

MOU SCHEDULE NO. 1 – GROUND SUPPORT EQUIPMENT

This MOU Schedule No. 1 is based on the Authority's AQIP measure for ground support equipment¹.

- I. PROGRAM DESCRIPTION – Require that all ground support equipment associated with commercial operations achieve a fleet average NOx combined emission factors of 1.66 and 0.74 g/bhp-hr by January 1, 2023 and 2031, respectively.
- II. PROGRAM TIMEFRAME – Upon execution through 2032.
- III. AIRPORT OBLIGATIONS – The Authority agrees to:
 - A. Implement the measure by working with airport tenants to achieve the above performance targets by specified dates through accelerated turnover to cleaner equipment. Airport shall have complete discretion as to mechanisms used to implement this measure. Such mechanisms may include leases, licenses, operational requirements, or other agreements.
 - B. Beginning in 2021, and every year thereafter through 2032, provide the following information to South Coast AQMD on an annual basis by June 1 for each preceding calendar year:
 1. List of ground support equipment as provided by airlines operating at BUR with the following information:
 - a. Equipment ID
 - b. Equipment type
 - c. Fuel type
 - d. Engine model year
 - e. Power rating (hp or kW)
 - f. Engine tier level (for diesel engines)
 - g. Annual activity data for non-zero emission equipment that is sufficient to determine emission reductions at a reasonable level of accuracy (i.e., actual operating hours from hour meter readings/maintenance records, average operating hours representative of equipment type and airport, or average operating hours by equipment/fuel type from CARB's OFFROAD model, if applicable)

¹ Ground Support Equipment or "GSE" is any vehicle or equipment used to support aircraft operations that is subject to, or included in compliance plans to meet, the requirements of the California Air Resources Board (CARB) In-Use Off-Road Diesel (ORD) Vehicle Regulation Program, CARB Off-Road Large Spark-Ignition (LSI) Engine Fleet Requirements Regulation Program, or CARB Portable Equipment Registration Program and associated Portable Diesel Engine Airborne Toxic Control Measure. Furthermore, GSE as defined here only includes equipment that is not subject to compliance with SCAQMD Rule XX - RECLAIM, or included in a mobile source emission reduction credit program under SCAQMD Rule XVI.

2. For non-zero emission ground support equipment subject to this GSE measure, information regarding the sale or retirement of equipment available through CARB's DOORS system and, for pre-Tier 4 diesel, pre-2010 gasoline, or pre-2010 LPG ground support equipment relocated from BUR to another airport within the South Coast Air Basin, identify: a) the airport to which equipment is relocated, b) date of relocation, and c) estimated projected usage hours.
3. An annual emission inventory for all ground support equipment associated with commercial operations at BUR, including methodology and calculations.

III **OBLIGATIONS** – South Coast AQMD agrees to:

- A. Verify emission reductions from the implementation of this AQIP measure in order to determine actual emission reductions.
- B. Ensure that any emission reduction data related to this AQIP measure and other pertinent information and accessible to the public and the USEPA.

MOU SCHEDULE NO. 1 – III.B.1. List of Ground Support Equipment

List of ground support equipment subject to this GSE measure with the following information: a) Equipment ID, b) Equipment type, c) Fuel type, d) Engine model year, e) Power rating (hp or kW), f) Engine tier level (for diesel engines), g) Annual activity data based on average operating hours from CARB's OFFROAD model

Airport GSE ID	Reported Type	Equipment Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
BUR-OP01-001	golf cart	cart	electric	2008	52	--	200	electric	john deer	yes	no
BUR-OP01-002	air conditioner	air conditioner	diesel	2005	110	tier 2	391	diesel	tld	no	no
BUR-OP02-001	bag tractor	baggage tug	gasoline	1979	116	--	846		tug	no	no
BUR-OP02-002	fork lift	forklift	lpg/propane	1998	46	--	591		tcm	no	no
BUR-OP02-003	cart	cart	electric	1999	6	--	152		taylor dunn	no	no
BUR-OP02-004	cart	cart	electric	1999	6	--	152		taylor dunn	no	no
BUR-OP02-005	gpu	ground power unit	diesel	2015	44	tier 4	798		aerospecialties	no	no
BUR-OP02-006	towbarless tow tractor	a/c tug narrow body	electric	1998	3	--	385		lektro	no	no
BUR-OP02-007	towbarless tow tractor	a/c tug narrow body	electric	2001	6	--	385		aerospecialties	no	no
BUR-OP02-008	lift	lift	electric	1996	5	--	391		jlg	no	no
BUR-OP03-001	fuel truck	fuel truck	diesel	2017	275	tier 4	83		international	no	no
BUR-OP03-002	fuel truck	fuel truck	diesel	2000	175	≤ tier 1	83		international	no	no
BUR-OP03-003	fuel truck	fuel truck	diesel	2016	275	tier 4	83		international	no	no
BUR-OP03-004	fuel truck	fuel truck	diesel	2017	275	tier 4	83		international	no	no
BUR-OP03-005	fuel truck	fuel truck	diesel	2016	275	tier 4	83		international	no	no
BUR-OP03-006	fuel truck	fuel truck	diesel	2000	175	≤ tier 1	83		international	no	no
BUR-OP03-007	fuel truck	fuel truck	diesel	2000	195	≤ tier 1	83		international	no	no
BUR-OP03-008	fuel truck	fuel truck	diesel	2019	260	tier 4	83		international	no	no
BUR-OP03-009	fuel truck	fuel truck	diesel	2014	215	tier 4	83		international	no	no
BUR-OP03-010	fuel truck	fuel truck	diesel	2014	215	tier 4	83		international	no	no
BUR-OP03-011	fuel truck	fuel truck	diesel	2000	175	≤ tier 1	83		isuzu	no	no
BUR-OP03-012	fuel truck	fuel truck	diesel	2000	175	≤ tier 1	83		international	no	no

Airport GSE ID	Reported Type	Equipment Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
BUR-OP03-013	fuel truck	fuel truck	gasoline	1999		--	83		ford	no	no
BUR-OP03-014	stair truck	passenger stand	gasoline	1975	300	--	137		ford	no	no
BUR-OP03-015	belt loader	belt loader	gasoline	1975	84	--	706		cargo king	no	no
BUR-OP03-016	belt loader	belt loader	electric	2018	6	--	706		tld	no	no
BUR-OP03-017	floor scrubber	sweeper	electric	1999		--	339		tenant	no	no
BUR-OP03-018	floor scrubber	sweeper	electric			--	339		tenant	no	no
BUR-OP03-019	golf cart	cart	electric	2015	120	--	152		cart mart inc	no	no
BUR-OP03-020	golf cart	cart	electric	2002		--	152		ez-go	no	no
BUR-OP03-021	gpu	ground power unit	diesel	2014		tier 4i	798		aero specialties	no	no
BUR-OP03-022	gpu	ground power unit	diesel	2015		tier 4	798		aero specialties	no	no
BUR-OP03-023	gpu	ground power unit	electric			--	798		foxcart	no	no
BUR-OP03-024	gpu	ground power unit	electric	2000	1	--	798		davco	no	no
BUR-OP03-025	gpu	ground power unit	diesel	2019		tier 4	798		aero specialties	no	no
BUR-OP03-026	gpu	ground power unit	diesel	2020		tier 4	798		tld	no	no
BUR-OP03-027	gpu	ground power unit	diesel	2014		tier 4i	798		tld	no	no
BUR-OP03-028	lavatory cart	lav cart	gasoline	2002		--	150		aero specialties	no	no
BUR-OP03-029	lavatory cart	lav cart	electric	2018		--	150		aero specialties	no	no
BUR-OP03-030	lavatory cart	lav cart	electric	2015		--	150		aero specialties	no	no
BUR-OP03-031	light tower	other gse	diesel	2002		tier 1	412		coleman	no	no
BUR-OP03-032	ramp pickup truck	service truck	gasoline	2005	282	--	883		toyota	no	no

Airport GSE ID	Reported Type	Equipment Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
BUR-OP03-033	ramp pickup truck	service truck	gasoline	2005	245	--	883		toyota	no	no
BUR-OP03-034	potable water cart	cart	electric	2002		--	152		aero specialties	no	no
BUR-OP03-035	potable water cart	cart	electric	2019		--	152		aero specialties	no	no
BUR-OP03-036	towbarless tow tractor	a/c tug narrow body	electric	2013		--	385		lektro	no	no
BUR-OP03-037	towbarless tow tractor	a/c tug narrow body	electric	2001		--	385		lektro	no	no
BUR-OP03-038	towbarless tow tractor	a/c tug narrow body	electric	2019		--	385		lektro	no	no
BUR-OP03-039	tug	a/c tug narrow body	diesel	2020	120	tier 4	385		tld	no	no
BUR-OP03-040	tug	a/c tug narrow body	diesel	2018	68	tier 4	385		eagle	no	no
BUR-OP03-041	tug	a/c tug narrow body	gasoline			--	385		united	no	no
BUR-OP03-042	tug	a/c tug narrow body	gasoline			--	385		united	no	no
BUR-OP04-001	towbarless tow tractor	a/c tug narrow body	electric	1998	300	--	200	electric tug	lektro	yes	no
BUR-OP04-002	towbarless tow tractor	a/c tug narrow body	electric	2008	300	--	200	electric tug	lektro	yes	no
BUR-OP04-003	golf cart	cart	electric	2011	100	--	200	electric golf cart	carryall	yes	no
BUR-OP04-004	golf cart	cart	electric	2008	100	--	200	electric golf cart	carryall	yes	no
BUR-OP04-005	golf cart	cart	electric	2000	100	--	200	electric golf cart	trans-porter	yes	no
BUR-OP05-001	cargo loader	cargo loader	diesel	2007	110	tier 3	556	loader/a	jbtae	no	no
BUR-OP05-002	aircraft tow tractor	a/c tug narrow body	diesel	2008	200	tier 3	385	tuga/c	jbtae	no	no
BUR-OP05-003	aircraft tow tractor	cargo loader	diesel	2011	175	tier 4i	556	tuga/c	jbtae	no	no
BUR-OP05-004	tug	cargo loader	diesel	2008	125	tier 3	556	loader/a	fmcxx	no	no

Airport GSE ID	Reported Type	Equipment Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
BUR-OP05-005	tug	cargo loader	diesel	2011	125	tier 3	556	loader/a	fmcxx	no	no
BUR-OP05-006	tug	cargo loader	diesel	2005	102	tier 2	556	loader/a	fmcxx	no	no
BUR-OP05-007	tug	cargo loader	diesel	2005	102	tier 2	556	loader/a	fmcxx	no	no
BUR-OP05-008	tug	cargo loader	diesel	2005	132	tier 2	556	loader/a	fmcxx	no	no
BUR-OP05-009	tug	cargo loader	diesel	2017	160	tier 4	556	loader/a	jbtae	no	no
BUR-OP05-010	fork lift	forklift	gasoline	2008	57	--	591	forklift	toyot	no	no
BUR-OP05-011	belt loader	belt loader	gasoline	2009	56	--	706	bltloadr	tldxx	no	no
BUR-OP05-012	tug	a/c tug narrow body	gasoline	2010	80	--	385	tug	tiger	no	no
BUR-OP05-013	tug	a/c tug narrow body	gasoline	2010	80	--	385	tug	tiger	no	no
BUR-OP05-014	tug	a/c tug narrow body	gasoline	2010	80	--	385	tug	tiger	no	no
BUR-OP05-015	tug	a/c tug narrow body	gasoline	2010	80	--	385	tug	tiger	no	no
BUR-OP05-016	tug	a/c tug narrow body	gasoline	2009	75	--	385	tug	tiger	no	no
BUR-OP05-017	tug	a/c tug narrow body	gasoline	2009	75	--	385	tug	tiger	no	no
BUR-OP05-018	tug	a/c tug narrow body	gasoline	2009	75	--	385	tug	tiger	no	no
BUR-OP05-019	fork lift	forklift	lpg/propane	2011	51	--	591	forklift	toyot	no	no
BUR-OP05-020	fork lift	forklift	lpg/propane	2011	51	--	591	forklift	toyot	no	no
BUR-OP05-021	tug	baggage tug	gasoline	2011	79	--	846	tug	tugmn	no	no
BUR-OP05-022	belt loader	belt loader	gasoline	1999	100	--	706	bltloadr	tugmn	no	no
BUR-OP05-023	tug	baggage tug	electric	2004	100	--	846	tug	tugmn	no	no
BUR-OP05-024	tug	baggage tug	electric	2004	100	--	846	tug	tugmn	no	no
BUR-OP05-025	tug	baggage tug	gasoline	2004	100	--	846	tug	tugmn	no	no

Airport GSE ID	Reported Type	Equipment Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
BUR-OP05-026	tug	baggage tug	gasoline	2004	100	--	846	tug	tugmn	no	no
BUR-OP05-027	tug	baggage tug	gasoline	2004	100	--	846	tug	tugmn	no	no
BUR-OP05-028	fork lift	forklift	lpg/propane	2006	59	--	591	forklift	toyot	no	no
BUR-OP05-029	fork lift	forklift	lpg/propane	2006	59	--	591	forklift	toyot	no	no
BUR-OP05-030	tug	baggage tug	gasoline	2017	86	--	846	tug	tugmn	no	no
BUR-OP05-031	other	maint. truck	gasoline	2019	293	--	450	maintrk	isuzu	no	yes
BUR-OP05-032	other	maint. truck	gasoline	1992	138	--	450	maintrk	tesco	no	yes
BUR-OP05-033	other	cart	gasoline	2013	138	--	152	burdnear	cshmn	no	no
BUR-OP05-034	other	cart	gasoline	2014	138	--	152	burdnear	cshmn	no	no
BUR-OP05-035	ground power unit	ground power unit	diesel	2007	170	tier 3	798	diesel perp_actm equipment	149001	no	no
BUR-OP05-036	ground power unit	ground power unit	diesel	2007	170	tier 3	798	diesel perp_actm equipment	149000	no	no
BUR-OP05-037	air start	air start unit	diesel	1999	550	≤ tier 1	200	diesel perp_actm equipment	125746	yes	no
BUR-OP05-038	ground power unit	ground power unit	diesel	2015	155	tier 4	798	diesel perp_actm equipment	175401	no	no
BUR-OP05-039	air start	air start unit	diesel	2015	550	tier 4	79	diesel perp_actm equipment	175402	no	no
BUR-OP05-040	air conditioner	air conditioner	diesel	2006	99	tier 2	391	diesel perp_actm equipment	140711	no	no

Airport GSE ID	Reported Type	Equipment Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
BUR-OP05-041	air conditioner	air conditioner	diesel	2007	145	tier 3	391	diesel perp_actm equipment	144313	no	no
BUR-OP06-001	pushback	a/c tug narrow body	diesel	2004	194	tier 2	200	pushback	tug	yes	no
BUR-OP06-002	pushback	a/c tug narrow body	diesel	2009	88	tier 3	200	pushback	tug	yes	no
BUR-OP06-003	pushback	a/c tug narrow body	diesel	2007	88	tier 2	200	pushback	tug	yes	no
BUR-OP06-004	pushback	a/c tug narrow body	diesel	1997	88	≤ tier 1	200	pushback	tug	yes	no
BUR-OP06-005	pushback	a/c tug narrow body	diesel	2018	88	tier 4	200	pushback	tld	yes	no
BUR-OP06-006	gpu	ground power unit	diesel	2009	194	tier 3	200	gpu	hobart	yes	no
BUR-OP06-007	gpu	ground power unit	diesel	2016	194	tier 4	200	gpu	tug	yes	no
BUR-OP06-008	gpu	ground power unit	diesel	2006	194	tier 3	200	gpu	tug	yes	no
BUR-OP06-009	gpu	ground power unit	diesel	2008	194	tier 3	200	gpu	tug	yes	no
BUR-OP06-010	gpu	ground power unit	diesel	2010	194	tier 3	200	gpu	tug	yes	no
BUR-OP06-011	air conditioner	air conditioner	diesel	2016	310	tier 4	200	acu	tld	yes	no
BUR-OP06-012	air conditioner	air conditioner	diesel	2009	310	tier 3	200	acu	tld	yes	no
BUR-OP06-013	air start	air start unit	diesel	2009	400	tier 3	200	as	tld	yes	no
BUR-OP06-014	lavatory cart	lav cart	gasoline	2015	5	--	200	lc	phoenix	yes	no
BUR-OP06-015	lavatory cart	lav cart	gasoline	2009	5	--	200	lc	par kan	yes	no
BUR-OP06-016	lavatory cart	lav cart	electric	2016	28	--	200	lc	par kan	yes	no
BUR-OP06-017	service truck	service truck	electric	2012	10	--	200	as	par kan	yes	no
BUR-OP06-018	belt loader	belt loader	lpg/propane	2006	120	--	200	bd	tug	yes	no

Airport GSE ID	Reported Type	Equipment Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
BUR-OP06-019	belt loader	belt loader	electric	2007	40	--	200	bd	tug	yes	no
BUR-OP06-020	belt loader	belt loader	electric	2007	40	--	200	bd	tug	yes	no
BUR-OP06-021	belt loader	belt loader	diesel	2014	77	tier 4i	200	bd	tug	yes	no
BUR-OP06-022	belt loader	belt loader	gasoline	2004	30	--	200	bw	wasp	yes	no
BUR-OP06-023	belt loader	belt loader	diesel	2007	77	tier 2	200	bd	tug	yes	no
BUR-OP06-024	belt loader	belt loader	electric	2012	40	--	200	bd	tug	yes	no
BUR-OP06-025	belt loader	belt loader	diesel	2006	77	tier 2	200	bd	tug	yes	no
BUR-OP06-026	belt loader	belt loader	electric	2012	40	--	200	bd	tug	yes	no
BUR-OP06-027	belt loader	belt loader	diesel	2007	77	tier 2	200	bd	tug	yes	no
BUR-OP06-028	potable water cart	cart	electric	2004	5	--	200	pw	phoenix	yes	no
BUR-OP06-029	potable water cart	cart	electric	1999	5	--	200	pw	davey	yes	no
BUR-OP06-030	potable water cart	cart	electric	2001	5	--	200	pw	par kan	yes	no
BUR-OP06-031	bag tug	baggage tug	gasoline	2006	88	--	200	t	harlad	yes	no
BUR-OP06-032	bag tug	baggage tug	gasoline	2006	88	--	200	t	harlad	yes	no
BUR-OP06-033	bag tug	baggage tug	electric	2007	40	--	200	t	tug	yes	no
BUR-OP06-034	bag tug	baggage tug	electric	2007	40	--	200	t	tug	yes	no
BUR-OP06-035	bag tug	baggage tug	electric	2006	40	--	200	t	tug	yes	no
BUR-OP06-036	bag tug	baggage tug	electric	2006	40	--	200	t	tug	yes	no
BUR-OP06-037	bag tug	baggage tug	electric	2006	40	--	200	t	tug	yes	no
BUR-OP06-038	bag tug	baggage tug	diesel	2001	77	tier 1	200	t	tug	yes	no
BUR-OP06-039	bag tug	baggage tug	lpg/propane	2009	95	--	200	t	tug	yes	no
BUR-OP06-040	golf cart	cart	electric	2010	25	--	200	g	gem	yes	no
BUR-OP07-001	tug	a/c tug narrow body	gasoline	1991	300	--	200	tug	clark	yes	no
BUR-OP07-002	other	other gse	gasoline	1991	300	--	200	diesel perp_actm equipment		yes	no
BUR-OP08-001	ground power unit	ground power unit	electric	1998	25	--	798	gpu	unitron	no	no

Airport GSE ID	Reported Type	Equipment Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
BUR-OP08-002	ground power unit	ground power unit	electric	2002	37	--	798	gpu	unitron	no	no
BUR-OP08-003	ground power unit	ground power unit	electric	2003	15	--	798	gpu	unitron	no	no
BUR-OP08-004	ground power unit	ground power unit	electric	1990	15	--	798	gpu	unitron	no	no
BUR-OP08-005	ground power unit	ground power unit	electric	2006	90	--	798	gpu	unitron	no	no
BUR-OP08-006	ground power unit	ground power unit	electric	2004	25	--	798	gpu	unitron	no	no
BUR-OP08-007	ground power unit	ground power unit	electric	1989	28	--	798	gpu	hobart	no	no
BUR-OP08-008	ground power unit	ground power unit	electric	2006	28	--	798	gpu	hobart	no	no
BUR-OP08-009	ground power unit	ground power unit	electric	1985	28	--	798	gpu	hobart	no	no
BUR-OP08-010	ground power unit	ground power unit	electric	1987	28	--	798	gpu	hobart	no	no
BUR-OP08-011	ground power unit	ground power unit	electric	1995	180	--	798	gpu	hobart	no	no
BUR-OP08-012	ground power unit	ground power unit	electric	1984	40	--	798	gpu	trilectron	no	no
BUR-OP08-013	hpu	ground power unit	electric	1998	28	--	798	hpu	tronair	no	no
BUR-OP08-014	hpu	ground power unit	electric	1996	28	--	798	hpu	tronair	no	no
BUR-OP08-015	hpu	ground power unit	electric	2001	28	--	798	hpu	trionair	no	no
BUR-OP08-016	fork lift	forklift	lpg/propane	1972	25	--	591	forklift	tmc	no	no
BUR-OP08-017	tug	baggage tug	diesel		43	tier 4	846	tug	hydratug	no	no
BUR-OP08-018	tug	baggage tug	diesel		43	tier 4	846	tug	hydratug	no	no
BUR-OP08-019	aircraft tow tractor	a/c tug narrow body	electric	1996	48	--	385		lektro	no	no
BUR-OP08-020	aircraft tow tractor	a/c tug narrow body	electric	1989	48	--	385		lektro	no	no

Airport GSE ID	Reported Type	Equipment Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
BUR-OP08-021	golf cart	cart	electric	2002	6	--	152		clubcar	no	no
BUR-OP08-022	golf cart	cart	electric	1996	6	--	152		clubcar	no	no
BUR-OP08-023	golf cart	cart	electric	1995	6	--	152		clubcar	no	no
BUR-OP09-001	air start	air start unit	diesel	2017	565	tier 4	79		tug	no	no
BUR-OP09-002	generator	generator	gasoline	2018	15	--	913		champion	no	no
BUR-OP09-003	golf cart	cart	electric	2005	20	--	152		yamaha	no	no
BUR-OP09-004	fork lift	forklift	lpg/propane	2012	85	--	591		toyota	no	no
BUR-OP09-005	towbarless tow tractor	a/c tug narrow body	electric	2019	110	--	385		lektro	no	no
BUR-OP09-006	man lift	lift	electric	2010	40	--	391		genie	no	no
BUR-OP10-001	fuel truck	fuel truck	diesel	2003	300	tier 2	83	aircraft refueler	sterling	no	no
BUR-OP10-002	fuel truck	fuel truck	diesel	2006	210	tier 3	83	aircraft refueler	international	no	no
BUR-OP10-003	fuel truck	fuel truck	diesel	2016	275	tier 4	83	aircraft refueler	international	no	no
BUR-OP10-004	fuel truck	fuel truck	diesel	2018	275	tier 4	83	aircraft refueler	international	no	no
BUR-OP10-005	fuel truck	fuel truck	diesel	2006	183	tier 3	83	aircraft refueler	iisuzu	no	no
BUR-OP10-006	tug	a/c tug narrow body	gasoline	1977	84	--	385	tug	clark	no	no
BUR-OP10-007	tug	a/c tug narrow body	gasoline	1978	84	--	385	tug	clark	no	no
BUR-OP10-008	tug	a/c tug narrow body	diesel	2019	74	tier 4	385	tug	tld	no	no
BUR-OP10-009	tug	a/c tug narrow body	diesel	2017	74	tier 4	385	tug	tld	no	no
BUR-OP10-010	belt loader	belt loader	diesel	2018	50	tier 4	706	belt loader	tld	no	no
BUR-OP10-011	gpu	ground power unit	diesel	2016	50	tier 4	798	gpu	jet go	no	no
BUR-OP10-012	gpu	ground power unit	diesel	2010	50	tier 4i	798	gpu	hobart	no	no
BUR-OP10-013	golf cart	cart	electric	2012	3	--	152	golf cart	club car	no	no

Airport GSE ID	Reported Type	Equipment Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
BUR-OP10-014	golf cart	cart	electric	2012	3	--	152	golf cart	e-z-g0	no	no
BUR-OP10-015	golf cart	cart	electric	2001	3	--	152	golf cart	e-z-go	no	no
BUR-OP10-016	golf cart	cart	electric	1999	3	--	152	golf cart	club car	no	no
BUR-OP11-001	golf cart	cart	electric	2005	10	--	152	golf cart	club car	no	no
BUR-OP11-002	golf cart	cart	electric	2005	10	--	152	golf cart	club car	no	no
BUR-OP11-003	towbarless tow tractor	a/c tug narrow body	electric	2018	10	--	385	towbarless tow tractor	lektro	no	no
BUR-OP11-004	lavatory cart	cart	electric	2005	0	--	152	towable lav cart	tronair	no	no
BUR-OP11-005	platform lift	lift	electric	1990	10	--	391	platform lift	us lift	no	no
BUR-OP11-006	other	other gse	electric	2019	0	--	412	hydraulic mule	tronair	no	no
BUR-OP11-007	other	other gse	electric	1990	0	--	412	hydraulic mule	dynamo	no	no
BUR-OP11-008	ground power unit	ground power unit	electric	2017	0	--	798	power cart	tronair	no	no
BUR-OP11-009	ground power unit	ground power unit	electric	2018	0	--	798	power cart	tronair	no	no
BUR-OP12-001	bag tug	baggage tug	electric	2004	40	--	846	tug		no	no
BUR-OP12-002	bag tug	baggage tug	electric	2004	40	--	846	tug		no	no
BUR-OP12-003	bag tug	baggage tug	electric	2004	40	--	846	tug		no	no
BUR-OP12-004	bag tug	baggage tug	electric	2004	40	--	846	tug		no	no
BUR-OP12-005	bag tug	baggage tug	electric	2004	40	--	846	tug		no	no
BUR-OP12-006	bag tug	baggage tug	electric	2004	40	--	846	tug		no	no
BUR-OP12-007	bag tug	baggage tug	electric	2004	40	--	846	tug		no	no
BUR-OP12-008	bag tug	baggage tug	electric	2004	40	--	846	tug		no	no
BUR-OP12-009	bag tug	baggage tug	electric	2005	40	--	846	tug		no	no
BUR-OP12-010	bag tug	baggage tug	electric	2005	40	--	846	tug		no	no
BUR-OP12-011	bag tug	baggage tug	electric	2005	40	--	846	tug		no	no
BUR-OP12-012	bag tug	baggage tug	gasoline	2007	40	--	846	harlan		no	no
BUR-OP12-013	bag tug	baggage tug	gasoline	2007	40	--	846	harlan		no	no
BUR-OP12-014	bag tug	baggage tug	gasoline	2008	40	--	846	harlan		no	no
BUR-OP12-015	belt loader	belt loader	electric	1994	60	--	706	tug		no	no

Airport GSE ID	Reported Type	Equipment Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
BUR-OP12-016	belt loader	belt loader	electric	1994	60	--	706	tug		no	no
BUR-OP12-017	belt loader	belt loader	electric	1993	60	--	706	tug		no	no
BUR-OP12-018	belt loader	belt loader	electric	1994	60	--	706	tug		no	no
BUR-OP12-019	belt loader	belt loader	electric	1995	60	--	706	tug		no	no
BUR-OP12-020	belt loader	belt loader	electric	1995	60	--	706	tug		no	no
BUR-OP12-021	belt loader	belt loader	electric	1994	60	--	706	tug		no	no
BUR-OP12-022	belt loader	belt loader	electric	1994	60	--	706	tug		no	no
BUR-OP12-023	belt loader	belt loader	electric	1994	60	--	706	tug		no	no
BUR-OP12-024	belt loader	belt loader	electric	2018	60	--	706	tug		no	no
BUR-OP12-025	belt loader	belt loader	electric	2018	60	--	706	tug		no	no
BUR-OP12-026	fork lift	forklift	lpg/propane	2002	52	--	591	toyota		no	no
BUR-OP12-027	fork lift	forklift	lpg/propane	2002	52	--	591	toyota		no	no
BUR-OP12-028	fork lift	forklift	lpg/propane	2018	52	--	591	toyota		no	no
BUR-OP12-029	fork lift	forklift	lpg/propane	2018	52	--	591	toyota		no	no
BUR-OP12-030	lavatory truck	lav truck	gasoline	2002	100	--	1158	phoenix metals		no	yes
BUR-OP12-031	passenger stairs	passenger stand	electric	2001	49	--	137	wollard		no	no
BUR-OP12-032	passenger stairs	passenger stand	electric	2001	49	--	137	wollard		no	no
BUR-OP12-033	passenger stairs	passenger stand	electric	2001	49	--	137	wollard		no	no
BUR-OP12-034	passenger stairs	passenger stand	electric	2004	49	--	137	wollard		no	no
BUR-OP12-035	passenger stairs	passenger stand	gasoline	2018	49	--	137	phoenix metals		no	no
BUR-OP12-036	passenger stairs	passenger stand	gasoline	2018	49	--	137	phoenix metals		no	no
BUR-OP12-037	service truck	service truck	gasoline	1993	205	--	883	chevrolet		no	yes
BUR-OP12-038	service truck	service truck	gasoline	1993	205	--	883	chevrolet		no	yes

Airport GSE ID	Reported Type	Equipment Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
BUR-OP12-039	service truck	service truck	gasoline	2018	205	--	883		chevrolet	no	yes
BUR-OP12-040	towbarless tow tractor	a/c tug narrow body	electric	2019	110	--	385		lektro	no	no
BUR-OP12-041	towbarless tow tractor	a/c tug narrow body	electric	2019	110	--	385		lektro	no	no
BUR-OP12-042	towbarless tow tractor	a/c tug narrow body	electric	2019	110	--	385		lektro	no	no
BUR-OP12-043	towbarless tow tractor	a/c tug narrow body	electric	2019	110	--	385		lektro	no	no
BUR-OP12-044	towbarless tow tractor	a/c tug narrow body	electric	2019	110	--	385		lektro	no	no
BUR-OP12-045	towbarless tow tractor	a/c tug narrow body	electric	2019	110	--	385		lektro	no	no
BUR-OP12-046	towbarless tow tractor	a/c tug narrow body	electric	2019	110	--	385		lektro	no	no
BUR-OP12-047	ground power unit	ground power unit	diesel	2015	155	tier 4	798	diesel perp_actm equipment	171034	no	no
BUR-OP12-048	ground power unit	ground power unit	diesel	2014	155	tier 4i	798	diesel perp_actm equipment	167040	no	no
BUR-OP12-049	ground power unit	ground power unit	diesel	2012	256	tier 4i	798	diesel perp_actm equipment	161453	no	no
BUR-OP12-050	ground power unit	ground power unit	diesel	2019	155	tier 4	798	diesel perp_actm equipment	184846	no	no
BUR-OP12-051	ground power unit	ground power unit	diesel	2019	155	tier 4	798	diesel perp_actm equipment	184847	no	no
BUR-OP12-052	ground power unit	ground power unit	diesel	2019	155	tier 4	798	diesel perp_actm equipment	184848	no	no
BUR-OP12-053	ground power unit	ground power unit	diesel	2019	155	tier 4	798	diesel perp_actm equipment	184849	no	no

Airport GSE ID	Reported Type	Equipment Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
BUR-OP12-054	ground power unit	ground power unit	diesel	2019	155	tier 4	798	diesel perp_actm equipment	184850	no	no
BUR-OP12-055	air start	air start unit	diesel	2016	333	tier 4	200	diesel perp_actm equipment	173066	yes	no
BUR-OP13-001	aircraft tow tractor	a/c tug narrow body	electric	2018		--	200	pushback tug	lektro	yes	no
BUR-OP13-002	aerial platform	lift	electric	2018		--	200	scissor lift	jlg lift	yes	no
BUR-OP13-003	boom lift	lift	electric	2018		--	200	boom lift	jlg lift	yes	no
BUR-OP13-004	fork lift	forklift	electric	2018		--	200	fork lift	hyster	yes	no
BUR-OP13-005	golf cart	cart	electric	2018		--	200	golf cart	club car	yes	no
BUR-OP13-006	golf cart	cart	electric	2018		--	200	colf cart	columbia	yes	no
BUR-OP13-007	floor scrubber	sweeper	electric	2018		--	200	floor scrubber	tennant	yes	no
BUR-OP13-008	electric cart	cart	electric	2018		--	200	115v/ 400cyc ground power	unitron	yes	no
BUR-OP14-001	golf cart	cart	electric	2001	3	--	200	electric golf cart	ez-go	yes	no
BUR-OP15-001	air conditioning	air conditioner	diesel	2020		tier 4	391	ac/heat combo	tld	no	no
BUR-OP15-002	air conditioning	air conditioner	diesel	2020		tier 4	391	ac/heat combo	tld	no	no
BUR-OP15-003	aircraft tow tractor	a/c tug narrow body	diesel	2020		--	385	aircraft tow tractor	tug technologies	no	yes
BUR-OP15-004	aircraft tow tractor	a/c tug narrow body	diesel	2020		--	385	aircraft tow tractor	tug technologies	no	yes
BUR-OP15-005	air start	air start unit	diesel	2020		tier 4	79	air start	tld	no	no
BUR-OP15-006	ground power unit	ground power unit	diesel	2020		tier 4	798	gpu	tld	no	no
BUR-OP15-007	ground power unit	ground power unit	diesel	2020		tier 4	798	gpu	tld	no	no

Airport GSE ID	Reported Type	Equipment Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
BUR-OP15-008	bag tractor	baggage tug	gasoline	2020	69	--	846	baggage tractor	tug technologies	no	yes
BUR-OP15-009	bag tractor	baggage tug	gasoline	2020	69	--	846	baggage tractor	tug technologies	no	yes
BUR-OP15-010	bag tractor	baggage tug	gasoline	2020	69	--	846	baggage tractor	tug technologies	no	yes
BUR-OP15-011	bag tractor	baggage tug	gasoline	2020	69	--	846	baggage tractor	tug technologies	no	yes
BUR-OP15-012	belt loader	belt loader	gasoline	2020		--	706	belt loader	tug technologies	no	yes
BUR-OP15-013	belt loader	belt loader	gasoline	2020		--	706	belt loader	tug technologies	no	yes
BUR-OP15-014	belt loader	belt loader	gasoline	2020		--	706	belt loader	tug technologies	no	yes
BUR-OP15-015	ramp pickup truck	service truck	gasoline	2013		--	883	pickup truck	ford	no	yes
BUR-OP16-001	cargo loader	cargo loader	diesel	2003	152	tier 2	556	cargo loader	tld	no	no
BUR-OP16-002	cargo loader	cargo loader	diesel	2005	152	tier 2	556	cargo loader	tld	no	no
BUR-OP16-003	aircraft tow tractor	a/c tug narrow body	diesel	2014	119	tier 4i	200	pushback tractor	tld	yes	no
BUR-OP16-004	cargo tractor	cargo tractor	gasoline	1996		--	1114	cargo tractor	tiger	no	no
BUR-OP16-005	cargo tractor	cargo tractor	gasoline	2004		--	1114	cargo tractor	s&s	no	no
BUR-OP16-006	cargo tractor	cargo tractor	gasoline	2004		--	1114	cargo tractor	s&s	no	no
BUR-OP16-007	cargo tractor	cargo tractor	gasoline	2004		--	1114	cargo tractor	s&s	no	no
BUR-OP16-008	belt loader	belt loader	gasoline	2012		--	706	belt loader	tld	no	no
BUR-OP16-009	belt loader	belt loader	gasoline	2012		--	706	belt loader	tld	no	no
BUR-OP16-010	belt loader	belt loader	gasoline	2012		--	706	belt loader	tld	no	no
BUR-OP16-011	cargo loader	cargo loader	gasoline	2014		--	556	cargo loader	tld	no	no

Airport GSE ID	Reported Type	Equipment Designation	Fuel Type	Engine Model Year	Power Rating	Engine Tier Level	Annual Activity Data	Vehicle Description	Vehicle Manufacture	Designated Low Use	On-Road Equivalent Engine
BUR-OP16-012	belt loader	belt loader	gasoline	2019	64	--	706	belt loader	tld	no	no
BUR-OP16-013	air start	air start unit	diesel	2018	535	tier 4	200	diesel perp_actm equipment	189721	yes	no
BUR-OP16-014	ground power unit	ground power unit	diesel	2010	155	tier 3	798	diesel perp_actm equipment	158385	no	no

Notes: Reported Type, Fuel Type, Engine Model Year, Power Rating, Vehicle Description, Vehicle Manufacture, Low Use Designation, and On-Road Equivalent Engine data are provided directly by airport GSE operators. A unit's Emissions Designation is the representative emissions unit's type from which its emission rates are derived. A unit's Airport GSE ID is a unique ID assigned by the airport for tracking and identification of the unit in subsequent years.

MOU SCHEDULE NO. 1 – III.B.3. Emission Inventory

An annual emission inventory for all ground support equipment associated with commercial operations at BUR, including methodology and calculations.

2020 Hollywood Burbank Airport MOU Summary

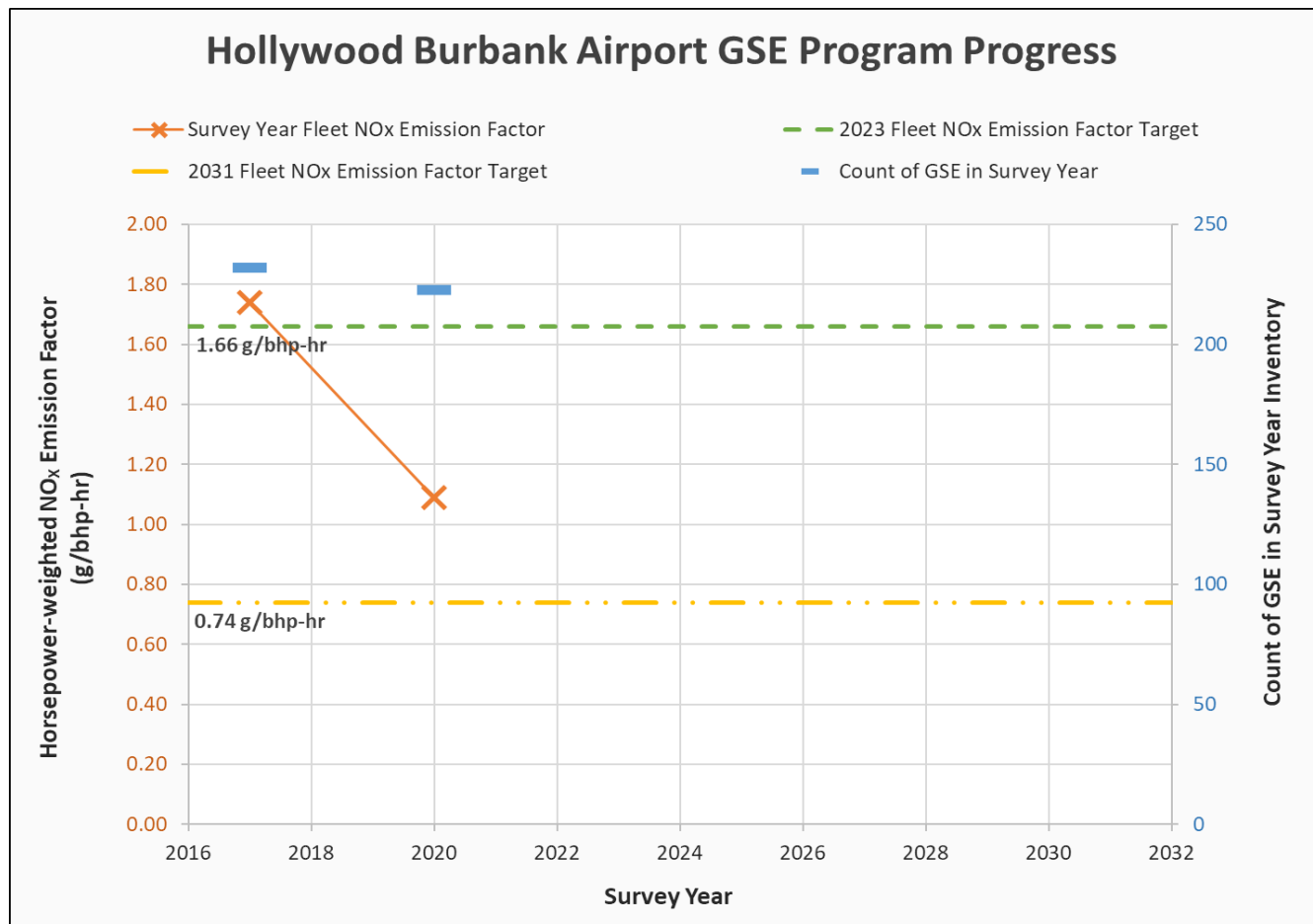
Fleet Mix ¹					Fleet Emissions (tons per year; metric tons for CO ₂ e) ²							
Total	Electric	Diesel	Gas	Other	CO	ROG	NO _x	PM ₁₀	PM _{2.5}	SO _x	CO ₂ e	
223	90	68	55	10	27.0	2.1	10.0	0.28	0.24	0.01	2,404	

Notes:

1. Fleet counts include >25 horsepower in-use equipment used in the calculation of the NO_x performance factor.
2. Fleet emissions include the operation of all reported equipment, including <25 HP and low-use (<200 hours per year) equipment.

Fleet NO_x performance factor:

1.09 grams per brake horsepower-hour



Methodology - Collection of Data

In February 2021, reporting forms were distributed to all known GSE operators at the airport. Operators were asked to submit completed reporting forms, which detail model year, horsepower, GSE type, fuel type, and other identifying characteristics of equipment operating at the airport. All tenants had completed and returned the forms by late April 2021.

Each unit of reported GSE was reviewed for accuracy and GSE program applicability based on previous data and professional judgement. Non-electric GSE with power ratings less than or equal to 25 horsepower are exempt from the California Air Resource Board (CARB) in-use off-road diesel-fueled (ORD) fleets, and large spark-ignition (LSI) fleets regulations, upon which the MOU's GSE agreement is predicated and thus were removed from the inventory. Low-use ground support equipment (defined as operating fewer than 200 hours per year), were retained in the inventory for the purposes of determining fleet-total emissions but were not included in the calculation of the fleet-wide grams of NO_x per brake horsepower-hour performance factor. Quality review was performed for each reported unit and adjustments were made to irregular data. Such adjustments include but are not limited to corrections to on-road/off-road vehicle designations and the use of surrogate horsepower and model year data based on fleet-aggregated values for units where such data was not reported or otherwise attainable from a previous inventory.

Methodology - Emission Calculations

The fleet performance factor was estimated using California regulatory standard emissions models, OFFROAD2017 and EMFAC2017, developed by CARB. For each unit of GSE, a representative equipment type was identified from either the OFFROAD2017 model (for off-road engine units) or EMFAC2017 model (for on-road engine units) based on Table 2-3 in the Hollywood Burbank AQIP Technical Support Document. Emission factors from the emissions models were queried for the Los Angeles (South Coast) region for calendar year 2020, assuming all adopted rules for exhaust controls. All fuel types, model years, and horsepower bins (OFFROAD2017 only) were selected, and an aggregated speed was assumed (EMFAC2017 only). Emission factors were assigned to each reported unit of GSE based on the GSE category, model year, horsepower, and fuel type of the equipment. For units which were reported without complete horsepower or model year data, the average horsepower or model year for similar equipment in-use at the airport were used.

Emission factors were obtained in units of grams per brake horsepower-hour from OFFROAD2017, and in units of grams per mile from EMFAC2017. For equipment paired to the EMFAC2017 model, an average on-airport speed of 15 miles per hour was multiplied against the model's emission factor and the resulting factor was divided by a reported equipment's respective horsepower to convert to the appropriate grams per brake horsepower-hour unit. The resultant factors, with units of grams per brake horsepower-hour, were weighted by reported equipment horsepower and averaged to determine the NO_x fleet performance factor.

On July 12 2021, it was determined that the publicly available version of CARB's OFFROAD2017 model did not incorporate the engine-standard requirements associated with CARB's 2006 LSI rulemaking and subsequent 2010 amendments. These standards required new LSI equipment certified for sale in the state of California to meet stringent emission standards for NO_x and hydrocarbons which far exceeded previous requirements. As a result, LSI engine emissions calculated using the OFFROAD2017 factors resulted in vastly overpredicted emissions, especially for newer equipment.

SCAQMD was informed of this discrepancy and discussed the issue with CARB on July 14, 2021. Updated emission factors were developed by CARB based on actual historical engine certifications in the state of California since the 2006 rulemaking came into effect. These updated factors were provided initially on July 16, 2021 and were updated on July 23, 2021 with final load factors and deterioration caps provided on August 13, 2021. These finalized LSI factors were used with CARB's ORDAS factors for diesel (which also incorporated the most recent engine standard requirements) were used to develop the emissions inventory.

Although the emission factors were updated, the fundamental calculation methodology was not changed from the methodology used in the 2017 AQIP and MOU. Equipment categories were paired to each reported unit and emission factors were looked up based on the model year, fuel type, horsepower, and equipment category of a given unit. In the calendar year 2017 MOU calculations, base emission factors were back calculated from the OFFROAD2017 model's tons per year per equipment population outputs. The CARB-provided updated base factors were calculated using zero-hour emissions, emission deterioration rates, fuel correction factors, and load factors. Activity factors were derived from the OFFROAD2017 default activity levels for diesel GSE pairings, except where gasoline & natural gas pairings provided a more specific factor (i.e. for air start GSE units, the activity for gasoline & natural gas "air start units" was used in lieu of the diesel "other GSE" activity). For low-use equipment, the activity level was assumed to be 200 hours per year regardless of the equipment type. Per unit emissions were calculated using the following formula and summed across all equipment listed at the airport to determine the fleet-total emissions:

Emissions (grams per year) = **Activity** (hours per year) × **Power Rating** (horsepower) × **Load Factor** (dimensionless) × { **Zero-hour Emission Factor** (grams per brake horsepower-hour) + [**Deterioration Rate** (grams per brake horsepower-hour per hour) × **Equipment Lifetime Cumulative Operational Hours** (hours)] } × **Fuel Correction Factor** (dimensionless)