

תשתיות אנרגיה בע"מ

מסוף אלרואי

סיכום פליטות לאוויר שנת 2022

פברואר 2023

פרויקט: 3013.19

סימוכין: 3013.19-036

תוכן עניינים

1.	מבוא	4
2.	נתוני מסוף	5
2.1.	נתוני מיכלים	5
2.2.	נתונים עבור מסוף מילוי מיכליות כביש	9
3.	חישוב פליטות	10
3.1.	כללי	10
3.2.	סוגי פליטות מחושבות	10
3.3.	בחירת חומרים בתוכנת TANKS	11
3.4.	נתונים מטאורולוגיים	11
4.	סיכום פליטות לשנת 2022	12
4.1.	מיכלים	12
4.2.	מסוף מילוי מיכליות כביש	12
4.3.	מיכל איסוף תשטיפים	12
4.4.	סיכום ממצאי ניטור LDAR	12
4.5.	פליטה שנתית מכלל המתקן	13
5.	פליטות לא שגרתיות במהלך שנת 2022	13
6.	מקורות	14

טבלאות

5.....	טבלה 1 : נתוני מיכלים – מידע כללי, מידות ונתוני תפעול – שנת 2022
6.....	טבלה 2 : נתוני מעטפת וגגות – שנת 2022
7.....	טבלה 3 : נתוני אביזרים – שנת 2022
8.....	טבלה 4 : צבעים מייצגים לצורך חישובי אקסל ותוכנת TANKS
9.....	טבלה 5 : נתונים עבור מסוף מילוי מיכליות כביש – שנת 2022
11.....	טבלה 6 : חומרים מייצגים בתוכנת TANKS
12.....	טבלה 7 : סיכום פליטות מכלים - שנת 2022
12.....	טבלה 8 : סיכום פליטות חומרים אורגנים נדיפים עבור רכיבים בשנת 2022
13.....	טבלה 9 : סיכום פליטות שנתי מכלל מסוף אלרואי – שנת 2022

נספחים

טבלה 1-5.2 (AP-42)	נספח א'
נתוני ניטור LDAR עבור מסוף אלרואי – סיכום שנת 2022	נספח ב'
דוגמת חישוב עבור מיכל גג חיצוני צף מס' 2 המאחסן קרוסין	נספח ג'
חישוב פליטות ממיכל לאיסוף תשטיפים	נספח ד'

0	להערות	26.02.2023	יואב פיסטינר	מירה ליה-זיו איסקוב
גרסה	תיאור	תאריך	שם מאשר	שם עורך

1. מבוא

חברת תשתיות נפט ואנרגיה בע"מ (להלן תש"א) מפעילה את מסוף אלרואי לאחסון ושינוע דלקים .

המסוף כולל:

- מבני משרדים
 - חוות מכלים לאחסון דלקים מסוגים שונים
 - רציפי מילוי מכליות כביש (לשימוש בעת חירום בלבד)
- המסוף ממוקם בשוליים הדרום מערביים של קריית טבעון, בצמוד לו וממערב ממוקמת שכונת אלרואי ומדרום לו שכונת קרית חרושת.
- באתר 9 מיכלים, מתוכם 7 מכלים תפעוליים ו-2 מכלים המשמשים כמכלים אסטרטגיים (מכלים מס' 1 ו-9).
- מערכת השינוע הינה באמצעות משאבות ובקרת מילוי ובנוסף קיימות מערכות תומכות כגון מערכות כיבוי אש ומערכות פיקוד ובקרה.
- כחלק מהתנאים ברישיון עסק מדצמבר 2010, בסוף כל שנה קלנדרית על תש"א להגיש דו"ח סיכום פליטות שנתי לגבי השנה שחלפה.
- חישובי הפליטות בוצעו בעזרת תוכנת Tanks ומסמכי EPA-AP 42 על פי נתוני המתקנים הקיימים במסוף.
- סיכום הפליטות הוכן על ידי חברת "פז" הנדסה וניהול (1980) בע"מ (להלן פז הנדסה), והוא מבוסס על סקר תהליכים ופליטות לאוויר ודו"חות ניטור LDAR שהוגשו לרשויות.

2. נתוני מסוף

2.1. נתוני מיכלים

בטבלאות הבאות מפורט מידע טכני של המיכלים בחוות המיכלים אלרואי.

טבלה 1: נתוני מיכלים – מידע כללי, מידות ונתוני תפעול – שנת 2022

מספר מיכל	סוג הדלק המאוחסן	לחץ אדים בטמפ' הנוזל הממוצעת (mmHg)	כמות צריכה שנתית (מ"ק)	סוג ניקוז בתחתית מיכל	קוטר מיכל (מטר)	נפח מיכל (מ"ק)	נפח מיכל פעיל (מ"ק)	גובה / אורך מעטפת מיכל (מטר)	גובה נוזל מירבי (מטר)	גובה נוזל ממוצע (מטר)
1 ⁽¹⁾	בנזין	405 @ 28°C	0	גבעה חלקית	48.77	32,056	28,768	17.16	15.4	10.5
2	קרוסין	0.833 @ 28°C	77,083	גבעה חלקית	48.77	32,056	28,768	17.16	15.4	10
3	סולר	0.507 @ 28°C	14,641	גבעה חלקית	48.77	32,056	28,768	17.16	15.4	9.5
4	סולר	0.507 @ 28°C	127,061	גבעה חלקית	48.77	32,056	28,768	17.16	15.4	10.3
5	סולר	0.507 @ 28°C	111,041	גבעה מלאה	68.27	56,959	51,614	15.56	14.1	14.1
6 ⁽¹⁾	סולר	0.507 @ 28°C	0	גבעה מלאה	68.27	56,959	51,614	15.56	14.1	14.1
7 ⁽¹⁾	סולר	0.507 @ 28°C	0	גבעה מלאה	68.27	56,959	51,614	15.56	14.1	11.4
8	קרוסין	0.833 @ 28°C	4,675	גבעה חלקית	48.8	36,547	34,228	19.54	18.3	18.3
9 ⁽¹⁾	קרוסין	0.833 @ 28°C	0	גבעה חלקית	48.77	32,056	28,768	17.16	15.4	9.7
סה"כ			334,501			367,704	332,913			

(1) מיכלים מס' 1, 6, 7 ו-9 משמשים כמכלי מלאי, לא היו תנועות במיכלים בשנת 2022.

טבלה 2: נתוני מעטפת וגגות – שנת 2022

מספר מיכל	סוג גג	אטם ראשי	אטם משני	צורת גג	סוג חיבורי גג	צבע גג	מצב צבע גג	צבע מעטפת חיצונית	מצב צבע מעטפת חיצונית	סוג חיבורי מעטפת	מצב מעטפת פנימית	מיכל מחומם
1	גג צף חיצוני	Mechanical Shoe	Rim mounted	Pontoon	מרותך	לבן	טוב	לבן	טוב	מרותך	חלוד הרבה	לא
2	גג צף חיצוני	Mechanical Shoe	Shoe mounted	Pontoon	מרותך	לבן	טוב	חום	טוב	מרותך	חלוד הרבה	לא
3	גג צף חיצוני	Mechanical Shoe	Shoe mounted	Pontoon	מרותך	לבן	טוב	לבן	טוב	מרותך	חלוד הרבה	לא
4	גג צף חיצוני	Mechanical Shoe	Shoe mounted	Pontoon	מרותך	לבן	טוב	חום	ישן	מרותך	חלוד הרבה	לא
5	גג צף חיצוני	Mechanical Shoe	Shoe mounted	Pontoon	מרותך	לבן	טוב	צהוב קרם	טוב	מרותך	חלוד הרבה	לא
6	גג צף חיצוני	Mechanical Shoe	Shoe mounted	Pontoon	מרותך	לבן	טוב	צהוב קרם	טוב	מרותך	חלוד הרבה	לא
7	גג צף חיצוני	Mechanical Shoe	Shoe mounted	Pontoon	מרותך	לבן	טוב	צהוב קרם	טוב	מרותך	חלוד הרבה	לא
8	גג צף חיצוני	Liquid mounted	Rim mounted	Pontoon	מרותך	לבן	טוב	כחול בהיר	טוב	מרותך	חלוד הרבה	לא
9	גג צף חיצוני	Mechanical Shoe	Rim mounted	Pontoon	מרותך	לבן	טוב	צהוב קרם	טוב	מרותך	חלוד הרבה	לא

טבלה 3: נתוני אביזרים – שנת 2022

מספר מיכל	שובר ואקום			רגליים מתכווננות התומכות בגג צף ⁽¹⁾			Rim Vent	כמות מדי מפלס	כמות בוצה בנקיון (מ"ק)	"גרביים" לבאר הדיגום המחורצת ולרגלי הגג הצף ⁽¹⁾
	כמות	Vacuum set. [psi]	Pressure set. [psi]	גובה (ft)	כמות באזור pontoon	כמות במרכז				
1	2	0	0.5	11	43	29	1	1	70	יש
2	2	0	0.5	11	43	29	1	1	70	יש
3	2	0	0.5	11	43	29	1	1	70	יש
4	2	0	0.5	11	43	29	1	1	70	יש
5	2	0	0.5	11	107	72	1	1	150	יש
6	2	0	0.5	11	107	72	1	1	150	יש
7	2	0	0.5	11	107	72	1	1	150	יש
8	6	0	0.5	9	54	36	1	1	70	יש
9	2	0	0.5	11	43	29	6	1	70	יש
סה"כ									870	

⁽¹⁾ הנ"ל לא נלקחו בחשבון בחישוב הפליטות מתוכנת ה-TANKS מפני שנדגמו במסגרת ניטורי ה-LDAR.

הנחות שנקחו לצורך החישובים

1. עבור חישוב Degassing במיכל עם גג צף – הונח:
 - גג צף נח על רגליים בגובה 9-11 ft (בהתאם לטבלה לעיל) וזהו גם הגובה המרבי של הנוזל במיכל.
 - גובה ממוצע של הנוזל במיכל הינו 50% מגובה הנוזל המרבי.
2. הונח כי ניקיון כללי וריקון של המיכלים מתבצע אחת ל-15 שנים. הניקיון יארך יום אחד.
3. הונח כי אירוע של נחיתת גגות צפים מתבצע אחת ל-15 שנים. זמן נחיתת הגג במקרה זה לא יעלה על 4 ימים.
4. יחס הנוזל בבוצה הונח כ- 0.8 [2]
5. בהתאם לטבלה 7.1-6 על פי [1], נבחרו הצבעים הבאים כמייצגים את צבע מעטפת המיכלים, לצורך חישובי פליטות לאוויר:

טבלה 4: צבעים מייצגים לצורך חישובי אקסל ותוכנת Tanks

צבע מעטפת מיכל	צבע לצורך חישובי אקסל בהתאם למסמך EPA AP-42	צבע לצורך חישובים בתוכנת (*) Tanks
כחול בהיר	Gray Medium	Gray Medium
חום	Brown	Aluminium/Diffuse
צהוב קרם	Beige/Cream	Aluminium/Specular
לבן	White	White

(*) בתוכנת Tanks מבחר הצבעים מצומצם יותר מאשר בטבלה 7.1-6 אשר במסמך EPA AP-42 [1].

2.2. נתונים עבור מסוף מילוי מיכליות כביש

טבלה 5: נתונים עבור מסוף מילוי מיכליות כביש – שנת 2022

מס' זרוע	מוצר	מילוי עילי / תחת	נפח מילוי שנתי (מ"ק)	נפח ממוצע של מיכלית (מ"ק)
1	קרוסין	עילי טבול	0	30
2	קרוסין	עילי טבול	0	30
3	קרוסין	עילי טבול	0	30
4	קרוסין	עילי טבול	0	30
5	קרוסין	עילי טבול	0	30
6	קרוסין	עילי טבול	0	30
7	קרוסין	עילי טבול	0	30
8	קרוסין	עילי טבול	0	30
	סה"כ		0	

לא התקיימה פעילות מיכליות כביש בשנת 2022.

3. חישוב פליטות

3.1. כללי

חישובי הפליטות עבור מיכלי האחסון בוצעו בתוכנת Tanks ובעזרת EPA-AP 42 [1].

הערכת פליטות כתוצאה מדליפות ציוד ואביזרים (LDAR) מצורפת בנספח ב'.

דוגמת חישוב עבור מיכל גג חיצוני צף (מיכל מס' 2) המאחסן קרוסין, מצורפת כנספח ג' למסמך זה.

בדוגמאות אלה ניתן לראות את נתוני הקלט (כולל הנחות) עליהם התבססו החישובים.

3.2. סוגי פליטות מחושבות

הערכת הפליטות ממיכלי אחסון כוללת [3]:

- פליטות בזמן אחסון (Breathing Losses)
- פליטות משינויי מפלס (Working Losses)
- פליטות כתוצאה מניקוי וריקון מיכלים (Degassing Losses)
- פליטות כתוצאה מנחיתת גוות צפים (Roof Landing Losses)
- פליטות כתוצאה מהפרשי לחץ (Flash Losses)
- פליטות בזמן מילוי מיכלים ומיכליות

בסקר הפליטות חושבו כל הפליטות המפורטות לעיל, למעט פליטות כתוצאה מהפרשי לחץ (Flash Losses).

פליטות אלה רלוונטיות לשינויי פתאומיים בלחץ הנוזל, נתון הגורם להפרת שיווי המשקל הקיים במיכל (בין גז לנוזל) וכתוצאה מכך נוצר תהליך הבזקה, בו מרכיבים קלים מפאזה הנוזל עוברים לפאזה הגזית. תופעות אלה מתרחשות, בדרך כלל, כאשר נוזל המאוחסן בלחץ נשלח לאחסון במיכל בעל לחץ נמוך יותר [3].

פליטות אלו הוזנחו כיוון שכל החומרים מוחזקים בתנאים אטמוספריים בכל אחד מהשלבים הנוגעים להובלתם ואחסונם, ולפיכך לא צפויה פליטת אדים כתוצאה מתהליך זה.

3.3. בחירת חומרים בתוכנת Tanks

על פי נתוני MSDS של הדלקים במסוף, נבחרו החומרים הבאים הקיימים בתוכנת Tanks כמייצגים של חומרים אלו:

טבלה 6: חומרים מייצגים בתוכנת Tanks

דלק קיים במסוף	חומר מייצג בתוכנת Tanks
סולר (תחבורה והסקה)	Distillate fuel oil no 2
נפט (קרוסין)	Jet kerosene
בנזין	Gasoline RVP 10

3.4. נתונים מטאורולוגיים

לצורך חישוב הנתונים בתוכנת Tanks הוגדרו נתונים מטאורולוגיים המתאימים למפרץ חיפה על פי מקורות [4].

4. סיכום פליטות לשנת 2022

4.1. מיכלים

סיכום חישובי פליטה עבור כל אחד ממכלי האחסון מפורט בטבלה להלן:

טבלה 7: סיכום פליטות מכלים - שנת 2022

מיכל	חומר	פליטות לאוויר (ק"ג/שנה)
1	בנזין	3,603
2	קרוסין	836
3	סולר	23
4	סולר	911
5	סולר	1,764
6	סולר	1,693
7	סולר	1,693
8	קרוסין	760
9	קרוסין	758
	סה"כ	12,041

4.2. מסוף מילוי מיכליות כביש

לא התקיימה פעילות מיכליות כביש בשנת 2022, ועל כן אין פליטות ממסוף מילוי מיכליות כביש.

4.3. מיכל איסוף תשטיפים

סך הפליטה ממכל לאיסוף תשטיפים הינה כ- 1 ק"ג/שנה.

חישוב מצורף בנספח ד'.

יצוין כי החישוב מתבסס על הנחה מחמירה שהמכל מכיל קרוסין בלבד. מעשית, המיכל מכיל בעיקר ניקוז מים מהמכלים.

4.4. סיכום ממצאי ניטור LDAR

טבלה 8: סיכום פליטות חומרים אורגניים נדיפים עבור רכיבים בשנת 2022

סה"כ פליטות (ק"ג/שנה)	
פליטה שנתית (ק"ג/שנה)	סיכום פליטות LDAR
6	סה"כ

4.5. פליטה שנתית מכלל המתקן

טבלה 9: סיכום פליטות שנתי מכלל מסוף אלוואי – שנת 2022

סה"כ פליטות (ק"ג/שנה)				
סה"כ	סיכום פליטות רכיבים (LDAR)	מיכל לאיסוף תשטיפים	מסוף מילוי מיכליות כביש	חוות מיכלים
12,048	6	1	0	12,041

5. פליטות לא שגרתיות במהלך שנת 2022

במהלך שנת 2022 לא התרחשו פליטות לא שגרתיות כתוצאה מפעילות הטרימינל.

6. מקורות

[1] EPA-AP42

[2] USER'S GUIDE to TANKS - Storage Tank Emissions Calculation Software Version
4.0 - APPENDIX D

[3] הנחיות להגשת בקשה להיתר פליטה ושינוי הפעלה משמעותי הנחיות הממונה לטיפול בבקשה
להיתר פליטה לפי סעיף 9(א) לתקנות אוויר נקי (היתרי פליטה), התשי"ע – 2010, מהדורה 5,
נובמבר 2020

[4] האטלס האקלימי לתכנון פיסי וסביבתי בישראל, מהדורה שנייה, 1994

נספח א'

טבלה 5.2-1

AP-42

Table 5.2-1. SATURATION (S) FACTORS FOR CALCULATING PETROLEUM LIQUID LOADING LOSSES

Cargo Carrier	Mode Of Operation	S Factor
Tank trucks and rail tank cars	Submerged loading of a clean cargo tank	0.50
	Submerged loading: dedicated normal service	0.60
	Submerged loading: dedicated vapor balance service	1.00
	Splash loading of a clean cargo tank	1.45
	Splash loading: dedicated normal service	1.45
	Splash loading: dedicated vapor balance service	1.00
Marine vessels ^a	Submerged loading: ships	0.2
	Submerged loading: barges	0.5

^a For products other than gasoline and crude oil. For marine loading of gasoline, use factors from Table 5.2-2. For marine loading of crude oil, use Equations 2 and 3 and Table 5.2-3.

נספח ב'

נתוני ניטור LDAR עבור אלרואי – סיכום שנת 2022

(מתוך דיווח שהתקבל ממעבדות אקולוגיה מתאריך 12.01.2023)

3013.19-003A

**LDAR
Fugitive Emission Monitoring
Report No.
RL-EI-R1-6-22**

Plant: *Energy Infrastructures LTD*

City: *Haifa*

District: *Haifa*

Production Unit: *Alroy*

Reporting period: *Annual Summary*

Report printing date: *12-Jan-2023*

Report editor: *Michael Ourievsky*

Approved by: *Alexey Ratner*

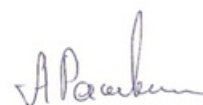


Table of Content

1. Executive Summary	4
2. Project introduction	5
2.1 Scope of work	5
2.2 Project phases	5
3. Monitoring Results	6
Table 3.1 – Overview by component class	6
Table 3.2 – Overview by reading range	6
Table 3.3 – Overview per Unit	7
Table 3.4 – Monitoring results, last known situation	7
Graph 3.5 – Total overview by chemicals	9
4. Detailed monitoring summary	9
Table 4.1 - Cumulative summary, Fugitive emission component classification and emission estimation for production facilities	10
Table 4.2 – Chemical Summary by Component Class	11
Table 4.3 - LDAR report for production facilities	13
Table 4.4 - Components with more than 5 significant leaks detected during last 12 months	14
Graph 4.5 - Comparison between count of components & kg/year, by components	15
5. Attachments	17
5.1 General Remarks	17
Table 5.1.1 Monitored components	17
Table 5.1.2 Unmonitored P&IDs	17
Table 5.2 Project schedule	17
5.3 Methodology	18
5.4 Calibration Log list	19
5.5 Calibration gas certificates	20
5.6 Stream Composition Summary	22
5.6 Quarterly Validation of LDAR Devices, Quarter 1	23
5.7 Quarterly Validation of LDAR Devices, Quarter 2	24
5.8 Quarterly Validation of LDAR Devices, Quarter 3	25
5.9 Quarterly Validation of LDAR Devices, Quarter 4	26
5.10 Cumulative production hours template	27

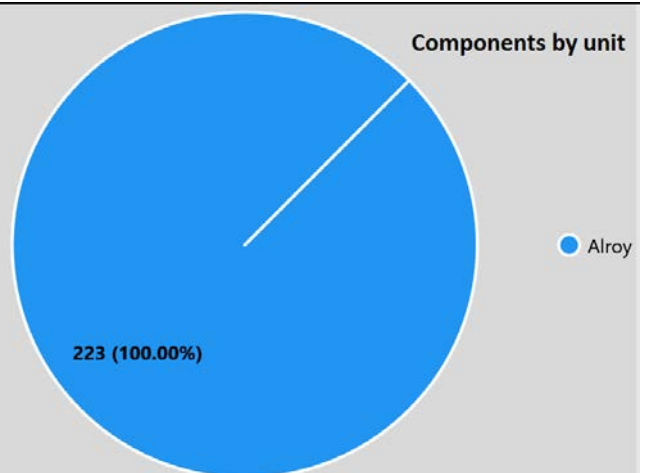
1. Executive Summary

- The total number of active components at Energy Infrastructures LTD is 223.
- Six rounds of measurements have been performed in the Quarter 1-4 of 2022.
- The total calculated emission from 01/01/2022 to 31/12/2022 is 6.08 kg.
- The number of components above leak definition found from the beginning of the year – 0
- The number of pegged readings (above 100,000 ppm) found from the beginning of the year - 0
- The last known situation of Energy Infrastructures LTD indicates there are no leaks

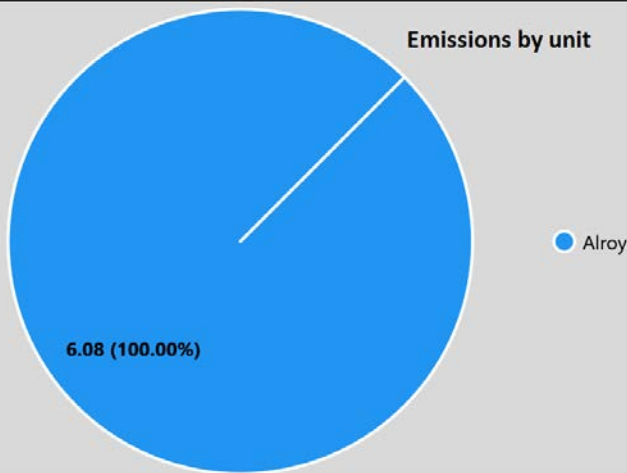
Total active components

223

Components by unit



Emissions by unit



Leaks by unit

2 Project introduction

2.1 Scope of work

Following measurements have been performed in 2022:

Round	Unit	Monitored group		
		G1	G2	G3
Round 1, Quarter 1	Alroy	✓		
Round 2, Quarter 1	Alroy	✓		
Round 3, Quarter 2	Alroy	✓	✓	✓
Round 4, Quarter 3	Alroy	✓		
Round 5, Quarter 4	Alroy	✓	✓	
Round 6, Quarter 4	Alroy	✓		

2.2 Project phases

- Monitoring
- Re-measurement after repair
- Revision of equipment and production processes
- Inventory: adding or deleting components

General

1. LDAR tests were performed under ISO-17025 accreditation of ISRAC (Israel Laboratory Accreditation Authority).
2. ISRAC is not responsible for the test results.
3. The following data is provided by the customer: production hours, P&IDs, and stream information.

3. Monitoring results

The table "Overview by component class" below shows the number of active components, number of leaks above leak definitions and number of components that are still leaking in each class (according to the monitoring round), and total calculated emissions in the specified period.

Table 3.1 Overview by component class, 01/01/2022-31/12/2022

Component Class	Total Components count	Total Components above leak definition count						% of components above leak definition %							Unrepaired Components count						Total Emissions kg 01/01/2022-31/12/2022
		Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Average	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	
PRD	4	0	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0	0	0	0	0.14
Sampling Point	4	0	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0	0	0	0	0.14
Total Group 1:	8	0	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0	0	0	0	0.28
Stem Valve	20			0		0				0.0%		0.0%		0.0%			0		0		1.367
Open End	102			0		0				0.0%		0.0%		0.0%			0		0		1.787
Total Group 2:	122			0		0				0.0%		0.0%		0.0%			0		0		3.154
Flange	55			0						0.0%				0.0%			0				0.149
Connection	38			0						0.0%				0.0%			0				2.497
Total Group 3:	93			0						0.0%				0.0%			0				2.646
Total:	223	0	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0	0	0	0	6.08

In table "Overview by reading range" all the components divided by their reading range at first measurement according to the monitoring round.

Table 3.2 Overview by reading range

Reading Range	Total Components											
	Round 1		Round 2		Round 3		Round 4		Round 5		Round 6	
	#	%	#	%	#	%	#	%	#	%	#	%
0 ppm	8	100.0%	8	100.0%	223	100.0%	8	100.0%	130	100.0%	8	100.0%
1-499 ppm	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
500-749 ppm	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
750-999 ppm	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
1,000-100,000 ppm	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Above 100,000 ppm	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total above leak definition	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Difficult to Monitor	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total:	8	100.0%	8	100.0%	223	100.0%	8	100.0%	130	100.0%	8	100.0%

Table 3.3 Overview per Unit, Group 1-3

Unit	Total components count	Components above leak definition						Total emission kg 01/01/2022-31/12/2022
		R1	R2	R3	R4	R5	R6	
Alloy	223	0	0	0	0	0	0	6.08
Total:	223	0	0	0	0	0	0	6.08

Table 3.4 – Monitoring results, Group 1-3, last known situation.

The last known situation of Energy Infrastructures LTD indicates there are no leaks.

0 "difficult to monitor" sources.

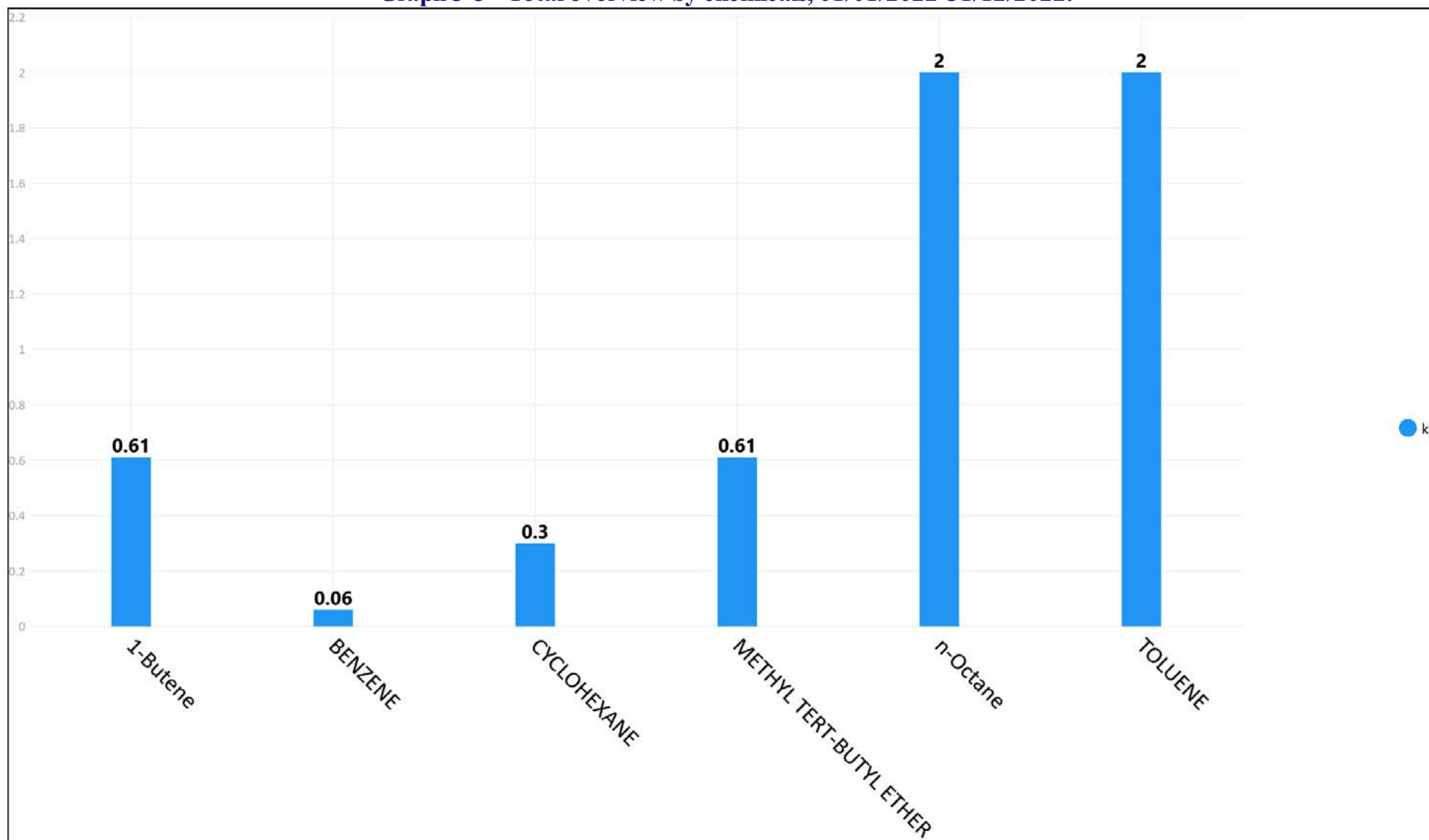
223 default-zero sources (0ppm).

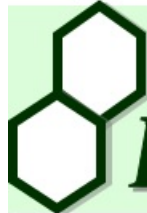
0 registered sources (1-999ppm).

0 components above leak definition

Component Class	Total components count	Components 1-499ppm count	Components 500-749ppm count	Components 750-999ppm count	Components above leak definition (1,000 ppm) count	% of components 1-999ppm %	% of components above leak definition %
PRD	4	0	0	0	0	0.00%	0.00%
Sampling Point	4	0	0	0	0	0.00%	0.00%
Stem Valve	20	0	0	0	0	0.00%	0.00%
Open End	102	0	0	0	0	0.00%	0.00%
Flange	55	0	0	0	0	0.00%	0.00%
Connection	38	0	0	0	0	0.00%	0.00%
Total:	223	0	0	0	0	0.00%	0.00%

Graph 3-5 - Total overview by chemicals, 01/01/2022-31/12/2022.





4. Detailed monitoring summary

01/01/2022-31/12/2022

10/27

Table 4.2 Chemical Summary by Component Class

Calculation Period: 01/01/2022- 31/12/2022

Report Chemical Summary Cumulative

Equation Set: Refinery

Units of Measurement: KG

Report Date: 12.01.2023

Alroy			
Unit	Chemical Name (Stream Name if Not Speciated)	CAS Number	Emissions
<u>Component Class:</u> PRD	1-Butene	106-98-9	0.014
	BENZENE	71-43-2	0.0014
	CYCLOHEXANE	110-82-7	0.007
	METHYL TERT-BUTYL ETHER	1634-04-4	0.014
	n-Octane	111-65-9	0.0561
	TOLUENE	108-88-3	0.0477
			0.1402
<u>Component Class:</u> Sampling Point	1-Butene	106-98-9	0.014
	BENZENE	71-43-2	0.0014
	CYCLOHEXANE	110-82-7	0.007
	METHYL TERT-BUTYL ETHER	1634-04-4	0.014
	n-Octane	111-65-9	0.0561
	TOLUENE	108-88-3	0.0477
			0.1402
<u>Component Class:</u> Stem Valve	1-Butene	106-98-9	0.1367
	BENZENE	71-43-2	0.0137
	CYCLOHEXANE	110-82-7	0.0683
	METHYL TERT-BUTYL ETHER	1634-04-4	0.1367
	n-Octane	111-65-9	0.5466
	TOLUENE	108-88-3	0.4646
			1.3666
<u>Component Class:</u> Open End	1-Butene	106-98-9	0.1787
	BENZENE	71-43-2	0.0179
	CYCLOHEXANE	110-82-7	0.0894
	METHYL TERT-BUTYL ETHER	1634-04-4	0.1787
	n-Octane	111-65-9	0.7148
	TOLUENE	108-88-3	0.6076
			1.7871

Table 4.2 Chemical Summary by Component Class

Calculation Period: 01/01/2022- 31/12/2022

Report Chemical Summary Cumulative

Equation Set: Refinery

Units of Measurement: KG

Report Date: 12.01.2023

Alroy			
Unit	Chemical Name (Stream Name if Not Speciated)	CAS Number	Emissions
<u>Component Class:</u> Flange	1-Butene	106-98-9	0.0149
	BENZENE	71-43-2	0.0015
	CYCLOHEXANE	110-82-7	0.0075
	METHYL TERT-BUTYL ETHER	1634-04-4	0.0149
	n-Octane	111-65-9	0.0597
	TOLUENE	108-88-3	0.0508
			0.1493
<u>Component Class:</u> Connection	1-Butene	106-98-9	0.2497
	BENZENE	71-43-2	0.025
	CYCLOHEXANE	110-82-7	0.1248
	METHYL TERT-BUTYL ETHER	1634-04-4	0.2497
	n-Octane	111-65-9	0.9986
	TOLUENE	108-88-3	0.8488
			2.4966
<u>Component Class:</u> All	1-Butene	106-98-9	0.608
	BENZENE	71-43-2	0.0609
	CYCLOHEXANE	110-82-7	0.304
	METHYL TERT-BUTYL ETHER	1634-04-4	0.608
	n-Octane	111-65-9	2.4319
	TOLUENE	108-88-3	2.0672
			6.08
<u>Grand Total</u>			6.08

Table 4.3-LDAR report for production facilities

Plant								Unit											
Energy Infrastructures LTD								Alroy											
Round	Unit	Drawing	Chemical State	Component Tag	Component Type	Component Class	Location Description	ppm value, First Measurement	More than 3 drops per minute	Date of First Measurement	Repair Due	Date of repair	Repair type	date of remeasurement after repair attempt	ppm value of remeasurement after repair attempt	Date of repair	Repair type	date of remeasurement after repair attempt	ppm value of remeasurement after repair attempt

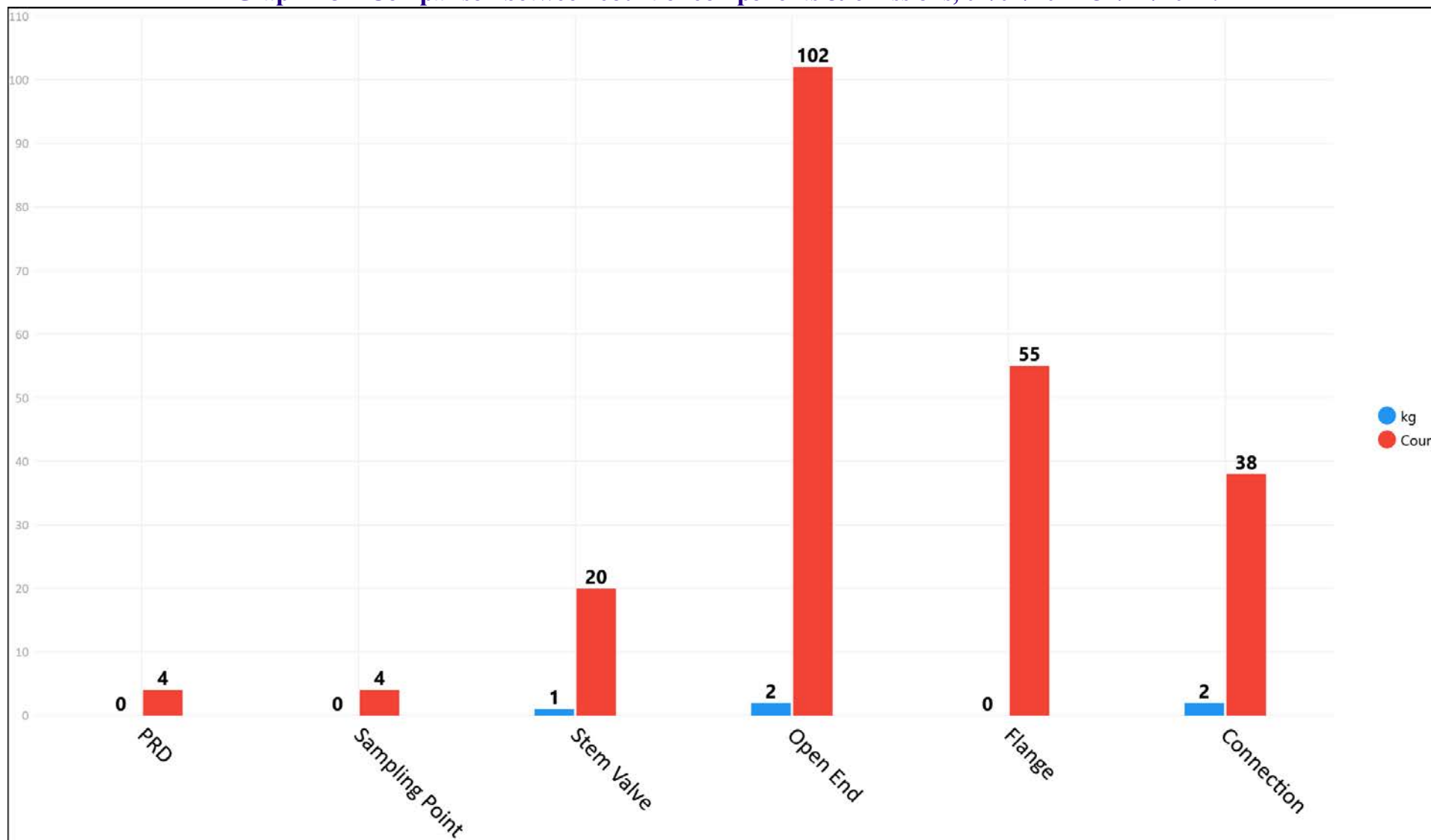
Table 4.4-Components with more than 5 significant leaks detected in the last 12 months

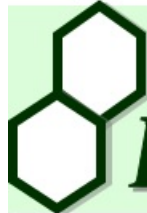
In the table below we provided a list of components with more than 5 Leaks during the last 12 months as follows: $\geq 10,000$ ppm, or more than 3 drops per minute or $\geq 1,000$ ppm for PRDs

Plant	Unit	Monitoring Round
Energy Infrastructures LTD	Alroy	Round 1-2-3-4-5-6

Unit	Drawing	Chemical State	Component Tag	Component Type	Component Class	Location Description	ppm value, First Measurement	More than 3 drops per minute	Date of First Measurement	Repair Due	Date of repair	Repair type	date of remeasurement after repair attempt	ppm value of remeasurement after repair attempt	Date of repair	Repair type	date of remeasurement after repair attempt	ppm value of remeasurement after repair attempt

Graph 4-5 – Comparison between count of components & emissions, 01/01/2022-31/12/2022.





**Ecological
Laboratories**

A.P. Ltd.

Environmental Services and Solutions

POB 13337, HaPrat Str. 2, Yavne, 8122702, Israel.

Tel.: +972-8-9322115, Fax: +972-8-9322116,

Mobile: +972-52-7361309, E-mail: michael@labs-eco.com

[Attachments](#)

5.1 General remarks

Table 5-1-1 - Monitored components

Unit	Round 1		Round 2		Round 3		Round 4		Round 5		Round 6	
	In scope	Measured	In scope	Measured	In scope	Measured	In scope	Measured	In scope	Measured	In scope	Measured
Alroy	8	8	8	8	223	223	8	8	130	130	8	8
Total	8	8	8	8	223	223	8	8	130	130	8	8

5.2 Project schedule (excluding measurements after repair)

Unit	Round 1		Round 2		Round 3		Round 4		Round 5		Round 6	
	Start date	End date	Start date	End date	Start date	End date	Start date	End date	Start date	End date	Start date	End date
Alroy	03/02/2022	03/02/2022	06/03/2022	06/03/2022	05/07/2022	05/07/2022	30/08/2022	30/08/2022	18/10/2022	18/10/2022	20/12/2022	20/12/2022

5.3 Methodology

Definitions

Chemical State:

Gas/Vapor: stream which is in process conditions under gaseous or vapor form.

Light Liquid: a liquid having a VOC content greater than 10% (by volume) that evaporates at 150°C

Heavy Liquid: a liquid having a VOC content of 10% or less (by volume) that evaporates at 150°C

Leak definition: 1,000 ppm (all sources)

Difficult to monitor components:

Any component positioned at a level higher than five meters above ground level or any component situated at a distance further than two meters from a platform and which cannot be accessed by employees in a safe way.

Any component which access requires the elevation of a person to a level higher than two meters above regular surfaces, and which cannot be accessed safely.

Registered components:

Components with a leak value greater than 0 ppm.

Default-zero:

This equation is valid for sources with a leak value of 0 ppm.

A fixed EPA emission calculation rule is used for all these components.

Total components:

All of the existing active components.

Total measured components:

All of the components, measured in specific monitoring round.

Methodology

Formulas:

Measured ppm values are converted to emission loss (kg/year) and these calculations are based on the E.P.A. "Correlation method"

Modified Trapezoidal Emission Calculation Method:

The modified trapezoid method assumes that the mass leak rate changes linearly between any two monitoring points, except for periods between leak leak detection and repair; the leak monitor reading is used from the time the leak is detected to the time it is repaired (i.e., re-screened).

Cumulative data:

In "Cumulative data" tables we provide the results of all of the measurements that performed from the beginning of the year till the end of current monitoring period (quarter). We also calculate the real sum of previous emissions based on the all rounds of the measurements (before and after repairing attempts).

(US EPA "Emission Estimation Protocol for Petroleum Refineries")

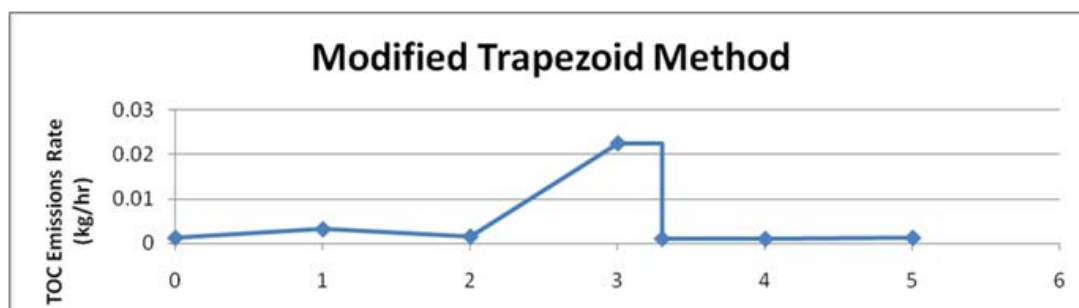


Table 5.4 - Calibration log list

Plant	Round	Equipment Type	Analyzer Type	Ultra-Zero	Span Gas	Span gas Cylinder No	Span concentration ppm	Check gas	Check gas Cylinder No	Check gas concentration (A) ppm	Date	Equipment No	Equipment Serial No	Check			Calibration error (CP)	Result
														1-st check (A1) ppm	2-st check (A2) ppm	3-st check (A3) ppm		
Energy Infrastructures LTD	1	TVA2020	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	03-Feb-2022	5	202016061436	509	507	504	1.33%	OK
Energy Infrastructures LTD	2	TVA2020	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	14-Feb-2022	5	202016061436	512	510	510	2.13%	OK
Energy Infrastructures LTD	2	TVA10008	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	14-Feb-2022	9	33461300	495	493	499	-0.87%	OK
Energy Infrastructures LTD	2	TVA2020	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	06-Mar-2022	5	202016061436	501	506	499	0.40%	OK
Energy Infrastructures LTD	2	TVA2020	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	07-Mar-2022	5	202016061436	490	492	488	-2.00%	OK
Energy Infrastructures LTD	3	TVA2020	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	12-May-2022	5	202016061436	499	507	503	0.60%	OK
Energy Infrastructures LTD	3	TVA10008	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	12-May-2022	9	33461300	497	495	490	-1.20%	OK
Energy Infrastructures LTD	3	TVA2020	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	19-May-2022	5	202016061436	490	491	488	-2.07%	OK
Energy Infrastructures LTD	3	TVA2020	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	06-Jun-2022	5	202016061436	492	490	488	-2.00%	OK
Energy Infrastructures LTD	3	TVA2020	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	13-Jun-2022	5	202016061436	507	503	499	0.60%	OK
Energy Infrastructures LTD	3	TVA10008	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	13-Jun-2022	9	33461300	502	507	510	1.27%	OK
Energy Infrastructures LTD	3	TVA2020	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	14-Jun-2022	5	202016061436	495	493	499	-0.87%	OK
Energy Infrastructures LTD	3	TVA10008	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	14-Jun-2022	9	33461300	490	488	487	-2.33%	OK
Energy Infrastructures LTD	4	TVA2020	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	05-Jul-2022	5	202016061436	508	499	502	0.60%	OK
Energy Infrastructures LTD	4	TVA10008	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	05-Jul-2022	8	05355151349	499	485	483	-2.20%	OK
Energy Infrastructures LTD	4	TVA10008	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	30-Aug-2022	9	33461300	493	490	495	-1.47%	OK
Energy Infrastructures LTD	4	TVA2020	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	30-Aug-2022	5	202016061436	497	500	499	-0.27%	OK
Energy Infrastructures LTD	4	TVA10008	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	15-Sep-2022	9	33461300	501	503	501	0.33%	OK
Energy Infrastructures LTD	5	TVA2020	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	13-Oct-2022	5	202016061436	501	494	490	-1.00%	OK
Energy Infrastructures LTD	5	TVA10008	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	13-Oct-2022	9	33461300	499	505	502	0.40%	OK
Energy Infrastructures LTD	5	TVA2020	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	18-Oct-2022	5	202016061436	504	506	501	0.73%	OK
Energy Infrastructures LTD	5	TVA10008	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	18-Oct-2022	9	33461300	498	496	499	-0.47%	OK
Energy Infrastructures LTD	5	TVA2020	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	07-Nov-2022	5	202016061436	514	515	515	2.93%	OK
Energy Infrastructures LTD	6	TVA2020	FID	Air, THC < 0.5ppm	Methane	12663	1,000	Methane	93531	500	20-Dec-2022	5	202016061436	502	506	504	0.80%	OK



CERTIFICATE OF ANALYSIS

Customer Name: Emproco Ltd.
Stock or Analyzer Tag Number: J19711000PA
Customer Reference: PO210239
MESA Reference: 130369
Date of Certification: October 22, 2021
Recommended Shelf Life: 3 Years

Cylinder Number: (2) 103L Cylinders
Product Class: Certified Standard
Cylinder Contents (1): 103 Liters @ 1000 PSI
Cylinder CGA: 103L/C-10
Analysis Method: GC-TCD
Preparation Method: Transfill

Component	Requested Concentration (2)	Reported Concentration (2,3)
Methane	1000 ppm	1000 ppm
Air	Balance	Balance

Lot#: 1-266-3



Authorized Signature: 

(1) The fill pressure shown on the COA is as originally quoted. The fill pressure measured by the customer may differ from the fill pressure originally quoted due to temperature effects, compressibility of the individual components when blended together in the cylinder, gauge accuracy or reduction in content volume before shipping as a result of samples withdrawn for laboratory QC necessary to ensure product quality.

(2) Unless otherwise stated, concentrations are given in molar units.

(3) Vapor pressure mixes are blended at a sufficiently low pressure so as to eliminate phase separation under most low temperature conditions encountered during transport or storage. However, it is generally recommended that cylinders containing vapor pressure restricted mixes be placed on the floor in a horizontal position and rolled back and forth to improve homogeneity of the gas phase mixture before being put into service.

Analytical Gas Standards are prepared and analyzed using combinations of NIST traceable weights, SRM's provided by NIST, or internal gas standards that have been verified for accuracy using procedures published by the US-EPA. Pure gases are analyzed and certified for purity using minor component Analytical Gas Standards prepared according to the methods specified above. Balances are calibrated to NIST test weights covered by NIST test number 822/278982-10. Reference Certification #'s: 1072/AB, 833/AD and 3280/J. Calibration methods are in conformance with MIL-STD 45662A.

MESA Specialty Gases & Equipment

division of MESA International Technologies, Inc.
2427 S. Anne St. • Santa Ana, California 92704 • USA
TEL: 714-434-7102 • FAX: 714-434-8006 • E-mail: mail@mesagas.com
On-line Catalog at www.mesagas.com



CERTIFICATE OF ANALYSIS

Customer Name: Emproco Ltd.
Stock or Analyzer Tag Number: J1971500PA
Customer Reference: PO210239
MESA Reference: 130369
Date of Certification: October 22, 2021
Recommended Shelf Life: 3 Years

Cylinder Number: (2) 103L Cylinders
Product Class: Certified Standard
Cylinder Contents (1): 103 Liters @ 1000 PSI
Cylinder CGA: 103L/C-10
Analysis Method: GC-TCD
Preparation Method: Transfill

Component	Requested Concentration (2)	Reported Concentration (2,3)
Methane	500 ppm	500 ppm
Air	Balance	Balance

Lot#: 9-353-1



Authorized Signature: 

(1) The fill pressure shown on the COA is as originally quoted. The fill pressure measured by the customer may differ from the fill pressure originally quoted due to temperature effects, compressibility of the individual components when blended together in the cylinder, gauge accuracy or reduction in content volume before shipping as a result of samples withdrawn for laboratory QC necessary to ensure product quality.

(2) Unless otherwise stated, concentrations are given in molar units.

(3) Vapor pressure mixes are blended at a sufficiently low pressure so as to eliminate phase separation under most low temperature conditions encountered during transport or storage. However, it is generally recommended that cylinders containing vapor pressure restricted mixes be placed on the floor in a horizontal position and rolled back and forth to improve homogeneity of the gas phase mixture before being put into service.

Analytical Gas Standards are prepared and analyzed using combinations of NIST traceable weights, SRM's provided by NIST, or internal gas standards that have been verified for accuracy using procedures published by the US-EPA. Pure gases are analyzed and certified for purity using minor component Analytical Gas Standards prepared according to the methods specified above. Balances are calibrated to NIST test weights covered by NIST test number 822/278982-10. Reference Certification #'s: 1072/AB, 833/AD and 3280/J. Calibration methods are in conformance with MIL-STD 45662A.

MESA Specialty Gases & Equipment

division of MESA International Technologies, Inc.
2427 S. Anne St. • Santa Ana, California 92704 • USA
TEL: 714-434-7102 • FAX: 714-434-8006 • E-mail: mail@mesagas.com
On-line Catalog at: www.mesagas.com

Table 5.6 - Stream Composition Summary

Stream Name	Stream Content	Stream Content Dates	TVA	MiniRAE 10.6	MiniRAE 11.7
Gasoline	1-Butene-10 %, BENZENE-1 %, CYCLOHEXANE-5 %, METHYL TERT-BUTYL ETHER-10 %, n-Octane-40 %, TOLUENE-34 %				
Petroleum	BENZENE-2 %, CYCLOHEXANE-35.2 %, n-Octane-55.3 %, TOLUENE-7.5 %				

Table 5.6 - Quarterly Validation of LDAR Devices

Date: 04-Jan-2022			Quarter:	1			Sampling Flow Rate Check		Accuracy Check								Response Time				
Equipment No	Equip.Ser. No	Equipment Type	Analyzer	Span Gas	Span gas Cylinder No	Span Gas Concentration	Sampling Flow Rate	Result	Check Gas	Check gas Cylinder No	Check Gas Concentration	1-st check	2nd check	3rd check	Calibration error	Result	90% of Span	Response Time 1	Response Time 2	Response Time 3	Result
						ppm	l/min				ppm						ppm	sec	sec	sec	
1	0715622657	TVA1000B	FID	Methane	ET0022865	995	0.91	OK	Methane	FF16599	501	510	506	513	1.53%	OK	895.5	4	4	4	OK
2	0115248185	TVA1000B	FID	Methane	ET0022865	995	1.02	OK	Methane	FF16599	501	505	499	501	-0.07%	OK	895.5	4	4	4	OK
3	0115248937	TVA1000B	FID	Methane	ET0022865	995	1.26	OK	Methane	FF16599	501	495	493	490	-1.86%	OK	895.5	4	3	4	OK
5	202016061436	TVA2020	FID	Methane	ET0022865	995	1.15	OK	Methane	FF16599	501	497	502	507	0%	OK	895.5	3	4	4	OK
6		MiniRAE2000	PID	Isobutylene	EA0010369	996	0.41	OK	Isobutylene	995-286088	500	490	488	493	-2.07%	OK	896.9	5	5	5	OK
7	110219070002	NEO	PID	Isobutylene	EA0010369	996	0.51	OK	Isobutylene	995-286088	500	511	509	510	1.86%	OK	896.9	5	5	5	OK
8	05355151349	TVA1000B	FID	Methane	ET0022865	995	0.99	OK	Methane	FF16599	501	509	501	507	0.73%	OK	895.5	4	4	4	OK
9	33461300	TVA1000B	FID	Methane	ET0022865	995	1.31	OK	Methane	FF16599	501	503	508	496	0.07%	OK	895.5	3	4	4	OK
1	0715622657	TVA1000B	FID	Methane	ET0022865	995	0.91	OK	Methane	FF16599	501	510	506	513	1.53%	OK	895.5	4	4	4	OK
2	0115248185	TVA1000B	FID	Methane	ET0022865	995	1.02	OK	Methane	FF16599	501	505	499	501	-0.07%	OK	895.5	4	4	4	OK
3	0115248937	TVA1000B	FID	Methane	ET0022865	995	1.26	OK	Methane	FF16599	501	495	493	490	-1.86%	OK	895.5	4	3	4	OK
5	202016061436	TVA2020	FID	Methane	ET0022865	995	1.15	OK	Methane	FF16599	501	497	502	507	0%	OK	895.5	3	4	4	OK
6		MiniRAE2000	PID	Isobutylene	EA0010369	996	0.41	OK	Isobutylene	995-286088	500	490	488	493	-2.07%	OK	896.9	5	5	5	OK
7	110219070002	NEO	PID	Isobutylene	EA0010369	996	0.51	OK	Isobutylene	995-286088	500	511	509	510	1.86%	OK	896.9	5	5	5	OK
8	05355151349	TVA1000B	FID	Methane	ET0022865	995	0.99	OK	Methane	FF16599	501	509	501	507	0.73%	OK	895.5	4	4	4	OK
9	33461300	TVA1000B	FID	Methane	ET0022865	995	1.31	OK	Methane	FF16599	501	503	508	496	0.07%	OK	895.5	3	4	4	OK

Table 5.7 - Quarterly Validation of LDAR Devices

Date: 01-Apr-2022			Quarter:	2			Sampling Flow Rate Check		Accuracy Check								Response Time				
Equipment No	Equip.Ser. No	Equipment Type	Analyzer	Span Gas	Span gas Cylinder No	Span Gas Concentration ppm	Sampling Flow Rate l/min	Result	Check Gas	Check gas Cylinder No	Check Gas Concentration ppm	1-st check	2nd check	3rd check	Calibration error	Result	90% of Span ppm	Response Time 1 sec	Response Time 2 sec	Response Time 3 sec	Result
1	0715622657	TVA1000B	FID	Methane	ET0022865	995	1.08	OK	Methane	FF16599	501	501	502	502	-0.07%	OK	895.5	4	4	4	OK
2	0115248185	TVA1000B	FID	Methane	ET0022865	995	1.1	OK	Methane	FF16599	501	510	514	513	2.06%	OK	895.5	4	4	4	OK
3	0115248937	TVA1000B	FID	Methane	ET0022865	995	1.21	OK	Methane	FF16599	501	490	491	488	-2.46%	OK	895.5	4	4	4	OK
5	202016061436	TVA2020	FID	Methane	ET0022865	995	1.09	OK	Methane	FF16599	501	492	492	493	-1.93%	OK	895.5	3	4	4	OK
6		MiniRAE2000	PID	Isobutylene	EA0010369	996	0.47	OK	Isobutylene	995-286088	500	488	488	493	-2.2%	OK	896.9	6	5	5	OK
7	110219070002	NEO	PID	Isobutylene	EA0010369	996	0.51	OK	Isobutylene	995-286088	500	515	513	512	2.52%	OK	896.9	5	5	6	OK
8	05355151349	TVA1000B	FID	Methane	ET0022865	995	0.96	OK	Methane	FF16599	501	501	501	502	-0.13%	OK	895.5	4	4	4	OK
9	33461300	TVA1000B	FID	Methane	ET0022865	995	1.28	OK	Methane	FF16599	501	510	510	508	1.46%	OK	895.5	4	4	4	OK

Table 5.8 - Quarterly Validation of LDAR Devices

Date: 01-Jul-2022			Quarter:	3			Sampling Flow Rate Check		Accuracy Check								Response Time				
Equipment No	Equip.Ser. No	Equipment Type	Analyzer	Span Gas	Span gas Cylinder No	Span Gas Concentration ppm	Sampling Flow Rate l/min	Result	Check Gas	Check gas Cylinder No	Check Gas Concentration ppm	1-st check	2nd check	3rd check	Calibration error	Result	90% of Span ppm	Response Time 1 sec	Response Time 2 sec	Response Time 3 sec	Result
1	0715622657	TVA1000B	FID	Methane	ET0022865	995	1.16	OK	Methane	FF16599	501	512	512	511	1.93%	OK	895.5	4	3	4	OK
2	0115248185	TVA1000B	FID	Methane	ET0022865	995	1.11	OK	Methane	FF16599	501	502	503	503	0.13%	OK	895.5	4	4	4	OK
3	0115248937	TVA1000B	FID	Methane	ET0022865	995	1.25	OK	Methane	FF16599	501	475	477	477	-5.11%	OK	895.5	4	4	4	OK
5	202016061436	TVA2020	FID	Methane	ET0022865	995	1.12	OK	Methane	FF16599	501	491	491	491	-2.19%	OK	895.5	4	4	4	OK
6		MiniRAE2000	PID	Isobutylene	EA0010369	996	0.49	OK	Isobutylene	995-286088	500	482	482	48	-32.63%	FAIL	896.9	5	5	5	OK
7	110219070002	NEO	PID	Isobutylene	EA0010369	996	0.52	OK	Isobutylene	995-286088	500	517	515	516	3.06%	OK	896.9	5	6	5	OK
8	05355151349	TVA1000B	FID	Methane	ET0022865	995	0.93	OK	Methane	FF16599	501	505	505	504	0.53%	OK	895.5	4	4	4	OK
9	33461300	TVA1000B	FID	Methane	ET0022865	995	1.21	OK	Methane	FF16599	501	515	516	516	2.72%	OK	895.5	4	4	4	OK

Table 5.9 - Quarterly Validation of LDAR Devices

Date: 30-Sep-2022			Quarter:	4			Sampling Flow Rate Check		Accuracy Check								Response Time				
Equipment No	Equip.Ser. No	Equipment Type	Analyzer	Span Gas	Span gas Cylinder No	Span Gas Concentration ppm	Sampling Flow Rate l/min	Result	Check Gas	Check gas Cylinder No	Check Gas Concentration ppm	1-st check	2nd check	3rd check	Calibration error	Result	90% of Span ppm	Response Time 1 sec	Response Time 2 sec	Response Time 3 sec	Result
1	0715622657	TVA1000B	FID	Methane	ET0022865	995	0.86	OK	Methane	FF16599	501	508	509	507	1.2%	OK	895.5	4	4	4	OK
2	0115248185	TVA1000B	FID	Methane	ET0022865	995	1.14	OK	Methane	FF16599	501	503	506	501	0.27%	OK	895.5	4	4	4	OK
5	202016061436	TVA2020	FID	Methane	ET0022865	995	1.26	OK	Methane	FF16599	501	499	501	502	-0.27%	OK	895.5	4	4	4	OK
6		MiniRAE2000	PID	Isobutylene	EA0010369	996	0.5	OK	Isobutylene	995-286088	500	506	506	507	1.13%	OK	896.9	6	6	6	OK
7	110219070002	NEO	PID	Isobutylene	EA0010369	996	0.92	OK	Isobutylene	995-286088	500	504	503	501	0.39%	OK	896.9	4	4	4	OK
8	05355151349	TVA1000B	FID	Methane	ET0022865	995	0.98	OK	Methane	FF16599	501	497	494	501	-0.93%	OK	895.5	4	4	4	OK
9	33461300	TVA1000B	FID	Methane	ET0022865	995	1.18	OK	Methane	FF16599	501	501	502	502	-0.07%	OK	895.5	4	4	4	OK
10	0115248463	TVA1000B	FID	Methane	ET0022865	995	1.39	OK	Methane	FF16599	501	501	499	502	-0.27%	OK	895.5	4	4	4	OK

Table 5.10 - PRODUCTION HOURS TEMPLATE

Plant	Energy Infrastructures LTD
-------	----------------------------

Unit	Drawing	Stream Name	Remark	Annual Production Hours	Q1	Q2	Q3	Q4
					01/01-31/03	01/04-30/06	01/07-30/09	01/10-31/12
					Quarter =	Quarter =	Quarter =	Quarter =
					Quarterly Production hours	Quarterly Production hours	Quarterly Production hours	Quarterly Production hours
Alroy	6006-100-006	Gasoline		8,760	2,160	2,184	2,208	2,208
Alroy	6006-100-007	Gasoline		8,760	2,160	2,184	2,208	2,208

נספח ג'

דוגמת חישוב עבור מיכל גג חיצוני צף מס' 2 המאחסן קרוסין

3013.19-034-T2

3013.19-025

T2 - kerosene

External Floating roof

1. Tank data

Diameter of the tank	D	m	Tank data	48.77	
		feet	---	160.01	
Effective height of the stock liquid (while roof landing episode)	h_{le}	m	Tank data		
		feet	---	11.00	
Shell Color and condition	α	color	חום	0.58	Table 7.1-6
		condition	טובה		Brown
Roof color and condition	α	color	לבן	0.17	Table 7.1-6
		condition	טוב		
Tank paint solar absorptance	α	dimensionless		0.38	Table 7.1-6
Vapor space outage (while roof landing episode)	H_{VO}	m	assumption - equal to legs height		Possible to use also equation 1-15
		feet		11.00	
Volume of the vapor space (while roof landing episode)	V_V	ft ³	$V_V = \pi(D^2/4) \cdot H_{VO}$	221,185	Equation 1-3
Breather vent pressure setting	ΔP_{BP}	psi	Typical value	0.50	Equation 1-11
Breather vent vacuum setting	ΔP_{BV}	psi	Typical value	0.00	Equation 1-11
Breather vent pressure setting range	ΔP_B	psi	$\Delta P_B = P_{BP} - P_{BV}$	0.50	Equation 1-11

2. Material data - קרוסין

Stock vapor molecular weight	M_V	gr/gr-mole lb/lb-mole	msds data	130	
Density of the liquid inside the tank	W_L	g/ml lb/gal	msds data	0.80	0
			---	6.68	
Vapor density	W_V	kg/m ³ lb/ft ³	msds data	4.5	
			---	0.28	
True vapor pressure of the stock liquid	P	mm Hg psia	PEI data	0.833	at 20°C
			---	0.02	
Vapor pressure at daily average liquid surface temperature	P_{VA}	psia	הנחה: $PV=nRT \rightarrow$ $P2=P1 \cdot (T2/T1)$ $T1(k)=20C+273$ $T2(k)=37.5C+273$	0.02	
Vapor pressure at the daily maximum liquid surface temperature, psia	P_{VX}	psia		0.02	
Vapor pressure at the daily minimum liquid surface temperature	P_{VN}	psia		0.02	
Daily vapor pressure range	ΔP_V	psia	$\Delta P_V = P_{VX} - P_{VN}$	0.00	Equation 1-9

3. Operation data

Number of days that the tank stands idle (on roof landing episode)	n_d	days/landing episode	site data	4	
Number of degassing and cleaning episode		landing episode/year	site data	0.07	
Number of roof landing episode		landing episode/year	site data	0.07	

4. Normal operation (Tanks program)

Working (withdrawal) losses		lb per year	Tanks Program	150	T2 - B&W 2022
		Kg per year	---	68	
Total emissions (Breathing & Working)		lb per year	Tanks Program	185	T2 - B&W 2022
		Kg per year	---	84	
Breathing (standing) losses		Kg per year		16	

5. Degassing and Cleaning (Tanks program)

Degassing: emission from one turnover of floating roof	$E_{\text{degass-floating}}$	lb per emptying	Tanks Program	59	T2 - DFloating 2019
		Kg per emptying	---	27	
Degassing: fixed roof with a height of roof legs	$E_{\text{degass-legs}}$	lb per emptying	Tanks Program	61	T2- DFixed 2019 (Only working losses)
		Kg per emptying	---	28	
Liquid fraction in sludge	F_{liquid}			0.8	Tanks FAQ - degassing and cleaning
Sludge volume	V_s	m3 per emptying		70	
Sludge weight	W_s	Kg per emptying		56,000	
Cleaning emissions	E_{cleaning}	lb per emptying	$E_{\text{cleaning}} = W_s * (1 - F_{\text{liquid}})$	24,692	
		Kg per emptying		11,200	
Total Degassing and Cleaning emissions	$E_{\text{degass-total}}$	lb per emptying	$E_{\text{degass-total}} = E_{\text{degass-floating}} + E_{\text{degass-legs}} + E_{\text{cleaning}}$	24,811	
		Kg per emptying		11,254	

6. Roof landing

Daily average liquid surface temperature	T_{LA}	°R	$T_{LA} = 0.44T_{AA} + 0.56T_B + 0.0079 * \alpha * I$	532.17	Equation 1-26
Daily vapor temperature range	ΔT_V	°R	$\Delta T_V = 0.72\Delta T_A + 0.028 * \alpha * I$	32.95	Equation 1-8
Daily maximum liquid surface temperature	T_{LX}	°R	$T_{LX} = T_{LA} + 0.25 * \Delta T_V$	540.41	Figure 7.1-17
Daily minimum liquid surface temperature	T_{LN}	°R	$T_{LN} = T_{LA} - 0.25 * \Delta T_V$	523.93	Figure 7.1-17
Liquid bulk temperature	T_B	°R	$T_B = T_{AA} + 6\alpha - 1$	527.22	Equation 1-28
Max standing idle losses during roof landing	L_{SL-max}	lb per landing episode	$L_{SL-max} = 5.9 * D^2 * h_{le} * W_I$	11,093,038	Equation 2-13
		Kg per landing episode	---	5,031,769	
Filling saturation factor	S	dimensionless	0.60 for a full liquid heel 0.50 for a partial 0.15 for drain-dry	0.50	Equation 2-26 (pages No 33,35)
saturation factor	K_S	dimensionless	$K_S = \frac{1}{1 + 0.053 * P_{VA} * H_{VO}}$	0.5	Equation 1-20 <i>KS is assumed to be less than or equal to the saturation factor during filling (S) .</i>
Vapor space expansion factor	K_E	dimensionless	$K_E = \frac{\Delta T_V}{T_{LA}} + \frac{\Delta P_V - \Delta P_B}{P_A - P_{VA}}$	0.028	Liquid stock has a true vapor pressure greater than 0.1psia - Equation 1-7.
Standing idle losses during roof landing	L_{SL}	lb per landing episode	$L_{SL} = n_d K_E \left(\frac{P V_V}{R T_{AA}} \right) M_V K_S$	5	Equation 2-16
Filling losses during roof landing	L_{FL}	lb per landing episode	$L_{FL} = \left(\frac{P * V_V}{R * T_{AA}} \right) M_V * S$	41	Equation 2-26
Total losses during roof landing	L_{TL}	lb per landing episode	$L_{TL} = L_{SL} + L_{FL}$	46	Equation 2-10
		Kg per landing episode		21	

7. Summary

Working (withdrawal) losses		Kg per year		68	
Breathing (standing) losses		Kg per year		16	
Total Degassing and Cleaning emissions		Kg per year		750	
Total losses during roof landing		Kg per year		1	
				836	Kg per year

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification:	T2 - B&W 2022
City:	Haifa-2
State:	Israel
Company:	PEI
Type of Tank:	External Floating Roof Tank
Description:	kerosene

Tank Dimensions

Diameter (ft):	160.01
Volume (gallons):	7,599,816.00
Turnovers:	2.68

Paint Characteristics

Internal Shell Condition:	Dense Rust
Shell Color/Shade:	Aluminum/Diffuse
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Shoe-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	3
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1

Meteorological Data used in Emissions Calculations: Haifa-2, Israel (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

T2 - B&W 2022 - External Floating Roof Tank
Haifa-2, Israel

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Jet kerosene	All	76.52	65.35	87.69	68.86	0.0136	N/A	N/A	130.0000			162.00	Option 1: VP70 = .011 VP80 = .015

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

T2 - B&W 2022 - External Floating Roof Tank
Haifa-2, Israel

Annual Emission Calculations

Rim Seal Losses (lb):	34.5005
Seal Factor A (lb-mole/ft-yr):	1.6000
Seal Factor B (lb-mole/ft-yr (mph) ⁿ):	0.3000
Average Wind Speed (mph):	6.2000
Seal-related Wind Speed Exponent:	1.6000
Value of Vapor Pressure Function:	0.0002
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0136
Tank Diameter (ft):	160.0100
Vapor Molecular Weight (lb/lb-mole):	130.0000
Product Factor:	1.0000
Withdrawal Losses (lb):	150.0107
Annual Net Throughput (gal/yr.):	20,363,275.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0075
Average Organic Liquid Density (lb/gal):	7.0000
Tank Diameter (ft):	160.0100
Roof Fitting Losses (lb):	0.8398
Value of Vapor Pressure Function:	0.0002
Vapor Molecular Weight (lb/lb-mole):	130.0000
Product Factor:	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	27.8819
Average Wind Speed (mph):	6.2000

Total Losses (lb): 185.3510

Roof Fitting/Status		Quantity	Roof Fitting Loss Factors		m	Losses(lb)
			KFa(lb-mole/yr)	KFb(lb-mole/(yr mph ⁿ))		
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed		3	1.60	0.00	0.00	0.1446
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.		2	6.20	1.20	0.94	0.6608
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.		1	0.71	0.10	1.00	0.0345

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

T2 - B&W 2022 - External Floating Roof Tank
Haifa-2, Israel

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Jet kerosene	34.50	150.01	0.84	0.00	185.35

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification:	T2 - DFixed 2019
City:	Haifa
State:	Israel
Company:	PEI
Type of Tank:	Vertical Fixed Roof Tank
Description:	kerosene

Tank Dimensions

Shell Height (ft):	11.00
Diameter (ft):	160.01
Liquid Height (ft) :	11.00
Avg. Liquid Height (ft):	5.50
Volume (gallons):	1,654,664.74
Turnovers:	1.00
Net Throughput(gal/yr):	1,654,664.74
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Aluminum/Diffuse
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	0.00
Slope (ft/ft) (Cone Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.50

Meteorological Data used in Emissions Calculations: Haifa, Israel (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

T2 - DFixed 2019 - Vertical Fixed Roof Tank
Haifa, Israel

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Jet kerosene	Apr	72.10	62.74	81.45	67.57	0.0118	0.0092	0.0159	130.0000			162.00	Option 1: VP70 = .011 VP80 = .015

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

T2 - DFixed 2019 - Vertical Fixed Roof Tank
Haifa, Israel

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):												
Vapor Space Volume (cu ft):												
Vapor Density (lb/cu ft):												
Vapor Space Expansion Factor:												
Vented Vapor Saturation Factor:												
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):												
Tank Diameter (ft):												
Vapor Space Outage (ft):												
Tank Shell Height (ft):												
Average Liquid Height (ft):												
Roof Outage (ft):												
Roof Outage (Cone Roof)												
Roof Outage (ft):												
Roof Height (ft):												
Roof Slope (ft/ft):												
Shell Radius (ft):												
Vapor Density												
Vapor Density (lb/cu ft):												
Vapor Molecular Weight (lb/lb-mole):												
Vapor Pressure at Daily Average Liquid												
Surface Temperature (psia):												
Daily Avg. Liquid Surface Temp. (deg. R):												
Daily Average Ambient Temp. (deg. F):												
Ideal Gas Constant R												
(psia cuft / (lb-mol-deg R)):												
Liquid Bulk Temperature (deg. R):												
Tank Paint Solar Absorptance (Shell):												
Tank Paint Solar Absorptance (Roof):												
Daily Total Solar Insulation												
Factor (Btu/sqft day):												
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:												
Daily Vapor Temperature Range (deg. R):												
Daily Vapor Pressure Range (psia):												
Breather Vent Press. Setting Range(psia):												
Vapor Pressure at Daily Average Liquid												
Surface Temperature (psia):												
Vapor Pressure at Daily Minimum Liquid												
Surface Temperature (psia):												
Vapor Pressure at Daily Maximum Liquid												
Surface Temperature (psia):												
Daily Avg. Liquid Surface Temp. (deg R):												
Daily Min. Liquid Surface Temp. (deg R):												
Daily Max. Liquid Surface Temp. (deg R):												
Daily Ambient Temp. Range (deg. R):												
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:												
Vapor Pressure at Daily Average Liquid:												
Surface Temperature (psia):												
Vapor Space Outage (ft):												
Working Losses (lb):												
Vapor Molecular Weight (lb/lb-mole):												
Vapor Pressure at Daily Average Liquid												
Surface Temperature (psia):												
Net Throughput (gal/mo.):												
Annual Turnovers:												
Turnover Factor:												
Maximum Liquid Volume (gal):												
Maximum Liquid Height (ft):												
Tank Diameter (ft):												
Working Loss Product Factor:												
Total Losses (lb):												

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

T2 - DFixed 2019 - Vertical Fixed Roof Tank
Haifa, Israel

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Jet kerosene	60.63	32.78	93.41

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification:	T2 - DFloating 2019
City:	Haifa
State:	Israel
Company:	PEI
Type of Tank:	External Floating Roof Tank
Description:	kerosene

Tank Dimensions

Diameter (ft):	160.01
Volume (gallons):	7,599,816.00
Turnovers:	1.00

Paint Characteristics

Internal Shell Condition:	Dense Rust
Shell Color/Shade:	Aluminum/Diffuse
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Shoe-mounted

Deck Fitting/Status

	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	3
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1

Meteorological Data used in Emissions Calculations: Haifa, Israel (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

T2 - DFloating 2019 - External Floating Roof Tank
Haifa, Israel

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Jet kerosene	Apr	76.46	63.88	89.04	68.86	0.0136	N/A	N/A	130.0000			162.00	Option 1: VP70 = .011 VP80 = .015

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

T2 - DFloating 2019 - External Floating Roof Tank
Haifa, Israel

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb): Seal Factor A (lb-mole/ft-yr): Seal Factor B (lb-mole/ft-yr (mph) ⁿ): Average Wind Speed (mph): Seal-related Wind Speed Exponent: Value of Vapor Pressure Function: Vapor Pressure at Daily Average Liquid Surface Temperature (psia): Tank Diameter (ft): Vapor Molecular Weight (lb/lb-mole): Product Factor:												
Withdrawal Losses (lb): Net Throughput (gal/mo.): Shell Clingage Factor (bbl/1000 sqft): Average Organic Liquid Density (lb/gal): Tank Diameter (ft):												
Roof Fitting Losses (lb): Value of Vapor Pressure Function: Vapor Molecular Weight (lb/lb-mole): Product Factor: Tot. Roof Fitting Loss Fact.(lb-mole/yr): Average Wind Speed (mph):												
Total Losses (lb):												
Roof Fitting/Status	Quantity	KFa(lb-mole/yr)	Roof Fitting Loss Factors									
			KFb(lb-mole/(yr mph ⁿ n))		m			Losses(lb)				
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	3	1.60	0.00		0.00			0.0000				
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20		0.94			0.0000				
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1	0.71	0.10		1.00			0.0000				

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

T2 - DFloating 2019 - External Floating Roof Tank
Haifa, Israel

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Jet kerosene	2.99	55.99	0.07	0.00	59.04

נספח ד'

חישוב פליטות ממיכל לאיסוף תשטיפים

תוכנת Tanks : חישוב פליטה כתוצאה מאחסון ושינוי מפלס

Horizontal Tank
Haifa, Israel

TANKS 4.0 Emissions Report - Detail Format Tank Identification and Physical Characteristics

Identification

User Identification: Runoff_Tank -Breathing&Working
City: Haifa
State: Israel
Company: PEI
Type of Tank: Horizontal Tank
Description: 60m3

Tank Dimensions

Shell Length (ft): 62.34
Diameter (ft): 6.56
Volume (gallons): 13,208.60
Turnovers: 3.00
Net Throughput (gal/yr): 39,625.80
Is Tank Heated (y/n): N
Is Tank Underground (y/n): Y

Paint Characteristics

Shell Color/Shade: White/White
Shell Condition:

Breather Vent Settings

Vacuum Settings (psig): 0.00
Pressure Settings (psig): 0.00

Meteorological Data used in Emissions Calculations: Haifa, Israel (Avg Atmospheric Pressure = 14.69 psia)

27/01/2010 17:35:13

Page 1



www.pazeng.co.il

3013.19-036.doc

20/30

26/02/2023

TANKS 4.0 Emissions Report - Detail Format Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F)			Liquid Bulk Temp. (deg F)	Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Jet kerosene	All	65.70	65.70	65.70	65.26	0.0099	0.0099	0.0099	130.0000			162.00	Option 5: A=12.39, B=8933

27/01/2010 17:35:13

Page 2



www.pazeng.co.il

3013.19-036.doc

21/30

26/02/2023

TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)

Annual Emission Calculations	
No Standing Losses: Underground Tank	
Working Losses (lb):	1.2166
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0099
Annual Net Throughput (gal/yr.):	39,625.8000
Annual Turnovers:	3.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	6.5600
Working Loss Product Factor:	1.0000
Total Losses (lb):	1.2166

27/01/2010 17:35:13

Page 3



TANKS 4.0
Emissions Report - Detail Format
Individual Tank Emission Totals

Annual Emissions Report

Components	Losses(lbs)		Total Emissions
	Working Loss	Breathing Loss	
Jet kerosene	1.22	0.00	1.22

27/01/2010 17:35:13

Page 4



תוכנת Tanks : חישוב פליטה כתוצאה מניקוי וריקון מיכל (שלב א')

Horizontal Tank
Haifa, Israel

TANKS 4.0 Emissions Report - Detail Format Tank Identification and Physical Characteristics

Identification

User Identification: Runoff_ tank-Degassing fixed
City: Haifa
State: Israel
Company: PEI
Type of Tank: Horizontal Tank
Description: Kerosene 60m3

Tank Dimensions

Shell Length (ft): 62.34
Diameter (ft): 6.56
Volume (gallons): 13,208.60
Turnovers: 1.00
Net Throughput (gal/yr): 13,208.60
Is Tank Heated (y/n): N
Is Tank Underground (y/n): Y

Paint Characteristics

Shell Color/Shade: White/White
Shell Condition:

Breather Vent Settings

Vacuum Settings (psig): 0.00
Pressure Settings (psig): 0.00

Meteorological Data used in Emissions Calculations: Haifa, Israel (Avg Atmospheric Pressure = 14.69 psia)

27/01/2010 17:38:14

Page 1



www.pazeng.co.il

3013.19-036.doc

24/30

26/02/2023

TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)

27/01/2010 17:38:15

Page 2

3013.19-036.doc

25/30

26/02/2023



www.pazeng.co.il

TANKS 4.0
Emissions Report - Detail Format
Individual Tank Emission Totals

Annual Emissions Report

Components	Losses(lbs)		Total Emissions
	Working Loss	Breathing Loss	
Jet kerosene	0.39	0.00	0.39

27/01/2010 17:38:16

Page 3



תוכנת Tanks : חישוב פליטה כתוצאה מניקוי וריקון מיכל (שלב ב')

Internal Floating Roof Tank
Haifa, Israel

TANKS 4.0 Emissions Report - Detail Format Tank Identification and Physical Characteristics

Identification

User Identification: Runoff_Tank - Degassing floating
City: Haifa
State: Israel
Company: gadot east
Type of Tank: Internal Floating Roof Tank
Description: Kerosene - 60m3

Tank Dimensions

Diameter (ft): 22.82
Volume (gallons): 13,208.60
Turnovers: 1.00
Self Supp. Roof? (y/n): Y
No. of Columns: 0.00
Eff. Col. Diam. (ft): 0.00

Paint Characteristics

Internal Shell Condition: Light Rust
Shell Color/Shade: White/White
Shell Condition: Good
Roof Color/Shade: White/White
Roof Condition: Good

Rim-Seal System

Primary Seal: Mechanical Shoe
Secondary Seal: None

Deck Characteristics

Deck Fitting Category: Typical
Deck Type: Welded

Deck Fitting/Status

	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	9
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meteorological Data used in Emissions Calculations: Haifa, Israel (Avg Atmospheric Pressure = 14.69 psia)

27/01/2010 17:47:15

Page 1



TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)

27/01/2010 17:47:16

Page 2

3013.19-036.doc

28/30

26/02/2023



www.pazeng.co.il

TANKS 4.0
Emissions Report - Detail Format
Individual Tank Emission Totals

Annual Emissions Report

Components	Losses(lbs)				Total Emissions
	Rim Seal Loss	Withdrawal Loss	Deck Fitting Loss	Deck Seam Loss	
Jet kerosene	0.26	0.14	0.27	0.00	0.67

27/01/2010 17:47:17

Page 3

3013.19-036.doc

29/30

26/02/2023



www.pazeng.co.il

חישובי פליטה ממכל תשטיפים

מכל תשטיפים - 60 מ³ - קרוסין

מבנה כל חישובים נחשב כי נעשה על פי המידע המסופק

Horizontal tank

1. Tank & Operation data

Diameter of the tank	D	m	site data	7	
		feet		22.98	
Length of the shell	L	m	site data	19	
		feet		62.34	
Effective tank diameter (for floating roof scenario)		feet	$D_e = \sqrt{\frac{D^2 + L^2}{2}}$	22.82	EPA-42, page 7.1-14, eq. 1-3
Tank paint solar absorptance	a	dimensionless	Gray shell & roof Paint Shade & Type: medium gray Paint Condition: good	0.17	Table 7.1-5
Number of degassing and cleaning episode		landing episode/year	site data	0.05	
Density of the liquid inside the tank	W _L	g/ml	made data	0.99	
Liquid bulk temperature	T _b	°R	T _b = T _{ad} + 80 - 1	525.99	Equation 1-25
		°C	—	19.05	

2. Normal operation (Tanks program)

Working losses		lb per year	Tanks Program	1.22	חיסול נפח breathing/working-losses
		Kg per year	—	0.55	
Breathing losses		lb per year	Tanks Program	0	חיסול נפח breathing/working-losses
		Kg per year	—	0.00	

3. Degassing and Cleaning (Tanks program)

Degassing: emission from one turnover	E _{degas floating}	lb per emptying	Tanks Program	0.39	חיסול נפח תשטיפים floating
		Kg per emptying	—	0.18	
Degassing: floating roof, 1 turnover	E _{degas roof}	lb per emptying	Tanks Program	0.67	חיסול נפח תשטיפים floating
		Kg per emptying	—	0	
Liquid fraction in sludge	F _{sludge}			0.9	Tanks FAQ - degassing and cleaning
Sludge weight	W _s	Kg per emptying	Distillate has no sludge	0	
Cleaning emissions	E _{cleaning}	lb per emptying	E _{cleaning} = W _s * (1 - F _{sludge})	0	
		Kg per emptying		0	
Total Degassing and Cleaning emissions	E _{degas total}	lb per emptying	E _{degas floating} + E _{degas roof} + E _{cleaning}	1	
		Kg per emptying		0	

4. Summary

Working losses		Kg per year	1	
Breathing losses		Kg per year	0.00	
Total Degassing and Cleaning emissions		Kg per year	0.02	
			1	Kg per year

3013-124 - T

1 / 1

28/01/2010

גיליון חישוב זה הוכן על ידי "פז" הנדסה וניהול (1980) בע"מ.

אין להעתיק ואו לעשות שימוש כלשהו במידע הנ"ל ללא הרשאה כתובה מ"פז" הנדסה וניהול (1980) בע"מ.

3013.19-036.doc

30/30

26/02/2023



www.pazeng.co.il