYARIKAT PENERIMA GERAN SUPERB

- 3.1 Penerima Geran SUPERB hendaklah merupakan pemegang saham majoriti di dalam syarikat Penerima Geran SUPERB.
- 3.2 Pegangan saham Penerima Geran SUPERB, hendaklah sepanjang Tempoh Geran SUPERB dan tiga (3) tahun selepas tamat Tempoh Geran SUPERB kekal seperti mana yang dinyatakan dalam Perkara 2, **Jadual 1**.
- 3.3 Sebarang perubahan terhadap pemegang saham dan pegangan saham Penerima Geran SUPERB dalam tempoh yang diperuntukkan di atas hendaklah dimaklumkan kepada TERAJU dan tertakluk kepada persetujuan bertulis TERAJU, kegagalan untuk



berbuat sedemikian merupakan pelanggaran kepada terma–terma dan syarat-syarat Surat Tawaran ini, dan TERAJU mempunyai hak dan kuasa mutlak untuk membatalkan Surat Tawaran ini.

- 3.4 Bagi tujuan mengelak sebarang keraguan, syarikat Penerima Geran SUPERB yang dinamakan di dalam **Jadual 1** hendaklah sepanjang Tempoh Geran SUPERB dan tiga (3) tahun selepas tamat Tempoh Geran SUPERB kekal seperti mana yang dinyatakan dalam **Jadual 1** tersebut. Sebarang perubahan atau penukaran terhadap syarikat entiti Penerima Geran SUPERB adalah tertakluk kepada persetujuan Jawatankuasa Pemantau SUPERB.

4. HAKMILIK HARTA INTELEK

- 4.1 Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB adalah bertanggungjawab untuk mendaftar hakmilik harta intelek Projek SUPERB sebaik sahaja Penerima Geran SUPERB menandatangani Surat Tawaran. TERAJU tidak akan bertanggungjawab terhadap sebarang kerugian ekoran kegagalan Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB untuk berbuat sedemikian.
- 4.2 Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB adalah dibenarkan menggunakan Geran SUPERB bagi tujuan menanggung kos pendaftaran hakmilik harta intelek Projek SUPERB seperti yang diperuntukkan di bawah Klausa 4.1 Surat Tawaran ini.
- 4.3 Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB bersetuju untuk memindahkan hakmilik harta intelek Projek SUPERB daripada Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB kepada TERAJU (yang mana terpakai) sekiranya TERAJU melakukan pembatalan Surat Tawaran ini di bawah Klausa 11 Surat Tawaran ini.

5. PENDEDAHAN

- 5.1 Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB hendaklah memaklumkan secara bertulis kepada TERAJU sekiranya Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB telah atau pada masa yang material menerima sebarang atau apa-apa bentuk geran daripada mana-mana agensi kerajaan untuk tujuan berkaitan dengan Projek SUPERB.
- 5.2 Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB bertanggungjawab memaklumkan secara bertulis dengan notis munasabah kepada TERAJU sebelum menerima sebarang pinjaman dan/atau pembiayaan dan/atau faedah daripada pinjaman dan pembiayaan daripada mana-mana institusi kewangan untuk tujuan berkaitan dengan Projek SUPERB.

6. PROJEK SUPERB DAN JADUAL PELAKSANAAN

Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB hendaklah melaksanakan Projek SUPERB selaras dengan jadual pelaksanaan yang dinyatakan dengan terperinci dalam **Jadual 4** (“**Jadual Pelaksanaan**”). Sebarang perubahan terhadap Jadual Pelaksanaan atau perlanjutan masa hendaklah tertakluk kepada Klausa 2 di atas.



7. PELAKSANAAN PROJEK SUPERB

- 7.1 Bagi tujuan pelaksanaan Projek SUPERB, TERAJU telah melantik agensi pemantau yang dinyatakan dalam Perkara 5, **Jadual 1** ("**Agensi Pemantau**") sebagai pihak yang akan:-
- (a) meneliti dan memantau status pelaksanaan serta perkembangan Projek SUPERB; dan
 - (b) menyalurkan pembayaran Geran SUPERB kepada Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB seperti mana yang dinyatakan di dalam **Jadual 2** dan dalam pecahan seperti mana yang dinyatakan dalam **Jadual 5** ("**Pecahan Pembayaran Geran SUPERB**").
- 7.2 Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB hendaklah berurusan dengan Agensi Pemantau berhubung isu-isu berkaitan **Jadual 2, Jadual 3, Jadual 4, Jadual 5 dan Jadual 6**.
- 7.3 Sekiranya perlu, Agensi Pemantau, selepas berunding dengan Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB, berhak pada bila-bila masa membuat permohonan kepada Pengerusi Jawatankuasa Pemantau SUPERB melalui TERAJU untuk meminda **Jadual 2, Jadual 4 dan/atau Jadual 5**. Pindaan kepada jadual-jadual tersebut selepas diluluskan oleh Pengerusi Jawatankuasa Pemantau SUPERB hendaklah berkuatkuasa dan dianggap sebagai pindaan kepada Surat Tawaran ini.

8. PEMBAYARAN GERAN SUPERB

- 8.1 Dalam masa tiga puluh (30) hari bekerja dari tarikh Surat Tawaran ini dikeluarkan, Geran SUPERB akan diserahkan oleh TERAJU kepada Agensi Pemantau.
- 8.2 Tertakluk kepada penyempurnaan Projek SUPERB (atau mana-mana bahagian daripadanya) selaras dengan **Jadual 4** dengan pengesahan bertulis oleh Agensi Pemantau, perakuan oleh TERAJU dan kelulusan oleh Jawatankuasa Pemantau SUPERB serta pematuhan oleh Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB ke atas semua terma-terma dan syarat-syarat yang dinyatakan dalam Surat Tawaran ini, Agensi Pemantau hendaklah membuat bayaran seperti pecahan dalam **Jadual 5** dalam tempoh tiga puluh (30) hari bekerja dari tarikh arahan tersebut diterima oleh Agensi Pemantau.
- 8.3 Bayaran Geran SUPERB hanya akan diproses setelah:-
- (a) Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB menyerahkan notis dalam format seperti di **Jadual 6** ("**Notis Pembayaran**") kepada Agensi Pemantau;
 - (b) Notis Pembayaran yang diterima oleh Agensi Pemantau adalah lengkap dan Agensi Pemantau berhak mengarahkan Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB untuk mengemukakan apa-apa dokumen tambahan sebagai sokongan kepada Notis Pembayaran, sekiranya perlu; dan
 - (c) Notis Pembayaran yang telah lengkap disahkan oleh Agensi Pemantau, diperakui oleh TERAJU dan diluluskan oleh Jawatankuasa Pemantau SUPERB.



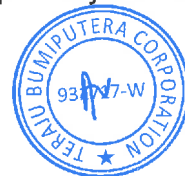
- 8.4 Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB dengan ini bersetuju bahawa:-
- (a) Geran SUPERB adalah merupakan peruntukan yang diterima oleh TERAJU daripada Kerajaan Malaysia;
 - (b) TERAJU berhak untuk mengarahkan Agensi Pemantau untuk menghentikan pembayaran Geran SUPERB pada bila-bila masa sekiranya:-
 - (i) Geran SUPERB ditarik balik oleh Kerajaan Malaysia atas apa-apa sebab atau atas sebab kegagalan Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB mematuhi mana-mana terma-terma atau syarat-syarat yang terkandung dalam Surat Tawaran ini; dan
 - (ii) sebarang keputusan untuk menarik balik Geran SUPERB daripada Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB telah dipersetujui oleh TERAJU dan Jawatankuasa Pemantau SUPERB.
- 8.5 Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB dengan ini membuat ikrar integriti bahawa:
- (a) tiada unsur-unsur rasuah sebagai dorongan atau hadiah telah ditawarkan oleh Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB atau mana-mana pihak lain yang bertindak bagi pihak Penerima Geran SUPERB kepada mana-mana pihak bagi kelulusan permohonan Geran SUPERB; dan
 - (b) pemegang saham bagi syarikat Penerima Geran SUPERB hendaklah pemilik *bona fide* Projek SUPERB dan tidak bertindak bagi pihak atau sebagai wakil atau proksi kepada mana-mana pihak lain.

9. JAWATANKUASA PEMANTAU SUPERB

- 9.1 Sebuah Jawatankuasa Pemantau SUPERB telah ditubuhkan untuk memantau Projek SUPERB dan membuat pertimbangan, keputusan dan kelulusan berkaitan Projek SUPERB, Geran SUPERB, Jadual Pelaksanaan serta apa-apa perkara lain yang berkaitan dengannya.
- 9.2 Keanggotaan Jawatankuasa Pemantau SUPERB adalah ditentukan oleh TERAJU dan pada setiap masa akan terdiri daripada wakil TERAJU (sekurang-kurangnya berpangkat Pengarah) dan wakil Agensi Pemantau.

10. LAPORAN

- 10.1 Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB hendaklah mengemukakan laporan bertulis berhubung kemajuan Projek SUPERB atau apa-apa laporan lain yang berkaitan kepada Agensi Pemantau dalam format dan pada masa yang akan ditetapkan oleh Agensi Pemantau seperti yang berikut:-
- (a) laporan suku tahunan mengenai perkembangan Projek SUPERB;
 - (b) laporan pertengahan tahun mengenai perkembangan Projek SUPERB; dan
 - (c) mengemukakan laporan bertulis 'Close Out Report' dan dokumen ringkasan perbelanjaan bagi pembayaran terakhir, ~~sebagai sahaja~~ pembayaran terakhir dibuat kepada syarikat Penerima Geran SUPERB.

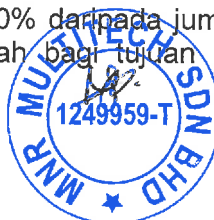


- 10.2 Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB hendaklah mengemukakan laporan syarikat setiap enam (6) bulan sehingga tiga (3) tahun selepas pembayaran terakhir.
- 10.3 Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB dan TERAJU bersetuju bahawa kegagalan Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB untuk mengemukakan laporan bertulis seperti dinyatakan di dalam Klausa 10.1, TERAJU mempunyai hak untuk menangguhkan dan/atau menghentikan bayaran kepada Penerima Geran SUPERB tertakluk kepada terma-terma dan syarat-syarat Surat Tawaran ini.

11. OBLIGASI PENERIMA GERAN SUPERB DAN/ATAU SYARIKAT PENERIMA GERAN SUPERB

11.1 Sebaik sahaja TERAJU menerima **Bahagian A (Akuan Setuju Terima) Lampiran A** dan salinan Surat Tawaran ini yang telah ditandatangani oleh Penerima Geran SUPERB, Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB secara automatik bersetuju bahawa:-

- (a) TERAJU dan/atau Agensi Pemantau (atau mana-mana pihak yang dilantik olehnya) mempunyai hak untuk melawat tempat Projek SUPERB dijalankan untuk tujuan pemantauan dan pengesanan;
- (b) TERAJU dan/atau Agensi Pemantau (atau mana-mana pihak yang dilantik olehnya) mempunyai hak untuk membuat sebarang kerja-kerja audit berhubung Projek SUPERB, Geran SUPERB dan perkara-perkara yang berkaitan dengannya;
- (c) Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB hendaklah menghadiri apa-apa mesyuarat, majlis dan/atau program yang diaturkan oleh TERAJU dan/ atau Agensi Pemantau;
- (d) Penerima Geran SUPERB hendaklah mematuhi sebarang arahan daripada TERAJU dan/ atau Agensi Pemantau berhubung Projek SUPERB, Geran SUPERB, Jadual Pelaksanaan serta Perbelanjaan dan Pembayaran;
- (e) Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB hendaklah memaklumkan secara bertulis dengan secepat mungkin kepada Agensi Pemantau berhubung sebarang isu-isu yang boleh menjejaskan kemajuan dan pelaksanaan Projek SUPERB;
- (f) Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB hendaklah memastikan bahawa sebarang kelulusan, permit, lesen dan/atau apa-apa bentuk kebenaran yang diperlukan dalam melaksanakan Projek SUPERB daripada mana-mana pihak diperolehi;
- (g) TERAJU mempunyai hak untuk membuat publisiti atau hebahan berhubung apa-apa perkara yang dinyatakan dalam Surat Tawaran ini kepada mana-mana pihak (sama ada secara terus atau melalui Agensi Pemantau) dan Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB hendaklah memberi kerjasama sepenuhnya kepada TERAJU dan/atau Agensi Pemantau dalam publisiti atau hebahan tersebut;
- (h) TERAJU berhak untuk memegang 10% daripada jumlah keseluruhan Geran SUPERB sebagai pemegang amanah bagi tujuan pelaksanaan program-



program atau perkara-perkara lain yang TERAJU fikirkan bermanfaat dan/atau demi kepentingan Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB;

- (i) Sekiranya perlu membuat sebarang hebahan atau publisiti berhubung Projek SUPERB kepada mana-mana pihak, Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB hendaklah:-
 - (i) mendapatkan kebenaran bertulis daripada TERAJU terlebih dahulu sebelum membuat hebahan atau publisiti tersebut; dan
 - (ii) memberi pengiktirafan kepada Projek SUPERB dan Kerajaan Malaysia dalam hebahan atau publisiti tersebut.
- (j) Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB hendaklah memastikan sebarang peralatan atau aset berkaitan Projek SUPERB diinsurankan daripada sebarang kebakaran, kecurian, kehilangan dan/atau kerosakan atau apa-apa risiko lain dan sebarang bayaran insuran yang diterima digunakan untuk menggantikan peralatan atau aset tersebut; dan
- (k) Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB hendaklah mematuhi semua undang-undang bertulis, peraturan, kaedah, polisi dan prosedur yang berkaitan dengan atau terpakai ke atas Penerima Geran SUPERB dan pelaksanaan Projek SUPERB.

12. PEMBATALAN TAWARAN PEMBIAYAAN

12.1 TERAJU berhak untuk membatalkan Surat Tawaran ini dengan serta-merta sekiranya:-

- (a) Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB mengingkari mana-mana terma-terma dan syarat-syarat yang dinyatakan dalam Surat Tawaran ini;
- (b) terdapat perubahan kepada pemegang saham dan pegangan saham syarikat Penerima Geran SUPERB sepanjang Tempoh Geran SUPERB dan tiga (3) tahun selepas tamat Tempoh Geran SUPERB seperti diperuntukkan di bawah Klausa 3.3 yang dibuat tanpa kelulusan bertulis oleh TERAJU;
- (c) terdapat perkembangan baru yang boleh memberi erti bahawa dalam pandangan TERAJU, Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB menunjukkan tanda-tanda tidak berkemampuan untuk memenuhi syarat-syarat dan terma-terma yang tertera dalam Surat Tawaran ini, jadual-jadual dalam Surat Tawaran ini serta arahan-arahan daripada TERAJU dan/atau Agensi Pemantau dari semasa ke semasa;
- (d) terdapat perubahan material dalam pelaksanaan Projek SUPERB seperti yang dinyatakan di dalam Jadual 3. Sebarang pindaan atau perubahan pelaksanaan Projek SUPERB adalah tertakluk kepada kebenaran dan kuasa budibicara Jawatankuasa Pemantau SUPERB.
- (e) TERAJU menerima laporan daripada Agensi Pemantau berhubung kegagalan Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB untuk mematuhi **Jadual 4** yang mana perkembangannya adalah dipantau oleh Agensi Pemantau;



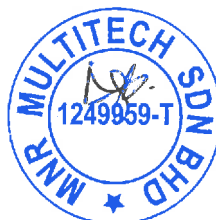
- (f) terdapat apa-apa maklumat, representasi atau akujanji Penerima Geran SUPERB yang namanya dinyatakan dalam **Jadual 1** dan/ atau Penerima Geran SUPERB atau apa-apa dokumen yang dikemukakan sebelum ini didapati tidak benar atau palsu;
- (g) terdapat tindakan undang-undang atau mahkamah atau lain-lain tindakan yang sedang atau akan dikenakan terhadap Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB;
- (h) Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB melanggar ikrar integriti di bawah Klausula 8.5 di atas;
- (i) kesemua atau sebahagian daripada terma-terma dan syarat-syarat yang dinyatakan dalam Surat Tawaran ini dipertikaikan atau tidak boleh dipersetujui oleh Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB;
- (j) Penerima Geran SUPERB dan/atau pemegang saham syarikat Penerima Geran SUPERB dinyatakan dalam **Jadual 1** adalah seorang yang bankrap; atau
- (k) atas sebab-sebab lain yang difikirkan sesuai oleh TERAJU dan/atau atas cadangan Agensi Pemantau yang dipersetujui oleh TERAJU dan Jawatankuasa Pemantau SUPERB.

12.2 Sekiranya Surat Tawaran ini dibatalkan di bawah Klausula 12.1 di atas, TERAJU berhak untuk:-

- (a) mengarahkan Agensi Pemantau untuk menghentikan dengan serta-merta pembayaran Geran SUPERB kepada Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB seperti mana yang dibenarkan di bawah **Jadual 2**;
- (b) menuntut kembali Geran SUPERB (semua atau sebahagian daripadanya) daripada Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB sebagai jumlah yang terhutang dan kena dibayar oleh Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB kepada TERAJU; dan
- (c) menerima hakmilik harta intelek Projek SUPERB yang dimiliki oleh Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB seperti yang dinyatakan di dalam Klausula 4.3 Surat Tawaran ini.

12.3 Tanpa menjejaskan hak-hak lain yang terkandung di dalam Surat Tawaran ini, TERAJU berhak untuk membatalkan Surat Tawaran ini pada bila-bila masa dengan memberikan notis dengan serta merta kepada Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB tersebut sekiranya Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB disyaki dan dibuktikan telah mengemukakan tuntutan palsu berhubung dengan Projek SUPERB.

12.4 Bagi mengelak sebarang keraguan, Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB tidak berhak menuntut sebarang kerugian termasuk kehilangan keuntungan, kerosakan, atau tuntutan jenis apa pun kerana pembatalan Surat Tawaran ini.



- 12.5 Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB tidak dibenarkan untuk menyaman atau mengambil tindakan undang undang terhadap TERAJU, kakitangan TERAJU atau Agensi Pemantau untuk apa alasan sekali pun berkaitan dengan Projek SUPERB.
- 12.6 Hak TERAJU di bawah Klausa 12.2(b) di atas hendaklah kekal sekalipun Tempoh Geran SUPERB telah tamat atau Surat Tawaran ini telah dibatalkan oleh kerana terdapat perubahan pemegang saham dan pegangan saham Penerima Geran SUPERB dalam tempoh tiga (3) tahun daripada tarikh tamat Tempoh Geran SUPERB.

13. LARANGAN KEGUNAAN SURAT TAWARAN

Surat Tawaran ini tidak boleh digunakan sebagai jaminan atau apa-apa bentuk komitmen TERAJU kepada mana-mana pihak lain selain daripada Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB dan terhad kepada perkara-perkara yang dinyatakan dalam Surat Tawaran ini sahaja.

14. AKUAN SETUJU TERIMA

- 14.1 Surat Tawaran ini dikemukakan kepada Penerima Geran SUPERB dalam dua (2) salinan asal. Sekiranya Penerima Geran SUPERB bersetuju dengan terma-terma dan syarat syarat yang terkandung dalam Surat Tawaran ini, sila tandatangi:

- (i) **Bahagian A (Akuan Setuju Terima Penerima Geran SUPERB)** dalam **Lampiran A** untuk Penerima Geran SUPERB; dan
- (ii) salinan kedua Surat Tawaran ini;

dan kembalikan kepada Unit Peneraju Agenda Bumiputera ("TERAJU"), Aras 5, Menara Surian, No. 1, Jalan PJU 7/3, Mutiara Damansara, 47810 Petaling Jaya, Selangor Darul Ehsan.

- 14.2 **Bahagian B** dalam **Lampiran A (Perakuan Agensi Pemantau)** hanya akan diperakui oleh Agensi Pemantau selepas **Bahagian A (Akuan Setuju Terima Penerima Geran SUPERB)** dalam **Lampiran A** ditandatangani oleh Penerima Geran SUPERB.

15. PENGGUNAAN DATA PERIBADI

- 15.1 Penerima Geran SUPERB bersetuju bahawa dengan menandatangani dan mengembalikan **Bahagian A (Akuan Setuju Terima Pemenang Geran SUPERB)** dalam **Lampiran A**, Unit Peneraju Agenda Bumiputera, TERAJU Bumiputera Corporation dan/ atau Agensi Pemantau, diberi kebenaran untuk memproses data-data peribadi Penerima Geran SUPERB selaras dengan peruntukan Akta Perlindungan Data Peribadi 2010.
- 15.2 Surat kebenaran pemprosesan data-data peribadi adalah seperti format di **Jadual 7** dan hendaklah ditandatangani oleh semua pemegang saham dan pengarah syarikat Penerima Geran SUPERB. Surat kebenaran tersebut hendaklah dikembalikan kepada TERAJU bersama **Bahagian A (Akuan Setuju Terima Penerima Geran SUPERB)** dalam **Lampiran A**.
- 15.3 Penerima Geran SUPERB hendaklah menghubungi Unit Peneraju Agenda Bumiputera, TERAJU Bumiputera Corporation dan/atau Agensi Pemantau sekiranya ingin mengakses, membetulkan, memansuhkan data-data peribadi atau menarik balik kebenaran untuk memproses data-data peribadi Penerima Geran SUPERB.



16. PERBELANJAAN DAN KOS

- 16.1 Melainkan diperuntukkan sebaliknya dalam **Jadual 2**, semua perbelanjaan dan kos berhubung pelaksanaan Projek SUPERB, kos guaman, dan lain-lain kos hendaklah menjadi tanggungan Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB.
- 16.2 Surat Tawaran ini hendaklah dikenakan duti setem dan semua kos yang berkaitan dengan duti setem tersebut hendaklah ditanggung oleh Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB.

17. NOTIS

Sebarang notis yang dikehendaki oleh satu pihak untuk diserahkan kepada pihak yang lain di bawah Surat Tawaran ini mestilah dalam bentuk bertulis dan hendaklah disifatkan sebagai memadai diserahkan jika ia diberikan oleh pihak tersebut atau peguamcaranya atau melalui peguamcaranya di dalam surat berdaftar yang diposkan dan dialamatkan kepada pihak satu lagi kepada alamat yang disebutkan di dalam Surat Tawaran ini dan di dalam keadaan ini, ianya hendaklah disifatkan (samada ianya sebenarnya diterima atau tidak) sebagai telah diterima pada hari **KETUJUH (7)** selepas surat tersebut diposkan.

18. UNDANG-UNDANG

Surat Tawaran ini adalah tertakluk kepada undang-undang Malaysia.

19. INTEGRASI

Surat Tawaran ini menggantikan semua perjanjian terdahulu dan persefahaman (sama ada secara bertulis atau lisan) antara TERAJU dan Penerima Geran SUPERB dan/atau syarikat Penerima Geran SUPERB berkenaan dengan perkara ini.

20. MASA

Masa hendaklah menjadi inti pati dalam Surat Tawaran ini.

21. PENEPIAN HAK

Kegagalan mana-mana pihak melaksanakan mana-mana hak, remedi atau peruntukan di bawah Surat Tawaran ini, pada bila-bila masa, tidak akan beroperasi sebagai suatu penepian hak, melainkan jika ia telah dibuat secara bertulis dan ditandatangani oleh pihak-pihak terlebih dahulu.

22. PEMATUHAN KEPADA UNDANG UNDANG

Pihak-pihak bersetuju untuk mematuhi segala peruntukan undang-undang, arahan, perintah dan pekeliling yang dikeluarkan oleh Kerajaan atau mana-mana pihak berkuasa yang berkenaan di bawah mana-mana peruntukan undang-undang yang berkuatkuasa di Malaysia.

23. SAH LAKU SURAT TAWARAN

Surat Tawaran ini adalah sah untuk tempoh empat belas (14) hari dari tarikh ia dikeluarkan dan hendaklah terbatal dengan sendirinya tanpa sebarang notis (bertulis

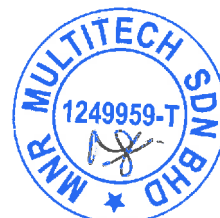


atau sebaliknya) sekiranya TERAJU tidak menerima **Bahagian A (Akan Setuju Terima) dalam Lampiran A**, mana-mana yang berkenaan, dan salinan Surat Tawaran ini yang bertandatangan daripada Penerima Geran SUPERB dalam tempoh tersebut.



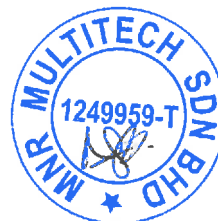
**JADUAL 1
BUTIR-BUTIR PENERIMA GERAN SUPERB**

No	Perkara	Butiran
1	Penerima Geran SUPERB	<p>Nama: Mohd Najib Bin Razali Nama Syarikat: MNR MULTITECH SDN. BHD. No. Syarikat: 1249959-T Alamat Berdaftar: No.8, Lorong Sri Damai Aman 31, Perumahan Sri Damai Aman, 25150 Kuantan Pahang</p>
2	Pemegang Saham Syarikat Penerima Geran SUPERB	<p>Nama: Mohd Najib Bin Razali No. Kad Pengenalan: 840809-01-5939 Alamat: No.8, Lorong Sri Damai Aman 31, Perumahan Sri Damai Aman, 25150 Kuantan Pahang Pegangan Saham Syarikat : 100%</p>
3	Pengarah Syarikat Penerima Geran SUPERB	<p>Nama: Mohd Aizudin Bin Abd Aziz No. Kad Pengenalan: 840204-14-6039 Alamat: Lot 61, Jalan 36 D, Kg. Cheras baru, 56100 Kuala Lumpur, Wilayah Persekutuan</p> <p>Nama: Musfakiri Bin Musa No. Kad Pengenalan: 871115-08-6013 Alamat: No 15, Lorong Gambang Damai 1/20, Taman Gambang Damai 1, Jalan Gambang-Kuantan, 26300 Gambang, Pahang</p>
4	Butiran Syarikat Penerima Geran SUPERB bagi tujuan serahan notis	<p>Nombor Telefon: 012-3530738 Emel: najib_ump@yahoo.com.my Alamat Surat Menyurat Syarikat Penerima Geran SUPERB: No.8, Lorong Sri Damai Aman 31, Perumahan Sri Damai Aman, 25150 Kuantan Pahang</p>
5	Agensi Pemantau	Technology Park Malaysia Corporation Sdn Bhd



JADUAL 2
JUMLAH GERAN SUPERB, TEMPOH GERAN DAN PERBELANJAAN

Perkara	Butiran																					
Jumlah Geran SUPERB	Ringgit Malaysia Lima Ratus Ribu (RM 500,000) sahaja																					
Tempoh Geran SUPERB	18 Bulan Bermula Dari Tarikh Duti Setem																					
Perbelanjaan Geran SUPERB yang dibenarkan	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">No.</th> <th style="text-align: center;">Butiran</th> <th style="text-align: center;">Amaun (RM)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>Mobilisasi</td> <td style="text-align: right;">25,000</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Perbelanjaan Modal</td> <td style="text-align: right;">240,000</td> </tr> <tr> <td style="text-align: center;">3</td> <td>Perbelanjaan Operasi</td> <td style="text-align: right;">160,000</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Penyelidikan & Pembangunan</td> <td style="text-align: right;">50,000</td> </tr> <tr> <td style="text-align: center;">5</td> <td>Promosi & Pemasaran</td> <td style="text-align: right;">25,000</td> </tr> <tr> <td></td> <td style="text-align: center;">JUMLAH</td> <td style="text-align: right;">500,000.00</td> </tr> </tbody> </table>	No.	Butiran	Amaun (RM)	1	Mobilisasi	25,000	2	Perbelanjaan Modal	240,000	3	Perbelanjaan Operasi	160,000	4	Penyelidikan & Pembangunan	50,000	5	Promosi & Pemasaran	25,000		JUMLAH	500,000.00
	No.	Butiran	Amaun (RM)																			
	1	Mobilisasi	25,000																			
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	3	Perbelanjaan Operasi	160,000																			
	4	Penyelidikan & Pembangunan	50,000																			
	5	Promosi & Pemasaran	25,000																			
	JUMLAH	500,000.00																				



MR

**JADUAL 3
PROJEK SUPERB**

G-TREAT

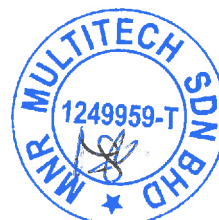
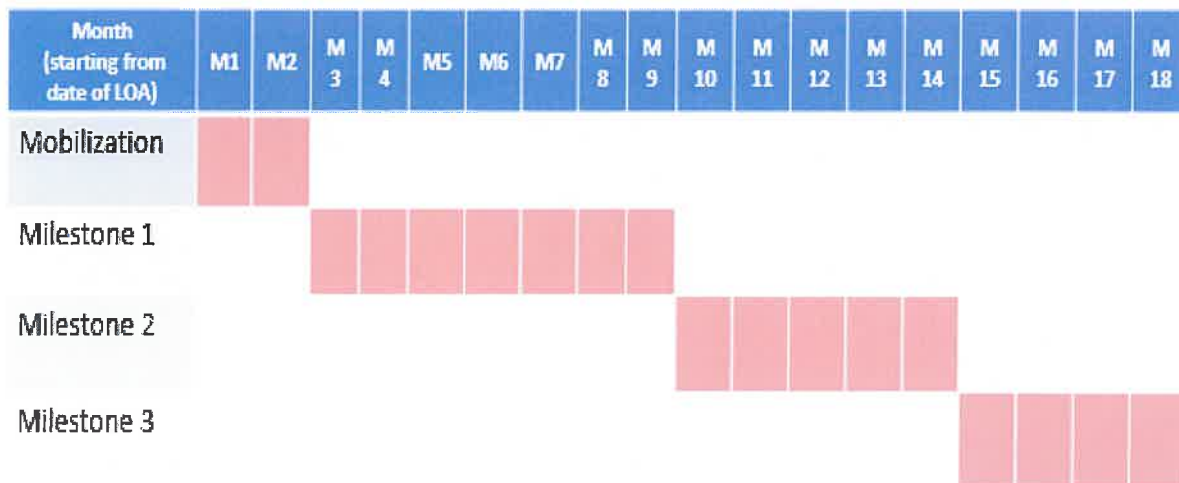
The high financial impact on the disposal cost of industrial waste emulsion drives the initiative in finding effective solution which can save this expenditure and at the same time protect the environment by introducing G-TREAT.



MR

JADUAL 4 JADUAL PELAKSANAAN

Milestones/Deliverables	Date (Duration)	Expenditure (RM)
Mobilisation (5%)		
<ul style="list-style-type: none"> ▪ Pre-Operating & Initial Setup: <ul style="list-style-type: none"> ▪ Administration, Company Formation, Consultation on Technology & Patent ▪ Virtual Incubation Program 	Month 1-2 (From date of LOA)	25,000.00
Phase/Milestone 1		
<ul style="list-style-type: none"> ▪ Operation: Allowance, Utilities, ▪ Intellectual Property ▪ CAPEX: Purchase Automatic Wastewater Treatment Plant , Mobile Calorimeter for Water testing, 2 unit of pump, 10 Unit IBC Tank. 20 Unit Drum Tank ▪ Hire Purchase (Down payment) : Forklift ▪ Business & Technical Coaching, Mentoring, Training & Consultancy ▪ Raw Materials. Packaging (Bottle 25 litre) 	Month 3-9 (From date of LOA)	275,000.00
Phase/Milestone 2		
<ul style="list-style-type: none"> ▪ Purchase of Raw Materials, Packaging (Bottle 25 liter) , Monthly Installment : Forklift ▪ Certification: SIRIM, MYHiau Brand, Material Safety Data Sheet (MSDS) Certification ▪ Professional Fees: Certified Environment Professional in Scheduled Waste Management (CePSwaM) ▪ Business & Technical Coaching, Mentoring, Training & Consultancy ▪ Marketing, Advertisement & Promotion ▪ Product Launching 	Month 10-15	125,000.00
Phase/Milestone 3		
<ul style="list-style-type: none"> ▪ Marketing, Advertisement & Promotion ▪ Exhibitions ▪ Product Sampling 	Month 16-18	75,000.00



MR

**JADUAL 5
PECAHAN PEMBAYARAN GERAN SUPERB**

Item	Cost per Item (RM)	Mobilization	Milestone 1	Milestone 2	Milestone 3	Total Cost (RM)	Note
Project Management		3,000.00				3,000.00	Company Registration, Logo
Preparation of Infrastructure		8,000.00				8,000.00	Office Equipment & Facilities, Fume Hood, Utilities
Salary & Allowance		12,000.00	38,500.00	27,500.00	22,000.00	100,000.00	Managing Director, Production Manager, Director, Admin/Technician
Purchase of Assets			164,000.00	76,000.00		240,000.00	Automatic wastewater treatment system for oil recovery process, mobile calorimeter for water testing (method approved by DOE), forklift & 2 units of pump
Cost of Technology			50,000.00			50,000.00	Technology licensing

Item	Cost per Item (RM)	Mobilization	Milestone 1	Milestone 2	Milestone 3	Total Cost (RM)	Note
R&D/Professional/ Training/Certificate Fees			10,000.00	10,000.00	30,000.00	50,000.00	SIRIM, MvHiau Brand, Material Safety Data Sheet Certification, Certified Environment Professional in Scheduled Waste Management (CePSwaM)
Raw Materials/Packaging			6,500.00	2,500.00	2,000.00	11,000.00	IBC Tank (1000 L), drum tank (200 L), plastic bottle (25 L), chemicals, seafood waste/product
Advertising & Promotion				6,000.00	19,000.00	25,000.00	Exhibition, product launching, trademarks registration, promotional video, market validation/product testing
Traveling, Transportation, Accommodation		2,000.00	6,000.00	3,000.00	2,000.00	13,000.00	For marketing & progress meeting
Total Expenditure (RM)		25,000.00	275,000.00	125,000.00	75,000.00	RM 500,000	



**JADUAL 6
NOTIS PEMBAYARAN**

[kepala surat Syarikat Penerima Geran SUPERB]

[Tarikh]

Nama Agensi Pemantau
Alamat Agensi Pemantau
Untuk Perhatian:

Tuan,

**NOTIS PEMBAYARAN BAGI TAWARAN GERAN DI BAWAH PROGRAM SKIM
USAHAWAN PERMULAAN BUMIPUTERA**

Tarikh Surat Tawaran: (“Surat Tawaran tersebut”)

Nama Penerima Geran SUPERB:

Kami merujuk kepada perkara di atas dan Surat Tawaran tersebut.

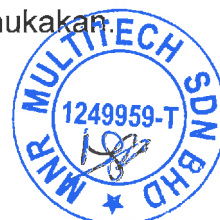
Melainkan diperuntukkan sebaliknya dalam Notis Pembayaran ini, semua perkataan dan terma yang didefinisikan dalam Surat Tawaran tersebut hendaklah apabila digunakan atau dirujuk dalam Notis Pembayaran ini, merujuk kepada tafsiran yang sama sepertimana yang diperuntukkan dalam Surat Tawaran tersebut.

Berdasarkan Klausula 6.3(a) Surat Tawaran tersebut, kami Penerima Geran SUPERB dengan ini:-

- (i) memberi notis kepada Tuan bagi pembayaran bahagian Geran SUPERB berjumlah Ringgit Malaysia (RM.....);
- (ii) meminta Tuan untuk membuat pembayaran tersebut ke akaun berikut:-

Nama:
No. Akaun.:
Bank Akaun:

- (iii) mengesahkan bahawa Projek SUPERB telah dijalankan sepertimana yang ditetapkan di bawah Jadual Pelaksanaan;
- (iv) mengesahkan bahawa semua dokumen-dokumen sokongan yang diperlukan bagi tujuan pembayaran ini sepertimana yang dikehendaki di bawah Klausula 6.3(b) Surat Tawaran tersebut adalah dilampirkan di sini; dan
- (v) mengesahkan bahawa semua terma-terma dan syarat-syarat bagi pembayaran sepertimana yang diperuntukkan dalam Klausula 6.2 Surat Tawaran tersebut telah dipatuhi semasa Notis Pembayaran ini dikemukakan.



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Kami dengan ini membuat representasi dan jaminan kepada Tuan bahawa:-

- (a) semua representasi dan perakuan yang dinyatakan dalam Surat Tawaran tersebut adalah benar dan tepat pada tarikh Notis Pembayaran ini;
- (b) tiada kemungkiran atau sebarang kemungkinan kemungkiran di bawah Klausula 11.1 Surat Tawaran tersebut pada tarikh Notis Pembayaran ini; dan
- (c) pembayaran yang dibuat oleh Tuan kelak tidak akan, sepanjang pengetahuan terbaik kami, menyebabkan berlakunya mana-mana kemungkiran di bawah Klausula 11.1 Surat Tawaran tersebut atau menyebabkan apa-apa representasi dan perakuan yang dinyatakan dalam Surat Tawaran tersebut menjadi tidak benar dan tidak tepat pada tarikh pembayaran dijangka akan dibuat dan tiada sebarang sebab di sepanjang pengetahuan terbaik kami yang tidak membenarkan Tuan membuat bayaran kepada kami sepertimana yang diperuntukkan dalam Surat Tawaran tersebut.

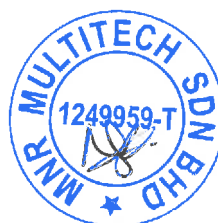
Yang Benar,
(Nama Syarikat Penerima Geran SUPERB)

Penandatanganan yang dibenarkan oleh Syarikat

.....

Salinan kepada:

Unit Peneraju Agenda Bumiputera
Tingkat 5, Surian Tower,
No. 1 Jalan 7/3, Mutiara Damansara,
47810 Petaling Jaya, Selangor Darul Ehsan.
(Untuk Perhatian: Ketua Pegawai Eksekutif)



NR

JADUAL 7
SURAT KEBENARAN PEMROSESAN MAKLUMAT PERIBADI DI BAWAH
AKTA PERLINDUNGAN DATA PERIBADI 2010

[kepala surat Syarikat Penerima Geran SUPERB]

[Tarikh]

Unit Peneraju Agenda Bumiputera

Tingkat 5, Surian Tower,
No. 1 Jalan 7/3, Mutiara Damansara,
47810 Petaling Jaya, Selangor Darul Ehsan.
(Untuk Perhatian: Ketua Pegawai Eksekutif)

Tuan,

**SURAT KEBENARAN PEMROSESAN DATA-DATA PERIBADI BAGI TAWARAN
GERAN DI BAWAH PROGRAM SKIM USAHAWAN PERMULAAN BUMIPUTERA
("Program SUPERB")**

Tarikh Surat Tawaran: ("Surat Tawaran tersebut")

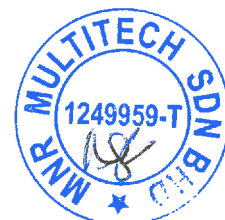
Nama Penerima Geran SUPERB:

Saya,, No. Kad Pengenalan adalah pemegang saham atau pengarah Penerima Geran SUPERB. Saya mengakui telah membaca dan memahami terma-terma dan syarat-syarat yang diperuntukkan dalam Surat Tawaran tersebut.

Saya dengan ini memberi kebenaran kepada Unit Peneraju Agenda Bumiputera, Teraju Bumiputera Corporation dan Agensi Pemantau yang dirujuk dalam Surat Tawaran tersebut untuk memproses data-data peribadi saya yang telah dikemukakan dan/atau akan dikemukakan kepada Unit Peneraju Agenda Bumiputera, Teraju Bumiputera Corporation dan/atau Agensi Pemantau bagi tujuan Program SUPERB selaras dengan peruntukan Akta Perlindungan Data Peribadi 2010.

Saya juga bersetuju bahawa saya hendaklah menghubungi Unit Peneraju Agenda Bumiputera, TERAJU Bumiputera Corporation atau Agensi Pemantau, mana-mana yang berkenaan, untuk mengakses, membetulkan, memansuhkan data-data peribadi saya atau menarik balik kebenaran yang diberikan di atas.

Saya faham dan bersetuju bahawa sebarang tindakan berhubung pembetulan, pemansuhan dan/atau penarikbalikan kebenaran ini boleh menjejaskan komunikasi di antara saya dan Unit Peneraju Agenda Bumiputera, TERAJU Bumiputera Corporation dan Agensi Pemantau serta boleh menjejaskan pelaksanaan Program SUPERB yang dipersetujui oleh Penerima Geran SUPERB di bawah Surat Tawaran tersebut.



Saya bersetuju bahawa Unit Peneraju Agenda Bumiputera, TERAJU Bumiputera Corporation dan Agensi Pemantau tidak akan bertanggungjawab ke atas sebarang kegagalan untuk melaksanakan mana-mana obligasinya yang berkaitan dengan Program SUPERB akibat daripada pembedaan, pemansuhan dan/atau penarikbalikan kebenaran ini oleh saya.

Yang Benar,
(Nama Syarikat Penerima Geran SUPERB)

Pemegang Saham / Pengarah

.....



21

LAMPIRAN A

BAHAGIAN A
AKUAN SETUJU TERIMA

Saya yang bertandatangan di bawah adalah Pengarah yang telah diberikuasa oleh (MNR MULTITECH SDN. BHD.) sebagai Penerima Geran SUPERB. Saya dengan ini mengaku bahawa saya telah membaca dan memahami segala terma-terma dan syarat-syarat yang terkandung dalam Surat Tawaran TERAJU (Ruj: TERAJU/SUPERB/S1/2017/MNRMULTITECH) bertarikh dan dengan ini bersetuju dengan semua terma-terma dan syarat-syarat tersebut.

'Surat Kebenaran Pemrosesan Data-Data Peribadi Bagi Tawaran Geran Di Bawah Program Skim Usahawan Permulaan Bumiputera' yang telah ditandatangani oleh semua pemegang saham dan pengarah Syarikat Penerima Geran SUPERB adalah dilampirkan.

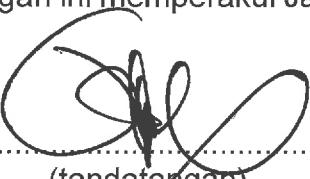

.....
(tandatangan)

Nama : MOHD NABI BIN RAZALI
No. Kad Pengenalan : 846809-01-5939
Jawatan : PENGARAH URUSAN, MNR MULTITECH SDN.BHD.

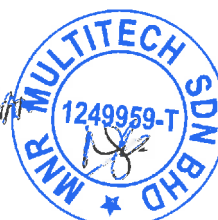
BAHAGIAN B
PERAKAUAN AGENSI PEMANTAU

Saya yang bertandatangan di bawah adalah wakil yang telah diberikuasa oleh (Technology Park Malaysia Corporation Sdn Bhd) dan dengan ini mengaku bahawa saya telah membaca dan memahami segala terma-terma dan syarat-syarat yang perlu dipatuhi oleh Penerima Geran SUPERB seperti mana yang terkandung dalam Surat Tawaran TERAJU (Ruj: TERAJU/SUPERB/S1/2017/MNRMULTITECH) bertarikh

Saya dengan ini memperakui Jadual 2, Jadual 3, Jadual 4 dan Jadual 5 adalah benar.


.....
(tandatangan)

Nama : AZRA'I BIN SHUIB
No. Kad Pengenalan : 630726-01-6017
Jawatan : PENGURUS BESAR,
INKUBATOR & PEMBANGUNAN
TEKNOPREMIUM



NR

**JADUAL 1
BUTIR-BUTIR PENERIMA GERAN SUPERB**

No	Perkara	Butiran
1	Penerima Geran SUPERB	<p>Nama: Mohd Najib Bin Razali Nama Syarikat: MNR MULTITECH SDN. BHD. No. Syarikat: 1249959-T Alamat Berdaftar: No.8, Lorong Sri Damai Aman 31, Perumahan Sri Damai Aman, 25150 Kuantan Pahang</p>
2	Pemegang Saham Syarikat Penerima Geran SUPERB	<p>Nama: Mohd Najib Bin Razali No. Kad Pengenalan: 840809-01-5939 Alamat: No.8, Lorong Sri Damai Aman 31, Perumahan Sri Damai Aman, 25150 Kuantan Pahang Pegangan Saham Syarikat : 100%</p>
3	Pengarah Syarikat Penerima Geran SUPERB	<p>Nama: Mohd Najib Bin Razali No. Kad Pengenalan: 840809-01-5939 Alamat: No.8, Lorong Sri Damai Aman 31, Perumahan Sri Damai Aman, 25150 Kuantan Pahang</p> <p>Nama: Mohd Aizudin Bin Abd Aziz No. Kad Pengenalan: 840204-14-6039 Alamat: Lot 61, Jalan 36 D, Kg. Cheras baru, 56100 Kuala Lumpur, Wilayah Persekutuan</p> <p>Nama: Musfafikri Bin Musa No. Kad Pengenalan: 871115-08-6013 Alamat: No 15, Lorong Gambang Damai 1/20, Taman Gambang Damai 1, Jalan Gambang-Kuantan, 26300 Gambang, Pahang</p>
4	Butiran Syarikat Penerima Geran SUPERB bagi tujuan serahan notis	<p>Nombor Telefon: 012-3530738 Emel: najib_ump@yahoo.com.my Alamat Surat Menyurat Syarikat Penerima Geran SUPERB: No.8, Lorong Sri Damai Aman 31, Perumahan Sri Damai Aman, 25150 Kuantan Pahang</p>
5	Agensi Pemantau	Technology Park Malaysia Corporation Sdn Bhd



DATED THE DAY OF , 2018

BETWEEN

UNIVERSITI MALAYSIA PAHANG

AND

MNR MULTITECH SDN BHD

(Company No: 1249959-T)

TECHNOLOGY LICENSING AGREEMENT

TECHNOLOGY LICENSING AGREEMENT

THIS AGREEMENT is made this **14 NOV 2018** day of 2018.



BETWEEN

1. **UNIVERSITI MALAYSIA PAHANG**, a University established under the University and Universities Colleges Act 1971 with its address at Canseleri Tun Abdul Razak, Kampus Utama Pekan, 26600 Pekan, Pahang Darul Makmur (hereinafter referred to as "the Licensor") of the one part;

AND

2. **MNR MULTITECH SDN BHD** (Company No. 1249959-T) a company incorporated in Malaysia and having its address at No. 3-02, Level 3, Mahkota Square, Jalan Mahkota, 25000 Kuantan, Pahang Darul Makmur (hereinafter referred to as "the Licensee") of the other part.

WHEREAS

1. The Licensor has developed a technology for the production of formulations of biocoagulant ("the Technology"). The Licensor had filed the said invention with the Intellectual Property Corporation of Malaysia (MYIPO) and was assigned a Utility Innovation filing number UI2015701032, ("collectively hereinafter referred to as "the Product") which is described in greater detail in the Schedule A of this Agreement;
2. The Licensee has agreed to explore opportunities in the production, marketing, distribution and selling of the said Product via the use of the Technology and the Licensee has asserted that it can produce the product to a quality and for a price that will be competitive with other global producers.
3. The Licensee is desirous of obtaining from the Licensor a Technical Advisory Service (hereinafter referred to as "the Service");
 - a. To use the Technology for the purpose of commercializing & producing for its own use and for sale of the Products thereof; and
 - b. To market, distribute and sell the Product.
4. On the representation of the Licensee that it is capable of producing the Product, the Licensor is willing to grant and the Licensee's wish to receive, the Technology, on the terms and conditions hereinafter set forth in this Technology Licensing Agreement ("the Agreement").

THE AGREEMENT IS NOW WITNESSETH as follows:

CLAUSE 1 DEFINITIONS

1.1 In the Agreement, unless there be something in the subject or context inconsistent therewith, the following words and expressions shall bear the meanings respectively assigned to them hereunder:-

- a. "Commencement Date" means the date of signing of the Agreement.
- b. "Territory" means open to any country in the world.
- c. "Exclusive" means sole exclusive rights to the Technology.
- d. "Derivative" means any improved product or new product which is developed or discovered by the Licensor and which is essentially derived from the product and/or the technology and which retains the essential characteristics of the Product.
- e. "Product" means the product mentioned under this agreement.
- f. "Technology" means the production system and material, technical information, trade secrets, processes and know-how, which relate to the Product.
- g. "Term" means the period starting on the Commencement Date and continuing until termination of the Agreement in accordance with the provisions herein.
- h. " Relevant Period" means the periods :
 - i) During the continuance of the Agreement; and
 - ii) During which the product may continue to be sold by the Receiver in pursuance of Clause 10 hereof upon termination of the Agreement.

1.2 In the Agreement (unless the context otherwise requires):-

- a. References to a schedule, recital, sub-recital, clause or sub-clause, are to the schedule(s) and to the recital, sub-recital, clause, sub-clause of the Agreement.
- b. References to an item or sub-item are to the item and sub-item of the schedule(s) of the Agreement.

- c. The headings of and the bold and/or underlined introductory words to, items of the schedule(s) and of and to recitals, sub-recitals, clauses and sub-clauses of the Agreement are inserted for ease of reference only and shall not affect the construction of this Agreement.
- d. The schedule(s) hereto shall form an integral part of the Agreement and shall be taken to read and construed as an essential part thereof.
- e. Words importing the singular meaning include the plural meaning and vice versa.
- f. Words of the masculine gender include the feminine and neuter genders and vice versa and words denoting natural persons include anybody or persons, company or corporations, firms or partnership corporate or un-incorporate and all such words shall be construed interchangeably in that manner.
- g. References to a statute, law, decree, rule or regulation or a provision therein include any re-enactment amendments and extension thereof for the time being in force.
- h. References to a document include the document as varied amended modified supplemented or substituted and the agreement(s) documents(s) instrument(s) or letter(s) effecting such variations amendments modifications supplements and/or substitutions.
- i. Where an act matter or thing is required to be done within a specified time from a specified date, the period is inclusive of and begins to run from the date so specified.
- j. Words denoting an obligation on a part to do any acts, matter or thing include an obligation to procure that it be done and words placing a party under a restriction include an obligation no to permit or allow infringement of the restriction.
- k. Any consent or approval required under the Agreement shall be required to be obtained before the act or event to which it applies is carried out or done and shall be effective only when the consent or approval is given in writing.

CLAUSE 2 COMMENCEMENT AND TERMS

- 2.1 The Agreement shall commence on the Commencement Date and shall continue in force for a period of two (2) years (hereinafter referred to as the "Initial Term") subject to the Licensee's rights of renewal contained in clauses 2.2 and 2.3.
- 2.2 Subject to provisions of Clause 2.3 below, the Licensee may at its option renew the service herein granted at the expiration of the initial term for a further term of two (2) years by giving notice in writing to the Licensor exercising the said option not less than six (6) months before the expiry date of the said initial term (the date of expiry of the said initial term is hereinafter referred to as the "Expiry Date").
- 2.3 Notwithstanding the giving of due notice pursuant to Clause 2.2 above, the renew shall only be effective provided that:
 - a. The Licensee has throughout the said Initial Term properly observed and performed all its obligations under the Agreement and is not at the Expiry Date in default under such obligations;
 - b. Not later than thirty (30) days period to the Expiry Date the Licensee has executed a new Technology Licensing Agreement with the Licensor in such other conditions mutually agreed by the Licensor and Licensee; and
 - c. Prior to the Expiry Date the Licensee has executed a deed of release in such form as the Licensor may require relinquishing any and all claims of whatsoever nature which the Licensee may or might have against the Licensor and/or any of the agents servants and/or employees of the Licensor in respect of or under the Agreement.

CLAUSE 3 LICENSE

- 3.1 The Licensor hereby grants to the Licensee an Exclusive and non-transferable License to use the Technology for the purpose in the Territory for its own use and/or sale of the Product.
- 3.2 The Licensor shall not grant to any person, body, company or agent within the said Territory the same license given to the Licensee under the Agreement.

CLAUSE 4 LICENSING FEE

- 4.1 In consideration of the granting of the license to the Licensee during the term of the Agreement, the Licensee shall pay to the Licensor a:
- a. **Licensing Fee of Ringgit Malaysia Five Hundred Thousand (RM50,000.00) Only and the payment of the Licensing Fee shall be made as per stated in Schedule B.**
 - b. Royalty in the following schedule:
 - i. **Five per centum (5%) on the Gross Sale** of the Product sold (hereinafter referred to as the "Royalty").
 - ii. To be paid every six months of the financial year.
- 4.2 The assessment of the Royalty and its payment to the Licensor shall be made at three (3) monthly period based on the management account of the Licensee. Final confirmation of the total 'Net Invoice Value' for the year shall be determined by the audited account of the Licensee. Any difference in amount of the audited account as compared to the management account shall be adjusted and made up accordingly.
- 4.3 The payment of the Royalty shall be made within sixty (60) days after the end of the four monthly periods. If the Licensee fails to pay the Royalty as stipulated in Clause 4.1 b., within the period stipulated, the Licensor shall be entitled (without prejudice to any rights or remedy it may have) to charge the Licensee interest on the Royalty at the rate of one per centum (1%) per month from the date of the Royalty became due until actual payment is made.
- 4.4 The Licensee shall if requested by the Licensor provide a statement to the Licensor giving particulars of the sales of the Product, the quantity of the product sold, the price charged, any discounts or other rebates given, the Net Invoice Price and the Licensing Fee due, together with any other particulars as the Licensor may reasonably require.
- 4.5 The Licensee shall submit Progress Report at six (6) months interval from the Commencement Date.

CLAUSE 5 UNDERTAKINGS OF THE LICENSEE

- 5.1 The Licensee shall use its best endeavors to facilitate adoption of the Technology to produce the Product.
- 5.2 The Licensee shall make available appropriate resources to produce, distribute and market the Product.

- 5.3 The Licensee agrees to produce the Product in such a manner, according to the advice of the consultants, which meets the requirement and specifications of the quality and other standards applicable in the Territory and outside where the Product is sold.
- 5.4 The Licensee agrees to seek the advice of the consultants for product raw material sourcing and pricing of the product in open market.
- 5.5 The Licensee agrees, at its expenses, to undertake and be responsible to comply with all statues, codes, ordinances, proclamations, orders, consents, registrations and/or regulations required by law for the performance of its obligations under the Agreement during the production, marketing, distribution and selling of the Product and to indemnify and keep the Licensor fully indemnified in respect to all such matters.

CLAUSE 6 UNDERTAKINGS OF LICENSOR

- 6.1 The Licensor shall provide to or make available to the Licensee the following:
 - a. Advice in regards to the establishment of a production facility, including on the design of the production line layout in which the Product may be satisfactorily produced including the equipment for such production line and the specification and operation of the same;
 - b. Provide training to technician for the production of the Product;
 - c. Continuous advice with regards to the system operation, trouble-shooting during the Term;
 - d. Advisory in product quality control, improvement and refinement from time to time and/or whenever required;
 - e. Assistance in product promotion and publicity; and
 - f. The use of the Licensor's logo for promotion and marketing purpose in accordance to clause 13.10.

CLAUSE 7 RELATIONS OF THE PARTIES

- 7.1 The Licensee shall not pledge the credit of the Licensor nor represent itself as being the Licensor nor an agent partner or employee of the Licensor and shall not hold itself out as such nor as having any power or authority to incur any obligation of any nature express or implied on behalf of the Licensor and nothing in the Agreement shall operate so to constitute the Licensee an agent, partner or employee of the Licensor.

- 7.2 The parties hereto recognize that it is impractical to make provision for every contingency that may arise out of the performance of the Agreement and accordingly declare that the Agreement shall operate with fairness and without detriment to the interest of either party and that in the event of any unfairness to either party being disclosed or anticipated in the implementation of the Agreement the parties shall use their best endeavor to agree upon such action as may be necessary and equitable to remove the cause or causes of the same.

CLAUSE 8 TECHNOLOGY LICENSOR'S RIGHT OF FIRST REFUSAL IN SHARES ACQUISITION IN THE TECHNOLOGY LICENSE INCORPORATION COMPANY.

8.1 Should the technology licensor and the Technology licensee wish to pursue commercialisation of the Products and/or Project Intellectual and/or the Improvements, the technology licensee hereby agree to give the technology licensor the first right of refusal to acquire amount of shares up to 30% at nominal value in the Technology licensee incorporated company which will be effective after two (2) years from this licensing agreement. The contribution of the technology licensor for the shares can be in the form of cash or outright transfer of the intellectual property currently licensed under this agreement to the technology licensee incorporated company. The technology licensor can be represented by its holding company or its affiliates.

8.2 Should the acquisition of shares materialised, a position in Board of Directors of the technology licensee incorporated company ("**the Board**") made available to technology licensor and/or any an authorised person, appointed by the Technology licensor.

CLAUSE 9 CONFIDENTIALITY

- 9.1 For the purpose of this Clause, the expression "Restricted Information" means the affairs of the Agreement, trade secrets of each party, and the confidential knowledge or information or financing relating to the affairs or business of each party, which either party may receive or obtain as a result of entering into the Agreement.
- 9.2 Except as provided by Clauses 9.4 and 9.5, or otherwise agreed required or permitted under the Agreement, at all times during the continuance of the Agreement and after its termination each party inclusive of the consultants shall:
- a. Use its best endeavors to, and shall so far as may be practicable, keep confidential from third parties all Restricted Information and accordingly shall not disclose, divulge or communicate any

- Restricted Information to any other person in or outside the Territory;
- b. Not use or exploit any Restricted Information for any purpose other than the performance of the obligations under the Agreement; and
 - c. Use its reasonable endeavors to prevent from acting in contravention of this provision.
- 9.3 Any Restricted Information may be disclosed by a party to:
- a. Any person whose province it is to know the same or with proper authority; and
 - b. Any employees of the parties, to such extent only as is necessary for the purpose contemplated by the Agreement, or as is required by law and subject in each case to the party using its best endeavors to ensure that the person in question keeps the same confidential and does not use the same except for the purposes for which the disclosure is made.
- 9.4 Any Restricted Information may be used by a party for any purpose or disclosed by a party to any other person, to the extent only that:
- a. It is at the date hereof, or hereafter becomes, public knowledge through no fault of the disclosing party (provided that in doing so the disclosing party shall not disclose any Restricted Information which is not public knowledge); or
 - b. It can be shown by the disclosing party to the reasonable satisfaction of the other party, to have been known to it prior to its being disclose by other party to the disclosing party.
- 95 Subject as otherwise provided in the Agreement, each party shall hand over to the other party all correspondence, budgets, schedules, documents and records belonging to or relating to the other and will not keep any copies thereof.

CLAUSE 10 INDEMNITY

- 10.1 The Licensee shall commercially exploit the Product at its own risk and shall be liable for and will indemnify the Licensor (together with its officers, employees, servants and agents), against any and all liability, loss, damages, costs, legal costs, professional and other expenses of any nature whatsoever incurred or suffered by the Licensor whether direct or consequential (including but without limitation any economic loss or other loss of profits, business or goodwill) arising out of any dispute or contractual or other claims or proceedings brought against the Licensor by reason of the manufacturer, distribution or sale of the Product by

the Licensee or its sub- Licensees or agents or the use by any of them of the Technology, except insofar as any such claims may arise from:

- a. Any breach of the Agreement by the Licensor;
- b. Any invalidity or defect in the title of the Licensor to the Technology not caused by any act or default of the Licensee; or
- c. From the instructions given to the Licensee by the Licensor provided such instructions have been properly carried out by the Licensee.

10.2 The Licensee's obligation under Clause 9.1 above to indemnify the Licensor and its officers, employees and agents is a continuing obligation separate and independent of the Licensee's other obligations and shall survive the expiration or any earlier termination of the Agreement.

10.3 The Licensee hereby agrees and acknowledge that apart from those contained in the Agreement, the Licensor has not made any (and hereby excludes all other) warranties, terms, conditions or undertakings, whether express or implied, written or oral, statutory or otherwise (including any implied warranty or merchantability or of fitness for a particular purpose) in respect of the Product, to the full extent permitted by the laws of Malaysia, any conditions or warranties imposed by such legislation are hereby excluded.

10.4 Without limiting the generality of Sub-clause 10.3 hereof, the Receiver acknowledges and agrees that:

- a. The Licensee shall be responsible for obtaining any approvals, authorizations and accreditations necessary or desirable to enable the Product to be commercially exploited or applied in its business operations;
- b. While the Licensor may discuss or have discussed with Licensee requirements for obtaining any approvals, authorizations and accreditations necessary desirable to enable the Product to be exploited or applied in the Licensor's business operations, the Licensor has not made, and does not by entering into the Agreement make, any representations or give any warranties regarding the suitability of the Product for such purposes; and
- c. The Licensor has not made, and does not by entering into the Agreement make, any representation or warranty, express or implied, that usage of production system and material, technical information, trade secrets, processes, and know how, which relates, but not limited to, equipment/machinery design and/or software or otherwise does not infringe any third party's intellectual property rights.

CLAUSE 11 TERMINATION

- 11.1 A party shall be treated for the purposes of this Clause as being in default;
- a. If it shall commit a breach of, or otherwise fail to observe or perform, or comply with, its obligations under the Agreement or, in the case of a breach or default capable of remedy, shall fail to remedy the same within thirty (30) days of being specifically required in writing to do so by the other party; or
 - b. If it shall enter into any composition or arrangement with its creditors generally, or shall be unable to pay its debts within the meaning of Section 218(2) of the Companies Act 1965; or
 - c. If it shall cease or threaten to cease wholly or substantially to carry on its business, otherwise than for the purpose of a reconstruction or amalgamation without insolvency previously approved by the party (such approval not to be unreasonably withheld); or
 - d. If any encumbrances shall take possession of, or a receiver and/or manager and/or administrator trustee or similar person shall be appointed over, the whole or any part of its undertaking property or assets; or
 - e. If an order shall be made or a resolution shall be passed for the winding up of it, or if it goes into liquidation either compulsory or voluntary, otherwise than for the purpose of a reconstruction or amalgamation without insolvency previously approved by the other party (such approval not to be unreasonably withheld).
- 11.2 In default of fulfillment of the Agreement by either party, the other party at its own discretion shall after giving notice, have the right to cancel the Agreement or to claim for specific performance, as the case may be, against the defaulter who shall on demand make good the loss, if any. If the party liable to pay shall be dissatisfied with the price or any form of compensation of such losses, or if neither of the above right is exercised, the damages if any, shall, failing amicable settlement be determined by Arbitration.
- 113 The exercise by a party of its rights under this Clause 11 shall not affect or prejudice any of its other rights or remedies against the Defaulting Party for breach non-observance or non-performance of, or non-compliance with, the Agreement and nothing in the Agreement contained shall require a party to serve notice of any breach, whether remediable or otherwise, before taking action in respect of it.

- 11.4 Notwithstanding anything in the Agreement to the contrary, despite the expiry or termination of the Agreement for any cause:
- a. Neither party shall be released from any liability which at the time of expiry or termination has already accrued to it or which thereafter may accrue in respect of any act or omission prior to such expiry or termination;
 - b. No rights of either party, which at the time of expiry or termination has already accrued, to it shall be prejudiced or otherwise adversely affected by any such expiry or termination; and
 - c. The terms of the Agreement shall nevertheless continue to bind the parties thereafter to such extent and for so long as may be necessary to give effect to the rights and obligations embodied herein; and the provisions of Clause 9 shall continue in force in accordance with its terms.

CLAUSE 12 TERMINATION CONSEQUENCES

- 12.1 Upon the expiry or termination of the Agreement for any reason:
- a. The Licensee shall promptly take whatsoever action as is necessary to fulfill its obligations under any orders for the Product for which it has accepted prior to the Expiry Date or termination of the Agreement and shall account for such sales in accordance with the terms of the Agreement, and for this purpose and to that extent the provisions of the Agreement shall continue in full force and effect;
 - b. Except where necessary to carry out its obligations pursuant to Clause 10 the Licensee shall forthwith cease to hold out that the Licensee has any connection association or affiliation with the Licensor in respect of the Product and shall forthwith cease to promote market, fabricate, sell or solicit orders for, the Product;
 - c. The Licensee shall at its own expense forthwith send to the Licensor or otherwise dispose of in accordance with the directions of the Licensor any papers, documents and other records and material including all copies thereof relating to the Product then in the possession of the Licensee or its sub-Licensees or agents;
 - d. The Licensee shall immediately pay all monies due to the Licensor;
 - e. The Licensee shall have no claim against the Licensor for compensation for loss of distribution rights, loss of goodwill or any similar loss;

- f. All provisions of the Agreement which in order to give effect to their meaning need to survive its termination shall remain in full force and effect thereafter in accordance with their respective terms unless termination is due to the Licensor's default; and
- g. Subject as otherwise provided herein and elsewhere in the Agreement and subject to any rights or obligations, which have accrued prior to the Expiry Date or termination, neither party shall have any further obligation to the other under the Agreement.

CLAUSE 13 FORCE MAJEURE

- 13.1 Should the performance of the Agreement be prevented by reason of fire, strikes, lockouts, riots, civil commotion and/or any cause comprehended in the term force majeure, the Agreement period shall be extended for a period equal to the duration of the disabling circumstances but not exceeding a period of sixty (60) calendar days. If the force majeure event ends within twenty one (21) calendar days preceding the end of the extended period, then a further twenty one (21) calendar days shall be allowed after the termination of the force majeure event.
- 13.2 Should the fulfillment of the Agreement not be possible within the extended period, the Agreement or any unfulfilled part thereof so affected shall be deemed to be null and void at the end of such extended period.

CLAUSE 14 GENERAL

14.1 Waiver

The rights of a party shall not be prejudiced or restricted by any indulgence or forbearance extended to the other and no failure by a party to enforce at any time or for any period any one or more of the terms of the Agreement shall operate as a waiver of them or as waiver of the right at any time subsequently to enforce them and no waiver by a party in respect of any breach shall operate as a waiver in respect of any subsequent breach.

14.2 Entire Agreement

- a. The Agreement supersedes any prior agreement, whether written or oral, between the parties in relation to the matters dealt with herein and any such prior agreements are cancelled as at the Commencement Date but without prejudice to any rights which have already accrued to either party.

- b. The Agreement contains the whole agreement, and represents the entire understanding, between the parties in relation thereto, and each party has not relied upon any oral or written representations made to it by the other or its employees or agents and has made its own independent investigations into all matters relevant to the Agreement.

14.3 Amendments

The Agreement shall not be varied unless such variation shall be expressly agreed in writing by each party.

14.4 Severability

If any provision of this Agreement is found by any judicial or other authority of competent jurisdiction to be voidable, void, invalid, illegal or otherwise unenforceable, then, unless the effect of such finding is to defeat the original intention of the parties in which event either party shall be entitled to terminate the Agreement by thirty (30) days' notice to the other,

- a. Such provision shall be deemed to be severed from the Agreement and the remaining provisions of the Agreement shall continue in full force and effect and the parties shall thereupon negotiate in good faith in order to agree on the terms of a mutually satisfactory provision to be substituted for the provision so found to be void, invalid, illegal or unenforceable; or
- b. The parties shall amend that provision in such reasonable manner as achieves the intention of the parties without illegality.

14.5 Notices

Any notice to be given under this Agreement shall be in writing and shall be

- a. Delivered personally;
- b. Sent by prepaid registered post; or
- c. Sent by tested facsimile.

The address for service of each party shall be

- a. Its respective address stated above; or
- b. Any other address for service previously notified by post or its last known address.

A notice shall be deemed to have served as follows:

- a. If personally delivered, at the time of delivery;
- b. If posted, at the expiration of three (3) days after the envelope containing the same was delivered into the custody of the postal authorities; and

- c. If sent by facsimile, at the time of transmission.

14.6 Assignment

The Licensee shall not be entitled to assign or transfer or purport to assign or transfer any of its rights or obligation hereunder without the prior written consent of the Licensor.

14.7 Jurisdiction

Any dispute arising out of the Agreement, including any question of law arising in connection therewith shall be referred to arbitration in Malaysia in accordance with rules of Arbitration and Appeal in force at the date of the initiation of the arbitration. Neither party hereto, nor any persons claiming under neither of them shall bring any action or other legal proceedings against the other of them in respect of any such dispute until such dispute shall first have been heard and determined by the Sole Arbitrator/Panel of Arbitrators/Appeal Board (as the case may be), in accordance with the Rules of Arbitration and Appeal.

14.8 Governing Law

The Agreement shall be governed by and construed in accordance with the laws of Malaysia in every particular including formation and interpretation and is, or other shall be deemed to have been made.

14.9 Dispute Resolution

In the event of any dispute or disagreement between the parties arising from the Agreement, both parties shall mutually resolve such dispute in good faith and in the spirit of cooperation envisaged in the Agreement. However, if the dispute or disagreement cannot be resolved mutually as aforesaid, the parties shall submit to Mediation as established under the Rules for Arbitration of the Regional Center for Arbitration Kuala Lumpur as per Clause 12.7.

14.10 Publication

In any publication relating to the promotion and/or sale of the Product, the Licensee shall where appropriate give due credit to the Licensor for the endorsement of the license but shall otherwise not permit to be used the name of the Licensor without first obtaining its consent in writing. The Licensee shall not knowingly make or permit to be made any inaccurate or misleading statement in relation to the Licensor or the Product.

14.11 Warranty

Each party warrants its power to enter into the Agreement and has obtained the necessary approvals to do so.

14.12 Rights Cumulative

- a. The rights powers privileges and remedies of the parties provided for in the Agreement are cumulative, and are independent of, and addition and without prejudice to, each other and of and to those which are available in law, in equity, by statute or otherwise; and all such rights powers privileges and remedies may be exercised as often as the parties may consider appropriate, and accordingly no exercise by a party of any rights powers privileges and remedies under the Agreement shall restrict or prejudice the exercise of any other rights power privileges and remedies granted or otherwise available to it.
- b. Further, the election by a party of any one or more of the remedies available to it shall not constitute a waiver of the right to pursue any other available remedy and if any matter shall fall within the scope of more than one of the provisions of the Agreement nothing shall prevent a party from enforcing against the other more (or most) stringent requirement.

14.13 Time

Time shall be of the essence of the Agreement in relation to all acts, matters or things required of the Licensee.

14.14 Costs

All costs legal fees and other expenses incurred in the preparation of the Agreement shall be borne and paid by the Licensor.

14.15 Successors & Assigns

The Agreement shall endure for the benefit of and be binding on the respective successors in title and permitted assigns of each party.

14.16 Change of Address

Each party shall give notice to the other of change of its address or telephone, facsimile or similar number as soon as practicable and in any event within forty-eight (48) hours of such change.

13.17 Further Agreements

Each party shall execute such agreements, deeds and documents and do or cause to be executed or done all such acts things as shall be necessary to give effect to the Agreement.

THE REST OF THIS PAGE IS INTENTIONALLY LEFT BLANK

IN WITNESS WHEREOF the parties hereto have hereunto set their hands and affixed their seals the day and year first above written.

THE COMMON SEAL of)
UNIVERSITI MALAYSIA PAHANG)
was hereunto affixed in the)
presence of :-)



[Handwritten Signature]

[Handwritten Signature]

PROFESSOR DATO' DR. MASHITAH MOHD. YUSOFF
DEPUTY VICE CHANCELLOR (RESEARCH & INNOVATION)
UNIVERSITI MALAYSIA PAHANG
6600 PEKAN
PAHANG DARUL MAKMUR
TEL: 09-424 5004 FAKS: 09 - 424 5444

PROFESOR DATO' SRI DR. DAING NASIR IBRAHIM
Ph.D. CA (M), FCPA (Aus), P.Tech
VICE-CHANCELLOR
UNIVERSITI MALAYSIA PAHANG

THE COMMON SEAL of)
(Company No))
was hereunto affixed in the)
presence of :-)



[Handwritten Signature]

[Handwritten Signature]

MUSFAKRI BIN MUSA
Director (Production)
MNR Multitech Sdn. Bhd. (1249959-T)

MOHD NAJIB BIN RAZALI
Managing Director
MNR Multitech Sdn. Bhd. (1249959-T)

SCHEDULE A**Details of the Intellectual Property**

	ITEMS	DETAILS
1.	[IP Filing No. / Grant No.]	UI 2015701032
2.	Title of Technology	A METHOD OF TREATING WASTEWATER
3.	Inventor(s)	A) MOHD NAJIB BIN RAZALI; B) PROF. DATO' DR. ROSLI BIN MOHD YUNUS
4.	Address	CANSELERI TUN ABDUL RAZAK, 26600 PEKAN, PAHANG DARUL MAKMUR
5.	Owner/ Applicant	UNIVERSITI MALAYSIA PAHANG
6.	Address	CANSELERI TUN ABDUL RAZAK, 26600 PEKAN, PAHANG DARUL MAKMUR
7.	[Filing Date / Date of Grant]	31 st MARCH 2015

SCHEDULE B**Summary Term Sheet of Technology Licensing Agreement**

No	Item	Details
1	Technology	Utility Innovation Filing No: UI 2015701032
2	Licensor	Universiti Malaysia Pahang (UMP)
3	Licensee	MNR Multitech Sdn Bhd
4	Technology Licensing Fee	RM50,000.00
5	Payment Schedule	Upon signing of agreement - RM5,000.00 Within 12 months after signing of agreement - RM45,000.00
6	Royalty	5% of gross sale of the product, to be paid every six months of the financial year
7	Duration	2 years
8	Exclusivity	Exclusive
9	Market Territory	Worldwide
10	Grant of Right	Rights to :- i) manufacture ii) produce iii) use, sell, deal iv) distribute, market, promote v : For the use of UMP's trademark/logo - company must request the usage as and when required, subject to UMP's approval
11	Intellectual Property (IP) Protection Cost	Bourne by UMP
12	Derivative IP	Any improvement made on the technology which originate from University's IP is to be owned by University except decided otherwise in future negotiation

Ruj. kami : UMP.05/28.13/6
Tarikh : 21 November 2018

En. Mohd Najib Razali
Pengarah,
MNR Multitech Sdn Bhd,
Kompleks UMP Holdings,
Lebuhraya Tun Razak,
26300 Gambang,
Pahang Darul Makmur.

Tuan,

BAYARAN YURAN PELESENAN TEKNOLOGI PRODUK *BIOCOAGULANT*

Dengan hormatnya, perkara di atas dan Perjanjian Pelesenan Teknologi bertarikh 14 November 2018 di antara Universiti Malaysia Pahang (UMP) dan pihak Tuan adalah dirujuk.

2. Sebagaimana maklum, nilai yuran pelesenan yang perlu dibayar MNR Multitech Sdn Bhd adalah seperti berikut:-

Bil.	Jangka Masa Pembayaran	Jumlah (RM)
1	Sebaik sahaja menandatangani Perjanjian Pelesenan Teknologi	5,000.00
2	Dalam tempoh 12 bulan dari tarikh penandatanganan Perjanjian Pelesenan Teknologi	45,000.00
Jumlah Keseluruhan		50,000.00

4. Oleh yang demikian, kami dengan ini menuntut untuk pembayaran sebagaimana dinyatakan di atas dijelaskan sebagaimana tempoh yang ditetapkan dengan pembayaran pertama perlu dijelaskan selewat-lewatnya 14 Disember 2018. Pihak kami juga tidak menghalang sekiranya pihak Tuan merancang untuk membuat pembayaran sekaligus untuk jumlah keseluruhan.

...1/2

UMP.05/28.13/6

4. Mohon perhatian dan tindakan lanjut pihak Tuan berkenaan perkara di atas.

Sekian, terima kasih.

“BERKHIDMAT UNTUK NEGARA”

“Memasyarakatkan Teknologi”

Saya yang menjalankan amanah,


(MOHD NIZAM BIN ABDUL RASHID)

Eksekutif

Pejabat Pemindahan Teknologi

Jabatan Penyelidikan & Inovasi

s.k.: 1. Timbalan Naib Canselor (Penyelidikan & Inovasi)
2. Pengurus Besar, JP&I
3. Jabatan Bendahari, UMP.

NSAH/pembelian/UMPlab2market



MNR Multitech Sdn. Bhd. (1249959-T)

(U/P: Mohd Najib Bin Razali)

Fakulti Kejuruteraan Kimia & Sumber Asli (FKKSA)
Universiti Malaysia Pahang (UMP)
Lebuhraya Tun Razak, 26300 Gambang
Kuantan, Pahang Darul Makmur
H/P: +6012 353 0738
Faks: +609 549 2889
e-Mail: mnrmultitech@gmail.com

Rujukan kami (*Our Ref.*) : MNR/Admin/020/11/2018

Tarikh : 26 November 2018

YH Professor Dato' Dr. Mashitah Mohd Yusoff
Timbalan Naib Canselor (Penyelidikan & Inovasi),
Universiti Malaysia Pahang,
26600 Pekan,
Pahang.
(U/P: En Mohd Nizam Bin Abdul Rashid)

YH Prof Dato',


**PEMAKLUMAN PEMBAYARAN YURAN PERLESENAN TEKNOLOGI PRODUK
BIOCOAGULANT**

Dengan segala hormatnya, surat tuntutan bayaran yuran perlesenan teknologi produk (No Rujukan: UMP.05/28.13/6) bertarikh 21 November 2018 adalah dirujuk.

2. MNR Multitech Sdn Bhd ingin memaklumkan bahawa pembayaran sebanyak RM50,000.00 telah dibuat ke akaun Bendahari Universiti Malaysia Pahang pada tarikh 23 November 2018. Beserta ini saya lampirkan baucer pembayaran yuran dan salinan bukti transaksi sebagai rujukan dan bukti pembayaran. Mohon tindakan selanjutnya dari pihak Tuan.

Sekian terima kasih.

Yang Benar,



(MOHD NAJIB BIN RAZALI)
Pengarah Urusan,
MNR Multitech Sdn Bhd.



MNR Multitech Sdn. Bhd. (1249959-T)
 (U/P: Mohd Najib Bin Razali)

Fakulti Kejuruteraan Kimia & Sumber Asli (FKKSA)
 Universiti Malaysia Pahang (UMP)
 Lebuhraya Tun Razak, 26300 Gambang
 Kuantan, Pahang Darul Makmur
 H/P: +6012 353 0738
 Faks: +609 549 2889
 e-Mail: mnrmultitech@gmail.com

PAYMENT ORDER

Our Ref : MNR/PAYORDER/031/11/2018
 Your Ref :

PAYMENT DETAILS

NAME : BENDAHARI UNIVERSITI MALAYSIA PAHANG
ADDRESS : CANSELERI TUN ABDUL RAZAK,
 UNIVERSITI MALAYSIA PAHANG,
 26600 PEKAN PAHANG.
BANK : MAYBANK BANKING BERHAD
ACCOUNT BANK: 556235301457

For admin references

Information	Note
Budget Approved	
Expenditure	
Balance	

Checked by,

DATE : 22 NOVEMBER 2018

NO. TEL : 09-4245400


Qty	Description	Rate (RM)	Total (RM)
1.	YURAN PERLESENAN TEKNOLOGI PRODUK BIOCOAGULANT	50,000.00	50,000.00

Sub-total (RM)	50,000.00
0% GST	
TOTAL (RM)	50,000.00

Method of payment

- Cheque
 Bank Transfer
 Cash

MNR Multitech Sdn Bhd,


MOHD NAJIB BIN RAZALI
 Managing Director
 MNR Multitech Sdn. Bhd. (1249959-T)

Signature & Stamp

Date: 22/11/2018



MNR Multitech Sdn. Bhd. (1249959-T)

(U/P: Mohd Najib Bin Razali)

Fakulti Kejuruteraan Kimia & Sumber Asli (FKKSA)
Universiti Malaysia Pahang (UMP)
Lebuhraya Tun Razak, 26300 Gambang
Kuantan, Pahang Darul Makmur
H/P: +6012 353 0738
Faks: +609 549 2889
e-Mail: mnrmultitech@gmail.com

PAYMENT VOUCHER

Pay to: BENDAHARI UNIVERSITI MALAYSIA
PAHANG

Maybank – 556235301457

Voucher No. : MNR/PVO/038/11/2018

Date : 22 NOVEMBER 2018

Payment by : Online Transfer

Reference No : MNR/PAYORDER/031/11/2018

In payment of:

NO.	PARTICULARS	AMOUNT (RM)
1.	YURAN PERLESENAN TEKNOLOGI PRODUK BIOCOAGULANT	50,000.00
	TOTAL	50,000.00

Admin & Finance

(Prepared by)

Director

(Approved by)

MOHD NAJIB BIN RAZALI
Managing Director
MNR Multitech Sdn. Bhd. (1249959-T)

Director

(Transfer by)

MUSFAKRI BIN MUSA
Director (Production)
MNR Multitech Sdn. Bhd. (1249658-T)

Open 3rd Party Transfer

Reprinted on 26 Nov 2018 16:49:00

Status:	Successful
Reference number:	5975532782
Transaction date:	23 Nov 2018 20:27:27
Amount:	RM50,000.00
From Account:	556011090199
To Open 3rd Party Account :	556235301457
Account Holder Name :	BENDAHARI UMP

Note: **This receipt is computer generated and no signature is required.**





Universiti
Malaysia
PAHANG
Engineering • Technology • Creativity

OFFICIAL RECEIPT

CUSTOMER COPY

UNIVERSITI MALAYSIA PAHANG
26600 PEKAN, PAHANG DARUL MAKMUR
TEL: 09-424 5300 (UNIT PENTADBIRAN)
TEL: 09-424 5358 / 5345 / 5337 (UNIT KEWANGAN PELAJAR)
TEL: 09-424 5338 / 5321 / 5360 (UNIT PEROLEHAN)

Received with compliments MNR MULTITECH SDN BHD

NAME : PREMIS K02, KOMPLEKS UMP HOLDINGS, PERSIARAN BANDAR GAMBANG, LEBUHRAYA TUN RAZAK

ADDRESS : BAYARAN YURAN PERLESENAN TEKNOLOGI PRODUK BIOCOAGULANT

PAYMENT FOR : DATE

GST REG. NO : RP1812-2566

RECEIPT NO : 24-12-2018

DATE :

NO.	CODE	DESCRIPTION	Quantity	AMOUNT (RM)
1	430204	TA HASIL ROYALTI	1	50,000.00
Ringgit Malaysia LIMA PULUH RIBU SAHAJA				Total 50,000.00

Doc No MNR MULTITECH
Type ONLINE
Bank Slip No 23/11/2018
Bank Code MAYBANK
Acct Code 210100
Bank Name Malaysian Banking Berhad

Amount 50,000.00
NULINA

Issued by

BENDAHARI
UNIVERSITI MALAYSIA PAHANG

FOR CHEQUE PAYMENT, THE CREDIT IS VALID ONLY UPON CLEARANCE.

Patent Form No.14 PATENTS ACT 1983 REQUEST FOR GRANT OF CERTIFICATE FOR UTILITY INNOVATION (Regulations 45(1)) To: The Registrar of Patents Patents Registration Office Kuala Lumpur, Malaysia	For Official Use APPLICATION NO: UI 2015701032 Filing Date: 31/03/2015 Application received on: 31/03/2015 Fee received on: 31/03/2015 Amount: RM200 *Cheque/Postal Order/Money Order/Draft/Cash No: Date of mailing:
Please submit this Form in duplicate together with the prescribed fee	Applicant's or Agent's file reference: P100-UMP-00247

THE APPLICANT(S) REQUEST(S) THE GRANT OF A CERTIFICATE FOR A UTILITY INNOVATION IN RESPECT OF THE FOLLOWING PARTICULARS:

I. Title Of Invention: A METHOD FOR TREATING WASTEWATER

II. APPLICANT(s) (the data concerning each applicant must appear in this box or, if the space insufficient, in the space below):

Name: **UNIVERSITI MALAYSIA PAHANG**
 I.C./Passport No.:
 Address: **LEBUHRAYA TUN RAZAK, GAMBANG 26300 KUANTAN MALAYSIA**
 Address for service in Malaysia: **C/O IPVOLUSI SDN. BHD., A-3-3A, CENTRIO PANTAI HILLPARK, NO. 1, JALAN PANTAI MURNI 59200 MALAYSIA**
 Nationality: **MALAYSIA**
 *Permanent residence or principal pce of business:

Telephone Number (if any): Fax Number (if any):

III. INNOVATOR:

Applicant is the innovator Yes No

If the applicant is not the innovator:

Name of innovator: **MOHD NAJIB BIN RAZALI**

Address of innovator: **FAKULTI KEJURUTERAAN KIMIA DAN SUMBER ASLI, UNIVERSITI MALAYSIA PAHANG, LEBUH RAYA TUN RAZAK, GAMBANG 26300 KUANTAN PAHANG MALAYSIA**

Applicant is the innovator Yes No

If the applicant is not the innovator:

Name of innovator: **ROSLI BIN MOHD YUNUS**

Address of innovator: **FAKULTI KEJURUTERAAN KIMIA DAN SUMBER ASLI, UNIVERSITI MALAYSIA PAHANG, LEBUH RAYA TUN RAZAK, GAMBANG 26300 KUANTAN PAHANG MALAYSIA**

A statement justifying the applicant's right to the certificate accompanies this Form:

YES NO

IV. AGENT OR REPRESENTATIVE:

Applicant has appointed a patent agent in accompanying Form No. 17 Yes No

Agent's registration No.: **PA/2010/0222**

Applicants have appointed to be their representative: **AHMAD FADZLEE BIN H A RASHID**

V. DIVISIONAL APPLICATION:

This applicaiton is divisional application

The benefit of the filling date priority date of the initial applicaiton is claimed in as much as the subject-matter of the present application is contained in the initial application identified below:

Initial Application No.:

Date of filling of initial application:

VI. DISCLOSURE TO BE REGARDED FOR PRIOR ART PURPOSES:

Additional information is contained in supplemental box:

(a) Disclosure was due to acts of applicant or his predecessor in title
 Date of disclosure:

(b) Disclosure was die to abuse of rights of applicant or his predecessor in title
 Date of disclosure:

statement specifying in more detail the facts concerning the disclosure accompanies this Form

Yes No

VII. PRIORITY CLAIM (if any):

The priority of an earlier application is claimed as follows:

Country (if the earlier application is a regional or international application, indicate the office with which it is filed):

Symbol of the International Patent Classification:

It not yet allocated, please tick

The priority of more than one earlier application is claimed:

Yes No

The certified copy of the earlier application(s) accompanies this Form:

Yes No

If No, it will be furnished by (date)

Additional information (if any)

VIII. CHECK LIST:

A. This application contains the following:

- | | |
|----------------|-----------|
| 1. request | 1 sheets |
| 2. description | 7 sheets |
| 3. claim | 1 sheets |
| 4. abstract | 1 sheets |
| 5. drawings | 2 sheets |
| Total | 12 sheets |

B. This Form as filed is accompanied by the items checked below

- (a) signed Form No. 17
- (b) declaration that inventor does not wish to be named in the patent
- (c) statement justifying applicant's right to the patent
- (d) statement that certain disclosure be disregarded
- (e) priority document (certified copy of earlier application)
- (f) cash, cheque, money order, bank draft or postal order for the payment of application fee
- (g) other documents (specify)

IX. SIGNATURE:

** (Applicant/Agent)

null

31/03/2015
(Date)

If Agent, indicate Agent's Registration No. **PA/2010/0222**

For Official Use

1. Date application received: **31/03/2015**
2. Date of receipt of correction, later filed papers or drawings completing the applicant:

* Delete whichever does not apply

** Type name under signature and delete whichever does not apply



Patent Form No.14
PATENTS ACT 1983

REQUEST FOR GRANT OF CERTIFICATE FOR UTILITY
INNOVATION
(Regulations 45(1))

To: The Registrar of Patents
Patents Registration Office
Kuala Lumpur, Malaysia

For Official Use

APPLICATION NO: **UI 2015701032**
Filing Date: **31/03/2015**
Application received on: **31/03/2015**
Fee received on: **31/03/2015**
Amount: **RM200**
*Cheque/Postal Order/Money Order/Draft/Cash No:

Date of mailing:

Please submit this Form in duplicate together with the prescribed fee

Applicant's or Agent's file reference: **P100-UMP-00247**

THE APPLICANT(S) REQUEST(S) THE GRANT OF A CERTIFICATE FOR A UTILITY INNOVATION IN RESPECT OF THE FOLLOWING PARTICULARS:

I. Title Of Invention: A METHOD FOR TREATING WASTEWATER

II. APPLICANT(s) (the data concerning each applicant must appear in this box or, if the space insufficient, in the space below):

Name: **UNIVERSITI MALAYSIA PAHANG**
I.C./Passport No.:
Address: **LEBUHRAYA TUN RAZAK, GAMBANG 26300 KUANTAN MALAYSIA**
Address for service in Malaysia: **C/O IPVOLUSI SDN. BHD., A-3-3A, CENTRIO PANTAI HILLPARK, NO. 1, JALAN PANTAI MURNI 59200 MALAYSIA**
Nationality: **MALAYSIA**
*Permanent residence or principal place of business:

Telephone Number (if any):

Fax Number (if any):

III. INNOVATOR:

Applicant is the innovator Yes No

If the applicant is not the innovator:

Name of innovator: **MOHD NAJIB BIN RAZALI**

Address of innovator: **FAKULTI KEJURUTERAAN KIMIA DAN SUMBER ASLI, UNIVERSITI MALAYSIA PAHANG, LEBUH RAYA TUN RAZAK, GAMBANG 26300 KUANTAN PAHANG MALAYSIA**

Applicant is the innovator Yes No

If the applicant is not the innovator:

Name of innovator: **ROSLI BIN MOHD YUNUS**

Address of innovator: **FAKULTI KEJURUTERAAN KIMIA DAN SUMBER ASLI, UNIVERSITI MALAYSIA PAHANG, LEBUH RAYA TUN RAZAK, GAMBANG 26300 KUANTAN PAHANG MALAYSIA**

A statement justifying the applicant's right to the certificate accompanies this Form:

YES NO

IV. AGENT OR REPRESENTATIVE:

Applicant has appointed a patent agent in accompanying Form No. 17 Yes No

Agent's registration No.: **PA/2010/0222**

Applicants have appointed to be their representative: **AHMAD FADZLEE BIN H A RASHID**

V. DIVISIONAL APPLICATION:

This application is divisional application

The benefit of the filing date priority date

of the initial application is claimed in as much as the subject-matter of the present application is contained in the initial application identified below:

Initial Application No.:

Date of filing of initial application:

VI. DISCLOSURE TO BE REGARDED FOR PRIOR ART PURPOSES:

Additional information is contained in supplemental box:

(a) Disclosure was due to acts of applicant or his predecessor in title

Date of disclosure:

(b) Disclosure was due to abuse of rights of applicant or his predecessor in title

Date of disclosure:

statement specifying in more detail the facts concerning the disclosure accompanies this Form

Yes No

VII. PRIORITY CLAIM (if any):

The priority of an earlier application is claimed as follows:

Country (if the earlier application is a regional or international application, indicate the office with which it is filed):

Symbol of the International Patent Classification:

It not yet allocated, please tick

The priority of more than one earlier application is claimed:

Yes No

The certified copy of the earlier application(s) accompanies this Form:

Yes No

If No, it will be furnished by (date)

Additional information (if any)

VIII. CHECK LIST:

A. This application contains the following:

- | | |
|----------------|----------|
| 1. request | 1 sheets |
| 2. description | 7 sheets |
| 3. claim | 1 sheets |
| 4. abstract | 1 sheets |

5. drawings
Total

2 sheets
12 sheets

- B. This Form as filed is accompanied by the items checked below
- (a) signed Form No. 17
 - (b) declaration that inventor does not wish to be named in the patent
 - (c) statement justifying applicant's right to the patent
 - (d) statement that certain disclosure be disregarded
 - (e) priority document (certified copy of earlier application)
 - (f) cash, cheque, money order, bank draft or postal order for the payment of application fee
 - (g) other documents (specify)

IX. SIGNATURE:

~~** (Applicant/Agent)~~

null

31/03/2015

(Date)

If Agent, indicate Agent's Registration No. **PA/2010/0222**

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1. Date application received: **31/03/2015**

2. Date of receipt of correction, later filed papers or drawings completing the applicant:

* Delete whichever does not apply

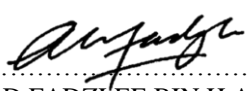
** Type name under signature and delete whichever does not apply



Attached Document

[D037-656889-00247 ABSTRACT.pdf](#)
[D038-656889-00247 FIGS.pdf](#)
[D062-656889-00247 DESCRIPTION.pdf](#)
[D063-656889-00247 CLAIMS.pdf](#)
[D093-656889-00247 PF22.pdf](#)

-None-

Patents Form No. 22 PATENTS ACT 1983 STATEMENT JUSTIFYING THE APPLICANT'S RIGHT TO A PATENT/CERTIFICATE (Regulations 10(2)) To : The Registrar of Patents Patents Registration Office Kuala Lumpur, Malaysia	<p style="text-align: center;">For Official Use</p> APPLICATION NO. : Filing Date : Request received on : Date of mailing
Please submit this Form in duplicate	Applicant's or Agent's file reference P100-UMP-00247
I. IN THE MATTER OF : Patent Application No. : Filing Date : Certificate Application No. : Filing Date :	
II. TITLE OF INVENTION : <u>A METHOD FOR TREATING WASTEWATER</u>	
III. APPLICANT (S) : Name : <u>UNIVERSITI MALAYSIA PAHANG</u> Address : <u>LEBUHRAYA TUN RAZAK, 26300 GAMBANG, KUANTAN, PAHANG DARUL MAKMUR</u>	
IV. I/we believe that the inventor(s)/innovator(s) of the above mentioned application is as follows : 1) MOHD NAJIB BIN RAZALI 2) ROSLI BIN MOHD YUNUS	
V. Statement justifying the applicant's right to a patent/certificate : <u>MOHD NAJIB BIN RAZALI and ROSLI BIN MOHD YUNUS are employees of UNIVERSITI MALAYSIA PAHANG and the invention was made in the course of their employment with UNIVERSITI MALAYSIA PAHANG.</u>	
VI. ADDITIONAL INFORMATION accompanies this Form : Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
VII. SIGNATURE  <u>30-MARCH-2015</u> AHMAD FADZLEE BIN H A RASHID ** (Applicant /Agent) (Date) If Agent, indicate Agent's Registration No. <u>PA/2010/0222</u>	

* Delete whichever does not apply

** Type name under signature and delete whichever does not apply



MNR Multitech Sdn. Bhd. (1249959-T)
(U/P: Mohd Najib Bin Razali)

Fakulti Kejuruteraan Kimia & Sumber Asli (FKKSA)
Universiti Malaysia Pahang (UMP)
Lebuhraya Tun Razak, 26300 Gambang
Kuantan, Pahang Darul Makmur
H/P: +6012 353 0738
Faks: +609 549 2889
e-Mail: mnrmultitech@gmail.com

QUOTATION

Customer details

TO : ISNAS Resources Sdn. Bhd.
No 16, Tingkat 1, Lorong Seri Damai
Aman 38, 25150 Kuantan, Pahang.
ATTN : Ir Jazmi Mohamed Jabar
TEL : 016-9801073

Quote No : MNR-QT-180116-01

Issued by : Dr Mohd Aizudin bin Abd Aziz

Date : 16/01/2018

No.	Description	Qty	Unit Price (RM)	Total Price (RM)
1	pH value	1	10	10
2	BOD5 @ 20°C	1	35	35
3	COD	1	30	30
4	Total Suspended Solids (TSS)	1	30	30
5	Oil & Grease	1	35	35
6	Ammoniacal Nitrogen (as N)	1	30	30
7	Package A : Environmental Quality Act 1974 , List of 31 Tested Parameter attached in appendix	1	400	400

Terms & Conditions :

Validity : 30 days

Payment: 30% before analysis, full payment before report.

MNR MULTITECH SDN BHD.

Appendix 1

Package A Wastewater (Environmental Quality Act 1974)

No	Parameter	Price (RM)
1	pH value	400
2	Temperature	
3	COD	
4	BOD5 @ 20°C	
5	Arsenic (as As)	
6	Boron (as B)	
7	Suspended Solids	
8	Cadmium (as Cd)	
9	Chromium (as Cr ³⁺)	
10	Chromium (as Cr ⁶⁺)	
11	Copper (as Cu)	
12	Lead (as Pb)	
13	Total Iron (as Fe)	
14	Manganese (as Mn)	
15	Nickel (as Ni)	
16	Mercury (as Hg)	
17	Tin (as Sn)	
18	Zinc (as Zn)	
19	Free Chlorine (as Cl ₂)	
20	Cyanide (as CN ⁻)	
21	Silve (as Ag)	
22	Aluminium (as Al)	
23	Phenol	
24	Sulphide	
25	Selenium (Se)	
26	Barium (as Ba)	
27	Fluoride	
28	Formaldehyde	
29	Colour	
30	Oil & Grease	
31	Ammoniacal Nitrogen	



MNR Multitech Sdn. Bhd. (1249959-T)

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Fakulti Kejuruteraan Kimia & Sumber Asli (FKKSA)
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H/P: +6012 353 0738
Faks: +609 549 2889
e- Mail: mnrmultitech@gmail.com

QUOTATION

Customer details

To : Halliburton Energy Services (M) Sdn Bhd
Warehouse No 21, Phase 2
Kemaman Supply Base,
24007 Kemaman Terengganu.
Attn : Ms Norashikin Mohammed
Tel : 09-862 8000

Quotation No : MNR/HB/QT/06/03/2019

Quoted By : Mr Mohd Najib Razali

Date : 19 March 2019

Dear Ms,

Thank you for your enquiry and we are pleased to quote you the following items.

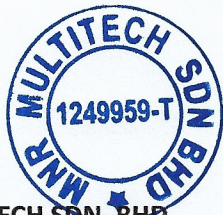
No.	Description	Qty	Unit Price (RM)	Total Price (RM)
1.	MNRg-Treat™ - 25 Litre	8	750.00	6,000.00
2.	Inclusive of Transportation			
			Tax	-
			Others	-
			Total (RM)	6,000.00

Terms & Conditions:

Validity : 30 days
Payment : Cash On Delivery
Delivery : 2-4 Weeks

Regards,

MNR MULTITECH SDN. BHD.



PRODUCTS OF UNIVERSITI MALAYSIA PAHANG (UMP)

Recovery of mineral oil from waste emulsion using electrocoagulation method

Mohd Najib Razali¹, Muhamed Yusuf Shahul Hamid², Abdul Aziz Mohd Azoddein³

^{1,2,3}*Faculty of Chemical & Natural Resources Engineering, University Malaysia Pahang, Lebuhraya Tun Razak, 26300 Kuantan, Pahang, MALAYSIA.*

Abstract. This paper presents a research to recover mineral oil from industrial waste emulsion. This research also evaluates the standard of water produced after the oil recovery. The ecosystem could be polluted if this waste is not treated prior to discharge. The equipment needed for this experiment is power supply (generator), connecting wire and metal plate for providing the coagulant. The chosen plates were aluminium and iron plate. The power supply will be connected to the plate producing anode (positive terminal) and cathode (negative terminal). Both plates are immersed into a beaker containing waste emulsion. The charge supplied by the current will cause the aluminium or ferum to dissipation and became ions. These ions will attract the oil to flock together and float at the surface. The water will then filter by using filter paper. Electrocoagulation was done without addition of chemical thus can prevent the hazard from the chemicals. The samples was sent for oil and grease test. The optimum time needed for recovery of oil was 3 hours. The percentage recovery reach constant trend of 95% afterwards. When the power consumption increases, the percentage recovery also increases. However, the current should be lower than 0.5 ampere as it is the limit that human body can withstand. Thus, power consumption of 27.5 Watt was chosen as optimum value. The oil recovery of at power consumption at 27.5W is 96%. The best plate in the process was the aluminium pair which can recover more than ferum plate. The present work concludes the promising future for waste water treatment by usage of electrocoagulation technique.

1 Introduction

Emulsions are a disperse systems consisting of two immiscible liquids. When oil is dispersed over continuous phase such as water, oil in water emulsion are formed [1]. The oil in water emulsions can classified into two categories, namely straight oils and soluble oils [2]. Both soluble oil and straight oil is used as cutting fluids in metal- mechanical industries to aid cutting processes, to prevent corrosion, and to improve lubrication, cooling, surface cleaning, and tool life. The cutting fluid is done by mixing small portion of cutting oil with larger portion of water.

When used in machining processes, this cutting fluid, oil in water emulsions loses its properties and effectiveness due to the thermal degradation and contamination. The replacement of these emulsions is responsible for the production of oily wastewaters. If this oil is landfilled or discharged directly without treatment, it can contaminate lakes and also river. Therefore these oils must be removed before the water is discharge or reuse [3].

The common treatment of this wastewater is membrane filtration and emulsion breaking. Membrane filtration has a problem with fouling of the membrane while emulsion breaking will need other treatment to

finish the process. Electrocoagulation technique does not involve addition of chemical and is expected to produce clean water that does not need to further treat. Greenhouse gases and activated sludge is some common problems occur during treatments of wastewater using biological and chemical method. Other than that, it also required large area compared to efficiency of residual chemicals removal.

Electrocoagulation, in the other hand, removes pollutants effectively in wastewater treatment system [4]. Electrocoagulation can be used to treat many type of waste water, provided that the contaminants can react to electric field in a redox reaction. Some of electrocoagulation advantages are can manage broad type of waste, sludge reduction, and easy operating procedure with less complex control. Another benefit of electrocoagulation is hydrogen production. This gas product if been collected can act as revenue to compensate the operational cost [5].

Electrocoagulation involves three major mechanisms formulation of coagulants by electrolytic oxidation of sacrificial anodes, destabilization of the contaminants and particulate suspension, breaking of emulsions and aggregation of the destabilized phases to form a floc [6]. Electrocoagulation has been documented positively to treat the wastewater from

steam cleaners, pressure washers, textile manufacturing, metal platers, meat and poultry processors, commercial laundry, mining operations, municipal sewage system plants and palm oil industrial effluents.

The objectives of this research is to study the effect of power (Watt), time (hours) and plate combinations to the efficiency of oil recovery from waste emulsion. In view of the fact that, no work has been done in the literature regarding the treatment of emulsion using real effluent, whereby many other studies were done using homemade synthetic effluent. Another objective is to compare treated water quality with Standard B of Industrial Effluent, Department of Environment. This is done by characterize the waste emulsion from Manufacturing and Industrial waste. The voltage was manipulated to identify the best power consumption (Watt) in order to achieve the highest oil separation efficiency in fastest time. Then, the effect of time on oil separation efficiency was studied by varying time of one to five hours with interval of one hour. Comparison of effect of using aluminium and zinc plate to find the best combination is included. Lastly, treated water quality was compared with standard A or B according to Environmental Quality Act.

2 Materials and Method

2.1 Materials

The raw material that is used for this experiment is waste emulsion from manufacturing and industrial waste. The waste is from Industrial Park, Gebeng, which had been used as lubricant and cooling oil in the process of metal drilling.

2.2 Experimental Set-up

Experiments were conducted in a 2L beaker with the power controlled by electrocoagulation unit manufactured by Watan Technology Sdn, Bhd. The setup of equipment is done by connecting two crocodile clip wire to the power supply. The other end of the wires will be connected to plate made of aluminium and also iron. The plate connected to positive terminal of the power supply is called anode while the plate connected to negative terminal of the power supply is called cathode [7]. Both anode and cathode will be immersed in 2-litre beaker containing the waste emulsion with inter-gap of 1.5 to 3.5 cm between the plates to avoid short circuit. The power supply is then turned on and the voltage will be set to 20 volt while the current will be set to 1 amp for the first trial. However, the current could not be controlled. Thus, the power value is taken according to its respective value for each voltage. The waste emulsion was leave to coagulate for three hours before filtration. The voltage was varied from 20 to 60 V. The current vary from 0 to 6 Amps.

2.3 Filtration Process

Two step filtration processes were used in this experiment. The first filtration was done by using mesh filter. This kind of filter will trap the coagulated oil and help to reduce time needed for filtration process in general. Second stage filtration was done by flowing the water from first filtration through a filter paper. This step will trap remaining small particle oil which could not be filtered from first stage. After each filtration, the treated water is kept in bottle and was kept in refrigerator at temperature 4 degree Celsius to prevent bioactivities from occurring.

2.4 Properties Analysis

Oil and grease content was determined by using American Public Health Association 5520B method (APHA5520b). Samples were adjusted to pH less than two by using hydrochloric acid, HCl or sulphuric acid, H₂SO₄. Water samples are sequentially extracted with three aliquots of hexane in a separator funnel. Samples are shaken vigorously for 2 minutes per extraction. The first aliquot of hexane is used to rinse the sample container so that its entire contents are transferred to the extraction vessel. The ratio of solvent to sample was set to be 50 mL of hexane for one extraction per 1 L of sample. The solvent extracts are passed through a drying funnel containing anhydrous sodium sulphate and combined together. Emulsions frequently occur during the extraction of many oil and grease samples. Precautions must be taken to ensure that adequate extraction efficiency is obtained [8]. For Oil and Grease, the extract is evaporated to dryness at ambient temperature. Following evaporation, residual water, solvent, and other volatiles are removed by heating in an oven at 50-60°C for 30-60 minutes or by continued evaporation at ambient temperature, prior to gravimetric determination of the residue using at least a 4 place balance. If the final evaporation step is done at ambient temperature, gravimetric measurements must be done to constant weight [9].

3 Results and Discussion

The percentage of oil recovered from waste emulsion using electrocoagulation was studied by varying three parameters which were the power consumption, the time for electrocoagulation and also the type of plate used. Initially the voltage and the current were to be tested separately. However, as we increase the voltage, the current also increase. Thus power which is the product of current and voltage were used as manipulative variable. The plates available are aluminium and iron which were compared.

3.1 Effect of Power Consumption

Power consumption was chosen as important factor in electrocoagulation process. The power consumption is the product of voltage and current, $V=IR$. The voltage is

set to the electrocoagulation unit and the responding current was noted. The voltage ranged from 20V to 60V and the power was shown in table below. Other parameters were kept constant during the experiment. The time for electrocoagulation was 3 hours and the plate was aluminium pair with inter-gap of 5cm. No adjustment was done to the pH value and the experiment was done at room temperature.

Table 1: Effect of power towards oil recovery percentage

Power (Watt)	Oil Content before treatment (mg/L)	Oil Content after Treatment (mg/L)	% Recovered
0	642	642	0
5	642	32.3	94.97
6.9	642	37.6	94.14
18	642	29.1	95.47
27.5	642	26.1	95.93
34.2	642	10.8	98.31

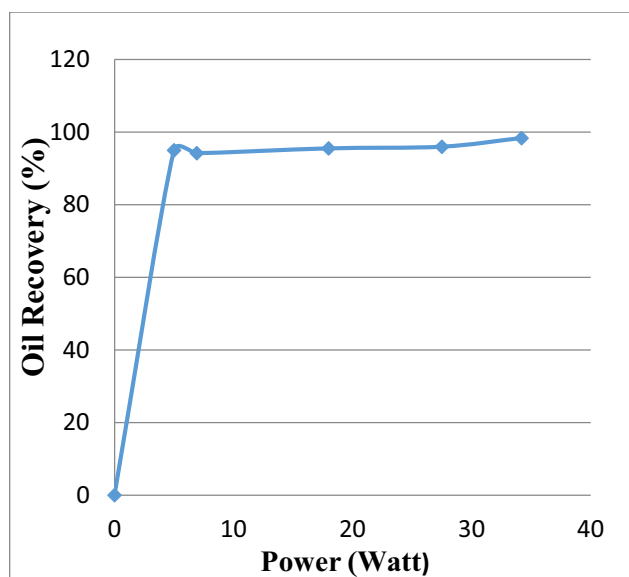


Figure 1: Oil recovery rate for several power adjustments

Table 1 and Figure 1 show the effect of power to oil recovery of oil from waste emulsion. At power of 5 watt, the recovery of oil is already very high which is 95 percent while at the highest power consumption of 34.2 Watt; the percentage recovery of oil is more than 98 percent. The efficiency of oil recovery is mainly affected by the current density. Current density is defined as current applied per unit surface area of the electrode. Generally, more applied current density results in more removal of solutes, after some value of current density, the dissipation of metal became saturated by the increase of current density [10]. The current control the amount of dissociated of aluminium into the waste water [11].

The current density not only determines the metal coagulant dissolution rate but also determines the bubble production rate and the size of the bubble generated in the electrode reaction, which influences the treatment efficiency of the electrocoagulation. As the current increase, the amount of aluminium dissipate into the waste emulsion also increases. Thus the amount of smaller flocculation will increase and the oil can coagulate better. However, higher current might cause fatality when accident happens. The safe levels of current as stated by [12] are 0.5 for direct current and 0.1 for alternating current.

3.2 Effect of Electrocoagulation Time

Coagulant concentration produced by electrolysis on anodes is directly proportional to the electric charge added per volume. Coagulant produced by electrolysis can be calculated according to Faraday's law when current and treatment times are known. Electrolysis time also affects the treatment efficiency of the electrochemical process as it may increase or decrease with current density or pH of the sample [13]. Time for coagulation to take place was varied from one hour to five hours with interval of one hour with power maintained at 27.5 Watt. The plate for each run was aluminium pair with inter-gap of 5cm. No adjustment was done to the pH value and the experiment was done at room temperature. The results were display in table 2.

Table 2: Oil recovery rate for several time parameters

Time (Hour)	Oil Content before treatment (mg/L)	Oil Content after Treatment (mg/L)	% Recovered
0	642	642	0
1	642	642	0
2	642	35	94.55
3	642	29.1	95.47
4	642	29	95.48
5	642	26	95.95

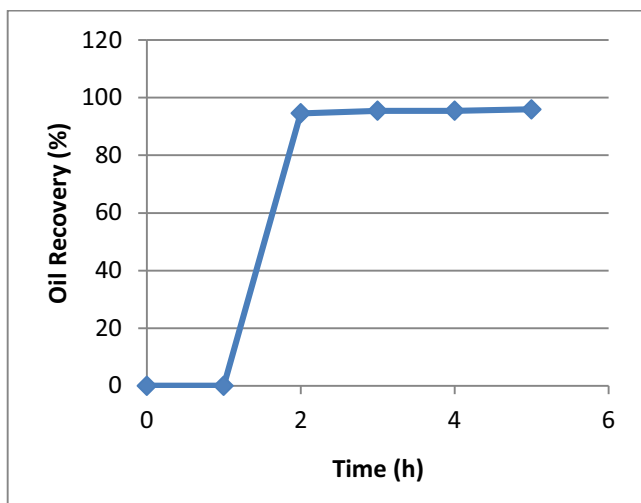


Figure 2: Effect of time towards oil recovery rate

Figure 2 demonstrate the effect of time on recovery of oil. From duration 1 to 2 hour, the oil recovery increase rapidly from 0% to 94.54% and start to constant at 3 hours and above. Time of electrocoagulation is one of the most important parameter in the process of electrocoagulation. It is the time to generate metal hydroxides and to complete coagulation of the impurities [14]. For 1 hour electrocoagulation time, the treated water was not able to filter. This may be due to the particle did not have enough time to form floc and coagulate together. Thus the oil and grease content is assumed to be the same as initial oil and grease content which is 642 mg/L. At time more than 3 hours, the recovery percentages remain constant at 95% which shows the limit of the electrocoagulation method. The reaction might have ended as per the observation; the water is separated from the oil and became clear. The water also became hot at longer time.

3.3 Effect of Metal Plate

Plate selection was the last parameter studied in this paper. Electrode material plays vital roles for the maximizing the efficiency of the EC process. Aluminium and ferum were selected since it was proven applicable to treat oily wastewater [15] at room temperature and the inter-gap was maintained at 5cm. No adjustments were done to initial pH. The power was maintained at 27.5 Watt with electrocoagulation time of 3 hours.

Table 3: Plate combination effect on oil recovery

Plate Combination	Oil Content before treatment (mg/L)	Oil Content after Treatment (mg/L)	% Recovered
Al/Al	642	26.1	95.93
Al/Fe	642	30	95.32
Fe/Fe	642	56	91.28

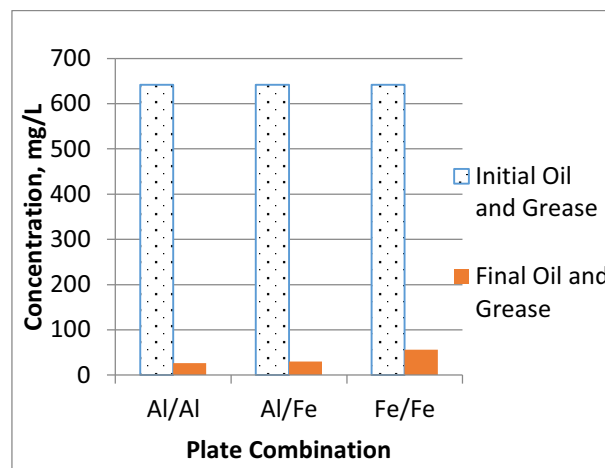


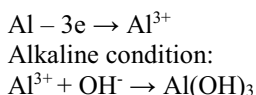
Figure 3: Oil and Grease content before and after treatment for several plate combinations

Figure 3 portrays oil content in the waste emulsion before treatment and after treatment. From the graph, it shows all combination of plate can be used to recover the oil. The oil recovery using aluminium pair was the highest with 96% and the lowest oil recovery was by using iron pair with 90% oil recovery percentage. [15] stated that aluminium and iron is the most suitable electrode for wastewater that contains metal. According to electronegativity series, the position of iron is lower than aluminium [16]. As the list goes down, the electronegativity increases. This means the tendency for the element to ionize decrease. Thus iron is harder to dissociate to become iron ion as compared to aluminium. As aluminium can dissipate easily it, the concentration of aluminium is the water increase and can coagulate more than iron.

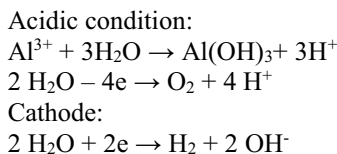
There are many chemical reactions that take place during the electrocoagulation process. Metal anodes are reduced during electrocoagulation process will produce hydroxide complexes. The hydroxide complex is what will move the mechanism of flocculation of suspended solids into stable form. Dissociation of water by EC generate hydroxide ions which are known as one of the most reactive aqueous radical specie and this radical has the ability to oxidize organic compounds because of its high affinity value of 136 kcal [17]. Production of oxygen and hydrogen as a result of electrolytic dissociation of water molecules cause emulsified oil droplets to be freed from water molecules making a separate layer on the surface.

In principle, it is based on the production of metallic hydroxide flocs as coagulants within the sample during electrochemical reaction through dissolution of the anode material. Electrocoagulation differs from chemical coagulation (CC) mainly in the mode of introduction of coagulants. Whereas point addition of coagulants is done in chemical coagulation, coagulants are generated across a wide range of electrode surface in electrocoagulation. Following reactions are carried out at different electrodes:

Anode:

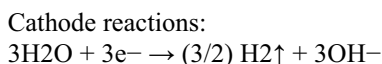
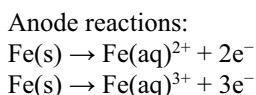


Electrocoagulation for Treatment of Industrial Effluents and Hydrogen Production



Al^{3+} and OH^- ions generated by electrode reactions (1) and (2) react to form various monomeric species such as $\text{Al}(\text{OH})_2^+$, $\text{Al}(\text{OH})_2^+$, $\text{Al}(\text{OH})_2^+$, and $\text{Al}(\text{OH})_4^-$ polymeric species such as $\text{Al}_6(\text{OH})_{15}^{3+}$, $\text{Al}_7(\text{OH})_{17}^{4+}$, $\text{Al}_8(\text{OH})_{20}^{4+}$, $\text{Al}_{13}\text{O}_4(\text{OH})_{24}^{7+}$ and $\text{Al}_{13}(\text{OH})_{34}^{5+}$, which transform finally into $\text{Al}(\text{OH})_3$ according to complex precipitation kinetics. Several interaction mechanisms are possible between organic molecules and hydrolysis products, and the rates of these depend on the pH of the medium and types of ions present. Freshly formed amorphous $\text{Al}(\text{OH})_3$ sweep flocs have large surface areas, which is beneficial for a rapid adsorption of soluble organic compounds and trapping of colloidal particles. These flocs polymerize as $\text{Al}_n(\text{OH})_{3n}$ and they are removed easily from the aqueous medium by sedimentation and by H_2 flotation [18].

The following main reactions occur in the EC when Fe electrode is used:



Similarly, ferric ions generated by electrochemical oxidation of iron electrode may form monomeric species $\text{Fe}(\text{OH})_2^+$, $\text{Fe}(\text{OH})_2^+$, $\text{Fe}(\text{OH})_6^{3+}$, $\text{Fe}(\text{H}_2\text{O})_5\text{OH}^{2+}$, $\text{Fe}(\text{H}_2\text{O})_4\text{OH}_2^+$, $\text{Fe}(\text{OH})_3$, and $\text{Fe}(\text{OH})_4^-$, and polymeric species $(\text{Fe}_2(\text{H}_2\text{O})_8\text{OH})_{24}^{4+}$, $\text{Fe}_2(\text{H}_2\text{O})_6\text{OH}_{42}^{2+}$, depending on the pH of the aqueous medium in the EC process. When Fe electrodes is used the amount and the variety of hydrolysis products formed by anodic dissolution depends significantly on electrolysis time. The resulting metal hydroxide polymers have amorphous structures with very large surface and positive charges. They are hydrophobic, causing them to sorb onto the organic anionic particle surfaces and become insoluble. Iron has a strong tendency to form insoluble complexes with a number of ligands, especially with polar molecules and with oxygen-containing functional groups such as the hydroxyl or carboxyl groups. These provide a local negative charge, which reacts with the iron cations. Charge neutralization leads to colloid destabilization with the consequent precipitation of the iron cations and organic anions. This induces sweep floc coagulation,

the adsorption and bridging enmeshment of both particulate organic and inorganic solids to form large, amorphous flocs. Dissolved organic compounds are removed primarily by adsorption onto by hydroxide surface [18].

3.4 Characterization of Waste emulsion and Treated Waste Water

The water produces from this treatment need to be examined further before we can conclude that the electrocoagulation method was suitable for oil recovery process from waste emulsion. Thus the optimum conditions from previous experiment were selected for this analysis purpose. The electrode chosen was aluminium pair with inter-gap of 5 cm. The time for coagulation was set to 3 hours and the power used was 27.5 Watt. No adjustment was done to the pH value and the experiment was done at room temperature.

Table 4: Comparison of treated waste water and raw waste emulsion

Parameter	Unit	Standard B	Waste Emulsion	Treated Waste Water
Percentage of Oil	%	-	0.13	0.004
Percentage of Water	%	-	99.87	99.97
Temperature	°C	40	-	
pH Value	-	5.5-9.0	3.48	6.99
BODS at 20°C	mg/L	50	58	72.5
COD	mg/L	100	More than 1500	130
Suspended Solid	mg/L	100	1341	27
Arsenic	mg/L	0.10	Not Detected	Not Detected
Cyanide	mg/L	0.10	Not Detected	Less than 0.01
Phenol	mg/L	1.0	Not Detected	1.44
Free Chlorine	mg/L	2.0	Not Detected	0.28
Sulphide	mg/L	0.5	0.245	
Oil and Grease	mg/L	10.0	642	21.3

Table 4 shows the comparison between raw waste emulsion and treated waste emulsion using electrocoagulation method. The initial percentage of oil in the solution was 0.13% and the remaining was water. From the table, the percentage of oil decrease from 0.13% to 0.004%. This indicates the electrocoagulation method was successful in removing oil from the waste emulsion. The oil and grease content were reduced greatly from 642 to 21.3 mg/L. The percentage of oil removed was 96.6 %

The water became clearer after electrocoagulation process and the pH value of the treated waste emulsion was around the neutral value, pH7. The Chemical Oxygen Demand (COD) value was almost complies with Standard B of Environmental Quality Act (EQA). COD was removed from more than 1500 to 130 mg/L. The total suspended solid (TSS) also decrease to accepted level of below 100 mg/L. The final value of TSS was 27 mg/L

However, some parameter shows increase values from the EQA standard. Phenol, Chlorine and Cyanide were not detected in the raw waste emulsion but were detected after the treatment. Cyanide and chlorine were within the standard B while phenol values increase above the limit. The treated waste water contains 1.44 mg/L phenol which was 0.44 mg/L above the standard.

The biological oxygen demand (BOD) also shows increased value from 58 to 72.5 mg/L. This might be due to storage problem before the sample was sent for analysis. The arsenic content remains undetected for both waste emulsion and treated waste emulsion.

4 Conclusions

The present exploratory works showed that electrocoagulation can be made into treatment method for oily wastewater with foreign substance such as metal particle. The optimum condition could be chosen from the highest percent of oil recovery. The most suitable plate combination would be aluminium with aluminium pair as it has more tendencies to dissociate into the wastewater as compared to iron plate. The optimum time needed for coagulation of 1.25L of waste sample is 3 hours as percentage recovery reach constant trend of 95% afterwards. According to figure 1, oil was recovered the most at the highest power. However, the optimum value should be chosen at current less than 0.5 Amp in order to be more environmental friendly. Current more than 0.5 Amp could be fatal to human being. Thus Power value of 27.5 Watt should be chosen as the current is less than 0.5 Amp but still with a high oil recovery of 96%. The cost for electrocoagulation is will also be lower at rate of 2.3 cent/L. However, when compared with Standard B of Environmental Quality Act, the treated water oil and grease content is higher than 10 mg/L. This indicates that the treated water needs further treatment to comply with the standard B.

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MNR Multitech Sdn. Bhd.

VISION:

- ✓ A prominent green technology-based company in Malaysia.

MISSION:

- ✓ Provide world-class green technology products, research, analysis, technical services, and consultation towards a better environment.

Company services and products:

- ✓ Water treatment consultation
- ✓ Wastewater treatment consultation
- ✓ Raw Water treatment
- ✓ Wastewater treatment
- ✓ Water analysis (40 parameters available or both raw water and wastewater)

mnrmultitech@gmail.com

G-TREAT

An Innovative Green Technology Wastewater Treatment

This system treats the wastewater from various industries by using coagulation agent to separate residue oil and water.

Advantages:

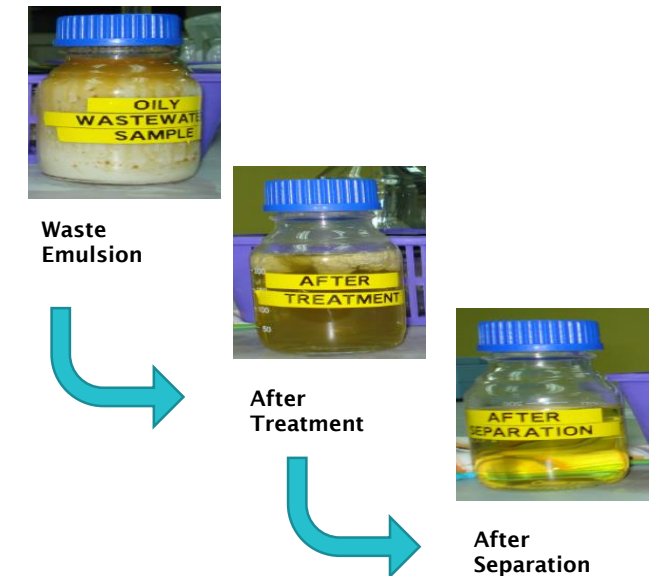
- ✓ Comply with Environmental Quality (Sewage & Industrial Effluent) Regulations 2009
- ✓ Use Natural Coagulant
- ✓ Environmentally friendly due to low pH, low temperature (no heating), and low pressure.
- ✓ Easy to handle, maintain, and service the system.
- ✓ Low maintenance cost.

Awards:

- ✓ **Gold Medal, Innovation and New Product Exposition, United States of America (USA) (INPEX 2013). Title : Innovative Green Technology Waste Emulsion Treatment System (From Waste To Wealth)**
- ✓ **Gold Medal, 24th International Invention, Innovation & Technology Exhibition (ITEX 2013). Title : Innovative Green Technology Waste Emulsion Treatment System (From Waste To Wealth)**
- ✓ **Silver Medal, Seoul International Invention Fair 2017 (SIIF 2017). Title: G-Treat: Smart System For Water Sustainability**

The Environmental Quality Act

Parameter	Unit	Standards	
		A	B
Temperature	C	40	40
pH Value	-	6.0-9.0	5.5-9.0
BOD5 at 20C	mg/l	20	50
COD	mg/l	50	100
Suspended Solids	mg/l	50	100
Mercury	mg/l	0.005	0.05
Cadmium	mg/l	0.01	0.02
Chromium, Hexavalent	mg/l	0.05	0.05
Arsenic	mg/l	0.05	0.10
Cyanide	mg/l	0.05	0.10
Lead	mg/l	0.10	0.5
Chromium, Trivalent	mg/l	0.20	1.0
Copper	mg/l	0.20	1.0
Manganese	mg/l	0.20	1.0
Nickel	mg/l	0.20	1.0
Tin	mg/l	0.20	1.0
Zinc	mg/l	1.0	1.0
Boron	mg/l	1.0	4.0
Iron (Fe)	mg/l	1.0	5.0
Phenol	mg/l	0.001	1.0
Free Chlorine	mg/l	1.0	2.0
Sulphide	mg/l	0.50	0.5
Oil and Grease	mg/l	Not Detectable	10.0



The wastewater treated using G-Treat will comply with The Standard B Effluent Discharge Environmental Quality Act 1974 imposed by the Department of Environment, Malaysia.

(Department of Environment Malaysia)

Sales Record

No	Companies	Total Payment (RM)	Invoice No	Payment Date
1	ISNAS water analysis Batch 1	340.00	MNR/ISNAS/INVS/002/03/2018	5/3/2018
2	ISNAS water analysis Batch 2	340.00	MNR/ISNAS/INVS/001/03/2018	30/3/2018
3	ISNAS water analysis Batch 3	170.00	MNR/ISNAS/INVS/003/04/2018	6/4/2018
4	ISNAS water analysis Batch 4	170.00	MNR/ISNAS/INVS/004/04/2018	6/4/2018
5	ISNAS water analysis Batch 5	170.00	MNR/ISNAS/INVS/005/04/2018	10/4/2008
6	ISNAS water analysis Batch 6	340.00	MNR/ISNAS/INVS/007/04/2018	26/4/2018
7	ISNAS water analysis Batch 7	170.00	MNR/ISNAS/INVS/008/05/2018	17/5/2018
8	ISNAS water analysis Batch 8	170.00	MNR/ISNAS/INVS/009/05/2018	23/5/2018
9	ISNAS water analysis Batch 9	340.00	MNR/ISNAS/INVS/010/05/2018	31/5/2018
10	ISNAS water analysis Batch 10	170.00	MNR/ISNAS/INVS/011/06/2018	8/6/2018
11	ISNAS water analysis Batch 11	170.00	MNR/ISNAS/INVS/012/06/2018	8/6/2018
12	ISNAS water analysis Batch 12	510.00	MNR/ISNAS/INVS/013/06/2018	2/7/2018
13	ISNAS water analysis Batch 13	510.00	MNR/ISNAS/INVS/014/07/2018	9/7/2018
14	ISNAS water analysis Batch 14	170.00	MNR/ISNAS/INVS/015/07/2018	24/7/2018
15	ISNAS water analysis Batch 15	170.00	MNR/ISNAS/INVS/016/07/2018	24/7/2018
16	ISNAS water analysis Batch 16	680.00	MNR/ISNAS/INVS/017/08/2018	8/8/2018
17	ISNAS water analysis Batch 17	170.00	MNR/ISNAS/INVS/018/08/2018	14/8/2018
18	ISNAS water analysis Batch 18	340.00	MNR/ISNAS/INVS/019/08/2018	3/9/2018
19	ISNAS water analysis Batch 19	170.00	MNR/ISNAS/INVS/020/09/2018	20/9/2018
20	ISNAS water analysis Batch 20	170.00	MNR/ISNAS/INVS/021/09/2018	20/9/2018
21	ISNAS water analysis Batch 21	170.00	MNR/ISNAS/INVS/022/09/2018	20/9/2018
22	ISNAS water analysis Batch 22	170.00	MNR/ISNAS/INVS/023/09/2018	27/9/2018
23	ISNAS water analysis Batch 23	340.00	MNR/ISNAS/INVS/025/10/2018	25/10/2018
24	Puting Jaya Batch 1	170.00	MNR/PUTINGJAYA/INVS/026/10/2018	4/12/2018
25	Puting Jaya Batch 2	340.00	MNR/PUTINGJAYA/INVS/027/11/2018	4/12/2018

26	Puting Jaya Batch 3	510.00	MNR/PUTINGJAYA/INVS/028/12/2018	20/12/2018
27	Puting Jaya Batch 4	340.00	MNR/PUTINGJAYA/INVS/029/01/2019	24/1/2019
28	Puting Jaya Batch 5	170.00	MNR/PUTINGJAYA/INVS/030/01/2019	31/1/2019
29	Puting Jaya Batch 6	340.00	MNR/PUTINGJAYA/INVS/031/02/2019	28/2/2019
30	Puting Jaya Batch 7	340.00	MNR/PUTINGJAYA/INVS/032/02/2019	28/2/2019
31	Puting Jaya Batch 8	170.00	MNR/PUTINGJAYA/INVS/033/02/2019	16/4/2019
32	Puting Jaya Batch 9	340.00	MNR/PUTINGJAYA/INVS/034/02/2019	18/3/2019
33	Puting Jaya Batch 10	340.00	MNR/PUTINGJAYA/INVS/035/03/2019	16/4/2019
34	Puting Jaya Batch 11	510.00	MNR/PUTINGJAYA/INVS/036/04/2019	16/4/2019
35	Puting Jaya Batch 12	340.00	MNR/PUTINGJAYA/INVS/037/04/2019	29/5/2019
36	Puting Jaya Batch 13	170.00	S1900003	29/5/2019
37	Puting Jaya Batch 14	170.00	MNR/PUTINGJAYA/INVS/038/05/2019	29/5/2019

	Total	10370.00		
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RESEARCH REPORT UMP GRANT

Laporan Prestasi Skim Geran UMP

Final

/

Progress

Progress Period : _____

√ Please tick

PROJECT DETAILS (Keterangan Projek)

A	Grant No	UIC 161003
	Faculty/CoE	Faculty of Chemical & Natural Resources Engineering
	Project Title	Bio-coagulant and Smart System for Sustainable Water Treatment
	Project Leader	Mr. Mohd Najib Bin Razali
	Project Member	1. Dr. Mohd Aizudin Bin Abd Aziz 2. Mr. Musfakri Bin Musa

PROJECT ACHIEVEMENT (Pencapaian Projek)

B	ACHIEVEMENT PERCENTAGE				
	Project progress according to milestones achieved up to this period	0 - 25%	26 - 50%	51 - 75%	76 - 100%
	Percentage (please state %)	25%	50%	75%	100%


EXPENDITURE (Perbelanjaan)

C	Budget Approved <i>Peruntukan diluluskan</i>	Amount Spent <i>Jumlah Perbelanjaan</i>	Balance Baki	% of Amount Spent <i>Peratusan Belanja</i>
	RM 50,000.00	RM 36,300.00	RM 13,700.00	72.6%

RESEARCH OUTPUT (Output Penyelidikan)

D	NO OF PUBLICATION				
	KPI FOR NO OF PUBLICATION				
		ISI	Scopus	Index Proceedings	Others
	KPI				
	Achievement		2		
<i>The contribution of funder (UMP, MOHE, MOSTI, Industry etc.) as the fund provider must be acknowledged at all times in all forms of publications. Please state the grant number (RDU/UIC) and grant name.</i>					
	ISI	Scopus			
Number of articles/manuscripts/books <i>(Please attach the First Page of Publication)</i>	1. 2.	1. Recovery of mineral oil from waste emulsion using electrocoagulation Method. http://dx.doi.org/10.1051/mateconf/20163803005 2. Treatment of waste emulsion using coagulation method. Doi:10.1088/1755-			

		1315/257/1/012016		
Conference Proceeding (Please attach the First Page of Publication)	International		National	
	1. 2.		1. 2.	
HUMAN CAPITAL DEVELOPMENT				
KPI FOR HUMAN CAPITAL DEVELOPMENT				
	PhD Student		Master Student	
KPI				
Achievement				
Human Capital Development	Number			Others (please specify)
	On-going		Graduated	
Citizen	Malaysian	Non Malaysian	Malaysian	Non Malaysian
PhD Student				
Masters Student				
Undergraduate Student			1	
Total				
Name of Student:	Name of Student: Mohamad Abdul Fattah Bin Ahmad			
ID Matric No:	ID Matric No: KA14139			
Faculty:	Faculty: FKKSA			
Thesis title:	Thesis title: Treatment Of Waste Emulsion Using Coagulation Method			
Graduation Year:	Graduation Year: 2018			
<i>** enter for more space</i>				
INTELECTUAL PROPERTIES				
KPI FOR INTELECTUAL PROPERTIES				
Patent, Copyright, Trademark, Industrial Design: <u>Patent</u>				
Patent, Copyright, Trademark, Industrial Design ect	1. A Method for Treating Wastewater (UI No: 2015701032)			
OTHERS				
KPI FOR OTHERS				
Prototype, Technology, Collaborations etc: _____				
Prototype, Technology, Collaborations etc	<ol style="list-style-type: none"> 1. Collaboration with Halliburton Energy Services (M) Sdn Bhd, Isnas Resources Sdn Bhd & Putting Jaya Enterprise 2. Silver Medal, Seoul International Invention Fair 2017 (SIIF 2017). Title: G-Treat: Smart System For Water Sustainability 3. Gold Medal, International Conference and Exposition On Inventions by Institutions of Higher Learning (PECIPTA 2017). Title: G-Treat: Smart System For Water Sustainability 4. Dana Permulaan Usahawan Bumiputera (SUPERB) Siri 1 2017, Unit Peneraju Agenda Bumiputera, Jabatan Perdana Menteri – G-Treat, Biocoagulant Treatment for Oily Wastewater (RM 500,000.00 - Ongoing) 			

ASSET (Aset)						
E	Bil	Peralatan (Equipment)	Model	No Daftar Aset (Asset Tagging No)	Amount (RM)	Lokasi (Location)
	1.					
PRODUCT DESCRIPTION FOR UMP R&D DIRECTORY (SHORT & BRIEF) <i>Only for Final Report</i>						
F	<p>MNRg-Treat is a bio-coagulant product that can treat oily wastewater from industries. It is able to treat polluted water by using coagulation agent to separate residue oil and water. MNRg-Treat is a safe green technology product compared to other existing chemicals in the industry. It treats water from oily waste up to 95% and fast in action of separating oil from water in a timely manner. The wastewater treated by MNRg-Treat will comply with The Standard B Effluent Discharge Environmental Quality Act 1974 imposed by the Department of Environment, Malaysia.</p>					
PRODUCT PICTURE FOR UMP R&D DIRECTORY <i>Only for Final Report</i>						
G						
SUMMARY OF RESEARCH FINDINGS (Ringkasan Penemuan Projek Penyelidikan)						
H	<p>Waste emulsion is one of the major toxic wastes that are generated from the metal processing industry. Emulsions are commonly used in the metal processing production as emulsified coolant and in power plant as lubricating oil. This paper presents a research to suggest the best coagulant in treating waste emulsion from manufacturing plant via coagulation method. Chitosan and bio-solvent will represent the natural coagulants, alum and polyaluminium chloride (PAC) will represent the industrial coagulant. Jar Test apparatus was used to treat the waste emulsion. It will be conducted in a batch test with a row of six beakers. One jar will be used as a control and the other five will be of different dosages of coagulant at 150 rpm of mixing rate, 30 minutes of mixing time and at room temperature. From the results, PAC showed to be the best coagulant with 82.29%, 95.45%, 99.95%, 96.4%, and 53% removal of COD, BOD O&G, TSS, and Turbidity, respectively, at a pH of 3.7 and minimum dosage of 2wt%. In conclusion, the PAC managed to break the oil and water bonding from the waste emulsion. Thus, it was suitable to treat the industrial waste emulsion.</p>					
PROBLEMS / CONSTRAINTS IF ANY (Masalah/ Kekangan sekiranya ada)						
I						

Date :
Tarikh

Project Leader's Signature:
Tandatangan Ketua Projek

COMMENTS, IF ANY/ ENDORSEMENT BY FACULTY (*Komen, sekiranya ada / Pengesahan oleh Fakulti*)

J **Recommend / Not Recommend / KIV / Need Ammendment**

.....

Name:
Nama:

Signature:
Tandatangan:

Date:
Tarikh:

**** Dean/TDR/Director/Deputy Director**

COMMENTS, IF ANY/ ENDORSEMENT BY RMC PNI (*Komen, sekiranya ada / Pengesahan oleh RMC PNI*)

K **Recommend / Not Recommend / KIV / Need Ammendment**

.....

Name:
Nama:

Signature:
Tandatangan:

Date:
Tarikh:



Welcome
MOHD NAJIB BIN RAZALI

UIC161003

- > Research Summary
- > Research Type, FOR & SEO Update
- > View Research Proposal
- > Research Team
- > Research Payment Details
- > Research Output
- > Progress & Final Report
- > Download
- > Research Application

Research Project Details

Project ID	UIC161003
Project Title	BIO-COAGULANT AND SMART SYSTEM FOR SUSTAINABLE WATER TREATMENT
Project Category	Sains Tulen (Pure Science)
Project Status	Tamat
Start Date	15/01/2017
End Date	14/01/2018
Extension Date	14/04/2019

Lists of Researcher for UIC161003

No	Staff ID	Staff Name	Start Date	End Date	Position
1	01460	MOHD NAJIB BIN RAZALI	15/01/0017	14/01/0018	Ketua
2	01623	MOHD AIZUDIN BIN ABD AZIZ	15/01/2017	14/01/2018	Ahli
3	01640	MUSFAFIKRI BIN MUSA	15/01/2017	14/01/2018	Ahli

Lists of External Researcher / Collaborator for UIC161003

Research Project Financial Info

Vote	Approved (RM)	Received (RM)	Expenditure (RM)	Balance (RM)
11000 - SALARY & WAGES	0.00	0.00	0.00	0.00
21000 - TRAVEL & TRANSPORTATION	7,984.94	7,984.94	7,984.94	0.00
22000 - TRANSPORTATION OF GOODS	0.00	0.00	0.00	0.00
23000 - COMMUNICATION & UTILITIES	0.00	0.00	0.00	0.00
24000 - RENTAL	16,700.00	16,700.00	3,000.00	13,700.00
26000 - SUPPLY OF RAW MATERIALS	0.00	0.00	0.00	0.00
27000 - RESEARCH MATERIALS & SUPPLIES	7,346.70	7,346.70	7,346.70	0.00
28000 - MAINTENANCE & MINOR REPAIR SERVICES	0.00	0.00	0.00	0.00
29000 - SPECIAL SERVICES (CONFERENCE FEES <= 2500)	17,968.36	17,968.36	17,968.36	0.00
35000 - SPECIAL EQUIPMENT (NOT MORE THAN <= 40%)	0.00	0.00	0.00	0.00
Total (RM)	50,000.00	50,000.00	36,300.00	13,700.00

RESEARCH OUTPUT

Research Exhibition & Award Winning List

Project Title	Exhibition	Award Winning / Medal	Year
INTEGRATED WIRELESS MONITORING AND TREATMENT SYSTEM FOR WATER SUSTAINABILITY	CITREX 2017	GOLD	2017
G-TREAT: SMART SYSTEM FOR WATER SUSTAINABILITY	PECIPTA 2017	GOLD	2017
G-TREAT: SMART SYSTEM FOR WATER SUSTAINABILITY	SEOUL INTERNATIONAL INVENTION FAIR (SIIF 2017)	SILVER	2017

Publication List

Journal List

Conference List

Research Intellectual Property List

Human Capital Development