ภาคผนวก ข

เอกสารประกอบการปฏิบัติตาม
มาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม

ภาคผนวก ข.1

สำเนาหนังสือนำส่งรายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม

UBE Chemicals (Asia) Public Company Limited

Office : 98 Sathorn Square Office Tower, 18th Floor,
North Sathorn Road, Silom, Bangrak, Bangkok 10500, Thailand
Tel. 66-2-206-9300 Fax. 66-2-206-9310

Factory : 140/6 Moo 4, Sukhumvit Road, Tapong Subdistrict,
Muang Rayong District, Rayong Province 21000, Thailand
Tel. 66-38-928-700 Fax. 66-38-928-865

http://www.ube.co.th

UBE GROUP (THAILAND)

กรมโรงงานอุตสาหกรรม
เลขที่ 1761
วันที่ 10 มี.ค. 2566

เลขที่ รง.UCHA/0005/66

23 มกราคม 2566

เรื่อง รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อมและมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม โครงการโรงงานผลิตคาโปรแลคตัม

เรียน อธิบดีกรมโรงงานอุตสาหกรรม

สิ่งที่ส่งมาด้วย รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อมและมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม โครงการโรงงานผลิตคาโปรแลคตัม ครั้งที่ 2/2565 ระหว่างเดือนกรกฎาคม ถึงธันวาคม พ.ศ. 2565 จำนวน 3 ฉบับ

ตามที่สำนักงานนโยบายและแผนทรัพยากรธรรมชาติและสิ่งแวดล้อม มีมติเห็นชอบรายงานการเปลี่ยนแปลงรายละเอียดโครงการโรงงานผลิตคาโปรแลคตัม ของบริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน) ตามหนังสือแจ้งผลการพิจารณา ที่ ทส 1009.8/5240 ลงวันที่ 1 พฤษภาคม พ.ศ.2560 โดยให้บริษัทฯ สรุปรายงานผลการปฏิบัติตามมาตรการฯ จัดส่งให้สำนักงานนโยบายและแผนทรัพยากรธรรมชาติและสิ่งแวดล้อม กรมโรงงานอุตสาหกรรม และสำนักงานทรัพยากรธรรมชาติและสิ่งแวดล้อมจังหวัดระยอง ทราบทุก 6 เดือน

บริษัทฯ ใคร่ขอส่งรายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อมและมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม ครั้งที่ 2/2565 ระหว่างเดือนกรกฎาคม ถึงธันวาคม พ.ศ. 2565 รายละเอียดดังสิ่งที่ส่งมาด้วย

จึงเรียนมาเพื่อโปรดพิจารณา

ขอแสดงความนับถือ

[redacted]

ผู้รับมอบอำนาจประกอบกิจการโรงงาน

UBE Chemicals (Asia) Public Company Limited

Office : 98 Sathorn Square Office Tower, 18th Floor,
North Sathorn Road, Silom, Bangrak, Bangkok 10500, Thailand
Tel. 66-2-206-9300 Fax. 66-2-206-9310

Factory : 140/6 Moo 4, Sukhumvit Road, Tapong Subdistrict,
Muang Rayong District, Rayong Province 21000, Thailand
Tel. 66-38-928-700 Fax. 66-38-928-865

http://www.ube.co.th

UBE GROUP (THAILAND)

เลขที่ รง.UCHA/0006/66

23 มกราคม 2566

เรื่อง รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อมและมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม โครงการโรงงานผลิตคาโปรแลคตัม

เรียน อุตสาหกรรมจังหวัดระยอง

สิ่งที่ส่งมาด้วย รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อมและมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม โครงการโรงงานผลิตคาโปรแลคตัม ครั้งที่ 2/2565 ระหว่างเดือนกรกฎาคม ถึงธันวาคม พ.ศ. 2565 จำนวน 1 ฉบับ

ตามที่ สำนักงานนโยบายและแผนทรัพยากรธรรมชาติและสิ่งแวดล้อม มีมติเห็นชอบรายงานการเปลี่ยนแปลงรายละเอียดโครงการโรงงานผลิตคาโปรแลคตัม ของบริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน) ตามหนังสือแจ้งผลการพิจารณา ที่ ทส 1009.8/5240 ลงวันที่ 1 พฤษภาคม พ.ศ.2560 โดยให้บริษัทฯ สรุปรายงานผลการปฏิบัติตามมาตรการฯ จัดส่งให้สำนักงานนโยบายและแผนทรัพยากรธรรมชาติและสิ่งแวดล้อม กรมโรงงานอุตสาหกรรม และสำนักงานทรัพยากรธรรมชาติและสิ่งแวดล้อมจังหวัดระยอง ทราบทุก 6 เดือน

บริษัทฯ ใคร่ขอส่งรายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อมและมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม ครั้งที่ 2/2565 ระหว่างเดือนกรกฎาคม ถึงธันวาคม พ.ศ. 2565 รายละเอียดดังสิ่งที่ส่งมาด้วย

จึงเรียนมาเพื่อโปรดพิจารณา

ขอแสดงความนับถือ

[redacted]

30/1/66

[redacted]

ผู้รับมอบอำนาจประกอบกิจการโรงงาน

UBE Chemicals (Asia) Public Company Limited

Office : 98 Sathorn Square Office Tower, 18th Floor,
North Sathorn Road, Silom, Bangrak, Bangkok 10500, Thailand
Tel. 66-2-206-9300 Fax. 66-2-206-9310

Factory : 140/6 Moo 4, Sukhumvit Road, Tapong Subdistrict,
Muang Rayong District, Rayong Province 21000, Thailand
Tel. 66-38-928-700 Fax. 66-38-928-865

http://www.ube.co.th

UBE GROUP (THAILAND)

เลขที่ รง.UCHA/0007/66

23 มกราคม 2566

เรื่อง รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อมและมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม โครงการโรงงานผลิตคาโปรแลคตัม

เรียน นายกองค์การบริหารส่วนตำบลตะพง

สิ่งที่ส่งมาด้วย รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อมและมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม โครงการโรงงานผลิตคาโปรแลคตัม ครั้งที่ 2/2565 ระหว่างเดือนกรกฎาคม ถึงธันวาคม พ.ศ. 2565 จำนวน 1 ฉบับ

ตามที่ สำนักงานนโยบายและแผนทรัพยากรธรรมชาติและสิ่งแวดล้อม มีมติเห็นชอบรายงานการเปลี่ยนแปลงรายละเอียดโครงการโรงงานผลิตคาโปรแลคตัม ของบริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน) ตามหนังสือแจ้งผลการพิจารณา ที่ ทส 1009.8/5240 ลงวันที่ 1 พฤษภาคม พ.ศ.2560 โดยให้บริษัทฯ สรุปรายงานผลการปฏิบัติตามมาตรการฯ จัดส่งให้สำนักงานนโยบายและแผนทรัพยากรธรรมชาติและสิ่งแวดล้อม กรมโรงงานอุตสาหกรรม และสำนักงานทรัพยากรธรรมชาติและสิ่งแวดล้อมจังหวัดระยอง ทราบทุก 6 เดือน

บริษัทฯ ใคร่ขอส่งรายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อมและมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม ครั้งที่ 2/2565 ระหว่างเดือนกรกฎาคม ถึงธันวาคม พ.ศ. 2565 รายละเอียดดังสิ่งที่ส่งมาด้วย

จึงเรียนมาเพื่อโปรดพิจารณา

ขอแสดงความนับถือ

[redacted]

[redacted]

ผู้รับมอบอำนาจประกอบกิจการโรงงาน

ภาคผนวก ข.2

การวิเคราะห์งานโดยวิธีการ HAZOP Study

ที่ อก ๐๓๑๒/ - ๑ ๗ ๕ ๖

กองส่งเสริมเทคโนโลยีความปลอดภัยโรงงาน
กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ เขตราชเทวี
กรุงเทพมหานคร ๑๐๔๐๐

๑๔ กันยายน ๒๕๖๑

เรื่อง รายงานการวิเคราะห์ความเสี่ยงจากอันตรายที่อาจเกิดจากการประกอบกิจการโรงงาน

เรียน กรรมการผู้จัดการ บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน)

สิ่งที่ส่งมาด้วย แบบรายงานการปฏิบัติตามแนวทาง/มาตรการที่เสนอในรายงานการวิเคราะห์ความเสี่ยง ประจำปี พ.ศ. ....

ตามที่ท่านได้ยื่นรายงานการวิเคราะห์ความเสี่ยงจากอันตรายที่อาจเกิดจากการประกอบกิจการโรงงาน ประกอบกิจการผลิตคาโปรแลคตัมและปุ๋ยแอมโมเนียมซัลเฟต ทะเบียนโรงงานเลขที่ ข ๓-๔๔-๑/๓๙ ตั้งอยู่เลขที่ ๑๔๐/๖ หมู่ที่ ๔ ตำบลตะพง อำเภอเมืองระยอง จังหวัดระยอง นั้น

กองส่งเสริมเทคโนโลยีความปลอดภัยโรงงาน กรมโรงงานอุตสาหกรรม ได้รับรายงานดังกล่าวแล้ว จึงขอให้ท่านปฏิบัติตามมาตรการป้องกันและควบคุมอันตราย แผนงานบริหารจัดการความเสี่ยง และกฎหมายความปลอดภัยที่เกี่ยวข้องอย่างเคร่งครัด ทั้งนี้ ให้ท่านจัดทำรายงานการปฏิบัติเป็นประจำทุกปี ตามสิ่งที่ส่งมาด้วย หรือแบบอื่นที่ท่านเห็นว่าเหมาะสม โดยเก็บไว้ที่โรงงานพร้อมให้เจ้าหน้าที่ตรวจสอบได้เสมอ

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

[redacted]

ผู้อำนวยการกองส่งเสริมเทคโนโลยีความปลอดภัยโรงงาน

ฝ่ายบริหารทั่วไป
โทร. ๐ ๒๒๐๒ ๔๒๑๖
โทรสาร ๐ ๒๓๕๔ ๓๓๙๒

[redacted]

UBE
UBE GROUP (THAILAND)

[redacted]

Printed by Korbua Kettet on 14/06/2564 10:55 (Effective Date : 18/01/2564)

[redacted]

ภาคผนวก ข.3

เอกสารแจ้งกำหนดการตรวจสอบผลการปฏิบัติตามมาตรการฯ

UBE Chemicals (Asia) Public Company Limited

Office : 98 Sathorn Square Office Tower, 18th Floor,
North Sathorn Road, Silom, Bangrak, Bangkok 10500, Thailand
Tel. 66-2-206-9300 Fax. 66-2-206-9310

Factory : 140/6 Moo 4, Sukhumvit Road, Tapong Subdistrict,
Muang Rayong District, Rayong Province 21000, Thailand
Tel. 66-38-928-700 Fax. 66-38-928-865

http://www.ube.co.th

UBE GROUP (THAILAND)

สำนักงาน
อุตสาหกรรมจังหวัดระยอง
เลขที่รับ 9643
วันที่ 15 ธ.ค. 2565
เวลา.....

เลขที่ รง.UCHA/0161/65

12 ธันวาคม 2565

เรื่อง แจ้งกำหนดการตรวจสอบผลการปฏิบัติตามมาตรการป้องกัน และแก้ไขผลกระทบสิ่งแวดล้อม และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อมของโครงการฯ บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน) โดยบริษัท ซีคอท จำกัด

เรียน อุตสาหกรรมจังหวัดระยอง

สิ่งที่ส่งมาด้วย รายการตรวจสอบผลการปฏิบัติตามมาตรการป้องกัน และแก้ไขผลกระทบสิ่งแวดล้อม และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อมของโครงการ

เนื่องด้วยตามมาตรการป้องกัน และแก้ไขผลกระทบสิ่งแวดล้อม (ระยะดำเนินการ) โครงการโรงงานผลิตคาโปรแลคตัม (ภายหลังการเปลี่ยนแปลงรายละเอียดโครงการในรายงานการวิเคราะห์ผลกระทบสิ่งแวดล้อม โครงการโรงงานผลิตคาโปรแลคตัม (ครั้งที่ 4)) ของบริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน) ในหัวข้อเรื่องมาตรการทั่วไป กำหนดให้ทางบริษัทฯ ดำเนินการว่าจ้างหน่วยงานกลาง (Third Party) เพื่อดำเนินการตรวจสอบผลการปฏิบัติตามมาตรการป้องกัน และแก้ไขผลกระทบสิ่งแวดล้อม และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อมของโครงการ ให้หน่วยงานอนุญาตรับทราบนั้น

ในการนี้ทางบริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน) ทะเบียนโรงงานเลขที่ ข 3-44-1/39 รย ประกอบกิจการผลิตคาโปรแลคตัมและปุ๋ยแอมโมเนียมซัลเฟต ตั้งอยู่เลขที่ 140/6 หมู่ที่ 4 ต.ตะพง อ.เมือง จ.ระยอง จึงขอเรียนแจ้งกำหนดการในการดำเนินการติดตามตรวจสอบผลการปฏิบัติตามมาตรการฯ โดยบริษัท ซีคอท จำกัด ในวันที่ 30 พฤศจิกายน 2565 ให้ทางอุตสาหกรรมจังหวัดรับทราบ โดยมีรายละเอียดตามสิ่งที่ส่งมาด้วย

จึงเรียนมาเพื่อโปรดทราบ

ได้รับเอกสารต้นฉบับแล้ว
ผู้รับ [redacted]
วันที่ 15 / 12 / 65
กรุณาส่งกลับ

ขอแสดงความนับถือ

[redacted]

ผู้รับมอบอำนาจประกอบกิจการโรงงาน

ผู้ประสานงาน : นางสาวกอบัว เกศเทศ โทร.(038) 928-842

ภาคผนวก ข.4

เอกสารการแจ้งซ่อมบำรุงเครื่องจักรและอุปกรณ์ประจำปี

Fax : 038-612-038 สอจ.ระยอง

FAX OUT
16 พย. 2565

แบบแจ้งการหยุดเดินเครื่องจักรและรายละเอียดในการป้องกันแก้ไขปัญหาสิ่งแวดล้อม

1. ชื่อผู้ประกอบกิจการโรงงาน บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน)
2. สถานที่ตั้งโรงงาน 140/6 หมู่ 4 ต.ตะพง อ.เมืองระยอง จ.ระยอง 21000
3. ประกอบกิจการ ผลิตสารคาโปรแลคตัมและแอมโมเนียมซัลเฟต
   ทะเบียนโรงงานเลขที่ ข 3-44-1/39 รย
4. หยุดเดินเครื่องจักรเนื่องจาก ซ่อมบำรุงเครื่องจักร
   หยุดเดินเครื่องจักร ระหว่างวันที่ 12 ตุลาคม 2565 ถึงวันที่ 24 พฤศจิกายน 2565
   หมายเหตุ :
   เนื่องด้วยเหตุผลทางด้านการตลาด จึงมีความจำเป็นที่จะต้องเลื่อนกำหนดการหยุดซ่อมบำรุง จากวันที่ 12 ต.ค. - 15 พ.ย. 65 เป็นวันที่ 12 ต.ค. - 24 พ.ย. 65
5. มาตรการป้องกันและแก้ไขปัญหาด้านสิ่งแวดล้อม และความปลอดภัย
   5.1) กระบวนการนำวัตถุดิบ ผลิตภัณฑ์ หรือวัสดุอื่นๆ ออกจากระบบ
   - ไม่มีสารเคมีตกค้างในอุปกรณ์เนื่องจากมีการวางแผนหยุดดำเนินการผลิต

   5.2) มาตรการป้องกันปัญหาสิ่งแวดล้อมด้านมลพิษทางอากาศ เช่น วิธีการไล่แก๊สเสียออกจากระบบ, การใช้เชื้อเพลิง/อัตราส่วนในการเผาทิ้งที่ปล่อง
   - ไม่มีผลกระทบด้านมลพิษทางอากาศ เนื่องจากมีการวางแผนหยุดดำเนินการผลิต

   5.3) มาตรการป้องกันปัญหาสิ่งแวดล้อมด้านน้ำเสีย
   - ไม่มีผลกระทบด้านน้ำเสีย เนื่องจากมีการวางแผนหยุดดำเนินการผลิต

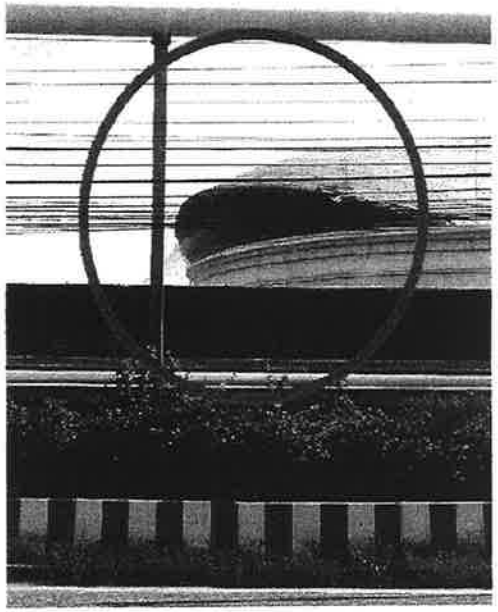
   5.4) มาตรการป้องกันปัญหาสิ่งแวดล้อมด้านกากอุตสาหกรรม
   - มีระบบการจัดเก็บกากอุตสาหกรรมลงภาชนะแบบปิด และส่งให้บริษัทผู้ได้รับอนุญาตไปดำเนินการกำจัด/ บำบัดตามมาตรฐานการจัดการกากอุตสาหกรรม
6. ชื่อผู้รับผิดชอบและประสานงาน นายปกรณ์ ธรรมเวชวิถี โทร. 081-559-1329

ผู้รายงาน [redacted]
([redacted])
ตำแหน่ง ผู้จัดการโรงงาน

ภาคผนวก ข.5

เอกสารการทบทวนเหตุการณ์อุบัติภัย/อุบัติเหตุที่เกิดจากการประกอบกิจการอุตสาหกรรมที่มีการผลิตลักษณะเดียวกันทั้งในประเทศและต่างประเทศ

Lesson learned : Explosion at Map Ta Phut Tank Terminal



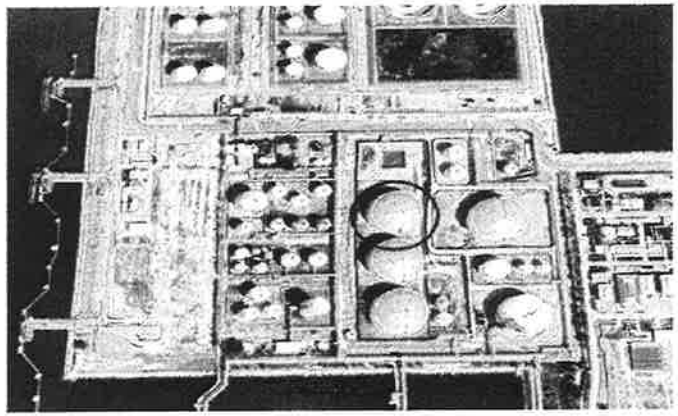
Date and Time : วันที่ 26 ตุลาคม 2564 เวลา 15.09 น.

Company : มาบตาพุด แทงค์ เทอร์มินัล จำกัด

Detail event : มีงานซ่อมบำรุงภายในถังแนฟทา หลังจาก Check gas และ empty ถังแล้ว ผู้รับเหมา 6 คน เข้าไปทำงาน clean ภายในถัง จากนั้นจึงเกิดเหตุระเบิดและไฟไหม้ขึ้น ทำให้มีผู้เสียชีวิต 3 ราย และบาดเจ็บสาหัส 2 ราย

ข้อสันนิษฐาน :

- มี Scale ที่เป็น fume อยู่ในถัง ทำให้อาจมีไอระเหยของ Naphtha สะสมในช่องว่าง เป็นเหตุให้ check gas ไม่พบในดอนแรก
- สันนิษฐานว่าอาจจะมีการใช้เครื่องมือที่ไม่เป็น Non sparking (เช่น ค้อน, จอบเหล็ก สามารถกระทบ/เสียดสีเกิดประกายไฟได้)
- หรืออุปกรณ์ไฟฟ้าที่ไม่เป็น explosion proof ในการทำงาน (เช่น Lighting ที่ชำรุด, etc.)



เราสามารถทำอะไรได้บ้าง เพื่อไม่ให้เกิดเหตุการณ์นี้

- อุปกรณ์ไฟฟ้าที่จะนำเข้าไปใช้งานภายในถัง จะต้องเป็น explosion proof และผ่านการตรวจสอบจากทีมไฟฟ้า รวมถึง กล้องถ่ายรูปที่นำเข้าไปใช้งานจะต้องปิด Flash ทุกครั้ง
- ควรใช้เครื่องมือที่ไม่ก่อให้เกิดประกายไฟ (Non sparking tool) โดยเป็นวัสดุที่ทำจากทองเหลือง, ทองแดง, นิกเกิล เป็นต้น
- เศษ fume scale อาจเป็นแหล่งสะสมตัวของ HC ได้ ดังนั้น ต้องตรวจสอบและกำจัดออกทั้งหมด ก่อนที่จะอนุญาตให้เข้าทำงานได้

ภาคผนวก ข.6

เอกสารการจัดทำฐานข้อมูลสุขภาพของพนักงาน

BANGKOK HOSPITAL
RAYONG

บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน)(UCHA)

ชื่อ :

Order No.: 305

เลขประจำตัวพนักงาน :

อายุ : 33 ปี เพศ : ชาย(Male)

ตำแหน่ง : Community Officer

แผนก :

ฝ่าย : UCHA Government Affair & Community

วันที่ตรวจ : 2 สิงหาคม 2565

MEDICAL CHECK-UP REPORT
HEALTH PROMOTION
รายงานผลการตรวจสุขภาพ

ภาคผนวก ข.7

เอกสารบันทึกข้อมูลสุขภาพของพนักงานและผู้รับเหมา

UBE GROUP (THAILAND)

TABLE OF PATIENT TREATED AT F/A on January 2023

TYPE OF SICKNESS											
GROUP	ระบบทางเดินหายใจ	ระบบทางเดินอาหาร	ระบบผิวหนัง	ระบบกล้ามเนื้อ	ระบบ หู ตา จมูก	ระบบประสาท	ระบบหัวใจและหลอดเลือด	ระบบทางเดินปัสสาวะ	อุบัติเหตุในงาน	ทำแผล	TOTAL (CASE) ราย
UCHA	124	53	22	59	4	14	0	0	0	5	281
TSL	6	5	1	3	0	0	0	0	0	0	15
UFA	9	0	0	6	0	0	0	0	0	0	15
UTCA	2	0	1	0	0	0	0	0	0	0	3
UTH	0	0	0	0	0	0	0	0	0	0	0
RFT	0	0	0	0	0	0	0	0	0	0	0
Contractor	20	42	5	11	2	12	0	3	0	0	95
TOTAL	160	97	29	79	6	26	0	3	0	5	405

UBE GROUP (THAILAND)

TABLE OF PATIENT TREATED AT F/A on February 2023

TYPE OF SICKNESS											
GROUP	ระบบทางเดินหายใจ	ระบบทางเดินอาหาร	ระบบผิวหนัง	ระบบกล้ามเนื้อ	ระบบ หู ตา จมูก	ระบบประสาท	ระบบหัวใจและหลอดเลือด	ระบบทางเดินปัสสาวะ	อุบัติเหตุในงาน	ทำแผล	TOTAL (CASE) ราย
UCHA	115	60	15	47	6	18	1	0	0	4	266
TSL	2	1	0	5	1	0	0	0	0	0	9
UFA	2	6	0	10	0	4	0	0	0	1	23
UTCA	2	1	1	0	0	0	0	0	0	0	4
UTH	0	0	0	0	0	0	0	0	0	0	0
RFT	0	0	0	0	0	0	0	0	0	0	0
Contractor	13	32	4	28	3	13	0	1	1	0	95
TOTAL	134	100	20	90	10	35	1	1	1	5	397

UBE GROUP (THAILAND)

TABLE OF PATIENT TREATED AT F/A on March 2023

TYPE OF SICKNESS											
GROUP	ระบบทางเดินหายใจ	ระบบทางเดินอาหาร	ระบบผิวหนัง	ระบบกล้ามเนื้อ	ระบบ หู ตา จมูก	ระบบประสาท	ระบบหัวใจและหลอดเลือด	ระบบทางเดินปัสสาวะ	อุบัติเหตุในงาน	ทำแผล	TOTAL (CASE) ราย
UCHA	139	42	19	57	4	19	4	1	0	3	288
TSL	6	3	1	4	0	0	0	0	0	0	14
UFA	8	3	4	6	0	1	0	0	0	3	25
UTCA	1	1	0	0	0	0	0	0	0	0	2
UTH	0	0	0	0	0	0	0	0	0	0	0
RFT	0	0	0	0	0	0	0	0	0	0	0
Contractor	16	38	12	39	5	2	2	2	0	1	117
TOTAL	170	87	36	106	9	22	6	3	0	7	446

UBE GROUP (THAILAND)

TABLE OF PATIENT TREATED AT F/A on April 2023

TYPE OF SICKNESS											
GROUP	ระบบทางเดินหายใจ	ระบบทางเดินอาหาร	ระบบผิวหนัง	ระบบกล้ามเนื้อ	ระบบ หู ตา จมูก	ระบบประสาท	ระบบหัวใจและหลอดเลือด	ระบบทางเดินปัสสาวะ	อุบัติเหตุในงาน	ทำแผล	TOTAL (CASE) ราย
UCHA	168	58	14	51	2	10	1	1	0	4	309
TSL	6	4	4	0	1	1	0	0	0	0	16
UFA	14	3	1	7	0	2	0	0	0	0	27
UTCA	0	0	1	0	0	0	0	0	1	0	2
UTH	0	0	0	0	0	0	0	0	0	0	0
RFT	0	0	0	0	0	0	0	0	0	0	0
Contractor	9	30	4	34	5	13	1	1	0	0	97
TOTAL	197	95	24	92	8	26	2	2	1	4	451

UBE GROUP (THAILAND)

TABLE OF PATIENT TREATED AT F/A on May 2023

TYPE OF SICKNESS											
GROUP	ระบบทางเดินหายใจ	ระบบทางเดินอาหาร	ระบบผิวหนัง	ระบบกล้ามเนื้อ	ระบบ หู ตา จมูก	ระบบประสาท	ระบบหัวใจและหลอดเลือด	ระบบทางเดินปัสสาวะ	อุบัติเหตุในงาน	ทำแผล	TOTAL (CASE) ราย
UCHA	140	58	25	52	4	18	0	0	0	3	300
TSL	8	6	4	6	1	3	0	0	0	0	28
UFA	7	3	2	6	0	3	0	0	0	3	24
UTCA	2	1	0	0	0	0	0	0	0	0	3
UTH	0	0	0	0	0	0	0	0	0	0	0
RFT	0	0	0	0	0	0	0	0	0	0	0
Contractor	71	46	21	33	8	18	0	3	0	1	201
TOTAL	228	114	52	97	13	42	0	3	0	7	556

UBE GROUP (THAILAND)

TABLE OF PATIENT TREATED AT F/A on June 2023

TYPE OF SICKNESS											
GROUP	ระบบทางเดินหายใจ	ระบบทางเดินอาหาร	ระบบผิวหนัง	ระบบกล้ามเนื้อ	ระบบ หู ตา จมูก	ระบบประสาท	ระบบหัวใจและหลอดเลือด	ระบบทางเดินปัสสาวะ	อุบัติเหตุในงาน	ทำแผล	TOTAL (CASE) ราย
UCHA	129	61	12	50	11	14	0	1	0	3	281
TSL	11	2	0	0	0	1	0	1	0	1	16
UFA	14	3	2	6	1	2	0	0	0	6	34
UTCA	3	0	0	0	0	0	0	0	0	0	3
UTH	0	0	0	0	0	0	0	0	0	0	0
RFT	0	0	0	0	0	0	0	0	0	0	0
Contractor	10	51	14	13	4	19	0	3	0	1	115
TOTAL	167	117	28	69	16	36	0	5	0	11	449

ภาคผนวก ข.8

เอกสารการคัดเลือกและประเมินคุณภาพห้องปฏิบัติการวิเคราะห์ของหน่วยงานกลาง (Third Party)

[redacted]

Summary : Environmental Monitoring Service Contract Y2023-2025 // UBE Group (Thailand)

To [redacted]

Cc [redacted]

You forwarded this message on 23/03/2023 17:06.

Compare 2023.xls
74 KB

Dear N'Smart

ขอนำส่งสรุปข้อมูล Environmental Monitoring จาก Third Party จำนวน 5 ราย ดังนี้ (รายละเอียดดังเอกสารแนบ)

- งานตรวจวัดคุณภาพอากาศ : SECOT (เจ้าเดิม)
- งานตรวจวัดคุณภาพน้ำ : ALS (เจ้าเดิม)

ทั้งนี้เพื่อดำเนินการในส่วนที่เกี่ยวข้องตามขั้นตอนต่อไปค่ะ

หมายเหตุ : หากไม่มีประเด็นอะไรเพิ่มเติม ทาง OSHE ขออนุญาตประสานงานเรื่องแผนตรวจวัดของเดือนเมษายน 2566 กับ third party ทั้ง 2 ราย เพื่อความต่อเนื่องในการปฏิบัติงานฯ นะคะ ... ขอบคุณค่ะ

[redacted]

RE: Bidding Scrap FY 2023 - 2024

To [redacted]

Cc [redacted]

You forwarded this message on 26/05/2023 09:37.

ราคาเสนอซื้อเศษวัสดุเหลือใช้ประจำปี 2566_Award.pdf 711 KB	รายการวัสดุเหลือใช้ 2565-2566_Update Price.xlsx 18 KB	3K_2023.pdf 644 KB
PTSL_2023_2.pdf 2 MB	CKC_2023.pdf 719 KB	

Dear All,

Greeting from procurement team,
Refer the official bidding and awarding process of Scrap FY 2023 – 2024

On behalf of the committee of UBE Group, we are pleased to informed you upon the new price list as attachment.
Validity Period: 1 June 2023 – 31 May 2024

Best Regards,

[redacted]

Procurement, UBE Group (Thailand)

UBE	ใบประเมินผู้ให้บริการ	SECTION : _____
UBE Technical Center (Asia) Ltd.	(Suppliers services annual evaluation form)	No. : _____

ผลิตภัณฑ์ / การบริการ	บริษัท / องค์กร	ประจำปี
_____	_____	_____

รายละเอียดของการการประเมินผู้ให้บริการสอบเทียบ

ลำดับ	หัวข้อการประเมิน	เกณฑ์การประเมิน		คะแนน
1	ความถูกต้องและความน่าเชื่อถือของข้อมูล	(20) เป็นที่พอใจ	- ไม่พบการรายงานผลผิดพลาด	
		(10) ยอมรับได้	- พบการรายงานผลผิดพลาดน้อย	
		(0) ไม่เป็นที่พอใจ	- พบการรายงานผลผิดพลาดมาก	
2	การให้บริการ	(20) เป็นที่พอใจ	- ให้บริการและตอบสนองความต้องการได้สม่ำเสมอ	
		(10) ยอมรับได้	- ให้บริการและตอบสนองความต้องการได้บ้าง	
		(0) ไม่เป็นที่พอใจ	- ให้บริการและตอบสนองความต้องการได้น้อยต้องคอยติดตาม	
3	ราคาค่าบริการ	(20) เป็นที่พอใจ	- ราคาต่ำกว่าผู้ให้บริการอื่น	
		(10) ยอมรับได้	- ราคาต่ำกว่าผู้ให้บริการอื่นเป็นส่วนใหญ่	
		(0) ไม่เป็นที่พอใจ	- ราคาสูงกว่าผู้ให้บริการรายอื่นๆ	
4	กำหนดการส่งมอบผลการทดสอบ/บริการ	(20) เป็นที่พอใจ	- ทันตามเวลาที่กำหนด (+ / - 15 วัน)	
		(10) ยอมรับได้	- ทันตามเวลาที่กำหนดเกิน (+ / - 15 วัน) แต่ไม่เกิน (+ / - 30 วัน)	
		(0) ไม่เป็นที่พอใจ	- ไม่ทันตามเวลาที่กำหนด	
5	ระบบคุณภาพของห้องปฏิบัติการทดสอบ	(20) เป็นที่พอใจ	- ได้รับการรับรองความสามารถของห้องปฏิบัติการทดสอบตามมาตรฐาน ISO/IEC 17025	
		(10) ยอมรับได้	- ได้รับการรับรองความสามารถของห้องปฏิบัติการทดสอบตามมาตรฐาน ISO 9000	
		(0) ไม่เป็นที่พอใจ	- มีระบบคุณภาพแต่อยู่ระหว่างการดำเนินการ	

เกณฑ์การประเมิน

- 80 คะแนนขึ้นไป จาก 100 คะแนน จึงจะผ่านเกณฑ์และให้คงไว้ใน Approved Suppliers list
- ต่ำกว่า 80 คะแนน ไม่เป็นที่หน้าพอใจ และสมควรให้ถอนรายชื่อออกจาก Approved Suppliers list

คะแนนรวม	
ผลการประเมิน	

UNCONTROLLED COPY

ข้อคิดเห็นจากผู้คัดเลือก / สรุปผลการประเมิน

- ☐ เป็นที่พอใจและสมควรให้ใช้บริการต่อไป
- ☐ สมควรให้ถอนรายชื่อออกจาก ASL
- ☐ อื่นๆ _____

ลงชื่อ _____

(_____)

Date ____ / _____ / ____

ความคิดเห็นของผู้จัดการห้องปฏิบัติการทดสอบ

_____

_____

_____

ลงชื่อ _____

(_____)

Date ____ / _____ / ____

Printed by korbua kettet on 19/07/2561 12:42 (Effective Date : 27/05/2557)

ภาคผนวก ข.9

เอกสารการจัดทำ VOCs Emission Inventory

แบบรายงานผลการตรวจวัดการรั่วซึมของสารอินทรีย์ระเหยจากอุปกรณ์
และการซ่อมแซมอุปกรณ์ในโรงงานอุตสาหกรรม
(๑ แบบรายงานต่อ ๑ โรงงาน) ประจำปี พ.ศ 2566 ครั้งที่ 1

(Complete) ประจำช่วงเดือน มกราคม พ.ศ. 2566 ถึง มิถุนายน พ.ศ. 2566

รายละเอียดเกี่ยวกับโรงงาน

ชื่อโรงงาน บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน) ทะเบียนโรงงานเลขที่ ข3-44-1/39รย

สถานที่ตั้งโรงงาน 140/6 หมู่ 4 ต.ตะพง อ.เมือง จ.ระยอง 21000

ปริมาณสารอินทรีย์ระเหยรวมที่มีหรือใช้ในกระบวนการผลิต 52,357 ตันต่อปี

ประเภทอุปกรณ์	สถานะสารอินทรีย์ระเหย	จำนวนอุปกรณ์ทั้งหมดของโรงงาน		จำนวนอุปกรณ์ที่ต้องตรวจวัดการรั่วซึมในรอบการรายงานครั้งนี้			ปริมาณสารอินทรีย์ระเหยรวมในรูปมีเทนที่รั่วซึมจากอุปกรณ์ที่ตรวจวัดการรั่วซึมทั้งหมดในรอบการรายงานครั้งนี้ (กิโลกรัม)
		จำนวนอุปกรณ์ที่ต้องตรวจวัดการรั่วซึม (จุด)	จำนวนอุปกรณ์ที่ได้รับการยกเว้นไม่ต้องตรวจวัดการรั่วซึม (จุด)	จำนวนอุปกรณ์ที่ตรวจวัดการรั่วซึมทั้งหมด (จุด)	จำนวนอุปกรณ์ที่มีผลการตรวจวัดเกินจากเกณฑ์การควบคุมการรั่วซึม (จุด)	จำนวนอุปกรณ์ที่ได้รับการซ่อมแซมให้อยู่ในเกณฑ์การควบคุมการรั่วซึม (จุด)	
วาล์ว (Valves)	แก๊ส	34	95	34	0	0	8.44
	ของเหลว	830	1,340	830	0	0	
ปั๊ม (Pumps)	ของเหลว	18	19	18	0	0	
อุปกรณ์ลดความดัน (Pressure Relief Devices)	แก๊ส	3	20	3	0	0	
	ของเหลว	4	17	4	0	0	
เครื่องอัดอากาศ (Compressors)	ทั้งหมด	0	0	0	0	0	
ข้อต่อหรือหน้าแปลน (Connectors or Flanges)	ทั้งหมด	1,658	2,205	1,658	0	0	
ท่อส่งปลายเปิด (Open-Ended Lines)	ทั้งหมด	30	37	30	0	0	
จุดเก็บตัวอย่างสารเคมี (Sampling Connections)	ทั้งหมด	2	0	2	0	0	
อุปกรณ์ที่ใช้กวนหรือผสมของเหลว (Agitators or Mixers)	ทั้งหมด	3	2	3	0	0	

(ลงชื่อ) .....
(.....)
ผู้จัดการสิ่งแวดล้อมหรือผู้ได้รับอนุญาตประกอบกิจการโรงงาน

ภาคผนวก ข.10

เอกสารการสอบเทียบอุปกรณ์ของระบบตรวจวัดคุณภาพอากาศจากปล่องแบบต่อเนื่อง (CEMS)

ENTECH
Where Solutions Begin

Calibration Certificate

Certificate No: G 660124
Date of issue : 02-Mar-23

Instrument description	:	Flue Gas Analyzer
Instrument model	:	Testo 350XL
Instrument serial no.	:	01322500
ID no. or control no.	:	-
Manufacturer	:	Testo SE & Co. KGaA
Probe description	:	-
Probe model	:	-
Probe serial	:	-
Customer name	:	UBE CHEMICALS (ASIA) PUBLIC CO., LTD.
Customer address	:	140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong 21000
Total pages of certificate	:	2 Pages
Receiving no.	:	L-230123
Receiving date.	:	01-Mar-23
Parameter of calibration	:	Gas Calibration(Oxygen 2.498,10.04,21.02 %vol, Carbon Monoxide 80.14,309.9,1003 ppm, Nitrogen Dioxide 80.96 ppm, Nitric Oxide 150.9 ppm, Sulphur Dioxide 100.8 ppm)
Condition of UUC.	:	Used
Ambient condition	:	All of the Measurment ware caried out the stabilized labotary Temperature : 23 ±5 °C Humidity : 55 ± 15 %RH
Calibration place	:	17/121 Soi Ngamwongwan 47 Yaek 48, Toongsonghong, Laksi, Bangkok 10210
Calibration procedure no.	:	WI-CL-28-C

The calibration certificate expanded uncertainty of measurement is stated as the standard uncertainty of measurent Multiplied by coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

This certificate is applied only to item under test Environmental condition.

This Calibration Certificate may not be reporduced other than in full except with the permission of the issuing laboratory. Calibration certificates without signature and seal not valid.

This calibration certificate documents are traceable to national standards, which realize measurement according to the International System of Units (SI).

Date of calibration : 02-Mar-23

[redacted]

Entech Industrial Solution Co.,Ltd.
17/121 Soi Ngamwongwan 47 Yaek 48, Toongsonghong, Laksi, Bangkok 10210 THAILAND Tel. 0-2779-8888 Calibration@entech.co.th
Tax ID : 0105536035591 www.entech.co.th

ENTECH
Where Solutions Begin

Calibration Certificate

Certificate No.: G 660124

Standard References (Table 1)

Standard	Certificate No.	Vendor	Due date
Oxygen (O2) 2.498 % Vol	4219/21	Linde	30-Sep-25
Oxygen (O2) 10.04 % Vol	CG-0153-21	Nimt	18-Nov-26
Oxygen (O2) 21.02 % Vol	CG-0041-22	Nimt	10-Feb-27
Carbon monoxide (CO) 80.14 ppm	CG-0040-22	Nimt	14-Feb-27
Carbon monoxide (CO) 309.9 ppm	2803/21	Linde	22-Jun-23
Carbon monoxide (CO) 1003 ppm	2583/22	Linde	09-Aug-24
Nitrogen Dioxide (NO2) 80.96 ppm	3240/21	Linde	26-Jun-24
Nitric Oxide (NO) 150.9 ppm	2857/21	Linde	27-Jun-23
Sulphur Dioxide (SO2) 100.8 ppm	3507/22	Linde	09-Nov-24

Measured room conditions
Temperature : 23.3 °C Humidity : 56.2 %RH Pressure : 1011.5 mbar

Calibration conditions
Gas Temperature : 23 °C Flow rate : 1,200 ml/min Gas pressure : 1020.4 mbar

Calibration Results (before adjustment) (Table 2)

Parameter of Standard	Standard Values	Mean of UUC	Error	Uncertainty (±)
O2 (%Vol)	2.498	2.55	0.052	0.20
O2 (%Vol)	10.04	10.12	0.08	0.40
O2 (%Vol)	21.02	21.13	0.11	0.80
CO (ppm)	80.14	82	1.86	3.0
CO (ppm)	309.9	319	9.1	6.0
CO (ppm)	1003	1025	22	12
*NO2 (ppm)	80.96	79.8	-1.16	8.0
*NO (ppm)	150.9	143	-7.9	8.0
*SO2 (ppm)	100.8	100	-0.8	6.0

Calibration Results (after adjustment) (Table 3)

Parameter of Standard	Standard Values	Mean of UUC	Error	Uncertainty (±)
O2 (%Vol)	2.498	2.55	0.052	0.20
O2 (%Vol)	10.04	10.12	0.08	0.40
O2 (%Vol)	21.02	21.13	0.11	0.80
CO (ppm)	80.14	81	0.86	3.0
CO (ppm)	309.9	310	0.1	6.0
CO (ppm)	1003	1004	1	12
*NO2 (ppm)	80.96	79.8	-1.16	8.0
*NO (ppm)	150.9	152	1.1	8.0
*SO2 (ppm)	100.0	100	-0.8	6.0

Remark : 1 cmol/mol = 1 %vol. , 1 µmol/mol = 1 ppm.

* Calibrations marked Not TISI Accredited "in this Certificate have been included for completeness."

End of Report

Entech Industrial Solution Co.,Ltd.
17/121 Soi Ngamwongwan 47 Yaek 48, Toongsonghong, Laksi, Bangkok 10210 THAILAND Tel. 0-2779-8888 Calibration@entech.co.th
Tax ID : 0105536035591 www.entech.co.th

ENTECH
Where Solutions Begin

Calibration Certificate

Certificate No: G 660123
Date of issue : 02-Mar-23

Instrument description	:	Flue gas Analyzer
Instrument model	:	Testo 350 New
Instrument serial no.	:	62932524
ID no. or control no.	:	-
Manufacturer	:	Testo SE & Co. KGaA
Probe description	:	-
Probe model	:	-
Probe serial	:	-
Customer name	:	UBE CHEMICALS (ASIA) PUBLIC CO., LTD.
Customer address	:	140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong 21000
Total pages of certificate	:	3 Pages
Receiving no.	:	L-230422
Receiving date.	:	01-Mar-23
Parameter of calibration	:	Gas Calibration(Oxygen 2.498,10.04,21.02 %vol, Carbon Monoxide 80.14,309.9,1003 ppm, Nitrogen Dioxide 30.34,80.96,202.2 ppm, Nitric Oxide 30.08,150.9,320.6 ppm, Sulphur Dioxide 50.04,100.8,601.1 ppm)
Condition of UUC.	:	Used
Ambient condition	:	All of the Measurment ware caried out the stabilized labotary Temperature : 23 ±5 °C Humidity : 55 ± 15 %RH
Calibration place	:	17/121 Soi Ngamwongwan 47 Yaek 48, Toongsonghong, Laksi, Bangkok 10210
Calibration procedure no.	:	WI-CL-28-C

The calibration certificate expanded uncertainty of measurement is stated as the standard uncertainty of measurent Multiplied by coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

This certificate is applied only to item under test Environmental condition.

This Calibration Certificate may not be reporduced other than in full except with the permission of the issuing laboratory. Calibration certificates without signature and seal not valid.

This calibration certificate documents are traceability to national standards, which realize measurement according to the International System of Units (SI).

Date of calibration : 02-Mar-23

[redacted]

Entech Industrial Solution Co.,Ltd.
17/121 Soi Ngamwongwan 47 Yaek 48, Toongsonghong, Laksi, Bangkok 10210 THAILAND Tel. 0-2779-8888 Calibration@entech.co.th
Tax ID : 0105536035591 www.entech.co.th

ENTECH
Where Solutions Begin

Calibration Certificate

Certificate No.: G 660123

Standard References (Table 1)

Standard	Certificate No.	Vendor	Due date
Oxygen (O2) 2.498 % Vol	4219/21	Linde	30-Sep-25
Oxygen (O2) 10.04 % Vol	CG-0153-21	Nimt	18-Nov-26
Oxygen (O2) 21.02 % Vol	CG-0041-22	Nimt	10-Feb-27
Carbon monoxide (CO) 80.14 ppm	CG-0040-22	Nimt	14-Feb-27
Carbon monoxide (CO) 309.9 ppm	2803/21	Linde	22-Jun-23
Carbon monoxide (CO) 1003 ppm	2583/22	Linde	09-Aug-24
Nitrogen Dioxide (NO2) 30.34 ppm	2703/22	Linde	22-Aug-24
Nitrogen Dioxide (NO2) 80.96 ppm	2041/22	Linde	26-Jun-24
Nitrogen Dioxide (NO2) 202.2 ppm	3239/21	Linde	20-Jul-23
Nitric Oxide (NO) 30.08 ppm	CG-0089-22	Nimt	13-Jun-24
Nitric Oxide (NO) 150.9 ppm	2857/21	Linde	27-Jun-23
Nitric Oxide (NO) 320.6 ppm	2944/21	Linde	02-Jul-23
Sulphur Dioxide (SO2) 50.04 ppm	3205/21	Linde	25-Jul-23
Sulphur Dioxide (SO2) 100.8 ppm	3507/22	Linde	09-Nov-24
Sulphur Dioxide (SO2) 601.1 ppm	3204/21	Linde	20-Jul-23

Measured room conditions
Temperature : 23.1 °C Humidity : 57.1 %RH Pressure : 1011.4 mbar

Calibration conditions
Gas Temperature : 23 °C Flow rate : 1,100 ml/min Gas pressure : 1019.2 mbar

Calibration Results Before Adjustment (Table 2)

Parameter of Standard	Standard Values	Mean of UUC	Error	Uncertainty (±)
O2 (%Vol)	2.498	2.57	0.072	0.20
O2 (%Vol)	10.04	10.08	0.04	0.40
O2 (%Vol)	21.02	21.13	0.11	0.80
CO (ppm)	80.14	79	-1.14	3.0
CO (ppm)	309.9	303	-6.9	6.0
CO (ppm)	1003	984	-19	12
NO2 (ppm)	30.34	23.7	-6.64	8.0
NO2 (ppm)	80.96	71.3	-9.66	8.0
NO2 (ppm)	202.2	183.5	-18.7	12
NO (ppm)	30.08	26	-4.08	8.0
NO (ppm)	150.9	141	-9.9	8.0
NO (ppm)	320.6	295	-25.6	12
SO2 (ppm)	50.04	49	-1.04	6.0
SO2 (ppm)	100.8	100	-0.8	6.0
SO2 (ppm)	601.1	597	-4.1	13

Entech Industrial Solution Co.,Ltd.
17/121 Soi Ngamwongwan 47 Yaek 48, Toongsonghong, Laksi, Bangkok 10210 THAILAND Tel. 0-2779-8888 Calibration@entech.co.th
Tax ID : 0105536035591 www.entech.co.th

Calibration Results After Adjustment (Table 3)

Parameter of Standard	Standard Values	Mean of UUC	Error	Uncertainty (±)
O2 (%Vol)	2.498	2.57	0.072	0.20
O2 (%Vol)	10.04	10.08	0.04	0.40
O2 (%Vol)	21.02	21.13	0.11	0.80
CO (ppm)	80.14	81	0.86	3.0
CO (ppm)	309.9	310	0.1	6.0
CO (ppm)	1003	1004	1	12
NO2 (ppm)	30.34	29.1	-1.24	8.0
NO2 (ppm)	80.96	81.3	0.34	8.0
NO2 (ppm)	202.2	204.8	2.6	12
NO (ppm)	30.08	30	-0.08	8.0
NO (ppm)	150.9	155	4.1	8.0
NO (ppm)	320.6	319	-1.6	12
SO2 (ppm)	50.04	49	-1.04	6.0
SO2 (ppm)	100.8	100	-0.8	6.0
SO2 (ppm)	601.1	597	-4.1	13

Remark : 1 cmol/mol = 1 %vol. , 1 µmol/mol = 1 ppm.

End of Report

Entech Industrial Solution Co.,Ltd.
17/121 Soi Ngamwongwan 47 Yaek 48, Toongsonghong, Laksi, Bangkok 10210 THAILAND Tel. 0-2779-8888 Calibration@entech.co.th
Tax ID : 0105536035591 www.entech.co.th

Work Report

Work Order NO.	Plant	Service	Work Team	Date
50186936	CPL	NOx Gas outlet	INST-04	23/01/23

Work Order Description

PM 1M Inspection and Calibration

TAG AT-45-202

List	Report by	Approve by
Signature		
Name	Nattapong	Panjira
Date	23/01/2023	23/01/2023

Save to IPAD | Send Update | Close Work

PM 1M Inspection and Calibration

UBE GROUP (THAILAND)

Tag No.:	AT-45-202 (NO)	Service :	Nox GAS Outlet	Equipment:	Nitric Oxide Analyzer (NO)
Manufacturer :	ABB	Model :	AO2040	Range :	0 - 300 ppm
S/N No :	P-No : 24031-0-111000000000 / A-No : 0240153053/100 / F-No : 3.3387958			Ambient Temp:	10-35 °C

Standard Gas (ppm)		Serial No.	Certificate No.	Expired Date
Zero Gas, Nitrogen :	0	-	-	-
Span Gas NO :	255.00	D878128	3696/22	2024/11/22

As Found — Allowable Error: 10.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00	0.04	0.40	Pass	47.60
Span Gas :	255.00	256.00	10.00	Pass	

As Left — Allowable Error: 10.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00		0.00	Pass	39.20
Span Gas :	255.00		-2550.00	Fault	
Remark:					

Tag No.:	AT-45-202 (NO2)	Service :	Nox GAS Outlet	Equipment:	Nitric Oxide Analyzer (NO2)
Manufacturer :	ABB	Model :	AO2040	Range :	0 - 100 ppm
S/N No :	P-No : 24031-0-111000000000 / A-No : 0240153053/100 / F-No : 3.3387958			Ambient Temp:	10-35 °C

Standard Gas (ppm)		Serial No.	Certificate No.	Expired Date
Zero Gas, Nitrogen :	0	-	-	-
Span Gas NO2 :	76.00	A00560SV	3693/22	2024/11/29

As Found — Allowable Error: 5.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00	-3.00	-60.00	Pass	5.20
Span Gas :	76.00	80.00	80.00	Pass	

As Left — Allowable Error: 5.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00		0.00	Pass	9.10
Span Gas :	76.00		-1520.00	Fault	
Remark:					

Work Report

Work Order NO.	Plant	Work Team	Date
50188505	CPL	INST-04	28/02/66

Work Order Description

PM 1M Inspection and Calibration

AT-45-202 AT-12-301 AT-12-302 A&B

List	Report by	Approve by
Signature	[redacted]	
Name		
Date	28/02/2566	28/02/2023

Save to IPAD | Send Update | Close Work

PM 1M Inspection and Calibration

UBE GROUP (THAILAND)

Tag No.:	AT-45-202 (NO)	Service :	Nox GAS Outlet	Equipment:	Nitric Oxide Analyzer (NO)
Manufacturer :	ABB	Model :	AO2040	Range :	0 - 300 ppm
S/N No :	P-No : 24031-0-111000000000 / A-No : 0240153053/100 / F-No : 3.3387958			Ambient Temp:	10-35 °C

Standard Gas (ppm)		Serial No.	Certificate No.	Expired Date
Zero Gas, Nitrogen :	0	-	-	-
Span Gas NO :	255.00	D878128	3696/22	2567/11/22

As Found — Allowable Error: 10.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00	0.00	0.00	Pass	17.00
Span Gas :	255.00	225.00	-300.00	Fault	

As Left — Allowable Error: 10.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00	0.00	0.00	Pass	18.00
Span Gas :	255.00	255.00	0.00	Pass	
Remark:					

Tag No.:	AT-45-202 (NO2)	Service :	Nox GAS Outlet	Equipment:	Nitric Oxide Analyzer (NO2)
Manufacturer :	ABB	Model :	AO2040	Range :	0 - 100 ppm
S/N No :	P-No : 24031-0-111000000000 / A-No : 0240153053/100 / F-No : 3.3387958			Ambient Temp:	10-35 °C

Standard Gas (ppm)		Serial No.	Certificate No.	Expired Date
Zero Gas, Nitrogen :	0	-	-	-
Span Gas NO2 :	76.00	A00560SV	3693/22	2567/11/29

As Found — Allowable Error: 5.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00	-3.30	-66.00	Pass	-2.30
Span Gas :	76.00	67.50	-170.00	Fault	

As Left — Allowable Error: 5.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00	0.00	0.00	Pass	1.20
Span Gas :	76.00	77.00	20.00	Pass	
Remark:					

Work Report

Work Order NO.	Plant	Work Team	Date
50190075	CPL	INST-04	17/03/23

Work Order Description

PM 1M Inspection and Calibration

AT-45-202 AT-12-301 AT-12-302 A&B

List	Report by	Approve by
Signature	[redacted]	
Name		
Date	17/03/2023	17/03/2023

Save to IPAD | Send Update | Close Work

PM 1M Inspection and Calibration

UBE GROUP (THAILAND)

Tag No.:	AT-45-202 (NO)	Service :	Nox GAS Outlet	Equipment:	Nitric Oxide Analyzer (NO)
Manufacturer :	ABB	Model :	AO2040	Range :	0 - 500 ppm
S/N No :	P-No : 24031-0-111000000000 / A-No : 02-01S20S3r100 / F-No : 3.358795.8			Ambient Temp:	10-35 °C

Standard Gas (ppm)		Serial No.	Certificate No.	Expired Date
Zero Gas, Nitrogen :	0	-	-	-
Span Gas NO :	255.00	D878128	3696/22	2024/11/22

As Found — Allowable Error: 10.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00	0.00	0.00	Pass	17.00
Span Gas :	255.00	248.00	-70.00	Pass	

As Left — Allowable Error: 10.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00		0.00	Pass	17.00
Span Gas :	255.00		-2550.00	Fault	
Remark :					

Tag No.:	AT-45-202 (NO2)	Service :	Nox GAS Outlet	Equipment:	Nitric Oxide Analyzer (NO2)
Manufacturer :	ABB	Model :	AO2040	Range :	0 - 100 ppm
S/N No :	P-No : 24031-0-111000000000 / A-No : 02-01S20S3r100 / F-No : 3.358795.8			Ambient Temp:	10-35 °C

Standard Gas (ppm)		Serial No.	Certificate No.	Expired Date
Zero Gas, Nitrogen :	0	-	-	-
Span Gas NO2 :	76.00	A00560SV	3693/22	2024/11/29

As Found — Allowable Error: 5.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00	-0.70	-14.00	Pass	0.70
Span Gas :	76.00	81.00	100.00	Fault	

As Left — Allowable Error: 5.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00	0.00	0.00	Pass	0.60
Span Gas :	76.00	76.00	0.00	Pass	
Remark:					

Work Report

Work Order NO.	Plant	Work Team	Date
50191798	CPL	INST-04	27/04/66

Work Order Description

PM 1M Inspection and Calibration

AT-45-202 AT-12-301 AT-12-302 A&B

List	Report by	Approve by
Signature	[redacted]	
Name		
Date	27/04/2566	27/04/2023

Save to IPAD | Send Update | Close Work

PM 1M Inspection and Calibration

UBE GROUP (THAILAND)

Tag No.:	AT-45-202 (NO)	Service :	Nox GAS Outlet	Equipment:	Nitric Oxide Analyzer (NO)
Manufacturer :	ABB	Model :	AO2040	Range :	0 - 500 ppm
S/N No :	P-No : 24031-0-111000000000 / A-No : 02-01S20S3r100 / F-No : 3.358795.8			Ambient Temp:	10-35 °C

Standard Gas (ppm)		Serial No.	Certificate No.	Expired Date
Zero Gas, Nitrogen :	0	-	-	-
Span Gas NO :	255.00	D878/28	3696/22	2567/11/22

As Found — Allowable Error: 10.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00	0.00	0.00	Pass	16.00
Span Gas :	255.00	233.00	-220.00	Fault	

As Left — Allowable Error: 10.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00	0.00	0.00	Pass	23.00
Span Gas :	255.00	254.00	-10.00	Pass	
Remark:					

Tag No.:	AT-45-202 (NO2)	Service :	Nox GAS Outlet	Equipment:	Nitric Oxide Analyzer (NO2)
Manufacturer :	ABB	Model :	AO2040	Range :	0 - 100 ppm
S/N No :	P-No : 24031-0-111000000000 / A-No : 02-01S20S3r100 / F-No : 3.358795.8			Ambient Temp:	10-35 °C

Standard Gas (ppm)		Serial No.	Certificate No.	Expired Date
Zero Gas, Nitrogen :	0	-	-	-
Span Gas NO2 :	76.00	A00560SV	3693/22	2567/11/29

As Found — Allowable Error: 5.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00	-2.00	-40.00	Pass	0.40
Span Gas :	76.00	82.00	120.00	Fault	

As Left — Allowable Error: 5.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00	0.00	0.00	Pass	2.60
Span Gas :	76.00	76.00	0.00	Pass	
Remark:					

Work Report

Work Order NO.	Plant	Work Team	Date
50193138	CPL	INST-04	25/05/66

Work Order Description

PM 1M Inspection and Calibration

AT-45-202 AT-12-301 AT-12-302 A&B

List	Report by	Approve by
Signature	[redacted]	
Name		
Date	25/05/2566	25/05/2023

Save to IPAD | Send Update | Close Work

PM 1M Inspection and Calibration

UBE GROUP (THAILAND)

Tag No :	AT-45-202 (NO)	Service :	Nox GAS Outlet	Equipment:	Nitric Oxide Analyzer (NO)
Manufacturer :	ABB	Model :	AO2040	Range :	0 - 500 ppm
S/N No :	P-No : 24031-0-11100000000 / A-No : 0340153053/100 / F-No : 3.338795.0			Ambient Temp:	10-35 °C

Standard Gas (ppm)		Serial No.	Certificate No.	Expired Date
Zero Gas, Nitrogen :	0	-	-	-
Span Gas NO :	255.00	D878128	3696/22	2567/11/22

As Found — Allowable Error: 10.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00	0.00	0.00	Pass	17.00
Span Gas :	255.00	250.00	-50.00	Pass	

As Left — Allowable Error: 10.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00		0.00	Pass	18.00
Span Gas :	255.00		-2550.00	Fault	
Remark:					

Tag No.:	AT-45-202 (NO2)	Service :	Nox GAS Outlet	Equipment:	Nitric Oxide Analyzer (NO2)
Manufacturer :	ABB	Model :	AO2040	Range :	0 - 100 ppm
S/N No :	P-No : 24031-0-11100000000 / A-No : 0340153053/100 / F-No : 3.338795.0			Ambient Temp:	10-35 °C

Standard Gas (ppm)		Serial No.	Certificate No.	Expired Date
Zero Gas, Nitrogen :	0	-	-	-
Span Gas NO2 :	76.00	A00560SV	3693/22	2567/11/29

As Found — Allowable Error: 5.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00	0.00	0.00	Pass	0.30
Span Gas :	76.00	75.00	-20.00	Pass	

As Left — Allowable Error: 5.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00		0.00	Pass	0.40
Span Gas :	76.00		-1520.00	Fault	
Remark:					

Work Report

Work Order NO.	Plant	Work Team	Date
50194603	CPL	INST-04	22/06/66

Work Order Description

PM 1M Inspection and Calibration

AT-45-202 AT-12-301 AT-12-302 A&B

List	Report by	Approve by
Signature	[redacted]	
Name		
Date	22/06/2566	22/06/2023

Save to IPAD | Send Update | Close Work

PM 1M Inspection and Calibration

UBE GROUP (THAILAND)

Tag No.:	AT-45-202 (NO)	Service :	Nox GAS Outlet	Equipment:	Nitric Oxide Analyzer (NO)
Manufacturer :	ABB	Model :	AO2040	Range :	0 - 500 ppm
S/N No :	P-No : 24031-0-11100000000 / A-No : 0340153053/100 / F-No : 3.338795.0			Ambient Temp:	10-35 °C

Standard Gas (ppm)		Serial No.	Certificate No.	Expired Date
Zero Gas, Nitrogen :	0	-	-	-
Span Gas NO :	255.00	D878128	3696/22	2567/11/22

As Found — Allowable Error: 10.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00	0.00	0.00	Pass	0.00
Span Gas :	255.00	254.00	-10.00	Pass	

As Left — Allowable Error: 10.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00		0.00	Pass	19.00
Span Gas :	255.00		-2550.00	Fault	
Remark:					

Tag No.:	AT-45-202 (NO2)	Service :	Nox GAS Outlet	Equipment:	Nitric Oxide Analyzer (NO2)
Manufacturer :	ABB	Model :	AO2040	Range :	0 - 100 ppm
S/N No :	P-No : 24031-0-11100000000 / A-No : 0340153053/100 / F-No : 3.338795.0			Ambient Temp:	10-35 °C

Standard Gas (ppm)		Serial No.	Certificate No.	Expired Date
Zero Gas, Nitrogen :	0	-	-	-
Span Gas NO2 :	76.00	A00560SV	3693/22	2567/11/29

As Found — Allowable Error: 5.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00	0.00	0.00	Pass	0.00
Span Gas :	76.00	78.00	40.00	Pass	

As Left — Allowable Error: 5.00 ppm

Standard Gas (ppm)		Reading (ppm)	% OffSpec	Result	Process Reading
Zero Gas :	0.00		0.00	Pass	2.00
Span Gas :	76.00		-1520.00	Fault	
Remark:	Replace Temp Sampling Cell				

ภาคผนวก ข.11

เอกสารการตรวจสอบความถูกต้องของ CEMS (RATA)

Relative Accuracy Determination for CEMS : UBE Chemical (Asia) Public Co., Ltd.: Waste Gas Treatment Off Gas

DATE July 06, 2022

Run No.	Time		O_2	NOx		
	Start	End	%	ppm@7% O_2		
			Instrumental RM	Instrumental RM	CEMS	Diff(d_i)
1	11:30 AM	11:50 AM	7.28	53.90	51.98	1.92
2	11:51 AM	12:11 PM	7.22	57.69	53.37	4.32
3	12:12 PM	12:32 PM	7.22	59.28	54.82	4.46
4	12:33 PM	12:53 PM	7.17	76.59	70.56	6.02
5	1:15 PM	1:35 PM	7.19	64.58	56.96	7.62
6	1:36 PM	1:56 PM	7.21	82.67	78.05	4.62
7	1:57 PM	2:17 PM	7.26	68.79	68.09	0.69
8	2:18 PM	2:38 PM	7.30	58.02	55.56	2.46
9	3:00 PM	3:20 PM	7.25	71.55	73.08	-1.54
10	3:21 PM	3:41 PM	7.23	52.21	50.90	1.31
11	3:42 PM	4:02 PM	7.02	77.71	74.51	3.20
12	4:03 PM	4:23 PM	7.17	76.96	77.80	-0.84
Average			7.21	66.66	63.81	2.85
Confidence Coefficient			-	1.7324		
Relative Accuracy			-	2.82		
Performance Specification : RA			-	10%**		

* Instrumental RM and CEMS data are on a consistant basis, that is, dry and actual oxygen.

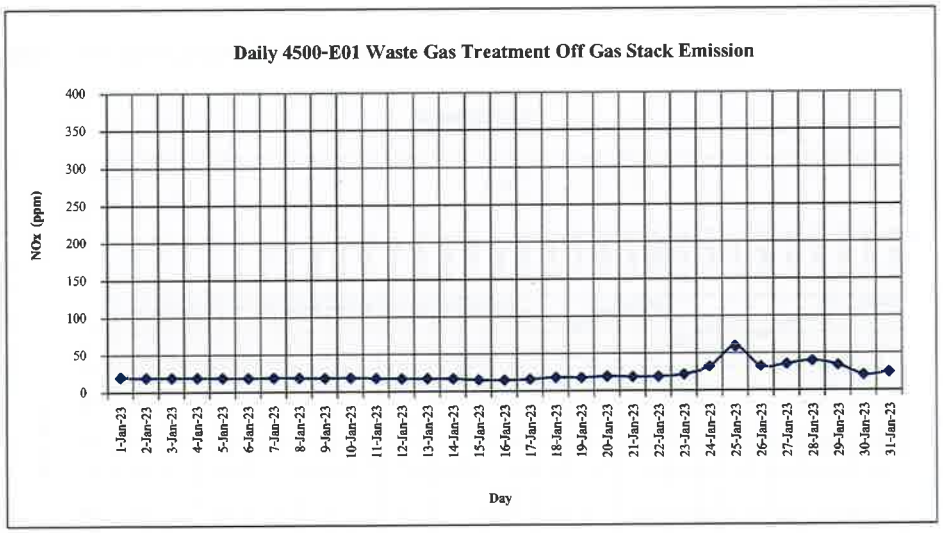
** 10% of Emission Standard value 162.5 ppmvd@7%O2 for NO_x

ภาคผนวก ข.12

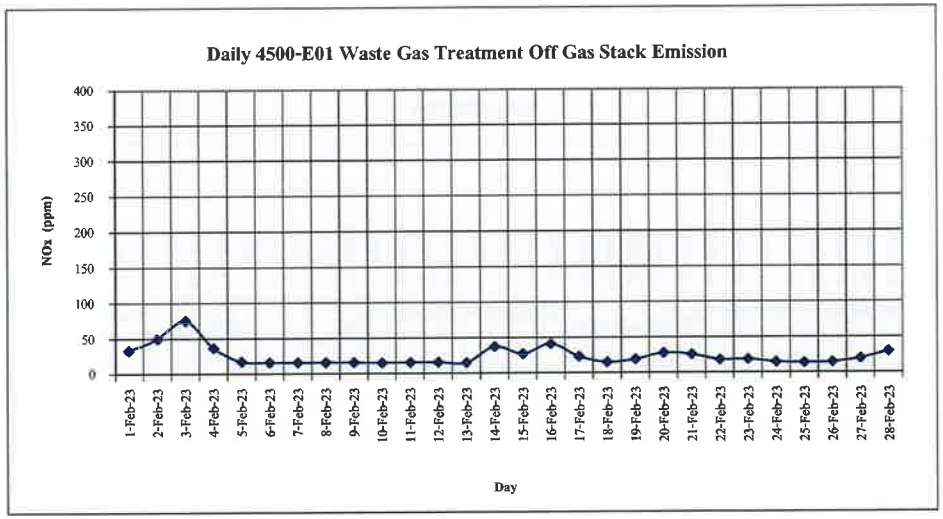
เอกสารบันทึก CEMS

ระหว่างเดือนมกราคม ถึงมิถุนายน พ.ศ.2566

ผลการตรวจวัด NO_x จาก CEMs ระหว่างเดือนมกราคม ถึงมิถุนายน พ.ศ.2566



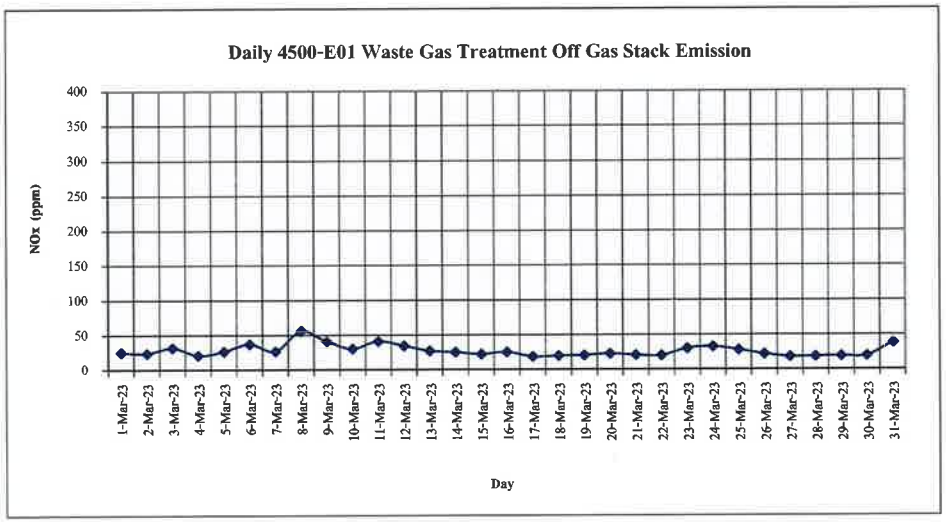
เดือนมกราคม



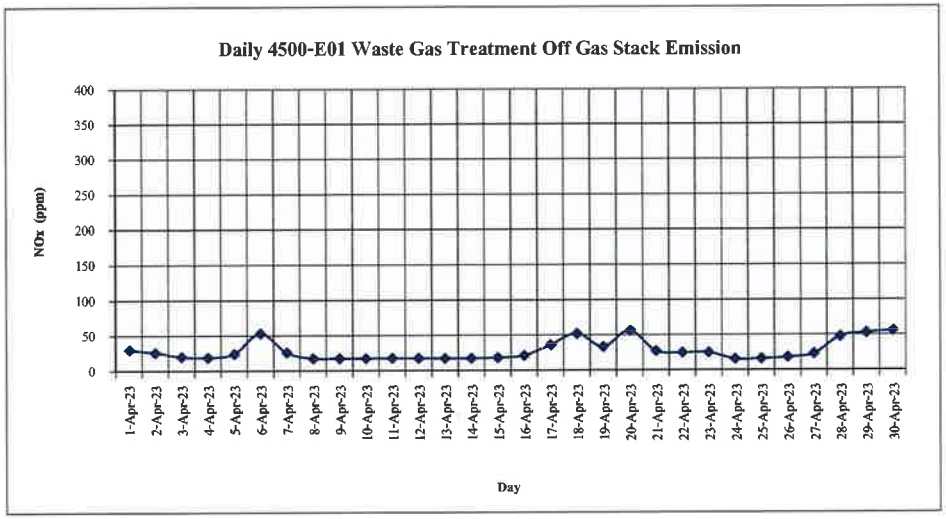
เดือนกุมภาพันธ์

ที่มา : โครงการโรงงานผลิตดาโปรแลคตัมฯ บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน)

ผลการตรวจวัด NO_x จาก CEMs ระหว่างเดือนมกราคม ถึงมิถุนายน พ.ศ.2566 (ต่อ)



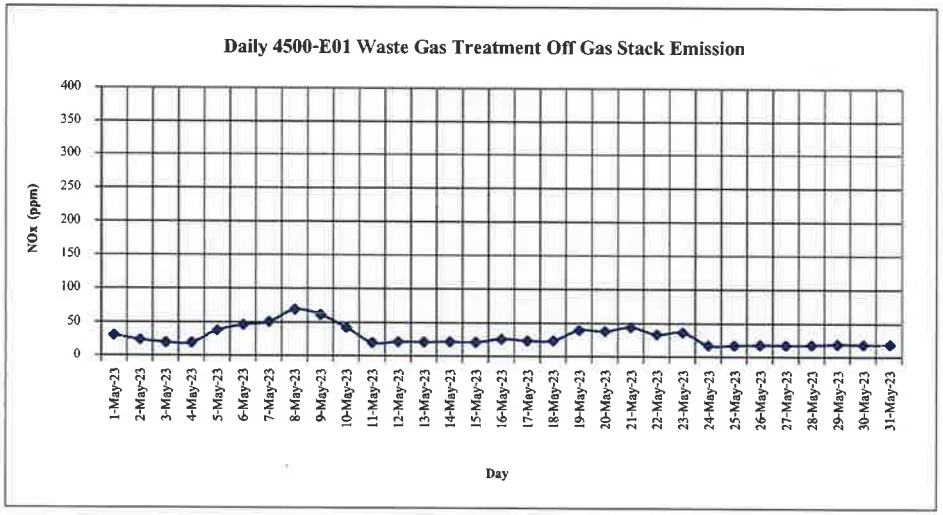
เดือนมีนาคม



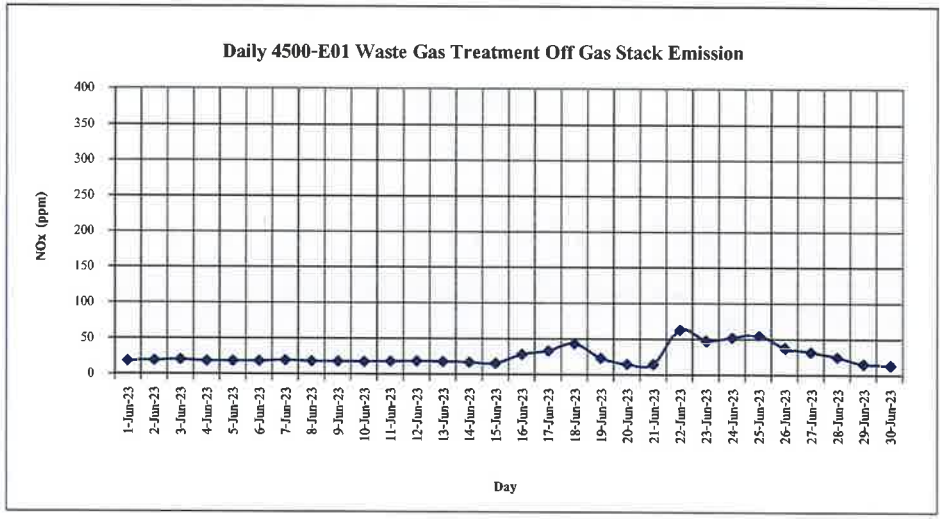
เดือนเมษายน

ที่มา : โครงการโรงงานผลิตดาโปรแลคตัมฯ บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน)

ผลการตรวจวัด NO_x จาก CEMs ระหว่างเดือนมกราคม ถึงมิถุนายน พ.ศ.2566 (ต่อ)



เดือนพฤษภาคม



เดือนมิถุนายน

ที่มา : โครงการโรงงานผลิตคาโปรแลคตัมฯ บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน)

ภาคผนวก ข.13

PM Plan ประจำปี พ.ศ.2566

UBE

MAINTENANCE CENTER

PM MASTER PLAN

FY2023

(Jan'23-Dec'23)

CPL Plant

Dept	Prepare Engineer	Review Department Manager	Approve Division Manager	Approve Production Manager	Approve Plant Manager
Electrical					
Instrument					
Mechanical					
Maintenance Engineering					
PSC (DCS)					

Revision : 0

Issue date : 18/01/2023

Milestone for PM Improvement

Note : Calendar year

Item	Task	Due Date	Status	2022				2023			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	Equipment ranking review in Excel	01/01/2022-10/01/2023	Completed								
2	Equipment ranking present to EVP	01/01/2023-15/01/2023	Completed								
3	Equipment ranking upload in SAP	01/01/2022-10/01/2023	Completed								
4	PM Plan review by discipline (Excel)	01/01/2023-15/01/2023	Completed								
5	Prepare KPI for PM Outcome	05/01/2023-20/01/2023	Completed								
6	PM Plan upload in SAP	01/01/2022-31/12/2022	Completed								
7	Study wireless technology for machine's key parameter monitoring in order to reduce PM work load & provide real-time data trend for more accurate of machine condition analysis.	01/10/2022-10/01/2023	Completed								
8	PM Plan intergrate of EE/IN/ME/MG in SAP	01/01/2022-10/01/2023	Completed								
9	Issue the final PM Plan	01/02/2023	Completed								

Note

1. After completed upload PM Plan in SAP, all PM plan will generate work order in SAP automatically. Any work order that could not be executed as plan, those work order will be remained in back log for easier follow up by MTN crew & PDN staff by UBE instranet system.

   Back log work will be reported to Plant Manager or Production Manager by weekly.
   This kind of automate workflow will make PM more effective in view of Time Base MTN program.
   Expected outcome is to eliminate Avoidable Loss from lag of PM.

2. Detail of PM master plan will not be printed out. MTN shall prepare in electronic format (PDF) and submit to plant manager by Email, for reference.

3. For FY2023, PM analysis & KPI will be presented by MTN discipline again around end of Dec'22

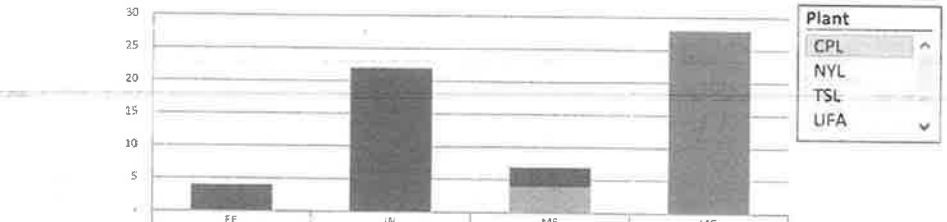
4. For next Fiscal Year (FY2023), PM KPI & analysis will be included in this PM Master Plan before submit to Plant Manager for approval.

5. Abbriviation
   - EE = Electrical Department
   - IN = Instrument Department
   - ME = Mechanical Departmen
   - MG = Maintenance Engineering Department
   - MTN = Maintenance Division

Summary of PM change in FY2023

Plant
Count of Source...

Quantity of PM Change & Reason for FY2023



	EE	IN	ME	MG
SIGN-OUT	-	-	-	28
ADD NEW CYCLE	-	-	3	-
PMFR	-	-	4	-
CHANGE SCOPE OF WORK	-	16	-	-
SIGN-IN	4	5	-	-

Dept

Summary of PM change in FY2023

Plant
Count of Source...

Activity on each Equipment Ranking

	EE		IN				ME	MG
	NA	B	NA	B	A	C	A	NA
SIGN-OUT	-	-	-	-	-	-	-	28
ADD NEW CYCLE	-	-	-	-	-	-	3	-
PMFR	-	-	-	-	-	-	4	-
CHANGE SCOPE OF WORK	-	-	3	2	6	5	-	-
SIGN-IN	3	1	5	1	1	1	-	-

Dept Ranking-New

Plant
Count of Purpose of Change

Quantity of purpose for PM Change in FY2023

	EE	IN	ME	MG
CANCEL PM PLAN	-	-	-	28
NEW PM PLAN	1	1	4	-
ADJUST INTERVAL	3	19	3	-

Dept

Plant
Count of Purpose of Change

Adjustment on each Equipment Ranking

	EE		IN				ME
	NA	B	NA	B	A	C	A
NEW PM PLAN	-	1	-	1	1	1	4
ADJUST INTERVAL	3	-	5	2	6	5	3

Dept Ranking-New

clarification sheet

od : Apr'22-Mar'23

Click drop down list for select

Plant	Area	Dept	Line / Cabinet	Purpose of Change	Source of change	PM Type	Remarks		PM Plan No.	Maintenance Item No.	Maintenance Item Description	Functional Location	Equipment No.	Equipment Name (short name)	Reason of change	Interval frequency	
CPL	CXN	EE	NO	ADJUST INTERVAL	SIGN-IN	NORMAL (ONLINE)	NA	NA	101051	101051	PM 2M MOTOR (CN/WLC)	1100	NA	NA		2M	
CPL	HX/LC/SA	EE	NO	ADJUST INTERVAL	SIGN-IN	NORMAL (ONLINE)	NA	NA	101051	105579	PM 2M MOTOR (HX/LC/SA)	1200	NA	NA		2M	
CPL	AS/UT/WH	EE	NO	ADJUST INTERVAL	SIGN-IN	NORMAL (ONLINE)	NA	NA	101051	105580	PM 2M MOTOR (AS/UT)	1400	NA	NA		2M	
CPL	AS/UT/WH	EE	NO	NEW PM PLAN	SIGN IN	NORMAL (ONLINE)	B	B	200044	300201	2600-MCC07-APF01	10032212	10032212	POWER ACTIVE FILTER 4L-0 4/600A		6M	
CPL	AS/UT/WH	IN	NO	ADJUST INTERVAL	SIGN-IN	NORMAL (ONLINE)	NA	NA	101650	101650	PM 6M CALIBRATE GAS DETECTOR	0000	NA	NA		6M	
CPL	CXN	IN	NO	ADJUST INTERVAL	SIGN-IN	NORMAL (ONLINE)	NA	NA	101654	101654	PM 3M CALIBRATE ANALYZER CNWLC	1100	NA	NA		3M	
CPL	CXN	IN	NO	ADJUST INTERVAL	CHANGE SCOPE OF WORK	NORMAL (ONLINE)	C	C	104013	108569	PM 4M TX-REPLACE-N 1110BOWATER SEPARATOR	1110-K03-PDT6820	10001420	PRESSURE TRANSMITTER, DIFF.		4M	
CPL	CXN	IN	NO	ADJUST INTERVAL	CHANGE SCOPE OF WORK	NORMAL (ONLINE)	C	C	104014	108598	PM 4M TX-REPLACE-N 1110BOWATER SEPARATOR	1110-K03-PD1902	10001476	PRESSURE TRANSMITTER, DIFF.		4M	
CPL	CXN	IN	NO	ADJUST INTERVAL	CHANGE SCOPE OF WORK	NORMAL (ONLINE)	B	B	104534	109264	PM 1W TX-CLEAN-N FT1116	1110-P07A-FT116	10023788	FLOW TRANSMITTER		1W	
CPL	CXN	IN	NO	ADJUST INTERVAL	CHANGE SCOPE OF WORK	NORMAL (ONLINE)	A	A	104534	109263	PM 1W TX-CLEAN-N FT1116	1110-P07A-PT106	10023791	PRESSURE TRANSMITTER		1W	
CPL	HOL	IN	NO	ADJUST INTERVAL	CHANGE SCOPE OF WORK	NORMAL (ONLINE)	A	A	103956	108534	PM 2M TX-CLEAN-N-LT1601A	1140-V01A-LT801A	10023996	LEVEL TRANSMITTER, RADIATION		2M	
CPL	HX/LC/SA	IN	NO	ADJUST INTERVAL	CHANGE SCOPE OF WORK	NORMAL (ONLINE)	NA	NA	101655	101655	PM 3M ANALYZER HOLC	1200	NA	NA		3M	
CPL	AS/UT/WH	IN	NO	ADJUST INTERVAL	CHANGE SCOPE OF WORK	NORMAL (ONLINE)	NA	NA	101656	101656	PM 3M CALIBRATE ANALYZER ASUT	1400	NA	NA		3M	
CPL	AS/UT/WH	IN	NO	ADJUST INTERVAL	SIGN-IN	NORMAL (ONLINE)	NA	NA	101669	101669	PM 2W ANALYZER AS/UT	1400	NA	NA		2W	
CPL	AS/UT/WH	IN	NO	ADJUST INTERVAL	CHANGE SCOPE OF WORK	NORMAL (ONLINE)	A	A	104013	108597	PM 1M TX-CLEAN-N-2400K3 AIR FILTER	2400-K03	10028039	COMPRESSOR, SCREW OIL-FREE		1M	
CPL	HX/LC/SA	IN	NO	ADJUST INTERVAL	CHANGE SCOPE OF WORK	NORMAL (ONLINE)	C	C	104535	109274	PM 2W TX-CLEAN-N-FT4120S	4120-F02-FT203	10028731	FLOW TRANSMITTER,ORIFIC		2W	
CPL	HX/LC/SA	IN	NO	ADJUST INTERVAL	CHANGE SCOPE OF WORK	NORMAL (ONLINE)	C	C	104535	109275	PM 2W TX-CLEAN-N-PT4123S	4120-F02-PT223	10028734	PRESSURE TRANSMITTER		2W	
CPL	HX/LC/SA	IN	NO	ADJUST INTERVAL	CHANGE SCOPE OF WORK	NORMAL (ONLINE)	C	C	104535	109285	PM 2W TX-CLEAN-N-PT41405	4140-C03-PT405	10011340	PRESSURE TRANSMITTER, DIFF		2W	
CPL	HX/LC/SA	IN	NO	ADJUST INTERVAL	CHANGE SCOPE OF WORK	NORMAL (ONLINE)	A	A	101668	101668	PM 2W ANALYZER SA	4140-Z01-AT406	10023498	ANALYZER, INFRARED		2W	
CPL	AS/UT/WH	IN	NO	ADJUST INTERVAL	SIGN-IN	NORMAL (ONLINE)	NA	NA	102181	102965	PM 10M ANALYZER RENEW SENSOR (AS/UT)	4700	NA	NA		10M	
CPL	HX/LC/SA	IN	NO	ADJUST INTERVAL	CHANGE SCOPE OF WORK	NORMAL (ONLINE)	A	A	103426	105540	PM 1Y CALIBRATE WEIGHT OPL By UNIT	5640-Z01-WE-R01	10022452	WEIGHT SCALE		1Y	
CPL	HX/LC/SA	IN	NO	ADJUST INTERVAL	CHANGE SCOPE OF WORK	NORMAL (ONLINE)	B	B	104542	109293	PM 3M Service Ink jet by KGK AS	5640-Z03-PRNT01	NA	NA		3M	
CPL	HX/LC/SA	IN	NO	ADJUST INTERVAL	CHANGE SCOPE OF WORK	NORMAL (ONLINE)	A	A	104539	109265	PM 1Y SERVICE ROBOT BY KAWASAKI	5640-Z04	10031279	ROBOT PALLETIZER		1Y	
CPL	HX/LC/SA	IN	NO	NEW PM PLAN	SIGN-IN	NORMAL (ONLINE)	A	A	200062	300223	PM 2W TX-CLEAN-N-LT4140 PUMP TANK	4140-V01-LT401	NA	LEVEL TRANSMITTER, DIFF.		2W	
CPL	HX/LC/SA	IN	NO	NEW PM PLAN	SIGN-IN	NORMAL (ONLINE)	C	C	200019	300175	PM 6M IN_OVERHAUL SEWING M/C BY NEWLONG	5640-Z03-Q01	NA	5540-Z03-Q01 Sewing machine		6M	
CPL	AS/UT/WH	IN	NO	NEW PM PLAN	SIGN-IN	NORMAL (ONLINE)	B	B	200115	300394	PM 2W Clean & Check pH,DO ICT	5700-AT014	NA	ANALYZER, PH		2W	
CPL	AS/UT/WH	ME	NO	ADJUST INTERVAL	ADD NEW CYCLE	NORMAL (ONLINE)	NA	A	100389	100389	PM 1M ADJUST GLAND PACKING (ELBOW PUMP)	1450	NA	NA		1M	
CPL	CXN	ME	NO	ADJUST INTERVAL	ADD NEW CYCLE	NORMAL (STOP)	A	A	103027	103934	PM 3Y OVERHAUL PUMP 4620-P53	4620-P53	10032078	PRODUCT LIQUOR CIRC PUMP		3Y	
CPL	CXN	ME	NO	ADJUST INTERVAL	ADD NEW CYCLE	NORMAL (STOP)	NA	A	103901	108468	PM 6M INSPECT OMEGA COUPLING	4620-P53	10032076	PRODUCT LIQUOR CIRC PUMP		6M	
CPL	HX/LC/SA	ME	NO	NEW PM PLAN	PMFR	NORMAL (STOP)	A	A	200007	300111	PM 1Y REPLACE BEARING PENDULUM LINKAGE	1360-Z01-Q07	10031297	LIFTING UNIT, WORM GEAR SCREW		1Y	
CPL	HX/LC/SA	ME	NO	NEW PM PLAN	PMFR	NORMAL (STOP)	A	A	200010	300114	PM 3M REPLACE SEAL OF DISCHARGE GATE	1360-Z01-V02	10031293	NET WEIGHER		3M	
CPL	AS/UT/WH	ME	NO	NEW PM PLAN	PMFR	NORMAL (STOP)	A	A	104548	109925	PM 6M INSPECT & ADJUST ROLLER SKEW	1410-D03	10004501	DRYER, ROTARY		6M	
CPL	AS/UT/WH	ME	NO	NEW PM PLAN	PMFR	NORMAL (STOP)	A	A	104549	109926	PM 6M INSPECT & ADJUST ROLLER SKEW	1410-D02	10004508	DRYER, ROTARY		6M	
CPL	CXN	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (STOP)		NA	103510	106425	PM 1M Lubrication monthly CN	1100	NA	NA	Already have work permit for monthly	1M	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (STOP)		NA	103510	106426	PM 1M Lubrication monthly HOLC/SA	1300	NA	NA	Already have work permit for monthly	1M	
CPL	AS/UT/WH	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (STOP)		NA	103510	106427	PM 1M Lubrication monthly ASUT	1400	NA	NA	Already have work permit for monthly	1M	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104052	108636	PM 1Y URM PIPE 12-DA-41005-T1S	4100-12-DA-41005-T1S	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104045	108629	PM 1Y UTM PIPE 12-SA-41020-A1N	4100-12-SA-41020-A1N	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104027	108611	PM 1Y UTM 1-OM-41010-ASL	4100-1-OM-41010-ASL	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104048	108632	PM 1Y UTM PIPE 1-OM-41411-A6A	4100-1-OM-41411-A6A	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104028	108612	PM 1Y UTM 1-OM-41412-ASL	4100-1-OM-41412-ASL	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104034	108618	PM 1Y UTM 1-OM-41415-ASL	4100-1-OM-41415-ASL	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104029	108613	PM 1Y UTM 1-OM-41421-A6A	4100-1-OM-41421-A6A	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104043	108627	PM 1Y UTM PIPE 1-SA-41015-ASL	4100-1-SA-41015-ASL	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104050	108634	PM 1Y URM PIPE 1-SA-41061-ASL	4100-1-SA-41061-ASL	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104044	108628	PM 1Y UTM PIPE 1-SA-41063-ASL	4100-1-SA-41063-ASL	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104035	108620	PM 1Y UTM PIPE 1-SA-41073-ASL	4100-1-SA-41073-ASL	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104033	108617	PM 1Y UTM 1-SA-41078 ASL	4100-1-SA-41078-ASL	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104047	108631	PM 1Y UTM PIPE 1-SA-41090-A6A	4100-1-SA-41090-A6A	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104032	108616	PM 1Y UTM 1-SA-41092-A6A	4100-1-SA-41092-A6A	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104046	108630	PM 1Y UTM PIPE 1-SA-41418-A6A	4100-1-SA-41418-A6A	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104038	108622	PM 1Y UTM PIPE 28-WG-41101 T1S-P	4100-28-WG-41001-T1L-P	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104037	108621	PM 1Y UTM PIPE 28-WG-41102-T1S	4100-28-WG-41102-T1S	NA	NA	Follow RBI program	1Y	
	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104030	108614	PM 1Y UTM 2-OM-41002-ASL	4100-2-OM-41003-ASL	NA	NA	Follow RBI program	1Y	
L	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104031	108615	PM 1Y UTM 2-OM-41013-ASL	4100-2-OM-41013-ASL	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104042	108628	PM 1Y UTM PIPE 2-SA-41076-ASL	4100-2-SA-41076-ASL	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104039	108619	PM 1Y UTM PIPE 2-SA-41088-ASL	4100-2-SA-41088-ASL	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104041	108625	PM 1Y UTM PIPE 30-SG-41026-T1L	4100-30-SG-41026-T1L	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	A	NA	104026	108610	PM 1Y UTM 32-SG-41004-T1K-H	4100-32-SG-41004-T1K-H	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	B	NA	104049	108633	PM 1Y UTM PIPE 8-WS-41106-T1L	4100-8-WS-41106-T1L	NA	NA	Follow RBI program	1Y	
CPL	HX/LC/SA	MG	NO	CANCEL PM PLAN	SIGN-OUT	NORMAL (ONLINE)	B	NA	104051	108635	PM 1Y URM PIPE 8-WS-41109-T1L	4100-8-WS-41109-T1L	NA	NA	Follow RBI program	1Y	

ภาคผนวก ข.14

เอกสารการตรวจสอบประสิทธิภาพ

ของระบบ Waste Gas Treatment

UBE

Operate Date 21/04/25 DCS LOG SHEET AMINE UNIT (1200 UNIT) Recorded by UB / / Checked by / /

[redacted]

UBE

Operate Date 3/0/25 DCS LOG SHEET AMINE UNIT (1200 UNIT) Recorded by / / Checked by / /

[redacted]

UBE

Operate Date 11/2/25 DCS LOG SHEET AMINE UNIT (1200 UNIT) Recorded by / / Checked by / /

[redacted]

UBE

Operate Date 30/1/25 DCS LOG SHEET AMINE UNIT (1200 UNIT) Recorded by / / Checked by / /

[redacted]

UBE

Recorded by ..... Checked by .....

Operate Date 16 - Jun - 23

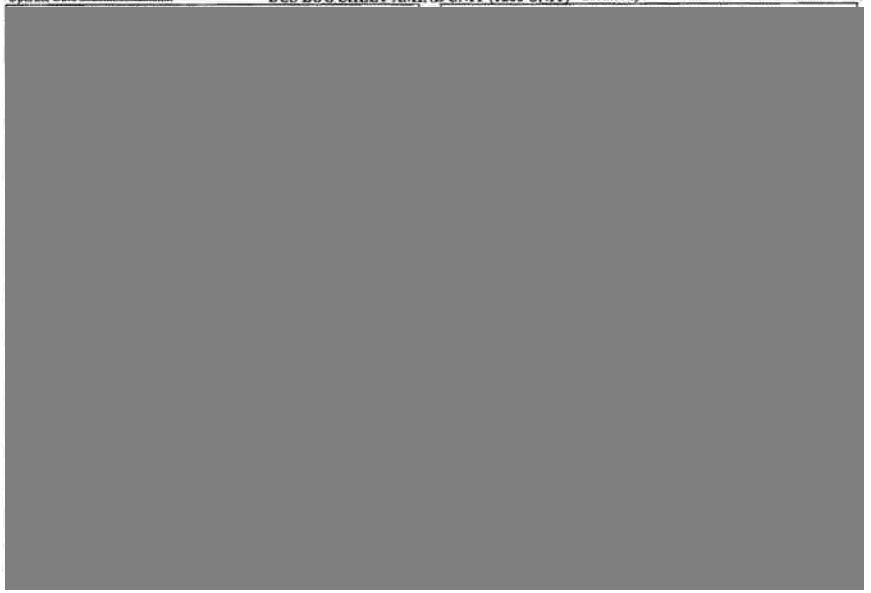
DCS LOG SHEET AMINE UNIT (1200 UNIT)

UBE

Recorded by ..... Checked by .....

Operate Date 25 / 05 / 23

DCS LOG SHEET AMINE UNIT (1200 UNIT)



ภาคผนวก ข.15

คู่มือการปฏิบัติงาน (Work Instruction) ในการควบคุมระบบ Waste Gas Treatment กรณี Shutdown แบบปกติและแบบฉุกเฉิน

UBE

UBE Chemicals (Asia) Public Company Limited

WORK INSTRUCTION	การทำงานส่วนผลิตของ Section 4500 (Waste Gas Treatment Section)	Date : 8 Jan. 2019
		Page : 1 of 2
Doc. No. :WI-LC9-45-004		Rev. no : 01

[redacted]

UBE

UBE Chemicals (Asia) Public Company Limited

WORK INSTRUCTION	การทำงานส่วนผลิตของ Section 4500 (Waste Gas Treatment Section)	Date : 8 Jan. 2019
		Page : 2 of 2
Doc. No. :WI-LC9-45-004		Rev. no : 01

[redacted]

Printed by Korbua Kettet on 30/05/2562 11:00 (Effective Date : 08/01/2562)

ภาคผนวก ข.16

เอกสารการตรวจสอบประสิทธิภาพของระบบควบคุมกำมะถัน (4140-C6)

CPL SA 4140 4140-U1 U2 and Turbine

Conducted by : **Rapin Kummeto (Rapin)**

Conducted on : **Jun 21, 2023 03:00:00**

Completed on : **Jun 21, 2023 06:01:44**

Report created with Advansoft ODM

1	EQUIPMENT Status	Duty			6/21/2023 5:17:30 AM	
2	TG-41-453	32	C	30 - 46	6/21/2023 5:17:38 AM	
3	4140E7_Condition	Normal			6/21/2023 5:17:30 AM	
4140-P9A :						
1	EQUIPMENT Status	Duty			6/21/2023 5:17:57 AM	
2	PG-41-455A	4.1	kg/cm2	2,5 - 4	6/21/2023 5:17:57 AM	
3	II-41-452A	120	Amp	90 - 120	6/21/2023 5:17:57 AM	
4	4140P9A_Condition	Normal			6/21/2023 5:17:57 AM	
4140-P9B :						
1	PG-41-455B	0	kg/cm2	2.5 - 4	6/21/2023 5:18:30 AM	
2	II-41-452B	0	Amp	90 - 120	6/21/2023 5:18:30 AM	
3	EQUIPMENT Status	Stand By			6/21/2023 5:18:30 AM	
4	4140P9B_Condition	Normal			6/21/2023 5:18:30 AM	
4140-C6 :						
1	FG-41-456	1000	l/h		6/21/2023 5:19:51 AM	
2	PG-41-452	380	mmH2O	0 - 900	6/21/2023 5:19:51 AM	
3	PDG-41-453	-375	mmH2O		6/21/2023 5:19:51 AM	
4	PDG-41-454	-25	mmH2O		6/21/2023 5:19:51 AM	
5	LG-41-451	8	%	0 - 60	6/21/2023 5:19:51 AM	
6	EQUIPMENT Status	Duty			6/21/2023 5:19:51 AM	
7	4140C6_Condition	Normal			6/21/2023 5:19:51 AM	
4140-P10A :						
1	EQUIPMENT Status	Duty			6/21/2023 5:20:28 AM	
2	4140P10A_Condition	Normal			6/21/2023 5:20:28 AM	
3	PG-41-456A	5.55	kg/cm2	3 - 6	6/21/2023 5:20:28 AM	
4140-P10B :						

1	4140P10B_Condition	Normal			6/21/2023 5:21:05 AM	
2	EQUIPMENT Status	Stand By			6/21/2023 5:21:05 AM	
3	PG-41-456B	0	kg/cm2	3 - 6	6/21/2023 5:21:05 AM	
SI SOLUTION to 1200 UNIT :						
1	EQUIPMENT Status	Duty			6/21/2023 5:21:31 AM	
2	FG-41-455	1	l/h		6/21/2023 5:22:14 AM	
4140-V5 : 1						
1	LT-41-409	0	%	50 - 70	6/21/2023 5:22:33 AM	
2	EQUIPMENT Status	Duty			6/21/2023 5:22:33 AM	
3	4140V5_Condition	Normal			6/21/2023 5:22:33 AM	
4140-P5 : 1						
1	4140-P5_Condition	Normal			6/21/2023 5:23:04 AM	
2	PG-41-421	3.77	kg/cm2	3 - 5	6/21/2023 5:23:04 AM	
3	P5-IA seal	Open			6/21/2023 5:23:04 AM	
4	EQUIPMENT Status	Duty			6/21/2023 5:23:04 AM	
5	PG-41-00	0	kg/cm2	0.1 - 0.5	6/21/2023 5:23:04 AM	
4140-V3 :						
1	EQUIPMENT Status	Duty			6/21/2023 5:23:52 AM	
2	4140V3_Condition	Normal			6/21/2023 5:23:52 AM	
4140-P3 : 1						
1	EQUIPMENT Status	Duty			6/21/2023 5:24:30 AM	
2	PG-41-422	3.3	kg/cm2	2.8 - 3.8	6/21/2023 5:24:30 AM	
3	P3-IA	Open			6/21/2023 5:24:30 AM	
4	PG-41-00	0.065	kg/cm2	0.1 - 0.5	6/21/2023 5:24:30 AM	
5	4140P3_Condition	Normal			6/21/2023 5:24:30 AM	
4140-V1 to 4140-V3 :						

3	PG-41-416	0	mmHg		6/21/2023 5:30:37 AM	
4	EQUIPMENT Status	Duty			6/21/2023 5:30:37 AM	
4140-C5 :						
1	EQUIPMENT Status	Duty			6/21/2023 5:31:07 AM	
2	PG-41-419	0.16	kg/cm2	< 0.37	6/21/2023 5:31:07 AM	
3	PG-41-418	0	kg/cm2		6/21/2023 5:31:07 AM	
4	PG-41-420	0.16	kg/cm2		6/21/2023 5:31:07 AM	
5	4140C5_Condition	Normal			6/21/2023 5:31:07 AM	
4140-B4 :						
1	4140B4_Condition	Normal			6/21/2023 5:32:09 AM	
2	II-4140B4	178	Amp		6/21/2023 5:32:09 AM	
3	PG-41-455	0	mmH2O	0 - 850	6/21/2023 5:32:09 AM	
4	FG-N2-B4	5	Nm3/H	2 - 6	6/21/2023 5:32:09 AM	
5	EQUIPMENT Status	Duty			6/21/2023 5:32:09 AM	
LOCAL PANEL AT41408 : 1						
1	EQUIPMENT Status	Duty			6/21/2023 5:32:49 AM	
2	HEATED-AT41408	120.1	C	0 - 140	6/21/2023 5:32:49 AM	
3	O2-AT41408	8.67	%vol	0 - 1	6/21/2023 5:33:01 AM	
4	AT-41-408	6	ppm	0 - 150	6/21/2023 5:32:49 AM	
STEAM HEADER :						
1	EQUIPMENT Status	Duty			6/21/2023 5:33:20 AM	
2	PG-41-521	23	kg/cm2	21 - 27	6/21/2023 5:33:20 AM	
3	PG-41-520	23	kg/cm2	19 - 23	6/21/2023 5:33:20 AM	
4	PG-41-508	3.1	kg/cm2	2.5 - 4.5	6/21/2023 5:33:20 AM	
COOLING WATER : 1						
1	EQUIPMENT Status	Duty			6/21/2023 5:33:45 AM	

ภาคผนวก ข.17

คู่มือการตั้งอุณหภูมิในการหยุดระบบการผลิตอัตโนมัติ

ภาคผนวก ข.18

แผนควบคุมภาวะฉุกเฉินสำหรับระบบควบคุมกำมะถัน (4140-C6)

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

ภาคผนวก ข.19

เอกสารการตรวจสอบระบบกำจัดกลิ่นกำมะถัน

CPL SA 4110 to 4130 and 4150 Deodorants

Conducted by : **Puvanai Kaipong (puvanai)**

Conducted on : **Jun 21, 2023 07:00:00**

Completed on : **Jun 21, 2023 09:22:24**

Report created with Advansoft ODM

6	XA-41-503B	0	Amp	0 - 195	6/21/2023 8:23:27 AM	
7	4120-P1B_MODE	AUTO			6/21/2023 8:23:27 AM	
8	4120-P1B Condition	Normal			6/21/2023 8:23:27 AM	
Work Summary (Deodorants 4110-B1,4110-B2,4110-B3) : (1)						
1	Throughput rate (TP)	3800	Kg/hr		6/21/2023 8:24:03 AM	
4110-B2 (DEODORANT Sulphur Blower) : (7)						
1	EQUIPMENT Status	Stand By			6/21/2023 8:24:24 AM	
2	PG-41-122	0	mmH2O	-400 - -200	6/21/2023 8:24:24 AM	
3	4110-B2-I	0	Amp		6/21/2023 8:24:24 AM	
4	ATM VALUE	0	degree		6/21/2023 8:24:24 AM	
5	DISH. TO ATM	NR			6/21/2023 8:24:24 AM	
6	DISH. TO 4150-F1	NR			6/21/2023 8:24:24 AM	
7	4110-B2 Condition	NR			6/21/2023 8:24:24 AM	
4110-S3 (Sulphur Dust Separator) : (2)						
1	EQUIPMENT Status	Stand By			6/21/2023 8:24:45 AM	
2	4110-S3 Condition	NR			6/21/2023 8:24:45 AM	
4110-V11 (K.O. Drum) : (6)						
1	EQUIPMENT Status	Stand By			6/21/2023 8:25:15 AM	
2	PG-41-121A	0	mmH2O		6/21/2023 8:25:15 AM	
3	TG-41-122A	0	C		6/21/2023 8:25:15 AM	
4	PG-41-121B	0	mmH2O		6/21/2023 8:25:15 AM	
5	TG-41-122B	0	C		6/21/2023 8:25:15 AM	
6	4110-V11 Condition	NR			6/21/2023 8:25:15 AM	
SUMP TANK : (2)						
1	EQUIPMENT Status	Stand By			6/21/2023 8:26:08 AM	
2	SUMP TANK-PH	0	pH	8 - 12	6/21/2023 8:26:08 AM	

4110-B3 :						
1	EQUIPMENT Status	Duty			6/21/2023 8:26:45 AM	
2	PG-41-114	0	mmH2O		6/21/2023 9:17:49 AM	
3	PG-41-113	-10	mmH2O		6/21/2023 9:17:53 AM	
4	Damper suction	100	%		6/21/2023 9:17:56 AM	
4110-P8A :						
1	EQUIPMENT Status	Duty			6/21/2023 8:27:07 AM	
2	PG-41-115	3.5	kg/cm2		6/21/2023 8:27:07 AM	
4110-P9A :						
1	EQUIPMENT Status	Stand By			6/21/2023 8:27:26 AM	
2	PG-41-116	2.7	kg/cm2		6/21/2023 8:27:26 AM	
4110-V12 :						
1	EQUIPMENT Status	Duty			6/21/2023 9:16:10 AM	
2	LIAS-41-109	49.1	%		6/21/2023 9:16:08 AM	
4110-S5A :						
1	EQUIPMENT Status	Duty			6/21/2023 8:27:55 AM	
2	Condition Fillter A	Normal			6/21/2023 8:27:55 AM	
3	Condition Fillter B	Normal			6/21/2023 8:27:55 AM	
4110-Z2 :						
1	EQUIPMENT Status	Duty			6/21/2023 8:28:27 AM	
2	PG-41-110	-10	mmH2O		6/21/2023 9:18:35 AM	
Diff Filter 4110-Z2 :						
1	EQUIPMENT Status	Duty			6/21/2023 9:19:32 AM	
2	PG-41-111	-10	mmH2O		6/21/2023 9:19:27 AM	
3	PG-41-112	0	mmH2O		6/21/2023 9:19:30 AM	
PH drain line of AV-41102 :						
1	EQUIPMENT Status	Duty			6/21/2023 9:16:45 AM	
2	Line drain	10.2	pH		6/21/2023 9:16:40 AM	
4110-E1 (Sulphur Condenser) : (9) 2[1]						
1	EQUIPMENT Status	Stand By			6/21/2023 8:28:55 AM	
2	4110-E1 Condition	NR			6/21/2023 8:28:55 AM	
3	TG-41-121A	0	C		6/21/2023 8:28:55 AM	
4	TG-41-121B	0	C		6/21/2023 8:28:55 AM	
5	4110-E1A/B Condition	NR			6/21/2023 8:28:55 AM	
6	PG-41-123	0	kg/cm2	2.5 - 4	6/21/2023 8:28:55 AM	
7	PG-41-120	0	mmH2O		6/21/2023 8:28:55 AM	
8	TG-41-120	0	C	120 - 150	6/21/2023 8:28:55 AM	
9	VALUE 4110-Z1	NR			6/21/2023 8:28:55 AM	
4110-B1 (DEODORANT Sulphur Blower) : (4)						
1	EQUIPMENT Status	Stand By			6/21/2023 8:29:29 AM	
2	PG-41-106	0	mmH2O		6/21/2023 8:29:29 AM	
3	PG-41-110	0	mmH2O		6/21/2023 8:29:29 AM	
4	4110-B1 Condition	NR			6/21/2023 8:29:29 AM	
4110-P6 P7 (Sulphur Scrubbing Pump) : (7) 1[1]						
1	EQUIPMENT Status	Stand By			6/21/2023 8:29:48 AM	
2	PG-41-107	0	KG/CM2G	5 - 7	6/21/2023 8:29:48 AM	
3	PG-41-108	0	KG/CM2G		6/21/2023 8:29:48 AM	
4	PG-41-109	0	KG/CM2G		6/21/2023 8:29:48 AM	
5	FG-41-102	0	m3/H		6/21/2023 8:29:48 AM	
6	4110-P6 Condition	NR			6/21/2023 8:29:48 AM	
7	4110-P7 Condition	NR			6/21/2023 8:29:48 AM	
4110-Z1 (Sulphur Scrubber) : (5) 2[1]						

ภาคผนวก ข.20

เอกสารขึ้นทะเบียนบุคลากรด้านสิ่งแวดล้อมประจำโรงงาน

ที่ อก ๐๓๓๓/ ๓๐๔๐๐

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๐๓ พฤศจิกายน ๒๕๖๔

เรื่อง หนังสือรับแจ้งการมีบุคลากรด้านสิ่งแวดล้อมประจำโรงงาน

เรียน ผู้รับใบอนุญาตประกอบกิจการโรงงาน บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน)

อ้างถึง คำขอเลขที่ ๑๔๐๗ ลงรับวันที่ ๒๐ ตุลาคม ๒๕๖๔

ตามคำขอที่อ้างถึง ท่านแจ้งการมีบุคลากรด้านสิ่งแวดล้อมประจำโรงงาน ของ บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน) ทะเบียนโรงงานเลขที่ ข ๓-๔๔-๑/๓๙ รย ประกอบกิจการผลิตคาโปรแลคตัม และปุ๋ยแอมโมเนียซัลเฟต ตั้งอยู่ ณ เลขที่ ๑๔๐/๖ หมู่ที่ ๔ เขตประกอบการอุตสาหกรรม บริษัท ไออาร์พีซี จำกัด (มหาขน) ตำบลตะพง อำเภอเมืองระยอง จังหวัดระยอง โทรศัพท์ ๐ ๓๘๙๒ ๘๗๐๐

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว รับแจ้งการให้มีบุคลากรด้านสิ่งแวดล้อมประจำโรงงาน และให้ท่านยื่นคำขอแจ้งการมีบุคลากรด้านสิ่งแวดล้อมประจำโรงงานครั้งต่อไป ภายในวันที่ ๑๙ พฤศจิกายน ๒๕๖๗ โดยมีบุคลากรด้านสิ่งแวดล้อมประจำโรงงาน ดังนี้

ผู้จัดการสิ่งแวดล้อม	นายเก่งกาจ ปัทมารัตน์

ลำดับ	ผู้ควบคุมระบบบำบัด	เลขทะเบียน	มลพิษน้ำ	มลพิษอากาศ	มลพิษกากอุตสาหกรรม
๑	[redacted]	[redacted]	✓	✓	✓
๒			✓		
๓			✓	✓	✓
๔				✓	
๕			✓		
๖			✓		

ลำดับ	ผู้ปฏิบัติงานประจำระบบบำบัด	มลพิษน้ำ	มลพิษอากาศ	มลพิษกากอุตสาหกรรม
๑	[redacted]	✓		✓
๒		✓		
๓			✓	
๔		✓		
๕		✓		
๖		✓		
๗				✓
๘			✓	✓
๙			✓	
๑๐			✓	✓
๑๑			✓	✓

ลำดับ ๑๒...

ลำดับ	ผู้ปฏิบัติงานประจำระบบบำบัด	มลพิษน้ำ	มลพิษอากาศ	มลพิษกากอุตสาหกรรม
๑๒	[redacted]		✓	
๑๓			✓	
๑๔			✓	
๑๕			✓	
๑๖			✓	
๑๗			✓	
๑๘				✓
๑๙				✓
๒๐				✓
๒๑			✓	✓
๒๒				✓
๒๓				✓
๒๔			✓	✓
๒๕				✓
๒๖		✓		
๒๗		✓		
๒๘			✓	
๒๙				✓
๓๐				✓
๓๑				✓
๓๒			✓	
๓๓			✓	
๓๔				✓
๓๕		✓		
๓๖		✓	✓	✓

หมายเหตุ ๑. การแจ้งการมี/ยกเลิก/เพิ่มเติม/เปลี่ยนแปลง บุคลากรด้านสิ่งแวดล้อมประจำโรงงาน ต้องส่งหนังสือฉบับนี้ด้วย
๒. ยกเลิกหนังสือรับแจ้งการมีบุคลากรด้านสิ่งแวดล้อมประจำโรงงาน ที่ อก ๐๓๑๓/๖๘๖๐ ลงวันที่ ๒ มิถุนายน ๒๕๖๓

จึงเรียนมาเพื่อโปรดทราบ

ขอแสดงความนับถือ

[redacted]

ผู้อำนวยการกองส่งเสริมเทคโนโลยีสิ่งแวดล้อมโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองส่งเสริมเทคโนโลยีสิ่งแวดล้อมโรงงาน
กลุ่มกำกับบุคลากรด้านสิ่งแวดล้อมประจำโรงงาน
โทรศัพท์ ๐ ๒๔๓๐ ๖๓๑๕ ต่อ ๒๔๐๕
โทรสาร ๐ ๒๔๓๐ ๖๓๑๕ ต่อ ๒๔๙๙
ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th

ภาคผนวก ข.21

เอกสารชี้แจงระบบควบคุมมลสาร

receive date 19/05/11

ที่ รย 0028(3)/1222

สำนักงานอุตสาหกรรมจังหวัดระยอง
140/20 ถนนสุขุมวิท ระยอง 21000

28 เม.ย. 2554

เรื่อง การขอใช้เชื้อเพลิงประเภทสารอินทรีย์ผสมกับเตาเผา HEAT TRANSFER SALT (HTS) FURNACE

เรียน กรรมการผู้จัดการบริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน)

อ้างถึง หนังสือบริษัทฯ เลขที่ รง UCHA/0031/54 ลงวันที่ 28 กุมภาพันธ์ 2554

ตามหนังสือที่อ้างถึง บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน) ประกอบกิจการโรงงานผลิตคาโปรแลคตัมและปุ๋ยแอมโมเนียมซัลเฟต ตั้งอยู่ ณ เลขที่ 140/6 หมู่ที่ 4 ตำบลตะพง อำเภอเมือง จังหวัดระยอง ทะเบียนโรงงานเลขที่ ข 3-44-1/39 รย ได้แจ้งความประสงค์จะขอนำเชื้อเพลิงประเภทสารอินทรีย์ผสม ซึ่งมีคุณสมบัติคล้ายก๊าซ แอลพีจี เพื่อนำไปใช้เป็นเชื้อเพลิงที่เตาเผา HTS FURNACE ในกระบวนการผลิตของหน่วยผลิตไซโคลเฮกซาโนน โดยเชื้อเพลิงดังกล่าวได้นำมาจาก บริษัท ยางสังเคราะห์ไทย จำกัด ซึ่งเป็นโรงงานในกลุ่มเดียวกันและส่งผ่านมาตามท่อส่ง นั้น

สำนักงานอุตสาหกรรมจังหวัดระยอง ได้พิจารณาแล้วเห็นว่าเดิมบริษัทฯ ได้มีการใช้แก๊ส แอลพีจี ร่วมกับก๊าซไฮโดรเจนเป็นเชื้อเพลิงที่เตาเผา HTS FURNACE อยู่แล้ว ดังนั้น กรณีที่ขอนำเชื้อเพลิงประเภทสารอินทรีย์ผสม ซึ่งมีคุณสมบัติคล้ายก๊าซ แอลพีจี มาใช้ร่วมด้วยจึงไม่ขัดข้องในการใช้เชื้อเพลิงดังกล่าว แต่อย่างไรก็ตาม บริษัทฯ จะต้องควบคุมอัตราการระบายมลสารจากปล่องของแหล่งกำเนิดให้มีค่าเป็นไปตามมาตรการป้องกันและลดผลกระทบสิ่งแวดล้อม ที่สำนักงานนโยบายและแผนทรัพยากรธรรมชาติและสิ่งแวดล้อมให้ความเห็นชอบ คือ NO_x ไม่เกิน 60 mg/Nm^3 (0.07 กรัมต่อวินาที)

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

[redacted]

นักวิเคราะห์นโยบายและแผนชำนาญการพิเศษ รักษาราชการแทน
ผู้ตรวจราชการกรมจังหวัดระยอง

ฝ่ายโรงงานอุตสาหกรรม
โทรศัพท์ 0 3861 2038, 0 3880 8177
โทรสาร 0 3880 8178
E-mail : moi_rayong@industry.go.th

ก8-1

เอกสารขอใช้เชื้อเพลิง

UBE Chemicals (Asia) Public Company Limited

Office : 87/2 CRC Tower, All Seasons Place, 9th Floor,
Wireless Road, Lumpini, Pathumwan, Bangkok 10330, Thailand
Tel. 66-2-263-6600 Fax. 66-2-263-6688

Factory : 140/6 Moo 4, Tambol Tapong, Muang Rayong District,
Rayong Province 21000, Thailand
Tel. 66-38-928-700 Fax. 66-38-928-865

http://www.ube.co.th

UBE GROUP (THAILAND)

สำนักงาน
อุตสาหกรรมจังหวัดระยอง
รับที่ 8351
วันที่ 1 ต.ค. 2553
เวลา 14.49 น.

ที่ รง. UCHA 0186/53

1 ตุลาคม 2553

เรื่อง ขอชี้แจงการประกอบกิจการโรงงานในส่วนพวยไอน้ำจากปล่องระบาย

เรียน อุตสาหกรรมจังหวัดระยอง

ตามที่ บ.ยูเบะเคมิคอลส์ (เอเชีย) จำกัด (มหาชน) ซึ่งตั้งอยู่ เลขที่ 140/6 หมู่ที่ 4 ตำบลตะพง อำเภอเมือง จังหวัดระยอง ทะเบียนโรงงานเลขที่ ข2ง3-44-1/39 รย ผลิตสารคาโปรแลคตัมและปุ๋ยแอมโมเนียมซัลเฟต ปัจจุบันการเดินเครื่องจักรในส่วนของโรงงาน AR Boiler มีปัญหาหม้อน้ำชำรุดไม่สามารถใช้การได้ อนึ่ง AR Boiler ได้ถูกติดตั้งในปี2549 มีหน้าที่เผาสารละลายด่างใช้แล้ว (Spent Alkali) เพื่อให้ได้สารละลายโซเดียมคาร์บอเนตและนำกลับมาใช้ใหม่ (Recycle) และยังได้ไอน้ำ (Steam) กลับมาใช้ในกระบวนการผลิตซึ่งเป็นการนำความร้อนกลับมาใช้ใหม่ (Heat Recovery) เป็นการประหยัดพลังงานและลดปริมาณไอน้ำที่ออกสู่ปล่องระบายเมื่อเทียบกับจากการเผาด้วยเตาเผาเดิม (Quenching Process)

จากปัญหาหม้อน้ำชำรุดดังกล่าว ทำให้ทางบริษัทฯ จำเป็นต้องใช้เตาเผาเดิม ซึ่งไม่มีการผลิตไอน้ำ ความร้อนจากการเผาไหม้ดังกล่าวจะถูกถ่ายเทไปยังน้ำ (Quenching Process) ทำให้มีน้ำระเหยกลายเป็นไอถูกส่งไปยังปล่องระบาย ซึ่งถ้าสังเกตจากลักษณะภายนอกจะเห็นเป็นพวยไอน้ำสีขาวออกมาจากปล่องระบาย โดยเฉพาะอย่างยิ่งหากในอากาศมีความชื้นมากขึ้นจะทำให้มองเห็นไอน้ำได้ชัดเจนมากขึ้น

ส่วนหม้อไอน้ำที่ชำรุด ขณะที่ทางบริษัทฯ กำลังปรับปรุงแก้ไข และต้องใช้เวลาในการซ่อมแซมประมาณ 8-12 เดือน

บริษัทฯ ขอเรียนชี้แจงมายังท่านว่าตลอดระยะเวลาที่ผ่านมาบริษัทได้ตระหนักและถือเป็นความรับผิดชอบในการประกอบกิจการไม่ให้เกิดผลกระทบแก่ผู้อยู่อาศัยโดยรอบโรงงาน ซึ่งโรงงานได้ดำเนินการตรวจวัดคุณภาพอากาศและน้ำทิ้ง โดยว่าจ้างบริษัทฯ ภายนอกที่ได้รับรองมาตรฐานจากหน่วยราชการ ผลจากการตรวจนั้นพบค่าต่างๆอยู่ในเกณฑ์มาตรฐานที่กฎหมายกำหนด และบริษัทฯก็ได้รายงานค่าคุณภาพอากาศและน้ำทิ้งจากโรงงานต่อหน่วยราชการที่เกี่ยวข้องอย่างสม่ำเสมอ แต่อย่างไรก็ตามบริษัทฯก็มีความมุ่งมั่นที่จะพัฒนาและปรับปรุงการดำเนินกิจการของโรงงานให้ดียิ่งขึ้นตลอดเวลา เพื่อมิให้ก่อผลกระทบด้านมลภาวะต่อชุมชน

จึงเรียนมาเพื่อโปรดทราบ

ขอแสดงความนับถือ

[redacted]

ผู้จัดการโรงงาน

ภาคผนวก ข.22

เอกสารการตรวจสอบประสิทธิภาพของ AR Boiler

LOG SHEET #4620 (DCS)

[redacted]

FM-WL9-00-005:22/06/2020:Rev.06

9

[redacted]

FM-WL9-00-005:22/06/2020:Rev.06

LOG SHEET #4620 (DCS)

ภาคผนวก ข.23

เอกสารการบันทึกปริมาณน้ำเสียที่เข้าระบบบำบัดน้ำเสีย

บันทึกปริมาณน้ำเสียที่เข้าสู่ระบบบำบัดน้ำเสีย

โครงการโรงงานผลิตคาโปรแลคตัมฯ บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน)

ระหว่างเดือนมกราคม ถึงมิถุนายน พ.ศ.2566

รายการ	เดือน					
	มกราคม	กุมภาพันธ์	มีนาคม	เมษายน	พฤษภาคม	มิถุนายน
ปริมาณน้ำเสียที่เข้าสู่ระบบบำบัด (ลูกบาศก์เมตร)	70,163	68,839	71,071	73,702	70,828	72,249

ภาคผนวก ข.24

เอกสารการตรวจสอบระบบบำบัดน้ำเสีย

CPL UT 4700 (1)

Conducted by : **Somchai Prom-Yoo (Somchaip)**

Conducted on : **Jan 09, 2023 20:00:00**

Completed on : **Jan 09, 2023 21:28:08**

Report created with Advansoft ODM

Disclaimer

The assessors believe the information contained within this risk assessment report to be correct at the time of printing. The assessors do not accept responsibility for any consequences arising from the use of the information herein. The report is based on matters which we observed or came to the attention of the assessors during the day of the assessment and should not be relied upon as an exhaustive record of all possible risks or hazards that may exist or potential improvements that can be made.

Confidentiality Statement

In order to maintain the integrity and credibility of the risk assessment processes and to protect the parties involved, it is understood that the accessors will not divulge to unauthorized persons any information obtained during this risk assessment unless legally obligated to do so.

No	Description	Value	EU	Lo - Hi	Remarks
UBE Chemical : (11244)					
CPL : (5060)					
UT :					
UT_4700 (1) :					
Work Summary :					
1	Production Load	100	%		
4700-V1 :					
1	EQUIPMENT Status	Duty			
2	FQ-001	1.87531e+0...	m3		
	1.87531e+008				
E1-A :					
1	EQUIPMENT Status	Duty			
2	TG001-A	32.2	C	30 - 50	
3	INLET TG-001A EFFLUENT TEMP.	58	C	50 - 75	
4	OUTLET TG-002A EFFLUENT TEMP.	35	C	30 - 45	
5	INLET TG-003A COOLING WATER	32	C	25 - 35	
6	OUTLET TG-004A COOLING WATER	34	C	30 - 40	
E1-B :					
1	EQUIPMENT Status	Duty			
2	TIC-001B	33.5	C	30 - 50	
3	INLET TG-001B EFFLUENT TEMP.	58	C	50 - 75	
4	OUTLET TG-002B EFFLUENT TEMP.	35	C	30 - 45	
5	INLET TG-003B COOLING WATER	32	C	30 - 35	
6	OUTLET TG-004B COOLING WATER	34	C	30 - 40	
4700-P39 : (4)					
1	EQUIPMENT Status	Stand By			
2	Discharge	0	kg/cm2	2 - 5	
3	Pressure	0	kg/cm2	2 - 4	
4	Flow	0	x 0.1 M3/hr	2 - 5	
4700-P40 : (4)					
1	EQUIPMENT Status	Duty			
2	Discharge	4	kg/cm2	2 - 5	
3	Pressure	3.8	kg/cm2	2 - 4	
4	Flow	5	x 0.1 M3/hr	2 - 5	
4700-V11 :					
1	EQUIPMENT Status	Duty			
2	FI47003	42984			
3	CHEM FEED NaOC	Stand By			
4710-V4 :					
1	EQUIPMENT Status	Duty			
2	AT-101	3.1	DO	2 - 4.8	
3	AT-101	35.3	TEMP	30 - 40	
4	AT-102	3.5	DO	2 - 4.8	
5	AT-102	35	TEMP	30 - 40	
6	AT-103	2.7	DO	2 - 4.8	
7	AT-103	35.3	TEMP	30 - 40	
4710-V2 :					
1	EQUIPMENT Status	Duty			
2	MIXER V2-A1	Running			
3	AIC-001	7.1	pH	1 - 14	
4	AIC-001	34.7	TEMP	30 - 40	

5	H2SO3 FEED ON/OFF	Stand By			
6	NaOH FEED ON/OFF	Stand By			

4710-V3 :

1	EQUIPMENT Status	Duty			
2	H3PO4 ON/OFF	Running			

4700-V4 :

1	EQUIPMENT Status	Duty			
2	AT-006	2.3	DO	2 - 4	
3	AT-006	34.9	TEMP	30 - 40	
4	AIA-002	2	DO	1 - 3	
5	AIA-002	34.7	TEMP	30 - 40	

V32 : 1

1	EQUIPMENT Status	Stand By			
2	Level	0.6	%		
3	Press P-35	0	kg/cm2	1 - 3	

4700-P29A : 2

1	EQUIPMENT Status	Stand By			
2	SUMP PUMP V-16	Stand By			
3	PG-018A	0	kg/cm2	1 - 3	
4	Level Oil	50	%	> 50	

4700-P29B : 2

1	EQUIPMENT Status	Stand By			
2	SUMP PUMP V-16	Stand By			
3	PG-018B	0	kg/cm2	1 - 3	
4	Level Oil	50	%	> 50	

4700-P11 :

1	EQUIPMENT Status	Duty			
2	P-11 CHECK ON/OFF	Running			
3	PG-...	1.9	kg/cm2	1 - 3	

4700-P28A : 1

1	EQUIPMENT Status	Stand By			
2	PG-016A	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-P28B : 1

1	EQUIPMENT Status	Stand By			
2	PG-016B	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-P10A :

1	EQUIPMENT Status	Duty			
2	X'FER P. Check	1.7		1 - 3	
3	Level Oil	50	%	> 50	

4700-P10B : 1

1	EQUIPMENT Status	Stand By			
2	X'FER P. Check	0		1 - 3	
3	Level Oil	50	%	> 50	

4700-P15 : 1

1	EQUIPMENT Status	Stand By			
2	PG-022	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-B3 : 1

1	EQUIPMENT Status	Stand By			
2	PG-023	Stand By			

4700-S5 : 2

1	EQUIPMENT Status	Stand By			
2	AIC-005	3.3	pH	1 - 8	
3	AIC-005	35	TEMP	30 - 40	
4	LG-002	800	%	200 - 1000	
5	CHEM. FEED H2SO4	Stand By			

4700-P16 : 1

1	EQUIPMENT Status	Stand By			
2	PG-024	Stand By			
3	Level Oil	50	%	> 50	

4700-P1A :

1	EQUIPMENT Status	Duty			
2	PG-001A	2	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-P1B :

1	EQUIPMENT Status	Duty			
2	PG-001B	1.8	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-P1C : 1

1	EQUIPMENT Status	Stand By			
2	PG-001C	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-P8A : 1

1	EQUIPMENT Status	Stand By			
2	ON/OFF	Stand By			

4700-P8B :

1	EQUIPMENT Status	Duty			
2	ON/OFF	Running			

4700-P32A : 2

1	EQUIPMENT Status	Stand By			
2	Pressure	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	
4	Current	0	A	20 - 25	

4700-P32B : 1

1	EQUIPMENT Status	Duty			
2	Pressure	1.8	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	
4	Current	15.5	A	20 - 25	

4700-V30S :

1	EQUIPMENT Status	Duty			
2	Site check	Normal			

4700-E2 :

1	EQUIPMENT Status	Duty			
2	TG-101 Air	32	C	30 - 40	
3	TG-102 CW	30	C	25 - 35	

4700-E3 :

1	EQUIPMENT Status	Duty			
2	TG-103 Air	32	C	30 - 40	
3	TG-104 CW	30	C	25 - 35	

4700-B2A :

1	EQUIPMENT Status	Duty			
2	PRESS	0.6	kg/cm2	0.5 - 1	

3	Temp	76	C	70 - 90	
4	DP air filter	0	kg/cm2	> -0.05	
5	Oil Press	2.8	Bar	> 2	

4700-B1B : 2

1	EQUIPMENT Status	Stand By			
2	PG-002B	0	kg/cm2	0.6 - 0.8	
3	CURRENT	0	Amps	55 - 75	
4	Level Oil	50	%	> 50	

4700-B1C : 2

1	EQUIPMENT Status	Stand By			
2	PG-002C	0	kg/cm2	0.6 - 0.8	
3	CURRENT	0	Amps	55 - 75	
4	Level Oil	50	%	> 50	

4700-B1D : 2

1	EQUIPMENT Status	Stand By			
2	PG-002D	0	kg/cm2	0.6 - 0.8	
3	CURRENT	0	Amps	55 - 75	
4	Level Oil	50	%	> 50	

4710-B1C : 2

1	EQUIPMENT Status	Stand By			
2	PG-101C	0	kg/cm2	0.6 - 1	
3	CURRENT	0	Amps	110 - 140	
4	Level Oil	50	%	> 50	

4710-B2A :

1	EQUIPMENT Status	Duty			
2	PRESS	0.74	kg/cm2	0.7 - 1	

3	Temp	95	C	80 - 110	
4	DP air filter	-0.011	kg/cm2	> -0.05	
5	Oil Press	3.7	Bar	2 - 6.5	

4710-B2B :

1	EQUIPMENT Status	Duty			
2	PRESS	0.74	kg/cm2	0.7 - 1	
3	Temp	94	C	80 - 110	
4	DP air filter	-0.009	kg/cm2	> -0.05	
5	Oil Press	3.2	Bar	2 - 6.5	

4710-B2C :

1	EQUIPMENT Status	Duty			
2	PRESS	0.74	kg/cm2	0.7 - 1	
3	Temp	94	C	80 - 110	
4	Oil Press	3.1	Bar	> 2	

4710-B2D :

1	EQUIPMENT Status	Duty			
2	PRESS	0.74	kg/cm2	0.7 - 1	
3	Temp	94	C	80 - 110	
4	DP air filter	-0.011	kg/cm2	> -0.05	
5	Oil Press	2.9	Bar	2 - 6.5	

4710-B2E : 1

1	EQUIPMENT Status	Stand By			
2	PRESS	0	kg/cm2	0.7 - 1	
3	Temp	0	C	80 - 110	
4	DP air filter	0	kg/cm2	> -0.05	
5	Oil Press	0	Bar	2 - 6.5	

I hereby certify that all information is accurate and that an actual inspection was conducted.

By: Somchai Prom-Yoo
(Somchaip)
Date Time: Jan 09, 2023 21:28:08

Approved By: Kittiphon Sainam
(kittiphon)
Date Time: Jan 09, 2023 23:07:34

No signature is required as this is an electronic document

CPL UT 4700 (1)

Conducted by : **Denchai Pugnak (Denchai)**

Conducted on : **Feb 22, 2023 20:00:00**

Completed on : **Feb 22, 2023 20:55:54**

Report created with Advansoft ODM

No	Description	Value	EU	Lo - Hi	Remarks
UBE Chemical : (11244)					
CPL : (5060)					
UT :					
UT_4700 (1) :					
Work Summary :					
1	Production Load	100	%		
4700-V1 :					
1	EQUIPMENT Status	Duty			
2	FQ-001	1.96166e+0...	m3		
	1.96166e+006				
E1-A :					
1	EQUIPMENT Status	Duty			
2	TG001-A	35	C	30 - 50	
3	INLET TG-001A EFFLUENT TEMP.	60	C	50 - 75	
4	OUTLET TG-002A EFFLUENT TEMP.	34	C	30 - 45	
5	INLET TG-003A COOLING WATER	32	C	25 - 35	
6	OUTLET TG-004A COOLING WATER	32	C	30 - 40	
E1-B :					
1	EQUIPMENT Status	Duty			
2	TIC-001B	36.3	C	30 - 50	
3	INLET TG-001B EFFLUENT TEMP.	60	C	50 - 75	
4	OUTLET TG-002B EFFLUENT TEMP.	35	C	30 - 45	
5	INLET TG-003B COOLING WATER	32	C	30 - 35	
6	OUTLET TG-004B COOLING WATER	34	C	30 - 40	
4700-P39 : (4)					

Disclaimer
The assessors believe the information contained within this risk assessment report to be correct at the time of printing. The assessors do not accept responsibility for any consequences arising from the use of the information herein. The report is based on matters which we observed or came to the attention of the assessors during the day of the assessment and should not be relied upon as an exhaustive record of all possible risks or hazards that may exist or potential improvements that can be made.

Confidentiality Statement
In order to maintain the integrity and credibility of the risk assessment processes and to protect the parties involved, it is understood that the accessors will not divulge to unauthorized persons any information obtained during this risk assessment unless legally obligated to do so.

1	EQUIPMENT Status	Stand By			
2	Discharge	0	kg/cm2	2 - 5	
3	Pressure	0	kg/cm2	2 - 4	
4	Flow	0	x 0.1 M3/hr	2 - 5	
4700-P40 : (4)					
1	EQUIPMENT Status	Duty			
2	Discharge	4	kg/cm2	2 - 5	
3	Pressure	3.7	kg/cm2	2 - 4	
4	Flow	5	x 0.1 M3/hr	2 - 5	
4700-V11 :					
1	EQUIPMENT Status	Duty			
2	FI47003	42984			
3	CHEM FEED NaOC	Running			
4710-V4 :					
1	EQUIPMENT Status	Duty			
2	AT-101	2.9	DO	2 - 4.8	
3	AT-101	38.3	TEMP	30 - 40	
4	AT-102	2.9	DO	2 - 4.8	
5	AT-102	38.1	TEMP	30 - 40	
6	AT-103	3.1	DO	2 - 4.8	
7	AT-103	38.5	TEMP	30 - 40	
4710-V2 :					
1	EQUIPMENT Status	Duty			
2	MIXER V2-A1	Running			
3	AIC-001	7.2	pH	1 - 14	
4	AIC-001	38.1	TEMP	30 - 40	

5	H2SO3 FEED ON/OFF	Stand By			
6	NaOH FEED ON/OFF	Stand By			
4710-V3 :					
1	EQUIPMENT Status	Duty			
2	H3PO4 ON/OFF	Running			
4700-V4 :					
1	EQUIPMENT Status	Duty			
2	AT-005	3.6	DO	2 - 4	
3	AT-006	37.9	TEMP	30 - 40	
4	AIA-002	3	DO	1 - 3	
5	AIA-002	37.9	TEMP	30 - 40	
V32 :					
1	EQUIPMENT Status	Stand By			
2	Level	0.8	%		
3	Press P-35	0	kg/cm2	1 - 3	
4700-P29A :					
1	EQUIPMENT Status	Stand By			
2	SUMP PUMP V-16	Stand By			
3	PG-018A	0	kg/cm2	1 - 3	
4	Level Oil	50	%	> 50	
4700-P29B :					
1	EQUIPMENT Status	Stand By			
2	SUMP PUMP V-16	Stand By			
3	PG-018B	0	kg/cm2	1 - 3	
4	Level Oil	50	%	> 50	
4700-P11 :					

1	EQUIPMENT Status	Stand By			
2	P-11 CHECK ON/OFF	Stand By			
3	PG-[illegible]	0	kg/cm2	1 - 3	

4700-P28A : 1

1	EQUIPMENT Status	Stand By			
2	PG-016A	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-P28B : 1

1	EQUIPMENT Status	Stand By			
2	PG-016B	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-P10A :

1	EQUIPMENT Status	Duty			
2	X'FER P, Check	1.7		1 - 3	
3	Level Oil	50	%	> 50	

4700-P10B : 1

1	EQUIPMENT Status	Stand By			
2	X'FER P, Check	0		1 - 3	
3	Level Oil	50	%	> 50	

4700-P15 : 1

1	EQUIPMENT Status	Stand By			
2	PG-022	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-B3 : 1

1	EQUIPMENT Status	Stand By			
2	PG-023	Stand By			

4700-S5 : 2

1	EQUIPMENT Status	Stand By			
2	AIC-005	3.3	pH	1 - 8	
3	AIC-005	35	TEMP	30 - 40	
4	LG-002	800	%	200 - 1000	
5	CHEM. FEED H2SO4	Stand By			

4700-P16 : 1

1	EQUIPMENT Status	Stand By			
2	PG-024	Stand By			
3	Level Oil	50	%	> 50	

4700-P1A :

1	EQUIPMENT Status	Duty			
2	PG-001A	2	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-P1B :

1	EQUIPMENT Status	Duty			
2	PG-001B	1.8	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-P1C : 1

1	EQUIPMENT Status	Stand By			
2	PG-001C	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-P8A : 1

1	EQUIPMENT Status	Stand By			
2	ON/OFF	Stand By			

4700-P8B :

1	EQUIPMENT Status	Duty			
2	ON/OFF	Running			

4700-P32A : 2

1	EQUIPMENT Status	Stand By			
2	Pressure	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	
4	Current	0	A	20 - 25	

4700-P32B : 1

1	EQUIPMENT Status	Duty			
2	Pressure	1.8	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	
4	Current	19.5	A	20 - 25	

4700-V30S :

1	EQUIPMENT Status	Duty			
2	Site check	Normal			

4700-E2 :

1	EQUIPMENT Status	Duty			
2	TG-101 Air	32	C	30 - 40	
3	TG-102 CW	30	C	25 - 36	

4700-E3 :

1	EQUIPMENT Status	Duty			
2	TG-103 Air	32	C	30 - 40	
3	TG-104 CW	30	C	25 - 36	

4700-B2A :

1	EQUIPMENT Status	Duty			
2	PRESS	0.61	kg/cm2	0.5 - 1	
3	Temp	76	C	70 - 90	
4	DP air filter	0	kg/cm2	> -0.05	
5	Oil Press	2.5	Bar	> 2	

4700-B1B : 2

1	EQUIPMENT Status	Stand By			
2	PG-002B	0	kg/cm2	0.6 - 0.8	
3	CURRENT	0	Amps	55 - 75	
4	Level Oil	50	%	> 50	

4700-B1C : 2

1	EQUIPMENT Status	Stand By			
2	PG-002C	0	kg/cm2	0.6 - 0.8	
3	CURRENT	0	Amps	55 - 75	
4	Level Oil	50	%	> 50	

4700-B1D : 2

1	EQUIPMENT Status	Stand By			
2	PG-002D	0	kg/cm2	0.6 - 0.8	
3	CURRENT	0	Amps	55 - 75	
4	Level Oil	50	%	> 50	

4710-B1C : 2

1	EQUIPMENT Status	Stand By			
2	PG-101C	0	kg/cm2	0.6 - 1	
3	CURRENT	0	Amps	110 - 140	
4	Level Oil	50	%	> 50	

4710-B2A : 3

1	EQUIPMENT Status	Stand By			
2	PRESS	0	kg/cm2	0.7 - 1	

3	Temp	0	C	80 - 110	
4	DP air filter	0	kg/cm2	> -0.05	
5	Oil Press	0	Bar	2 - 6.5	

4710-B2B :

1	EQUIPMENT Status	Duty			
2	PRESS	0.75	kg/cm2	0.7 - 1	
3	Temp	93	C	80 - 110	
4	DP air filter	-0.011	kg/cm2	> -0.05	
5	Oil Press	3.3	Bar	2 - 6.5	

4710-B2C :

1	EQUIPMENT Status	Duty			
2	PRESS	0.75	kg/cm2	0.7 - 1	
3	Temp	94	C	80 - 110	
4	Oil Press	4.5	Bar	> 2	

4710-B2D :

1	EQUIPMENT Status	Duty			
2	PRESS	0.75	kg/cm2	0.7 - 1	
3	Temp	91	C	80 - 110	
4	DP air filter	-0.012	kg/cm2	> -0.05	
5	Oil Press	2.9	Bar	2 - 6.5	

4710-B2E :

1	EQUIPMENT Status	Duty			
2	PRESS	0.75	kg/cm2	0.7 - 1	
3	Temp	91	C	80 - 110	
4	DP air filter	0.05	kg/cm2	> -0.05	
5	Oil Press	3	Bar	2 - 6.5	

I hereby certify that all information is accurate and that an actual inspection was conducted.

By: Denchai Pugnak (Denchai)
Date Time: Feb 22, 2023 20:55:54

Approved By: Chamras Nisaisue (Chamras)
Date Time: Feb 22, 2023 23:08:31

No signature is required as this is an electronic document

CPL UT 4700 (1)

Conducted by : **Dolpark Suthithanakul (Dolpark)**

Conducted on : **Mar 08, 2023 20:00:00**

Completed on : **Mar 08, 2023 20:41:59**

Report created with Advansoft ODM

Disclaimer
The assessors believe the information contained within this risk assessment report to be correct at the time of printing. The assessors do not accept responsibility for any consequences arising from the use of the information herein. The report is based on matters which we observed or came to the attention of the assessors during the day of the assessment and should not be relied upon as an exhaustive record of all possible risks or hazards that may exist or potential improvements that can be made.

Confidentiality Statement
In order to maintain the integrity and credibility of the risk assessment processes and to protect the parties involved, it is understood that the accessors will not divulge to unauthorized persons any information obtained during this risk assessment unless legally obligated to do so.

No	Description	Value	EU	Lo - Hi	Remarks
UBE Chemical : (11244)					
CPL : (5060)					
UT :					
UT_4700 (1) :					
Work Summary :					
1	Production Load	100	%		
4700-V1 :					
1	EQUIPMENT Status	Duty			
2	FQ-001	1.98785e+0...	m3		
	1.98785e+006				
E1-A :					
1	EQUIPMENT Status	Duty			
2	TG001-A	34.9	C	30 - 50	
3	INLET TG-001A EFFLUENT TEMP.	55	C	50 - 75	
4	OUTLET TG-002A EFFLUENT TEMP.	35	C	30 - 46	
5	INLET TG-003A COOLING WATER	32	C	25 - 35	
6	OUTLET TG-004A COOLING WATER	32	C	30 - 40	
E1-B :					
1	EQUIPMENT Status	Duty			
2	TIC-001B	36.5	C	30 - 50	
3	INLET TG-001B EFFLUENT TEMP.	55	C	50 - 75	
4	OUTLET TG-002B EFFLUENT TEMP.	35	C	30 - 45	
5	INLET TG-003B COOLING WATER	30	C	30 - 35	
6	OUTLET TG-004B COOLING WATER	31	C	30 - 40	
4700-P39 : (4)					
1	EQUIPMENT Status	Stand By			
2	Discharge	0	kg/cm2	2 - 6	
3	Pressure	0	kg/cm2	2 - 4	
4	Flow	0	x 0.1 M3/hr	2 - 5	
4700-P40 : (4)					
1	EQUIPMENT Status	Duty			
2	Discharge	4	kg/cm2	2 - 6	
3	Pressure	3.7	kg/cm2	2 - 4	
4	Flow	5	x 0.1 M3/hr	2 - 5	
4700-V11 :					
1	EQUIPMENT Status	Duty			
2	FI47003	42984			
3	CHEM FEED NaOC	Running			
4710-V4 :					
1	EQUIPMENT Status	Duty			
2	AT-101	2.2	DO	2 - 4.8	
3	AT-101	37.3	TEMP	30 - 40	
4	AT-102	2.7	DO	2 - 4.8	
5	AT-102	37.2	TEMP	30 - 40	
6	AT-103	2.8	DO	2 - 4.8	
7	AT-103	37.4	TEMP	30 - 40	
4710-V2 :					
1	EQUIPMENT Status	Duty			
2	MIXER V2-A1	Running			
3	AIC-001	8.1	pH	1 - 14	
4	AIC-001	37.2	TEMP	30 - 40	
5	H2SO3 FEED ON/OFF	Running			
6	NaOH FEED ON/OFF	Running			
4710-V3 :					
1	EQUIPMENT Status	Duty			
2	H3PO4 ON/OFF	Running			
4700-V4 :					
1	EQUIPMENT Status	Duty			
2	AT-006	2.3	DO	2 - 4	
3	AT-006	37.1	TEMP	30 - 40	
4	AIA-002	2.4	DO	1 - 3	
5	AIA-002	37	TEMP	30 - 40	
V32 :					
1	EQUIPMENT Status	Stand By			
2	Level	0.9	%		
3	Press P-35	0	kg/cm2	1 - 3	
4700-P29A :					
1	EQUIPMENT Status	Stand By			
2	SUMP PUMP V-16	Stand By			
3	PG-018A	0	kg/cm2	1 - 3	
4	Level Oil	50	%	> 50	
4700-P29B :					
1	EQUIPMENT Status	Stand By			
2	SUMP PUMP V-16	Stand By			
3	PG-018B	0	kg/cm2	1 - 3	
4	Level Oil	50	%	> 50	
4700-P11 :					
1	EQUIPMENT Status	Duty			
2	P-11 CHECK ON/OFF	Running			
3	PG-...	1.5	kg/cm2	1 - 3	
4700-P28A :					
1	EQUIPMENT Status	Stand By			
2	PG-016A	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	
4700-P28B :					
1	EQUIPMENT Status	Stand By			
2	PG-016B	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	
4700-P10A :					
1	EQUIPMENT Status	Duty			
2	XFER P. Check	1.7		1 - 3	
3	Level Oil	50	%	> 50	
4700-P10B :					
1	EQUIPMENT Status	Stand By			
2	XFER P. Check	0		1 - 3	
3	Level Oil	50	%	> 50	
4700-P15 :					
1	EQUIPMENT Status	Stand By			
2	PG-022	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	
4700-B3 :					
1	EQUIPMENT Status	Stand By			
2	PG-023	Stand By			

4700-S5 :

1	EQUIPMENT Status	Stand By			
2	AIC-005	3.4	pH	1 - 8	
3	AIC-005	35	TEMP	30 - 40	
4	LG-002	800	%	200 - 1000	
5	CHEM.FEED H2SO4	Stand By			

4700-P16 :

1	EQUIPMENT Status	Stand By			
2	PG-024	Stand By			
3	Level Oil	50	%	> 50	

4700-P1A :

1	EQUIPMENT Status	Duty			
2	PG-001A	2	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-P1B :

1	EQUIPMENT Status	Duty			
2	PG-001B	1.8	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-P1C :

1	EQUIPMENT Status	Stand By			
2	PG-001C	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-P8A :

1	EQUIPMENT Status	Stand By			
2	ON/OFF	Stand By			

4700-P8B :

1	EQUIPMENT Status	Duty			
2	ON/OFF	Running			

4700-P32A :

1	EQUIPMENT Status	Stand By			
2	Pressure	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	
4	Current	0	A	20 - 25	

4700-P32B :

1	EQUIPMENT Status	Duty			
2	Pressure	1.8	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	
4	Current	19.6	A	20 - 25	

4700-V30S :

1	EQUIPMENT Status	Duty			
2	Site check	Normal			

4700-E2 :

1	EQUIPMENT Status	Duty			
2	TG-101 Air	32	C	30 - 40	
3	TG-102 CW	30	C	25 - 36	

4700-E3 :

1	EQUIPMENT Status	Duty			
2	TG-103 Air	32	C	30 - 40	
3	TG-104 CW	30	C	25 - 36	

4700-B2A :

1	EQUIPMENT Status	Duty			
2	PRESS	0.6	kg/cm2	0.5 - 1	

3	Temp	77	C	70 - 90	
4	DP air filter	0	kg/cm2	> -0.05	
5	Oil Press	2.8	Bar	> 2	

4700-B1B :

1	EQUIPMENT Status	Stand By			
2	PG-002B	0	kg/cm2	0.6 - 0.8	
3	CURRENT	0	Amps	55 - 75	
4	Level Oil	50	%	> 50	

4700-B1C :

1	EQUIPMENT Status	Stand By			
2	PG-002C	0	kg/cm2	0.6 - 0.8	
3	CURRENT	0	Amps	55 - 75	
4	Level Oil	50	%	> 50	

4700-B1D :

1	EQUIPMENT Status	Stand By			
2	PG-002D	0	kg/cm2	0.6 - 0.8	
3	CURRENT	0	Amps	55 - 75	
4	Level Oil	50	%	> 50	

4710-B1C :

1	EQUIPMENT Status	Stand By			
2	PG-101C	0	kg/cm2	0.6 - 1	
3	CURRENT	0	Amps	110 - 140	
4	Level Oil	50	%	> 50	

4710-B2A :

1	EQUIPMENT Status	Duty			
2	PRESS	0.74	kg/cm2	0.7 - 1	

3	Temp	94	C	80 - 110	
4	DP air filter	-0.005	kg/cm2	> -0.05	
5	Oil Press	3.7	Bar	2 - 6.5	

4710-B2B :

1	EQUIPMENT Status	Duty			
2	PRESS	0.73	kg/cm2	0.7 - 1	
3	Temp	93	C	80 - 110	
4	DP air filter	-0.008	kg/cm2	> -0.05	
5	Oil Press	3.3	Bar	2 - 6.5	

4710-B2C :

1	EQUIPMENT Status	Duty			
2	PRESS	0.74	kg/cm2	0.7 - 1	
3	Temp	94	C	80 - 110	
4	Oil Press	4.7	Bar	> 2	

4710-B2D :

1	EQUIPMENT Status	Duty			
2	PRESS	0.73	kg/cm2	0.7 - 1	
3	Temp	92	C	80 - 110	
4	DP air filter	-0.006	kg/cm2	> -0.05	
5	Oil Press	2.9	Bar	2 - 6.5	

4710-B2E :

1	EQUIPMENT Status	Stand By			
2	PRESS	0	kg/cm2	0.7 - 1	
3	Temp	0	C	80 - 110	
4	DP air filter	0	kg/cm2	> -0.05	
5	Oil Press	0	Bar	2 - 6.5	

I hereby certify that all information is accurate and that an actual inspection was conducted.

By: Dolpark Suthithanakul (Dolpark)
Date Time: Mar 08, 2023 20:41:59

Approved By: Thamnong Khongbanchong (Thamnong)
Date Time: Mar 08, 2023 22:36:30

No signature is required as this is an electronic document

CPL UT 4700 (1)

Conducted by : **Somchai Prom-Yoo (Somchaip)**

Conducted on : **Apr 10, 2023 08:00:00**

Completed on : **Apr 10, 2023 10:19:36**

Report created with Advansoft ODM

No	Description	Value	EU	Lo - Hi	Remarks
UBE Chemical : (11244)					
CPL : (5060)					
UT :					
UT_4700 (1) :					
Work Summary :					
1	Production Load	100	%		
4700-V1 :					
1	EQUIPMENT Status	Duty			
2	FQ-001	2.05039e+0...	m3		
	2.05039e+006				
E1-A :					
1	EQUIPMENT Status	Duty			
2	TG001-A	37.3	C	30 - 50	
3	INLET TG-001A EFFLUENT TEMP.	62	C	50 - 75	
4	OUTLET TG-002A EFFLUENT TEMP.	38	C	30 - 45	
5	INLET TG-003A COOLING WATER	33	C	25 - 35	
6	OUTLET TG-004A COOLING WATER	35	C	30 - 40	
E1-B :					
1	EQUIPMENT Status	Duty			
2	TIC-001B	38.1	C	30 - 50	
3	INLET TG-001B EFFLUENT TEMP.	62	C	50 - 75	
4	OUTLET TG-002B EFFLUENT TEMP.	38	C	30 - 45	
5	INLET TG-003B COOLING WATER	32	C	30 - 35	
6	OUTLET TG-004B COOLING WATER	34	C	30 - 40	
4700-P39 : (4)					

Disclaimer
The assessors believe the information contained within this risk assessment report to be correct at the time of printing. The assessors do not accept responsibility for any consequences arising from the use of the information herein. The report is based on matters which we observed or came to the attention of the assessors during the day of the assessment and should not be relied upon as an exhaustive record of all possible risks or hazards that may exist or potential improvements that can be made.

Confidentiality Statement
In order to maintain the integrity and credibility of the risk assessment processes and to protect the parties involved, it is understood that the accessors will not divulge to unauthorized persons any information obtained during this risk assessment unless legally obligated to do so.

1	EQUIPMENT Status	Stand By			
2	Discharge	0	kg/cm2	2 - 5	
3	Pressure	0	kg/cm2	2 - 4	
4	Flow	0	x 0.1 M3/hr	2 - 5	

4700-P40 : (4)

1	EQUIPMENT Status	Duty			
2	Discharge	4	kg/cm2	2 - 5	
3	Pressure	3.7	kg/cm2	2 - 4	
4	Flow	5	x 0.1 M3/hr	2 - 5	

4700-V11 : 1

1	EQUIPMENT Status	Duty			
2	FI47003	42984			
3	CHEM FEED NaOC	Stand By			

4710-V4 : 1

1	EQUIPMENT Status	Duty			
2	AT-101	2.6	DO	2 - 4.8	
3	AT-101	38.2	TEMP	30 - 40	
4	AT-102	2.2	DO	2 - 4.8	
5	AT-102	38.4	TEMP	30 - 40	
6	AT-103	1.8	DO	2 - 4.8	
7	AT-103	38.5	TEMP	30 - 40	

4710-V2 : 2

1	EQUIPMENT Status	Duty			
2	MIXER V2-A1	Running			
3	AIC-001	8.7	pH	1 - 14	
4	AIC-001	37.9	TEMP	30 - 40	

5	H2SO3 FEED ON/OFF	Stand By			
6	NaOH FEED ON/OFF	Stand By			

4710-V3 :

1	EQUIPMENT Status	Duty			
2	H3PO4 ON/OFF	Running			

4700-V4 : 1

1	EQUIPMENT Status	Duty			
2	AT-006	1.9	DO	2 - 4	
3	AT-006	38.5	TEMP	30 - 40	
4	AIA-002	2.9	DO	1 - 3	
5	AIA-002	38.5	TEMP	30 - 40	

V32 : 1

1	EQUIPMENT Status	Stand By			
2	Level	0.9	%		
3	Press P-35	0	kg/cm2	1 - 3	

4700-P29A : 2

1	EQUIPMENT Status	Stand By			
2	SUMP PUMP V-16	Stand By			
3	PG-018A	0	kg/cm2	1 - 3	
4	Level Oil	50	%	> 50	

4700-P29B : 2

1	EQUIPMENT Status	Stand By			
2	SUMP PUMP V-16	Stand By			
3	PG-018B	0	kg/cm2	1 - 3	
4	Level Oil	50	%	> 50	

4700-P11 :

1	EQUIPMENT Status	Duty			
2	P-11 CHECK ON/OFF	Running			
3	PG-...	1.5	kg/cm2	1 - 3	

4700-P28A : 1

1	EQUIPMENT Status	Stand By			
2	PG-016A	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-P28B : 1

1	EQUIPMENT Status	Stand By			
2	PG-016B	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-P10A :

1	EQUIPMENT Status	Duty			
2	X'FER P. Check	1.7		1 - 3	
3	Level Oil	50	%	> 50	

4700-P10B : 1

1	EQUIPMENT Status	Stand By			
2	X'FER P. Check	0		1 - 3	
3	Level Oil	50	%	> 50	

4700-P15 : 1

1	EQUIPMENT Status	Stand By			
2	PG-022	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-B3 : 1

1	EQUIPMENT Status	Stand By			
2	PG-023	Stand By			

4700-S5 : 2

1	EQUIPMENT Status	Stand By			
2	AIC-005	3.4	pH	1 - 8	
3	AIC-005	25	TEMP	30 - 40	
4	LG-002	800	%	200 - 1000	
5	CHEM. FEED H2SO4	Stand By			

4700-P16 : 1

1	EQUIPMENT Status	Stand By			
2	PG-024	Stand By			
3	Level Oil	50	%	> 50	

4700-P1A :

1	EQUIPMENT Status	Duty			
2	PG-001A	2	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-P1B : 1

1	EQUIPMENT Status	Stand By			
2	PG-001B	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-P1C :

1	EQUIPMENT Status	Duty			
2	PG-001C	1.8	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	

4700-P8A : 1

1	EQUIPMENT Status	Stand By			
2	ON/OFF	Stand By			

4700-P8B :

1	EQUIPMENT Status	Duty			
2	ON/OFF	Running			
4700-P32A :					
1	EQUIPMENT Status	Stand By			
2	Pressure	0	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	
4	Current	0	A	20 - 25	
4700-P32B :					
1	EQUIPMENT Status	Duty			
2	Pressure	1.8	kg/cm2	1 - 3	
3	Level Oil	50	%	> 50	
4	Current	20	A	20 - 25	
4700-V30S :					
1	EQUIPMENT Status	Duty			
2	Site check	Normal			
4700-E2 :					
1	EQUIPMENT Status	Duty			
2	TG-101 Air	34	C	30 - 40	
3	TG-102 CW	32	C	25 - 36	
4700-E3 :					
1	EQUIPMENT Status	Duty			
2	TG-103 Air	34	C	30 - 40	
3	TG-104 CW	32	C	25 - 36	
4700-B2A :					
1	EQUIPMENT Status	Under Repa...			
	Under Repair				
2	PRESS	0	kg/cm2	0.5 - 1	

3	Temp	0	C	80 - 110	
4	DP air filter	0	kg/cm2	> -0.05	
5	Oil Press	0	Bar	2 - 6.5	
4710-B2B :					
1	EQUIPMENT Status	Duty			
2	PRESS	0.75	kg/cm2	0.7 - 1	
3	Temp	99	C	80 - 110	
4	DP air filter	-0.012	kg/cm2	> -0.05	
5	Oil Press	3.2	Bar	2 - 6.5	
4710-B2C :					
1	EQUIPMENT Status	Duty			
2	PRESS	0.75	kg/cm2	0.7 - 1	
3	Temp	97	C	80 - 110	
4	Oil Press	4.8	Bar	> 2	
4710-B2D :					
1	EQUIPMENT Status	Stand By			
2	PRESS	0	kg/cm2	0.7 - 1	
3	Temp	97	C	80 - 110	
4	DP air filter	-0.009	kg/cm2	> -0.05	
5	Oil Press	2.9	Bar	2 - 6.5	
4710-B2E :					
1	EQUIPMENT Status	Duty			
2	PRESS	0.75	kg/cm2	0.7 - 1	
3	Temp	98	C	80 - 110	
4	DP air filter	-0.011	kg/cm2	> -0.05	
5	Oil Press	3.1	Bar	2 - 6.5	

3	Temp	0	C	70 - 90	
4	DP air filter	0	kg/cm2	> -0.05	
5	Oil Press	0	Bar	> 2	
4700-B1B :					
1	EQUIPMENT Status	Stand By			
2	PG-002B	0	kg/cm2	0.6 - 0.8	
3	CURRENT	0	Amps	55 - 75	
4	Level Oil	50	%	> 50	
4700-B1C :					
1	EQUIPMENT Status	Duty			
2	PG-002C	0.8	kg/cm2	0.6 - 0.8	
3	CURRENT	64	Amps	55 - 75	
4	Level Oil	50	%	> 50	
4700-B1D :					
1	EQUIPMENT Status	Stand By			
2	PG-002D	0	kg/cm2	0.6 - 0.8	
3	CURRENT	0	Amps	55 - 75	
4	Level Oil	50	%	> 50	
4710-B1C :					
1	EQUIPMENT Status	Stand By			
2	PG-101C	0	kg/cm2	0.6 - 1	
3	CURRENT	0	Amps	110 - 140	
4	Level Oil	50	%	> 50	
4710-B2A :					
1	EQUIPMENT Status	Stand By			
2	PRESS	0	kg/cm2	0.7 - 1	

I hereby certify that all information is accurate and that an actual inspection was conducted.

By: Somchai Prom-Yoo
(Somchaip)
Date Time: Apr 10, 2023 10:19:36

Approved By: Kittiphon Sainam
(kittiphon)
Date Time: Apr 10, 2023 18:21:19

No signature is required as this is an electronic document

CPL UT 4700 (1)

Conducted by : **Denchai Pugnak (Denchai)**

Conducted on : **May 09, 2023 08:00:00**

Completed on : **May 09, 2023 14:36:05**

Report created with Advansoft ODM

Disclaimer

The assessors believe the information contained within this risk assessment report to be correct at the time of printing. The assessors do not accept responsibility for any consequences arising from the use of the information herein. The report is based on matters which we observed or came to the attention of the assessors during the day of the assessment and should not be relied upon as an exhaustive record of all possible risks or hazards that may exist or potential improvements that can be made.

Confidentiality Statement

In order to maintain the integrity and credibility of the risk assessment processes and to protect the parties involved, it is understood that the assessors will not divulge to unauthorized persons any information obtained during this risk assessment unless legally obligated to do so.

No	Description	Value	EU	Lo - Hi	Remarks
UBE Chemical : (11244)					
CPL : (5060)					
UT :					
UT_4700 (1) :					
Work Summary :					
1	Production Load	100	%		
2	Production Load	100	%		
4700-V1 :					
1	EQUIPMENT Status	Duty			
2	FQ-001	2.10813e+0...	m3		
	2.10813e+006				
E1-A :					
1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	TG001-A	36	C	30 - 50	
4	TG001-A	36	C	30 - 50	
5	INLET TG-001A EFFLUENT TEMP.	62	C	50 - 75	
6	OUTLET TG-002A EFFLUENT TEMP.	36	C	30 - 45	
7	OUTLET TG-002A EFFLUENT TEMP.	36	C	30 - 45	
8	INLET TG-003A COOLING WATER	34	C	25 - 35	
9	INLET TG-003A COOLING WATER	34	C	25 - 35	
10	OUTLET TG-004A COOLING WATER	35	C	30 - 40	
11	OUTLET TG-004A COOLING WATER	35	C	30 - 40	
E1-B :					
1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	TIC-001B	36	C	30 - 50	
4	TIC-001B	36	C	30 - 50	
5	INLET TG-001B EFFLUENT TEMP.	62	C	50 - 75	
6	OUTLET TG-002B EFFLUENT TEMP.	36	C	30 - 45	
7	OUTLET TG-002B EFFLUENT TEMP.	36	C	30 - 45	
8	INLET TG-003B COOLING WATER	34	C	30 - 35	
9	OUTLET TG-004B COOLING WATER	35	C	30 - 40	
10	OUTLET TG-004B COOLING WATER	35	C	30 - 40	
4700-P39 : (4)					
1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	Discharge	2	kg/cm2	2 - 5	
4	Discharge	0	kg/cm2	2 - 5	
5	Pressure	2	kg/cm2	2 - 4	
6	Pressure	0	kg/cm2	2 - 4	
7	Flow	0	x 0.1 M3/hr	2 - 5	
8	Flow	0	x 0.1 M3/hr	2 - 5	
4700-P40 : (4)					
1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	Discharge	4	kg/cm2	2 - 5	
4	Pressure	3.7	kg/cm2	2 - 4	
5	Flow	5	x 0.1 M3/hr	2 - 5	
6	Flow	5	x 0.1 M3/hr	2 - 5	
4700-V11 :					

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	FI47003	42984			
4	FI47003	42984			
5	CHEM FEED NaOC	Stand By			
6	CHEM FEED NaOC	Stand By			

4710-V4 :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	AT-101	2.3	DO	2 - 4.8	
4	AT-101	2.3	DO	2 - 4.8	
5	AT-101	38.9	TEMP	30 - 40	
6	AT-101	38.9	TEMP	30 - 40	
7	AT-102	2	DO	2 - 4.8	
8	AT-102	2	DO	2 - 4.8	
9	AT-102	38.8	TEMP	30 - 40	
10	AT-102	38.8	TEMP	30 - 40	
11	AT-103	2.2	DO	2 - 4.8	
12	AT-103	2.2	DO	2 - 4.8	
13	AT-103	39.1	TEMP	30 - 40	
14	AT-103	39.1	TEMP	30 - 40	

4710-V2 : 2

1	EQUIPMENT Status	Duty			
2	MIXER V2-A1	Running			
3	AIC-001	6.2	pH	1 - 14	
4	AIC-001	6.2	pH	1 - 14	

5	AIC-001	35.1	TEMP	30 - 40	
6	AIC-001	35.1	TEMP	30 - 40	
7	H2SO3 FEED ON/OFF	Stand By			
8	NaOH FEED ON/OFF	Stand By			

4710-V3 :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	H3PO4 ON/OFF	Running			
4	H3PO4 ON/OFF	Running			

4700-V4 : 1

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	AT-006	2	DO	2 - 4	
4	AT-006	2	DO	2 - 4	
5	AT-006	39.1	TEMP	30 - 40	
6	AT-006	39.1	TEMP	30 - 40	
7	AIA-002	2.1	DO	1 - 3	
8	AIA-002	2.1	DO	1 - 3	
9	AIA-002	39	TEMP	30 - 40	
10	AIA-002	39	TEMP	30 - 40	

V32 : 1

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	Level	0.9	%		
4	Press P-35	0	kg/cm2	1 - 3	

4700-P29A : 2

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	SUMP PUMP V-16	Stand By			
4	SUMP PUMP V-16	Stand By			
5	PG-018A	0	kg/cm2	1 - 3	
6	Level Oil	50	%	> 50	

4700-P29B : 2

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	SUMP PUMP V-16	Stand By			
4	SUMP PUMP V-16	Stand By			
5	PG-018B	0	kg/cm2	1 - 3	
6	Level Oil	50	%	> 50	

4700-P11 : 2

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	P-11 CHECK ON/OFF	Stand By			
4	P-11 CHECK ON/OFF	Stand By			
5	PG-...	0	kg/cm2	1 - 3	
6	PG-...	0	kg/cm2	1 - 3	

4700-P28A : 1

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-016A	0	kg/cm2	1 - 3	
4	Level Oil	50	%	> 50	

4700-P28B : 1

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-016B	0	kg/cm2	1 - 3	
4	PG-016B	0	kg/cm2	1 - 3	
5	Level Oil	50	%	> 50	
6	Level Oil	50	%	> 50	

4700-P10A :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	XFER P. Check	1.7		1 - 3	
4	Level Oil	50	%	> 50	

4700-P10B : 1

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	XFER P. Check	0		1 - 3	
4	XFER P. Check	0		1 - 3	
5	Level Oil	50	%	> 50	
6	Level Oil	50	%	> 50	

4700-P15 : 1

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-022	0	kg/cm2	1 - 3	
4	PG-022	0	kg/cm2	1 - 3	
5	Level Oil	50	%	> 50	
6	Level Oil	50	%	> 50	

4700-B3 : 1

1	EQUIPMENT Status	Stand By			
2	PG-023	Stand By			

4700-S5 :

1	EQUIPMENT Status	Stand By			
2	AIC-005	3.4	pH	1 - 8	
3	AIC-005	3.4	pH	1 - 8	
4	AIC-005	25	TEMP	30 - 40	
5	LG-002	800	%	200 - 1000	
6	CHEM. FEED H2SO4	Stand By			

4700-P1G :

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-024	Stand By			
4	PG-024	Stand By			
5	Level Oil	50	%	> 50	
6	Level Oil	50	%	> 50	

4700-P1A :

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-001A	0	kg/cm2	1 - 3	
4	Level Oil	50	%	> 50	

4700-P1B :

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-001B	0	kg/cm2	1 - 3	
4	PG-001B	0	kg/cm2	1 - 3	

5	Level Oil	50	%	> 50	
6	Level Oil	50	%	> 50	

4700-P1C :

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-001C	0	kg/cm2	1 - 3	
4	Level Oil	50	%	> 50	

4700-P8A :

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	ON/OFF	Stand By			
4	ON/OFF	Stand By			

4700-P8B :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	ON/OFF	Running			
4	ON/OFF	Running			

4700-P32A :

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	Pressure	0	kg/cm2	1 - 3	
4	Level Oil	50	%	> 50	
5	Level Oil	50	%	> 50	
6	Current	0	A	20 - 25	

4700-P32B :

1	EQUIPMENT Status	Duty			

2	EQUIPMENT Status	Duty			
3	Pressure	1.8	kg/cm2	1 - 3	
4	Level Oil	50	%	> 50	
5	Current	20	A	20 - 25	
6	Current	20	A	20 - 25	

4700-V30S :

1	EQUIPMENT Status	Duty			
2	Site check	Normal			

4700-E2 :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	TG-101 Air	34	C	30 - 40	
4	TG-101 Air	34	C	30 - 40	
5	TG-102 CW	34	C	25 - 36	
6	TG-102 CW	34	C	25 - 36	

4700-E3 :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	TG-103 Air	34	C	30 - 40	
4	TG-104 CW	34	C	25 - 36	

4700-B2A :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	PRESS	0.61	kg/cm2	0.5 - 1	
4	Temp	81	C	70 - 90	
5	Temp	81	C	70 - 90	

6	DP air filter	0	kg/cm2	> -0.05	
7	Oil Press	2.6	Bar	> 2	
8	Oil Press	2.6	Bar	> 2	

4700-B1B :

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-002B	0	kg/cm2	0.6 - 0.8	
4	CURRENT	0	Amps	55 - 75	
5	Level Oil	50	%	> 50	
6	Level Oil	50	%	> 50	

4700-B1C :

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-002C	0	kg/cm2	0.6 - 0.8	
4	CURRENT	0	Amps	55 - 75	
5	Level Oil	50	%	> 50	
6	Level Oil	50	%	> 50	

4700-B1D :

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-002D	0	kg/cm2	0.6 - 0.8	
4	PG-002D	0	kg/cm2	0.6 - 0.8	
5	CURRENT	0	Amps	55 - 75	
6	CURRENT	0	Amps	55 - 75	
7	Level Oil	50	%	> 50	

4710-B1C :

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-101C	0	kg/cm2	0.6 - 1	
4	PG-101C	0	kg/cm2	0.6 - 1	
5	CURRENT	0	Amps	110 - 140	
6	Level Oil	50	%	> 50	
7	Level Oil	50	%	> 50	

4710-B2A :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	PRESS	0.79	kg/cm2	0.7 - 1	
4	Temp	95	C	80 - 110	
5	DP air filter	0.05	kg/cm2	> -0.05	
6	DP air filter	0.05	kg/cm2	> -0.05	
7	Oil Press	3.5	Bar	2 - 6.5	

4710-B2B : 3

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PRESS	0	kg/cm2	0.7 - 1	
4	PRESS	0	kg/cm2	0.7 - 1	
5	Temp	0	C	80 - 110	
6	DP air filter	0	kg/cm2	> -0.05	
7	Oil Press	0	Bar	2 - 6.5	
8	Oil Press	0	Bar	2 - 6.5	

4710-B2C : 3'

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PRESS	0	kg/cm2	0.7 - 1	
4	Temp	0	C	80 - 110	
5	Oil Press	0	Bar	> 2	
6	Oil Press	0	Bar	> 2	

4710-B2D :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	PRESS	0.73	kg/cm2	0.7 - 1	
4	Temp	96	C	80 - 110	
5	DP air filter	-0.027	kg/cm2	> -0.05	
6	Oil Press	3	Bar	2 - 6.5	

4710-B2E :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	PRESS	0.73	kg/cm2	0.7 - 1	
4	PRESS	0.73	kg/cm2	0.7 - 1	
5	Temp	96	C	80 - 110	
6	DP air filter	-0.009	kg/cm2	> -0.05	
7	DP air filter	-0.009	kg/cm2	> -0.05	
8	Oil Press	3	Bar	2 - 6.5	

I hereby certify that all information is accurate and that an actual inspection was conducted.

By: Denchai Pugnak (Denchai)
Date Time: May 09, 2023 14:36:05

Approved By: Channarong Wan-Ohn (Channarong)
Date Time: May 09, 2023 16:03:12

No signature is required as this is an electronic document

CPL UT 4700 (1)

Conducted by : **Denchai Pugnak (Denchai)**

Conducted on : **Jun 13, 2023 20:00:00**

Completed on : **Jun 13, 2023 20:46:12**

Report created with Advansoft ODM

No	Description	Value	EU	Lo - Hi	Remarks
UBE Chemical : (10926) :					
CPL : (4967) :					
UT : :					
UT_4700 (1) : :					
Work Summary :					
1	Production Load	100	%		
2	Production Load	100	%		
4700-V1 :					
1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	FQ-001	2.17277e+0...	m3		
	2.17277e+006				
E1-A :					
1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	TG001-A	32.6	C	30 - 50	
4	INLET TG-001A EFFLUENT TEMP.	58	C	50 - 75	
5	OUTLET TG-002A EFFLUENT TEMP.	35	C	30 - 45	
6	INLET TG-003A COOLING WATER	32	C	25 - 35	
7	OUTLET TG-004A COOLING WATER	34	C	30 - 40	
E1-B :					
1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	TIC-001B	32.7	C	30 - 50	
4	INLET TG-001B EFFLUENT TEMP.	58	C	50 - 75	

Disclaimer
The assessors believe the information contained within this risk assessment report to be correct at the time of printing. The assessors do not accept responsibility for any consequences arising from the use of the information herein. The report is based on matters which we observed or came to the attention of the assessors during the day of the assessment and should not be relied upon as an exhaustive record of all possible risks or hazards that may exist or potential improvements that can be made.

Confidentiality Statement
In order to maintain the integrity and credibility of the risk assessment processes and to protect the parties involved, it is understood that the accessors will not divulge to unauthorized persons any information obtained during this risk assessment unless legally obligated to do so.

5	OUTLET TG-002B EFFLUENT TEMP.	34	C	30 - 45	
6	INLET TG-003B COOLING WATER	32	C	30 - 35	
7	OUTLET TG-004B COOLING WATER	34	C	30 - 40	
4700-P39 : (4) :					
1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	Discharge	0	kg/cm2	2 - 5	
4	Pressure	0	kg/cm2	2 - 4	
5	Flow	0	x 0.1 M3/hr	2 - 5	
4700-P40 : (4)					
1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	Discharge	4	kg/cm2	2 - 5	
4	Pressure	3.8	kg/cm2	2 - 4	
5	Flow	5	x 0.1 M3/hr	2 - 5	
4700-V11 : :					
1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	FI47003	42984			
4	CHEM FEED NaOC	Stand By			
5	CHEM FEED NaOC	Stand By			
4710-V4 :					
1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	AT-101	3.3	DO	2 - 4.8	
4	AT-101	36.2	TEMP	30 - 40	

5	AT-102	4.8	DO	2 - 4.8	
6	AT-102	36	TEMP	30 - 40	
7	AT-103	3.7	DO	2 - 4.8	
8	AT-103	36.4	TEMP	30 - 40	
4710-V2 : :					
1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	MIXER V2-A1	Running			
4	MIXER V2-A1	Running			
5	AIC-001	9.7	pH	1 - 14	
6	AIC-001	35.6	TEMP	30 - 40	
7	H2SO3 FEED ON/OFF	Stand By			
8	H2SO3 FEED ON/OFF	Stand By			
9	NaOH FEED ON/OFF	Stand By			
10	NaOH FEED ON/OFF	Stand By			
4710-V3 :					
1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	H3PO4 ON/OFF	Running			
4	H3PO4 ON/OFF	Running			
4700-V4 : :					
1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	AT-006	2.2	DO	2 - 4	
4	AT-006	2.2	DO	2 - 4	
5	AT-006	36	TEMP	30 - 40	

6	AT-006	36	TEMP	30 - 40	
7	AIA-002	3.1	DO	1 - 3	
8	AIA-002	3.1	DO	1 - 3	
9	AIA-002	36	TEMP	30 - 40	
10	AIA-002	36	TEMP	30 - 40	

V32 : 1

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	Level	0.9	%		
4	Level	0.9	%		
5	Press P-35	0	kg/cm2	1 - 3	
6	Press P-35	0	kg/cm2	1 - 3	

4700-P29A : 1

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	SUMP PUMP V-16	Stand By			
4	SUMP PUMP V-16	Stand By			
5	PG-018A	0	kg/cm2	1 - 3	
6	Level Oil	50	%	> 50	

4700-P29B : 1

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	SUMP PUMP V-16	Stand By			
4	SUMP PUMP V-16	Stand By			
5	PG-018B	0	kg/cm2	1 - 3	
6	PG-018B	0	kg/cm2	1 - 3	

7	Level Oil	50	%	> 50	
8	Level Oil	50	%	> 50	

4700-P11 :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	P-11 CHECK ON/OFF	Running			
4	P-11 CHECK ON/OFF	Running			
5	PG-...	1.5	kg/cm2	1 - 3	
6	PG-...	1.5	kg/cm2	1 - 3	

4700-P28A : 1

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-016A	0	kg/cm2	1 - 3	
4	PG-016A	0	kg/cm2	1 - 3	
5	Level Oil	50	%	> 50	
6	Level Oil	50	%	> 50	

4700-P28B : 1

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-016B	0	kg/cm2	1 - 3	
4	PG-016B	0	kg/cm2	1 - 3	
5	Level Oil	50	%	> 50	
6	Level Oil	50	%	> 50	

4700-P10A :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			

3	K'FER P. Check	1.7		1 - 3	
4	K'FER P. Check	1.7		1 - 3	
5	Level Oil	50	%	> 50	
6	Level Oil	50	%	> 50	

4700-P10B : 1

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	K'FER P. Check	0		1 - 3	
4	Level Oil	50	%	> 50	

4700-P15 : 1

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-022	0	kg/cm2	1 - 3	
4	Level Oil	50	%	> 50	

4700-B3 : 1

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-023	Stand By			
4	PG-023	Stand By			

4700-S5 : 2

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	AIC-005	3.4	pH	1 - 8	
4	AIC-005	3.4	pH	1 - 8	
5	AIC-005	34	TEMP	30 - 40	
6	AIC-005	35	TEMP	30 - 40	

7	LG-002	1000	%	200 - 1000	
8	LG-002	1000	%	200 - 1000	
9	CHEM. FEED H2SO4	Stand By			
10	CHEM. FEED H2SO4	Stand By			

4700-P1B : 1

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-024	Stand By			
4	PG-024	Stand By			
5	Level Oil	50	%	> 50	
6	Level Oil	50	%	> 50	

4700-P1A :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	PG-001A	2	kg/cm2	1 - 3	
4	PG-001A	2	kg/cm2	1 - 3	
5	Level Oil	50	%	> 50	
6	Level Oil	50	%	> 50	

4700-P1B : 1

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-001B	0	kg/cm2	1 - 3	
4	PG-001B	0	kg/cm2	1 - 3	
5	Level Oil	50	%	> 50	
6	Level Oil	50	%	> 50	

4700-P1C :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	PG-001C	2	kg/cm2	1 - 3	
4	Level Oil	50	%	> 50	

4700-P8A :

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	ON/OFF	Stand By			
4	ON/OFF	Stand By			

4700-P8B :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	ON/OFF	Running			
4	ON/OFF	Running			

4700-P32A :

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	Pressure	0	kg/cm2	1 - 3	
4	Pressure	0	kg/cm2	1 - 3	
5	Level Oil	50	%	> 50	
6	Current	0	A	20 - 25	

4700-P32B :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	Pressure	2	kg/cm2	1 - 3	
4	Pressure	2	kg/cm2	1 - 3	
5	Level Oil	50	%	> 50	
6	Current	N/A	A	20 - 25	

4700-V30S :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	Site check	Normal			
4	Site check	Normal			

4700-E2 :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	TG-101 Air	32	C	30 - 40	
4	TG-102 CW	32	C	25 - 36	

4700-E3 :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	TG-103 Air	32	C	30 - 40	
4	TG-103 Air	32	C	30 - 40	
5	TG-104 CW	32	C	25 - 36	
6	TG-104 CW	32	C	25 - 36	

4700-B2A :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	PRESS	0.59	kg/cm2	0.5 - 1	
4	Temp	77	C	70 - 90	
5	DP air filter	0	kg/cm2	> -0.05	
6	Oil Press	2.6	Bar	> 2	

4700-B1B :

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-002B	0	kg/cm2	0.6 - 0.8	
4	CURRENT	0	Amps	55 - 75	
5	Level Oil	50	%	> 50	
6	Level Oil	50	%	> 50	

4700-B1C :

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-002C	0	kg/cm2	0.6 - 0.8	
4	CURRENT	0	Amps	55 - 75	
5	Level Oil	50	%	> 50	
6	Level Oil	50	%	> 50	

4700-B1D :

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-002D	0	kg/cm2	0.6 - 0.8	
4	CURRENT	0	Amps	55 - 75	
5	Level Oil	0	%	> 50	
6	Level Oil	0	%	> 50	

4710-B1C :

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PG-101C	0	kg/cm2	0.6 - 1	
4	CURRENT	0	Amps	110 - 140	
5	Level Oil	50	%	> 50	
6	Current	N/A	A	20 - 25	

4700-V30S :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	Site check	Normal			
4	Site check	Normal			

4700-E2 :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	TG-101 Air	32	C	30 - 40	
4	TG-102 CW	32	C	25 - 36	

4700-E3 :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	TG-103 Air	32	C	30 - 40	
4	TG-103 Air	32	C	30 - 40	
5	TG-104 CW	32	C	25 - 36	
6	TG-104 CW	32	C	25 - 36	

4700-B2A :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	PRESS	0.59	kg/cm2	0.5 - 1	
4	Temp	77	C	70 - 90	
5	DP air filter	0	kg/cm2	> -0.05	
6	Oil Press	2.6	Bar	> 2	

4710-B2A :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	PRESS	0.8	kg/cm2	0.7 - 1	
4	Temp	99	C	80 - 110	
5	Temp	99	C	80 - 110	
6	DP air filter	-0.009	kg/cm2	> -0.05	
7	Oil Press	3.8	Bar	2 - 6.5	
8	Oil Press	3.6	Bar	2 - 6.5	

4710-B2B :

1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	PRESS	0.79	kg/cm2	0.7 - 1	
4	Temp	97	C	80 - 110	
5	Temp	97	C	80 - 110	
6	DP air filter	-0.006	kg/cm2	> -0.05	
7	DP air filter	-0.005	kg/cm2	> -0.05	
8	Oil Press	3.4	Bar	2 - 6.5	

4710-B2C :

1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PRESS	0	kg/cm2	0.7 - 1	
4	PRESS	0	kg/cm2	0.7 - 1	
5	Temp	0	C	80 - 110	
6	Temp	0	C	80 - 110	

6	Oil Press	[illegible]	Bar	> 2	
7	Oil Press	[illegible]	Bar	> 2	
4710-B2D : [illegible]					
1	EQUIPMENT Status	Stand By			
2	EQUIPMENT Status	Stand By			
3	PRESS	[illegible]	kg/cm2	0.7 - 1	
4	Temp	[illegible]	C	80 - 110	
5	DP air filter	0	kg/cm2	> -0.05	
6	Oil Press	[illegible]	Bar	2 - 6.5	
4710-B2E : [illegible]					
1	EQUIPMENT Status	Duty			
2	EQUIPMENT Status	Duty			
3	PRESS	[illegible]	kg/cm2	0.7 - 1	
4	Temp	95	C	80 - 110	
5	DP air filter	-0.01	kg/cm2	> -0.05	
6	Oil Press	[illegible]	Bar	2 - 6.5	

I hereby certify that all information is accurate and that an actual inspection was conducted.

By: Denchai Pugnak (Denchai)
Date Time: Jun 13, 2023 20:46:12

Approved By: Channarong Wan-Ohn (Channarong)
Date Time: Jun 13, 2023 22:59:48

No signature is required as this is an electronic document

ภาคผนวก ข.25

ผลการตรวจสอบคุณภาพน้ำทิ้งหลังผ่านการบำบัด (ทุกสัปดาห์) ระหว่างเดือนมกราคม ถึงมิถุนายน พ.ศ.2566

ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet
Suan Luang, Bangkok 10250 Thailand
T +66 2 760 3000 F +66 2 760 3197

สรุปผลการตรวจวิเคราะห์คุณภาพน้ำทิ้ง
บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน)
ประจำเดือนมกราคม พ.ศ. 2566

โรงงาน : Caprolactam Plant

จุดเก็บตัวอย่าง : Effluent (S-32-104)

ผลการตรวจวิเคราะห์คุณภาพน้ำทิ้ง

พารามิเตอร์	วิธีการตรวจวิเคราะห์	หน่วย	ผลการตรวจวิเคราะห์				มาตรฐาน
			4 ม.ค. 66	11 ม.ค. 66	18 ม.ค. 66	25 ม.ค. 66	
BOD (5 days at 20 Degree C)	5-Day BOD Test	mg/L	<2	<2	<2	<2	≤20
COD	Closed Reflux, Colorimetric Method	mg/L	47	28	50	42	≤120
Oil & Grease	Partition Gravimetric Method	mg/L	4	<3	3	4	≤5
pH at 25 degree C	Electrometric Method	-	7.3	7.2	7.6	8.0	5.5-9.0
Total Dissolved Solids	Dried at 180 degree C/Gravimetric Method	mg/L	3,520	1,068	2,860	2,240	≤5000
Total Kjeldahl Nitrogen	Digestion, Semi-Automated Colorimetry	mg/L	<1.0	2.2	4.1	5.0	≤100
Total Suspended Solids	Dried at 103-105 degree C/Gravimetric Method	mg/L	<5	<5	<5	<5	≤50
Temperature	Laboratory and Field Methods	Degree C	31.6	33.1	33.7	33.2	≤40
Sulfate	Colorimetric Method	mg/L	1,475	301	1,280	692	No Standard
Flow rate	Flow meter	m^3/hr	95	99	106	101	No Standard

มาตรฐาน : ประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากโรงงานอุตสาหกรรม นิคมอุตสาหกรรม และเขตประกอบการอุตสาหกรรม พ.ศ. 2559 และประกาศกระทรวงอุตสาหกรรม เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากโรงงาน พ.ศ. 2560

ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet
Suan Luang, Bangkok 10250 Thailand
T +66 2 760 3000 F +66 2 760 3197

สรุปผลการตรวจวิเคราะห์คุณภาพน้ำทิ้ง
บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน)
ประจำเดือนกุมภาพันธ์ พ.ศ. 2566

โรงงาน : Caprolactam Plant

จุดเก็บตัวอย่าง : Effluent (S-32-104)

ผลการตรวจวิเคราะห์คุณภาพน้ำทิ้ง

พารามิเตอร์	วิธีการตรวจวิเคราะห์	หน่วย	ผลการตรวจวิเคราะห์				มาตรฐาน
			1 ก.พ. 66	8 ก.พ. 66	15 ก.พ. 66	22 ก.พ. 66	
BOD (5 days at 20 Degree C)	5-Day BOD Test	mg/L	<2.0	<2.0	<2.0	<2.0	≤20
COD	Closed Reflux, Colorimetric Method	mg/L	40	54	55	35	≤120
Oil & Grease	Partition Gravimetric Method	mg/L	<3	<3	<3	<3	≤5
pH at 25 degree C	Electrometric Method	-	7.8	8.0	7.9	8.1	5.5-9.0
Total Dissolved Solids	Dried at 180 degree C/Gravimetric Method	mg/L	1,500	2,540	2,780	2,300	≤5000
Total Kjeldahl Nitrogen	Digestion, Semi-Automated Colorimetry	mg/L	3.1	<1.0	<1.0	1.9	≤100
Total Suspended Solids	Dried at 103-105 degree C/Gravimetric Method	mg/L	<5	<5	<5	<5	≤50
Temperature	Laboratory and Field Methods	Degree C	32.4	32.9	34.5	35.0	≤40
Sulfate	Colorimetric Method	mg/L	929	1,046	1,102	763	No Standard
Flow rate	Flow meter	m^3/hr	95	106	92	120	No Standard

มาตรฐาน : ประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากโรงงานอุตสาหกรรม นิคมอุตสาหกรรม และเขตประกอบการอุตสาหกรรม พ.ศ. 2559 และประกาศกระทรวงอุตสาหกรรม เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากโรงงาน พ.ศ. 2560

ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand
T +66 2 760 3000 F +66 2 760 3197

สรุปผลการตรวจวิเคราะห์คุณภาพน้ำทิ้ง
บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน)
ประจำเดือนมีนาคม พ.ศ. 2566

โรงงาน : Caprolactam Plant
จุดเก็บตัวอย่าง : Effluent (S-32-104)

ผลการตรวจวิเคราะห์คุณภาพน้ำทิ้ง

พารามิเตอร์	วิธีการตรวจวิเคราะห์	หน่วย	ผลการตรวจวิเคราะห์					มาตรฐาน
			1 มี.ค. 66	8 มี.ค. 66	15 มี.ค. 66	22 มี.ค. 66	29 มี.ค. 66	
BOD (5 days at 20 Degree C)	5-Day BOD Test	mg/L	<2.0	<2.0	<2.0	<2.0	8.3	≤20
COD	Closed Reflux, Colorimetric Method	mg/L	41	52	<25	59	63	≤120
Oil & Grease	Partition Gravimetric Method	mg/L	<3	<3	<3	<3	<3	≤5
pH at 25 degree C	Electrometric Method	-	7.8	8.3	8.1	8.1	7.7	5.5-9.0
Total Dissolved Solids	Dried at 180 degree C/Gravimetric Method	mg/L	2,320	2,880	1,024	3,140	1,800	≤5000
Total Kjeldahl Nitrogen	Digestion, Semi-Automated Colorimetry	mg/L	2.4	3.2	1.9	4.6	1.8	≤100
Total Suspended Solids	Dried at 103-105 degree C/Gravimetric Method	mg/L	<5	<5	<5	<5	<5	≤50
Temperature	Laboratory and Field Methods	Degree C	33.4	34.1	30.2	33.1	34.7	≤40
Sulfate	Colorimetric Method	mg/L	719	842	346	1,219	601	No Standard
Flow rate	Flow meter	m^3/hr	96	86	88	78	72	No Standard

มาตรฐาน : ประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากโรงงานอุตสาหกรรม นิคมอุตสาหกรรม และเขตประกอบการอุตสาหกรรม พ.ศ. 2559 และประกาศกระทรวงอุตสาหกรรม เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากโรงงาน พ.ศ. 2560

right solutions.
right partner.

ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand
T +66 2 760 3000 F +66 2 760 3197

สรุปผลการตรวจวิเคราะห์คุณภาพน้ำทิ้ง
บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน)
ประจำเดือนเมษายน พ.ศ. 2566

โรงงาน : Caprolactam Plant
จุดเก็บตัวอย่าง : Effluent (S-32-104)

ผลการตรวจวิเคราะห์คุณภาพน้ำทิ้ง

พารามิเตอร์	วิธีการตรวจวิเคราะห์	หน่วย	ผลการตรวจวิเคราะห์				มาตรฐาน
			5 เม.ย. 66	12 เม.ย. 66	19 เม.ย. 66	26 เม.ย. 66	
BOD (5 days at 20 Degree C)	5-Day BOD Test	mg/L	<2.0	3.4	<2.0	<2.0	≤20
COD	Closed Reflux, Colorimetric Method	mg/L	46	51	48	33	≤120
Oil & Grease	Partition Gravimetric Method	mg/L	<3	<3	<3	<3	≤5
pH at 25 degree C	Electrometric Method	-	7.2	7.4	7.8	8.0	5.5-9.0
Temperature	Laboratory and Field Methods	Degree C	37.1	33.7	34.7	35.1	≤40
Total Dissolved Solids	Dried at 180 degree C/Gravimetric Method	mg/L	2,780	3,140	2,400	2,050	≤5000
Total Kjeldahl Nitrogen	Digestion, Semi-Automated Colorimetry	mg/L	2.6	1.1	2.0	1.0	≤100
Total Suspended Solids	Dried at 103-105 degree C/Gravimetric Method	mg/L	<5	<5	<5	<5	≤50
Flow rate	Flow meter	m^3/hr	75.0	83.0	93.0	101.0	No Standard
Sulfate	Colorimetric Method	mg/L	963	1,218	859	794	No Standard

right solutions.
right partner.

ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan,
Khet Suan Luang, Bangkok 10250 Thailand
T +66 2 760 3000 F +66 2 760 3197

มาตรฐาน : ประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากโรงงานอุตสาหกรรม นิคมอุตสาหกรรม และเขตประกอบการอุตสาหกรรม พ.ศ. 2559 และประกาศกระทรวงอุตสาหกรรม เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากโรงงาน พ.ศ. 2560

right solutions.
right partner.

ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand
T +66 2 760 3000 F +66 2 760 3197

สรุปผลการตรวจวิเคราะห์คุณภาพน้ำทิ้ง
บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน)
ประจำเดือนพฤษภาคม พ.ศ. 2566

โรงงาน : Caprolactam Plant

จุดเก็บตัวอย่าง : Effluent (S-32-104)

ผลการตรวจวิเคราะห์คุณภาพน้ำทิ้ง

พารามิเตอร์	วิธีการตรวจวิเคราะห์	หน่วย	ผลการตรวจวิเคราะห์					มาตรฐาน
			3 พ.ค 66	10 พ.ค 66	15 พ.ค 66	24 พ.ค 66	31 พ.ค 66	
BOD (5 days at 20 Degree C)	5-Day BOD Test	mg/L	12.9	3.5	<2.0	<2.0	<2.0	≤20
COD	Closed Reflux, Colorimetric Method	mg/L	45	36	33	34	32	≤120
Oil & Grease	Partition Gravimetric Method	mg/L	<3	<3	<3	<3	<3	≤5
pH at 25 degree C	Electrometric Method	-	7.8	7.6	7.7	8.0	8.1	5.5-9.0
Temperature	Laboratory and Field Methods	Degree C	31.5	33.7	30.4	35.6	33.9	≤40
Total Dissolved Solids	Dried at 180 degree C/Gravimetric Method	mg/L	380	1,720	912	2,100	2,400	≤5000
Total Kjeldahl Nitrogen	Digestion, Semi-Automated Colorimetry	mg/L	1.6	2.4	2.2	<1.0	<1.0	≤100
Total Suspended Solids	Dried at 103-105 degree C/Gravimetric Method	mg/L	8	<5	<5	<5	<5	≤50
Flow rate	Flow meter	m^3/hr	81.0	84.0	125	108	113	No Standard
Sulfate	Colorimetric Method	mg/L	89.6	551	291	851	874	No Standard

มาตรฐาน : ประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากโรงงานอุตสาหกรรม นิคมอุตสาหกรรม และเขตประกอบการอุตสาหกรรม พ.ศ. 2559 และประกาศกระทรวงอุตสาหกรรม เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากโรงงาน พ.ศ. 2560

right solutions.
right partner.

ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand
T +66 2 760 3000 F +66 2 760 3197

สรุปผลการตรวจวิเคราะห์คุณภาพน้ำทิ้ง
บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน)
ประจำเดือนมิถุนายน พ.ศ. 2566

โรงงาน : Caprolactam Plant

จุดเก็บตัวอย่าง : Effluent (S-32-104)

ผลการตรวจวิเคราะห์คุณภาพน้ำทิ้ง

พารามิเตอร์	วิธีการตรวจวิเคราะห์	หน่วย	ผลการตรวจวิเคราะห์				มาตรฐาน
			7 มิ.ย. 66	14 มิ.ย. 66	21 มิ.ย. 66	28 มิ.ย. 66	
BOD (5 days at 20 Degree C)	5-Day BOD Test	mg/L	2.9	<2.0	<2.0	<2.0	≤20
COD	Closed Reflux, Colorimetric Method	mg/L	40	42	47	35	≤120
Oil & Grease	Partition Gravimetric Method	mg/L	<3	<3	<3	3	≤5
pH at 25 degree C	Electrometric Method	-	8.3	8.1	7.6	7.8	5.5-9.0
Temperature	Laboratory and Field Methods	Degree C	29.5	34.1	32.1	36.0	≤40
Total Dissolved Solids	Dried at 180 degree C/Gravimetric Method	mg/L	1,580	2,660	3,700	2,780	≤5000
Total Kjeldahl Nitrogen	Digestion, Semi-Automated Colorimetry	mg/L	8.7	1.6	<1.0	3.0	≤100
Total Suspended Solids	Dried at 103-105 degree C/Gravimetric Method	mg/L	<5	<5	<5	<5	≤50
Flow rate	Flow meter	m^3/hr	96	92	98	112	No Standard
Sulfate	Colorimetric Method	mg/L	733	858	897	713	No Standard

right solutions.
right partner.

ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand
T +66 2 760 3000 F +66 2 760 3197

มาตรฐาน : ประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากโรงงานอุตสาหกรรม นิคมอุตสาหกรรม และเขตประกอบการอุตสาหกรรม พ.ศ. 2559 และประกาศกระทรวงอุตสาหกรรม เรื่อง กำหนดมาตรฐานควบคุมการระบายน้ำทิ้งจากโรงงาน พ.ศ. 2560

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 22147799
Date Received : Jan 04, 2023
Date Reported : Jan 12, 2023
Report Number : 2514355-1

Sample Number	22147799-1
Sampled Date	Jan 04, 2023 9:45 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Jan 04, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2	<2	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	5	47	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	4	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	7.3	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	31.6	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	3520	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	<1.0	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by D.Changchon
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 22147799
Date Received : Jan 04, 2023
Date Reported : Jan 12, 2023
Report Number : 2514355-1

Sampling By : Tanasit Wongsachal ทะเบียนเลขที่ ว-323-จ-9460

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by D.Changchon
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 22147799
Date Received : Jan 04, 2023
Date Reported : Jan 12, 2023
Report Number : 2514355-2

Sample Number	22147799-1
Sampled Date	Jan 04, 2023 9:45 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Jan 04, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	95	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	1475	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By :

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by N.Banchongkit
Narumon Banchongkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 22147800
Date Received : Jan 11, 2023
Date Reported : Jan 18, 2023
Report Number : 2514352-1

Sample Number	22147800-1
Sampled Date	Jan 11, 2023 9:41 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Jan 11, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	5	28	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	7.2	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	33.1	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1068	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	2.2	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by D.Changchon
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 22147800
Date Received : Jan 11, 2023
Date Reported : Jan 18, 2023
Report Number : 2514352-1

Sampling By : Tanasit Wongsachal หมายเลขที่ 3-323-a-9460

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Narumon Banchongkit, Supervisor, หมายเลขที่ 3-323-a-9445

Approved by Dej Changchon, Senior Manager, หมายเลขที่ 3-323-a-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 22147800
Date Received : Jan 11, 2023
Date Reported : Jan 18, 2023
Report Number : 2514352-2

Sample Number	22147800-1
Sampled Date	Jan 11, 2023 9:41 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Jan 11, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	99	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	301	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By :

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by Narumon Banchongkit, Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 22147801
Date Received : Jan 18, 2023
Date Reported : Jan 25, 2023
Report Number : 2514350-1

Sample Number	22147801-1
Sampled Date	Jan 18, 2023 9:25 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Jan 18, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	50	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	7.6	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	33.7	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2860	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	4.1	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Technical Management Narumon Banchongkit, Supervisor, หมายเลขที่ 3-323-a-9445

Approved by Dej Changchon, Senior Manager, หมายเลขที่ 3-323-a-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 22147801
Date Received : Jan 18, 2023
Date Reported : Jan 25, 2023
Report Number : 2514350-1

Sampling By : Tanasit Wongsachal หมายเลขที่ 3-323-a-9460

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Narumon Banchongkit, Supervisor, หมายเลขที่ 3-323-a-9445

Approved by Dej Changchon, Senior Manager, หมายเลขที่ 3-323-a-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 22147801
Date Received : Jan 18, 2023
Date Reported : Jan 25, 2023
Report Number : 2514350-2

Sample Number	22147801-1
Sampled Date	Jan 18, 2023 9:25 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Jan 18, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	106	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	1280	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By :

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by
Narumon Banchongkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 22147802
Date Received : Jan 25, 2023
Date Reported : Feb 01, 2023
Report Number : 2514337-1

Sample Number	22147802-1
Sampled Date	Jan 25, 2023 9:35 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Jan 25, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	42	≤120	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	4	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	8.0	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	33.2	≤40	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2240	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	5.0	≤100	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 22147802
Date Received : Jan 25, 2023
Date Reported : Feb 01, 2023
Report Number : 2514337-1

Sampling By : Tanasit Wongsachal ทะเบียนเลขที่ ว-323-ง-9460

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 22147802
Date Received : Jan 25, 2023
Date Reported : Feb 01, 2023
Report Number : 2514337-2

Sample Number	22147802-1
Sampled Date	Jan 25, 2023 9:35 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Jan 25, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	101	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	692	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Tanasit Wongsachal

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by
Narumon Banchongkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 231799
Date Received : Feb 01, 2023
Date Reported : Feb 08, 2023
Report Number : 2536059-1

Sample Number	231799-1
Sampled Date	Feb 01, 2023 9:45 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Feb 01, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	48	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	7.8	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	32.4	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1500	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	3.1	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

The above results are valid only for the sample/material sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 231799
Date Received : Feb 01, 2023
Date Reported : Feb 08, 2023
Report Number : 2536059-1

Page 2 of 2

Sampling By : Tanasit Wongsachai ทะเบียนเลขที่ ว-323-ง-9460

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

The above results are valid only for the sample/material sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER
R325-ภ/ EN/01

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 231799
Date Received : Feb 01, 2023
Date Reported : Feb 08, 2023
Report Number : 2536059-2

Sample Number	231799-1
Sampled Date	Feb 01, 2023 9:45 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Feb 01, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	95	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	929	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Tanasit Wongsachai

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by
Narumon Banchongkit
Supervisor

The above results are valid only for the sample/material sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 231800
Date Received : Feb 08, 2023
Date Reported : Feb 15, 2023
Report Number : 2536047-1

Sample Number	231800-1
Sampled Date	Feb 08, 2023 9:20 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Feb 08, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	54	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C		-	-	8.0	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	32.9	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2540	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	<1.0	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

The above results are valid only for the sample/material sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER
R325-ภ/ EN/01

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 231800
Date Received : Feb 08, 2023
Date Reported : Feb 15, 2023
Report Number : 2536047-1

Sampling By : Tanasit Wongsachal ทะเบียนเลขที่ ว-323-ง-9460

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by D.Changchon
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 231800
Date Received : Feb 08, 2023
Date Reported : Feb 15, 2023
Report Number : 2536047-2

Sample Number	231800-1
Sampled Date	Feb 08, 2023 9:20 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Feb 08, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	106	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	1046	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Tanasit Wongsachal

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by N.Banchongkit
Narumon Banchongkit
Supervisor

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 231801
Date Received : Feb 15, 2023
Date Reported : Feb 22, 2023
Report Number : 2536045-1

Sample Number	231801-1
Sampled Date	Feb 15, 2023 9:40 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Feb 15, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	55	≤120	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	7.9	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	34.5	≤40	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2780	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	<1.0	≤100	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by D.Changchon
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 231801
Date Received : Feb 15, 2023
Date Reported : Feb 22, 2023
Report Number : 2536045-1

Sampling By : Tanasit Wongsachal ทะเบียนเลขที่ ว-323-ง-9460

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by D.Changchon
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 231801
Date Received : Feb 15, 2023
Date Reported : Feb 22, 2023
Report Number : 2536045-2

Sample Number	231801-1
Sampled Date	Feb 15, 2023 9:40 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Feb 15, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	92	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	1102	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Tanasit Wongsachal

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by
Narumon Banchongkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com
Life Sciences
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 231802
Date Received : Feb 22, 2023
Date Reported : Mar 01, 2023
Report Number : 2536044-1

Sample Number	231802-1
Sampled Date	Feb 22, 2023 9:35 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Feb 22, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	35	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	8.1	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	35.0	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2300	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.9	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com
Life Sciences
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 231802
Date Received : Feb 22, 2023
Date Reported : Mar 01, 2023
Report Number : 2536044-1

Sampling By : Tanasit Wongsachal ทะเบียนเลขที่ ว-323-ง-9460

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 231802
Date Received : Feb 22, 2023
Date Reported : Mar 01, 2023
Report Number : 2536044-2

Sample Number	231802-1
Sampled Date	Feb 22, 2023 9:35 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Feb 22, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	120	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	763	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Tanasit Wongsachal

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com
Life Sciences
RIGHT SOLUTIONS RIGHT PARTNER

Approved by
Narumon Banchongkit
Supervisor

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com
Life Sciences
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2314679
Date Received : Mar 01, 2023
Date Reported : Mar 09, 2023
Report Number : 2562274-1

Sample Number	2314679-1
Sampled Date	Mar 01, 2023 9:17 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Mar 01, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	41	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	7.8	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	33.4	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2320	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	2.4	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by D.Chungchon
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2314679
Date Received : Mar 01, 2023
Date Reported : Mar 09, 2023
Report Number : 2562274-1

Sampling By : Tanasit Wongsachal ทะเบียนเลขที่ ว-323-ง-9460

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by D.Chungchon
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

R325-21/EMAIL S:\Reports_AR_GL.rpt (11:17AM)

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2314679
Date Received : Mar 01, 2023
Date Reported : Mar 09, 2023
Report Number : 2562274-2

Sample Number	2314679-1
Sampled Date	Mar 01, 2023 9:17 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Mar 01, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	96	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	719	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Tanasit Wongsachal

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

This above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by N.Banchongkit
Narumon Banchongkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2314678
Date Received : Mar 08, 2023
Date Reported : Mar 15, 2023
Report Number : 2562278-1

Sample Number	2314678-1
Sampled Date	Mar 08, 2023 9:40 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Mar 08, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	52	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	8.3	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	34.1	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2880	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	3.2	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by D.Chungchon
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

R325-IW/EMAIL S:\Reports_AR_GL.rpt (5:19PM)

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2314678
Date Received : Mar 08, 2023
Date Reported : Mar 15, 2023
Report Number : 2562278-1

Sampling By : Tanasit Wongsachai หมายเลขที่ ว-323-ร-9460

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
Narumon Banchongkit
Supervisor
หมายเลขที่ ว-323-ร-9445

Approved by
Dej Changchon
Senior Manager
หมายเลขที่ ว-323-ร-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2314678
Date Received : Mar 08, 2023
Date Reported : Mar 15, 2023
Report Number : 2562278-2

Sample Number	2314678-1
Sampled Date	Mar 08, 2023 9:40 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Mar 08, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	86	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	842	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Tanasit Wongsachai

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by
Narumon Banchongkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2314677
Date Received : Mar 15, 2023
Date Reported : Mar 22, 2023
Report Number : 2562281-1

Sample Number	2314677-1
Sampled Date	Mar 15, 2023 9:45 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Mar 15, 2023
Condition of Sample	Contained in one amber glass bottle, one BOD bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	<25	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	8.1	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	30.2	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1024	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.9	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Technical Management
Narumon Banchongkit
Supervisor
หมายเลขที่ ว-323-ร-9445

Approved by
Dej Changchon
Senior Manager
หมายเลขที่ ว-323-ร-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2314677
Date Received : Mar 15, 2023
Date Reported : Mar 22, 2023
Report Number : 2562281-1

Sampling By : Narunat thammasaro หมายเลขที่ ว-323-ร-9477

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
Narumon Banchongkit
Supervisor
หมายเลขที่ ว-323-ร-9445

Approved by
Dej Changchon
Senior Manager
หมายเลขที่ ว-323-ร-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2314677
Date Received : Mar 15, 2023
Date Reported : Mar 22, 2023
Report Number : 2562281-2

Sample Number	2314677-1
Sampled Date	Mar 15, 2023 9:45 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Mar 15, 2023
Condition of Sample	Contained in one amber glass bottle, one BOD bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	88	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	346	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Narunat thammasaro หมายเลขที่ ว-323-ง-9477

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
หมายเลขที่ ว-323-ง-9445

Approved by D.Changchon
Dej Changchon
Senior Manager
หมายเลขที่ ว-323-ง-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2314680
Date Received : Mar 22, 2023
Date Reported : Mar 29, 2023
Report Number : 2562273-1

Sample Number	2314680-1
Sampled Date	Mar 22, 2023 10:00 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Mar 22, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	59	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	8.1	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	33.1	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	3140	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	4.6	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Sampling By : Tanasit Wongsachal หมายเลขที่ ว-323-ง-9460

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
หมายเลขที่ ว-323-ง-9445

Approved by D.Changchon
Dej Changchon
Senior Manager
หมายเลขที่ ว-323-ง-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2314680
Date Received : Mar 22, 2023
Date Reported : Mar 29, 2023
Report Number : 2562273-1

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
หมายเลขที่ ว-323-ง-9445

Approved by D.Changchon
Dej Changchon
Senior Manager
หมายเลขที่ ว-323-ง-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2314680
Date Received : Mar 22, 2023
Date Reported : Mar 29, 2023
Report Number : 2562273-2

Sample Number	2314680-1
Sampled Data	Mar 22, 2023 10:00 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Data Analysis Commenced	Mar 22, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	78	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	1219	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Sampling By : Tanasit Wongsachal

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by N.Banchongkit
Narumon Banchongkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2314682
Date Received : Mar 29, 2023
Date Reported : Apr 05, 2023
Report Number : 2562271-1

Sample Number	2314682-1
Sampled Date	Mar 29, 2023 9:30 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Mar 29, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	8.3	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	63	≤120	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *	-	-	-	7.7	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	34.7	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1800	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.8	≤100	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, Industrial estate and Industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and Industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2314682
Date Received : Mar 29, 2023
Date Reported : Apr 05, 2023
Report Number : 2562271-1

Sampling By : Narunat thammasaro ทะเบียนเลขที่ ว-323-จ-9477

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER
8325-21/ EMAIL

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500138258
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2314682
Date Received : Mar 29, 2023
Date Reported : Apr 05, 2023
Report Number : 2562271-2

Sample Number	2314682-1
Sampled Date	Mar 29, 2023 9:30 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Mar 29, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	72	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	601	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, Industrial estate and Industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and Industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Narunat thammasaro

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by
Narumon Banchongkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O :
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2338003
Date Received : Apr 05, 2023
Date Reported : Apr 12, 2023
Report Number : 2613359-1

Sample Number	2338003-1
Sampled Date	Apr 05, 2023 10:00 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Apr 05, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	46	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *	-	-	-	7.2	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	37.1	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2780	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	2.6	≤100	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, Industrial estate and Industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and Industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand | PHONE +66 0 3304 8555 | FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER
8325-21/ EMAIL

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O :
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2338003
Date Received : Apr 05, 2023
Date Reported : Apr 12, 2023
Report Number : 2613359-1

Sampling By : Tanasit Wongsachai ทนสิทธนนทสาธิ ว-323-ง-9460

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

The above results are valid only for the sample(s)tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O :
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2338003
Date Received : Apr 05, 2023
Date Reported : Apr 12, 2023
Report Number : 2613359-2

Sample Number	2338003-1
Sampled Date	Apr 05, 2023 10:00 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Apr 05, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	75.0	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	963	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, Industrial estate and Industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and Industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Tanasit Wongsachai

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by
Narumon Banchongkit
Supervisor

The above results are valid only for the sample(s)tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O :
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2338021
Date Received : Apr 12, 2023
Date Reported : Apr 21, 2023
Report Number : 2613384-1

Sample Number	2338021-1
Sampled Date	Apr 12, 2023 9:20 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Apr 12, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	3.4	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	51	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	7.4	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	33.7	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	3140	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.1	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, Industrial estate and Industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and Industrial park set by Notification of The Ministry of Industry dated June 07, B.E 2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

The above results are valid only for the sample(s)tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O :
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2338021
Date Received : Apr 12, 2023
Date Reported : Apr 21, 2023
Report Number : 2613384-1

Sampling By : Tanasit Wongsachai ทนเบียนเลขที่ ว-323-ง-9460

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

The above results are valid only for the sample(s)tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O :
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2338021
Date Received : Apr 12, 2023
Date Reported : Apr 21, 2023
Report Number : 2613384-2

Sample Number	2338021-1
Sampled Date	Apr 12, 2023 9:20 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Apr 12, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	83.0	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	1218	No Standard	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Tanasit Wongsachal

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

This above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by
Narumon Banchongkit
Supervisor

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2338022
Date Received : Apr 19, 2023
Date Reported : Apr 26, 2023
Report Number : 2613381-1

Sample Number	2338022-1
Sampled Date	Apr 19, 2023 9:25 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Apr 19, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	48	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	7.8	5.5-9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	34.7	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2400	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	2.0	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Technical Management
Narumon Banchongkit
Supervisor
หมายเลขที่ ว-323-ก-9445

Approved by
Dej Changchon
Senior Manager
หมายเลขที่ ว-323-ก-9442

This above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2338022
Date Received : Apr 19, 2023
Date Reported : Apr 26, 2023
Report Number : 2613381-1

Sampling By : Tanasit Wongsachal หมายเลขที่ ว-323-ก-9460

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
Narumon Banchongkit
Supervisor
หมายเลขที่ ว-323-ก-9445

Approved by
Dej Changchon
Senior Manager
หมายเลขที่ ว-323-ก-9442

This above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2338022
Date Received : Apr 19, 2023
Date Reported : Apr 26, 2023
Report Number : 2613381-2

Sample Number	2338022-1
Sampled Date	Apr 19, 2023 9:25 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Apr 19, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	93.0	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	859	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Tanasit Wongsachal

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

This above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by
Narumon Banchongkit
Supervisor

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2338023
Date Received : Apr 26, 2023
Date Reported : May 05, 2023
Report Number : 2613369-1

Sample Number	2338023-1
Sampled Date	Apr 26, 2023 10:55 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Apr 26, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	33	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	8.0	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	35.1	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2050	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.0	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E 2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ค-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2338023
Date Received : Apr 26, 2023
Date Reported : May 05, 2023
Report Number : 2613369-1

Sampling By : Tanasit Wongsachai ทะเบียนเลขที่ ว-323-จ-9460

Remark :
- LOD : Limit of Detection
- "-" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ค-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2338023
Date Received : Apr 26, 2023
Date Reported : May 05, 2023
Report Number : 2613369-2

Sample Number	2338023-1
Sampled Date	Apr 26, 2023 10:55 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Apr 26, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	101	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	794	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E 2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Tanasit Wongsachai

Remark :
- LOD : Limit of Detection
- "-" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by
Narumon Banchongkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2349581
Date Received : May 03, 2023
Date Reported : May 11, 2023
Report Number : 2638668-1

Sample Number	2349581-1
Sampled Date	May 03, 2023 9:30 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	May 03, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	12.9	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	45	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	7.8	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	31.5	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	380	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.6	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	8	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E 2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ค-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2349581
Date Received : May 03, 2023
Date Reported : May 11, 2023
Report Number : 2638668-1

Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-จ-9461

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2349581
Date Received : May 03, 2023
Date Reported : May 11, 2023
Report Number : 2638668-2

Sample Number	2349581-1
Sampled Date	May 03, 2023 9:30 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	May 03, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	81.0	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	89.6	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Chainusorn Lertnanthakunchai

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Technical Management
Narumon Banchongkit
Supervisor

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2349577
Date Received : May 10, 2023
Date Reported : May 17, 2023
Report Number : 2638670-1

Sample Number	2349577-1
Sampled Date	May 10, 2023 10:00 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	May 10, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	3.5	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	36	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	7.6	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	33.7	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1720	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	2.4	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Sampling By : Tanasit Wongsachai ทะเบียนเลขที่ ว-323-จ-9460

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2349577
Date Received : May 10, 2023
Date Reported : May 17, 2023
Report Number : 2638670-1

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2349577
Date Received : May 10, 2023
Date Reported : May 17, 2023
Report Number : 2638670-2

Sample Number	2349577-1
Sampled Date	May 10, 2023 10:00 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	May 10, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	84.0	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	551	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Sampling By : Tanasit Wongsachal

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

This above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by
Narumon Banchongkit
Supervisor

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2349574
Date Received : May 15, 2023
Date Reported : May 22, 2023
Report Number : 2638676-1

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

This above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2349574
Date Received : May 15, 2023
Date Reported : May 22, 2023
Report Number : 2638676-1

Sample Number	2349574-1
Sampled Date	May 15, 2023 9:50 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	May 15, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	33	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	7.7	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	30.4	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	912	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	2.2	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Sampling By : Tanasit Wongsachal ทะเบียนเลขที่ ว-323-ง-9460

Technical Management
Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-ง-9445

Approved by
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ง-9442

This above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2349574
Date Received : May 15, 2023
Date Reported : May 22, 2023
Report Number : 2638676-2

Sample Number	2349574-1
Sampled Date	May 15, 2023 9:50 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	May 15, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	125	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	291	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Sampling By : Tanasit Wongsachal

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

This above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by
Narumon Banchongkit
Supervisor

Analysis / Test Report

TESTING No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2349569
Date Received : May 24, 2023
Date Reported : May 31, 2023
Report Number : 2638678-1

Sample Number	2349569-1
Sampled Date	May 24, 2023 9:20 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	May 24, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B	Rayong
COD	mg/L	1.5	25	34	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	8.0	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	35.6	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2100	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	<1.0	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 3,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Technical Management Narumon Banchongkit, Supervisor, หมายเลขที่ ว-323-ง-9445
Approved by Dej Changchon, Senior Manager, หมายเลขที่ ว-323-ง-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2349569
Date Received : May 24, 2023
Date Reported : May 31, 2023
Report Number : 2638678-1

Sampling By : Chainusorn Lertnanthakunchai หมายเลขที่ ว-323-ง-9461

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management Narumon Banchongkit, Supervisor, หมายเลขที่ ว-323-ง-9445
Approved by Dej Changchon, Senior Manager, หมายเลขที่ ว-323-ง-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2349569
Date Received : May 24, 2023
Date Reported : May 31, 2023
Report Number : 2638678-2

Sample Number	2349569-1
Sampled Date	May 24, 2023 9:20 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	May 25, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/s	-	-	108	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	851	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Chainusorn Lertnanthakunchai

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by Narumon Banchongkit, Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2349565
Date Received : May 31, 2023
Date Reported : Jun 08, 2023
Report Number : 2638679-1

Sample Number	2349565-1
Sampled Date	May 31, 2023 9:28 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	May 31, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	32	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	8.1	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	33.9	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2400	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	<1.0	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.

Technical Management Narumon Banchongkit, Supervisor, หมายเลขที่ ว-323-ง-9445
Approved by Dej Changchon, Senior Manager, หมายเลขที่ ว-323-ง-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2349565
Date Received : May 31, 2023
Date Reported : Jun 08, 2023
Report Number : 2638679-1

Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Chainusorn Lertnanthakunchai ทะเบียนเลขที่ ว-323-ล-9461

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management — Narumon Banchongkit, Supervisor, ทะเบียนเลขที่ ว-323-ล-9445
Approved by — Dej Changchon, Senior Manager, ทะเบียนเลขที่ ว-323-ล-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2349565
Date Received : May 31, 2023
Date Reported : Jun 08, 2023
Report Number : 2638679-2

Sample Number	2349565-1
Sampled Date	May 31, 2023 9:28 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	May 31, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	113	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	874	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Chainusorn Lertnanthakunchai

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by — Narumon Banchongkit, Supervisor

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2364715
Date Received : Jun 07, 2023
Date Reported : Jun 14, 2023
Report Number : 2672011-1

Sample Number	2364715-1
Sampled Date	Jun 07, 2023 11:15 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Jun 07, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	2.9	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	40	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *	-	-	-	8.3	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	29.5	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1580	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	8.7	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.

Technical Management — Narumon Banchongkit, Supervisor, ทะเบียนเลขที่ ว-323-ล-9445
Approved by — Dej Changchon, Senior Manager, ทะเบียนเลขที่ ว-323-ล-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2364715
Date Received : Jun 07, 2023
Date Reported : Jun 14, 2023
Report Number : 2672011-1

Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Narurat Thammasaro ทะเบียนเลขที่ ว-323-ล-9477

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management — Narumon Banchongkit, Supervisor, ทะเบียนเลขที่ ว-323-ล-9445
Approved by — Dej Changchon, Senior Manager, ทะเบียนเลขที่ ว-323-ล-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2364715
Date Received : Jun 07, 2023
Date Reported : Jun 14, 2023
Report Number : 2672011-2

Sample Number	2364715-1
Sampled Date	Jun 07, 2023 11:15 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Jun 07, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	96.00	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	733	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Narunat thammasaro

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

This above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by
Narumon Banchongkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phuakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2364716
Date Received : Jun 14, 2023
Date Reported : Jun 22, 2023
Report Number : 2672002-1

Sample Number	2364716-1
Sampled Date	Jun 14, 2023 9:30 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Jun 14, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	42	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *		-	-	8.1	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	34.1	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2660	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.6	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.

Technical Management
Narumon Banchongkit
Supervisor
หมายเลขที่ ว-323-ส-9445

Approved by
Dej Changchon
Senior Manager
หมายเลขที่ ว-323-ส-9442

This above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phuakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2364716
Date Received : Jun 14, 2023
Date Reported : Jun 22, 2023
Report Number : 2672002-1

Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Narunat thammasaro หมายเลขที่ ว-323-ส-9477

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management
Narumon Banchongkit
Supervisor
หมายเลขที่ ว-323-ส-9445

Approved by
Dej Changchon
Senior Manager
หมายเลขที่ ว-323-ส-9442

This above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phuakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2364716
Date Received : Jun 14, 2023
Date Reported : Jun 22, 2023
Report Number : 2672002-2

Sample Number	2364716-1
Sampled Date	Jun 14, 2023 9:30 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Jun 14, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	92.00	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	858	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Narunat thammasaro

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

This above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by
Narumon Banchongkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Phuakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company
www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

TESTING
No.0042

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2364717
Date Received : Jun 21, 2023
Date Reported : Jun 28, 2023
Report Number : 2671995-1

Sample Number	2364717-1
Sampled Date	Jun 21, 2023 9:40 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Jun 21, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	47	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	<3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *	-	-	-	7.6	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	32.1	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	3700	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	<1.0	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
หทเบียนเลขที่ ว-323-ง-9445

Approved by D.Changchon
Dej Changchon
Senior Manager
หทเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not re-produced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

TESTING
No.0042

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2364717
Date Received : Jun 21, 2023
Date Reported : Jun 28, 2023
Report Number : 2671995-1

Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Narunat thammasaro หเบียนเลขที่ ว-323-ง-9477

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
หทเบียนเลขที่ ว-323-ง-9445

Approved by D.Changchon
Dej Changchon
Senior Manager
หทเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

TESTING
No.0042

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2364717
Date Received : Jun 21, 2023
Date Reported : Jun 28, 2023
Report Number : 2671995-2

Sample Number	2364717-1
Sampled Date	Jun 21, 2023 9:40 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Jun 21, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	98	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	897	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.
Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Narunat thammasaro

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

The above results are valid only for the analyzed/tested sample(s) as indicated in the report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by N.Banchongkit
Narumon Banchongkit
Supervisor

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

8325-21/ EN/SL S:\Reports_All_GC.rpt (1:54PM)

TESTING
No.0042

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2364718
Date Received : Jun 28, 2023
Date Reported : Jul 05, 2023
Report Number : 2671984-1

Sample Number	2364718-1
Sampled Date	Jun 28, 2023 9:00 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Jun 28, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O G	Rayong
COD	mg/L	1.5	25	35	≤120	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5220 D	Rayong
Oil & Grease *	mg/L	-	3	3	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5520 B	Rayong
pH at 25 degree C *	-	-	-	7.8	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	36.0	≤40	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2780	≤5000 (1)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	3.0	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-Norg (C), part NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2540 D	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.

Technical Management N.Banchongkit
Narumon Banchongkit
Supervisor
หทเบียนเลขที่ ว-323-ง-9445

Approved by D.Changchon
Dej Changchon
Senior Manager
หทเบียนเลขที่ ว-323-ก-9442

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

ADDRESS 616/10 Moo 5 T. Maenam Khu A. Pluakdaeng Rayong 21140 Thailand I PHONE +66 0 3304 8555 I FAX +66 0 3304 8556
ALS LABORATORY GROUP (THAILAND) CO., LTD. An ALS Limited Company

Life Sciences www.alsglobal.com

Analysis / Test Report

TESTING
No.0042

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2364718
Date Received : Jun 28, 2023
Date Reported : Jul 05, 2023
Report Number : 2671984-1

Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Tanasit Wongsachai ทะเบียนเลขที่ ว-323-จ-9460

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Narumon Banchongkit
Supervisor
ทะเบียนเลขที่ ว-323-จ-9445

Approved by

Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ก-9442

This above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000
P/O : 4500153370
Project Name : Environmental Monitoring
Project Location: Caprolactam Plant

Lot ID: 2364718
Date Received : Jun 28, 2023
Date Reported : Jul 05, 2023
Report Number : 2671984-2

Sample Number	2364718-1
Sampled Date	Jun 28, 2023 9:00 AM
Sample Description	Wastewater
Location	Effluent (S-32-104)
Date Analysis Commenced	Jun 28, 2023
Condition of Sample	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Flow rate	m3/hr	-	-	112	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	713	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500-SO4 (E)	Rayong

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.

Note : For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

Sampling By : Tanasit Wongsachai

Remark :
- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

The above results are valid only for the analyzed/tested sample(s) as indicated in the report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Approved by

Narumon Banchongkit
Supervisor

ภาคผนวก ข.26

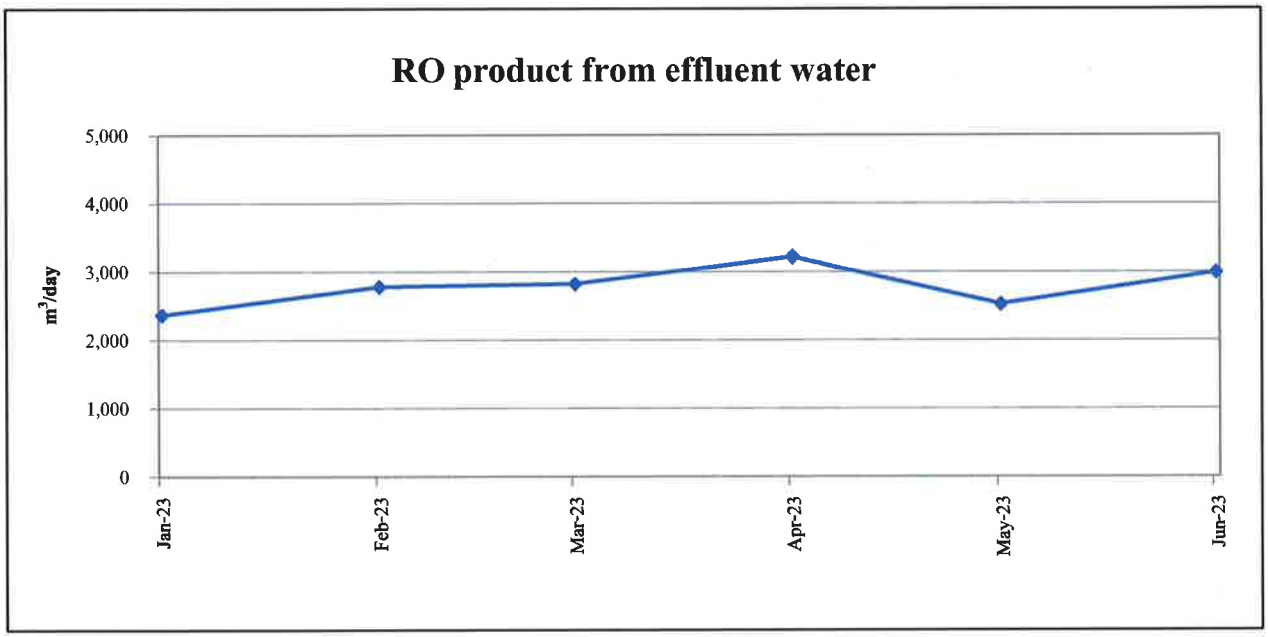
เอกสารการบันทึกปริมาณน้ำทิ้งที่ผ่านการบำบัดแล้วนำกลับมาใช้ประโยชน์ ระหว่างเดือนมกราคม ถึงมิถุนายน พ.ศ.2566

บันทึกปริมาณน้ำทิ้งที่ผ่านการบำบัดแล้วกลับมาใช้ประโยชน์

โครงการโรงงานผลิตคาโปรแลคตัมฯ บริษัท อูเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน)

ระหว่างเดือนมกราคม ถึงมิถุนายน พ.ศ.2566

รายการ	เดือน					
	มกราคม	กุมภาพันธ์	มีนาคม	เมษายน	พฤษภาคม	มิถุนายน
ปริมาณน้ำทิ้งที่ผ่านการบำบัดแล้วกลับมาใช้ประโยชน์ (ลูกบาศก์เมตร)	83,243	74,700	91,610	91,374	84,910	86,790



ภาคผนวก ข.27

เอกสารการตรวจสอบรางระบายน้ำ

รายละเอียดงาน	สถานที่ปฏิบัติงาน	ความถี่ของการปฏิบัติงาน
1.กวาดใบไม้,รดน้ำต้นไม้	UCHA,TSL,UTCA	ทุกวันจันทร์-ศุกร์
2.ตักตะกอนในรางระบายน้ำ	UCHA,TSL	ทุกวันจันทร์-ศุกร์
3.ตัดแต่งไม้พุ่ม ใส่ปุ๋ย พรวนดิน	UCHA,TSL,UTCA	ทุกวันเสาร์
4.กำจัดวัชพืชนอกเขตผลิต (ถอนทิ้ง)	UCHA,TSL,UTCA	ทุกวันเสาร์
5.กำจัดวัชพืชในเขตผลิ (ฉีดยาและนำต้นไปทิ้ง)	UCHA,TSL	เดือนละ 2 ครั้ง
6.ตัดหญ้า (สนามหญ้า)	UCHA,TSL,UTCA	เดือนละ 2 ครั้ง

งานตัดแต่งกิ่งต้นไม้ใหญ่

งานตัดหญ้าดูแลสวนหย่อม

งานตักใบไม้รางระบายน้ำ

ภาคผนวก ข.28

แผนการดำเนินงานด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน

UBE GROUP (THAILAND)

Environment Action Plan (Routine) of Year 2023

Item	Activities/Equipment List	2023									2024			Target	Responsible Persons	Relative Laws & Standard	Remark
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar				
1	**EIA Monitoring (as EIA mitigation) and Related**																
	1.1 Schedule and Coordinate with 3rd Party	x	x	x	x	x	x	x	x	x	x	x	x	Comply with EIA	Officer	EIA	CPL, TSL, Nylon
	- EIA Bidding <Yearly>										x	x		Comply with EIA	Officer	EIA	CPL, TSL, Nylon, UFA
	1.2 Environmental Monitoring																
	1.2.1 Water & Wastewater : Sampling Water at out-site plant																
	1. ตรวจวัดคุณภาพน้ำทะเล ปีละ 2 ครั้ง (2 จุด)						x						x	Comply with EIA	Officer	EIA	
	- ท่าเรือ IRPC และ ทะเลเปิด 1 แห่ง																CPL
	- ท่าเรือ IRPC และ ทะเลเปิด 2 แห่ง																TSL
	2. ตรวจวัดคุณภาพน้ำใต้ดิน ปีละ 2 ครั้ง (2 จุด)						x						x	Comply with EIA	Officer	EIA	CPL, TSL
	- บ่อน้ำตื้นที่บ้านหน้าพับ ร.7																
	- บ่อน้ำตื้นที่บ้านปลวกเกตุ																
	3. ตรวจวัดนิเวศวิทยาทางทะเลปีละ 2 ครั้ง (2 จุด)						x						x	Comply with EIA	Officer	EIA	CPL, TSL
	4. รวบรวมข้อมูลน้ำทิ้งจากจุดปล่อยออกจากโรงงาน CPL, NYL, TSL และ UFA	x	x	x	x	x	x	x	x	x	x	x	x	มีสรุปผลการวิเคราะห์ 1 ครั้ง/เดือน	Officer	EIA	CPL, TSL, Nylon
	5. รวบรวมข้อมูลน้ำทิ้งจากบ่อพักน้ำทิ้ง (PW Pond)	x	x	x	x	x	x	x	x	x	x	x	x	มีสรุปผลการวิเคราะห์ 1 ครั้ง/เดือน	Officer	IRPC (กรมเจ้าท่าฯ)	CPL, TSL, Nylon
	6. เก็บตัวอย่างดิน & น้ำใต้ดิน	x	x											ทุก 1 & 3 ปี	Officer	Legal/ EIA	UFA, TSL
	1.2.2 Air Pollution																
	1. VOCs : Ambient	x	x	x	x	x	x	x	x	x	x	x	x	On Schedule	Officer	กรมควบคุมมลพิษ	CPL, TSL
	- สวนสุขภาพ UBE (บ้านหน้าพันร.7)																
	- ทิศเหนือของ UCHA (หมู่ 4 ต.ตะพง)																
	- วัดปลวกเกตุ (บ้านปลวกเกตุ หมู่ 5 (ต. เชิงเนิน))																
	- ทิศเหนือของ WWT UCHA																
	- ทิศใต้ของ TSL Plant																
	2. จัดทำสรุป Monthly Report	x	x	x	x	x	x	x	x	x	x	x	x	Monthly Report	Officer		CPL, TSL
2	**Government Report**																
	2.1 EIA Monitoring Report																ครั้งที่ 1 : ภายใน 31ก.ค. และ ครั้งที่ 2 : ภายใน 31 ม.ค.
	- Follow up monitoring report			x						x				Comply with Law	Officer	EIA Requirement	
	- Prepare report and sent to government				x						x			Comply with Law	Officer	EIA Requirement	

UBE GROUP (THAILAND)

Environment Action Plan (Routine) of Year 2023

Item	Activities/Equipment List	2023									2024			Target	Responsible Persons	Relative Laws & Standard	Remark
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar				
	2.2 Ror Wor 1, 2, 3, 3/1																ครั้งที่ 1 : ภายใน 31ก.ค. และ ครั้งที่ 2 : ภายใน 31 ม.ค.
	- Prepare and follow up report			x						x				Comply with Law	Officer	DIWs	
	- Sent to government						x						x	Comply with Law	Officer	DIWs	ครั้งที่ 1 : ภายใน 31ก.ค. และ ครั้งที่ 2 : ภายใน 31 ม.ค.
	2.3 Waste Report																
	- DIWs (Yearly) : Sor Kor 3											x		Comply with Law	Officer	DIWs	ภายในวันที่ 1 มีนาคม
	2.4 Wastewater Report : Tor Sor 1,2	x	x	x	x	x	x	x	x	x	x	x	x	Comply with Law	Officer	กฎกระทรวงฯพ.ศ. 2555	ภายในวันที่ 15 ของทุกเดือน
	2.5 PRTR Report	x	x	x	x	x	x	x	x	x	x	x	x	Comply with Law	Officer	กฎกระทรวงฯพ.ศ. 2555	ภายในวันที่ 15 ของทุกเดือน
	2.6 Energy Report		x											Yearly	Officer	กฎกระทรวงฯพ.ศ. 2555	ภายในวันที่ 15 ของทุกเดือน
3	**Industrial Waste Management**																
	- Waste Summary for bidding new waste disposal										x			Comply with Law	Officer	ISO 14001	
	- Select and permission waste disposal : Sor Kor 2 <Yearly>												x	Comply with Law	Officer	DIWs	ใบอนุญาตหมดเดือน (CPL 29 ม.ย./Nylon/TSL มิ.ย.)
	- Expansion hazardous waste storage : Sor Kor 1	←											→	Comply with Law	Officer	DIWs	เมื่อมีการจัดเก็บเกิน 90 วัน
	- Co-ordinate with 3rd Party for Industrial waste Management	x	x	x	x	x	x	x	x	x	x	x	x	Comply with Law	Officer	Comply with Law MOI	
	- Follow up manifest and gps report	x	x	x	x	x	x	x	x	x	x	x	x	Comply with Law	Officer	Comply with Law MOI	ภายใน 15 วัน
	- Waste Summary	x	x	x	x	x	x	x	x	x	x	x	x	Summary 1 time/month	Officer		CPL, TSL, NYL, UFA
	- Audit Waste Processor	x	x	x	x	x	x	x	x	x	x	x	x	Audit Report	Officer/PDN/PR	EIA Requirement	อย่างน้อย 1 ครั้งปี
	- ติดตามการแก้ไข กรณีพบความผิดปกติ	x	x	x	x	x	x	x	x	x	x	x	x	สรุปผลการติดตามตรวจสอบ			CPL, TSL, NYL, UFA
4	**Environmental Legal**																
	- Update, Register, Communication and Evaluation Compliance	x	x	x	x	x	x	x	x	x	x	x	x	Comply with Law	Officer	All	
5	**Complain**																
	- Summary and Follow up	x	x	x	x	x	x	x	x	x	x	x	x	Monthly Report	Officer		
6	**Training Program <as legal and requirement>**																
	6.1 Training Plan													as legal and requirements	Officer		
	6.2 Inhouse : Orientation New Employee	←											→	พนักงานใหม่ทุกคน	Officer		
	6.3 Outside : Related Course	←											→	มีสรุปผลการฝึกอบรม	Officer		
7	**Environment Procedure**																
	7.1 ทบทวน/ปรับปรุง Procedure ที่เกี่ยวข้องกับด้านสิ่งแวดล้อม	←											→		Officer		
	7.2 ประเมินผล (Audit) การปฏิบัติตาม Procedure ที่ได้มีการ	x	x	x	x	x	x	x	x	x	x	x	x	สรุปผลการ Audit	Officer		

UBE GROUP (THAILAND)

Environment Action Plan (Routine) of Year 2023

Item	Activities/Equipment List	2023									2024			Target	Responsible Persons	Relative Laws & Standard	Remark
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar				
	ใช้งาน และเสนอมาตรการแก้ไข กรณีที่ไม่มีการปฏิบัติตาม																
8	**Environment Support**																
	8.1 CSR DIWs	←	—	—	—	—	—	—	—	—	—	—	→				
	8.2 Energy Conservation	←	—	—	—	—	—	—	—	—	—	—	→				
9	**Others**																
	9.1 Envi./ Energy Info.	←	—	—	—	—	—	—	—	—	—	—	→		Officer		
	9.2 Support CSR Activity	←	—	—	—	—	—	—	—	—	—	—	→	as requested	Officer		

ภาคผนวก ข.29

เอกสารรณรงค์ใช้น้ำอย่างประหยัด

UBE

Environmental

OSHE information

ฉบับที่ 7/2565

บริหารจัดการน้ำ อมตะซิตี้

ปัจจุบัน นิคมอุตสาหกรรมอมตะ

มีระบบบำบัดน้ำเสีย
และการรีไซเคิล
น้ำเสียกลับมา
ใช้ใหม่ภายในนิคม

5 สถานี

มีกำลังการผลิตน้ำเสียทั้งหมด 35,700 ลบ.ม. ต่อวัน
คิดเป็น 13 ล้านลบ.ม. ต่อปี

ประหยัดน้ำขึ้น 35-40%

การจัดการน้ำโดยใช้หลัก 3Rs

- Reduce ใช้น้อย
- Reuse ใช้ซ้ำ
- Recycle นำกลับมาใช้ใหม่

ใช้พลังงานแสงอาทิตย์ในกระบวนการผลิตน้ำประปาและบำบัดน้ำเสีย

สร้างศูนย์เรียนรู้การบริหารจัดการน้ำ เผยแพร่ความรู้ สร้างความเข้าใจในการบริหารจัดการน้ำ

ตามแนวคิดการจัดการแบบ "ALL WIN"

ลดการใช้น้ำ กำจัดน้ำเสีย

ลดการแย่งน้ำกับชุมชนในหน้าแล้ง

ช่วยอนุรักษ์แหล่งน้ำ

นิคมอุตสาหกรรมที่ดำเนินการโครงการนำน้ำเสียกลับมาใช้ใหม่

นิคมอุตสาหกรรมอมตะซิตี้ ชลบุรีและระยอง

- สวนอุตสาหกรรมสหพัฒน์ ศรีราชา
- นิคมอุตสาหกรรม WHA ตะวันออก
- นิคมอุตสาหกรรมแหลมฉบัง

ประเภทของอุตสาหกรรมที่มีศักยภาพในการนำน้ำเสียกลับมาใช้ใหม่

กลุ่มลังทอ	กลุ่มผลิตภัณฑ์ปิโตรเลียม	กลุ่มผลิตภัณฑ์อโลหะและยาง
ประหยัดขึ้น 15-49.5%	ประหยัดขึ้น 15-37%	ประหยัดขึ้น 18-55%
กลุ่มผลิตภัณฑ์เคมีภัณฑ์	**กลุ่มอาหารและเครื่องดื่ม**	**กลุ่มอิเล็กทรอนิกส์**
ประหยัดขึ้น 16-34%	ประหยัดขึ้น 15-37%	ประหยัดขึ้น 15%

ที่มา : นิคมอุตสาหกรรมอมตะซิตี้