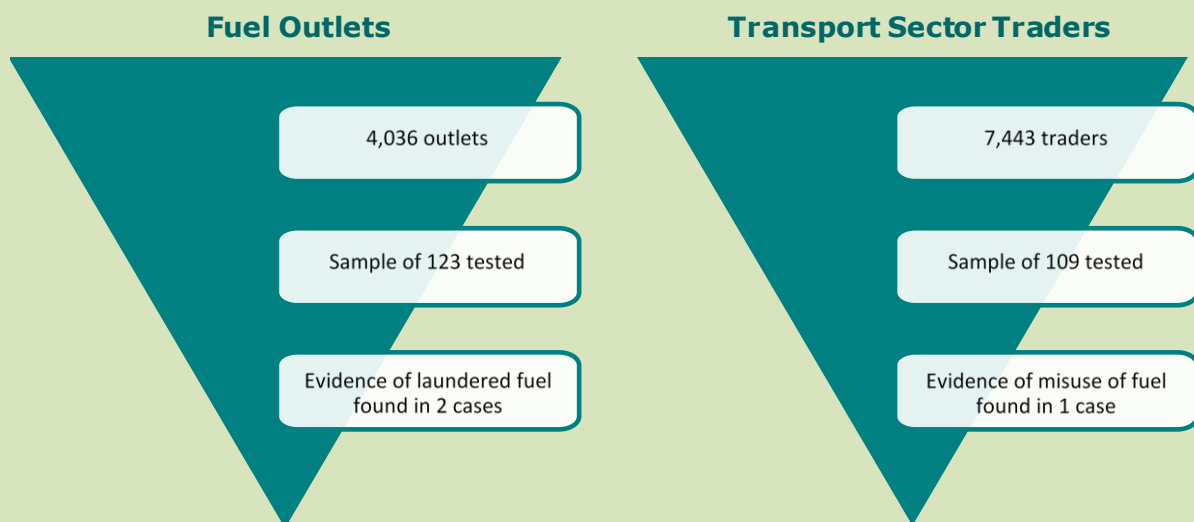# National Oil Random Sampling Programme 2019

Revenue has conducted an annual national sampling programme since 2016 to quantify the extent to which illicit fuel (laundered road diesel) is evidenced among licensed fuel outlets. The programme was extended to include transport sector traders in 2018.

The sampling programme entails taking samples of road diesel from randomly selected groups of licensed fuel outlets (mostly forecourt retailers and fuel distributors) and transport sector traders. The samples are tested for the presence of Accutrace, a colourless marker with chemical properties similar to diesel but resistant to conventional dye-washing laundering methods. Since 2015, Accutrace is required to be added, in addition to the existing mineral oil marker dyes, to any supply of rebated fuel in the Republic of Ireland or the United Kingdom.

The 2019 sampling programme took place between January and July:

Fuel Outlets

- 4,036 outlets
- Sample of 123 tested
- Evidence of laundered fuel found in 2 cases

Transport Sector Traders

- 7,443 traders
- Sample of 109 tested
- Evidence of misuse of fuel found in 1 case

The results represent confirmation of the effectiveness of the various measures introduced by Revenue in recent years to enhance compliance in the fuel trade and among users of diesel. The random sampling programme results do not signify the complete elimination of the illicit trade in fuel. However, they do demonstrate that systematic selling of illicit fuel through retail outlets and its use in the transport sector is negligible.

Revenue
Cáin agus Custaim na hÉireann
Irish Tax and Customs

Rachel Butler
Strategy, Evaluation & Reporting Branch
Revenue Statistics Revenue Research ✉ statistics@revenue.ie
June 2020

1 Background and Objectives

The introduction in 2015 of a new fiscal marker ("Accutrace S10™") for marked mineral oil products was part of a series of initiatives by Revenue to enhance compliance in the fuel trade and combat the trade in illicit fuel.

Accutrace is a colourless marker with chemical properties similar to diesel but resistant to conventional dye-washing laundering methods. Since 31 March 2015, Accutrace is required to be added, in addition to the existing mineral oil marker dyes, to any supply of rebated fuel removed from an oil warehouse in the Republic of Ireland or the United Kingdom.[1]

Following a suitable 'bedding-in' period, since 2016 Revenue has conducted an annual national random sampling programme to quantify the extent to which illicit fuel (e.g., laundered road diesel) is evidenced among licensed fuel outlets. The programme was extended to include transport sector traders in 2018.

The random sampling programme entails taking samples of road diesel from randomly selected licensed fuel outlets (mostly forecourt retailers and fuel distributors) and transport sector traders and testing each sample for the presence of markers.[2]

The field testing is conducted by Revenue's specialist enforcement teams. The project is coordinated by the Excise Working Group in Accountant General's & Strategic Planning Division. Independent case selection and outcome reporting is conducted under the auspices of Strategy, Evaluation & Reporting Branch. Cases are randomly selected and distributed to field test teams (with guidelines for conducting the sampling and reporting templates), with sampling conducted in a coordinated nationwide programme over the first seven months of 2019.

This random sampling exercise, conducted on a national level each year, provides a powerful and robust measure of the scale of the selling and use of laundered fuel in the State. Now in its fourth year, it gives a benchmark against which to compare outcomes over time.[3]

---

[1] The new fiscal marker is a collaboration between Irish Revenue and Her Majesty's Revenue & Customs in the UK.
[2] Revenue enforcement teams use portable analysers (that use micro-gas chromatograph technology) to test for the presence of Accutrace in road diesel. Detection of Accutrace in road diesel, particularly where there is no trace of the other marking agents (i.e., marker dyes), is a clear indication of laundered fuel. However, it should be noted that while a detection of the marker in road fuel empowers Revenue to detain or seize suspect fuel, subsequent prosecutions are only initiated following formal testing and certification of the presence of the marker by the State Laboratory.
[3] Reports on previous years' results from the sampling programmes are published at:
https://www.revenue.ie/en/corporate/information-about-revenue/research/research-reports/excise-and-vat.aspx.

Revenue
Cáin agus Custaim na hÉireann
Irish Tax and Customs

2 Sampling

For the 2019 programme, the sampling focused on two categories of cases: licenced fuel traders and transport sector traders (the 2016 and 2017 programmes only included the former group).

2.1 Licenced Fuel Traders

Any trader producing, selling, dealing in, or keeping for sale or delivery road diesel is legally obliged to hold an Auto Fuel Trader Licence ("AFTL"). The total population of AFTL holders (i.e., those holding a valid licence) was 4,036 at the time of sampling. Of these, a random sample of 130 was selected for sampling (3.2 per cent of the total population). A breakdown of the population and sample by region is shown in Table 1.

### Table 1: Auto Fuel Trader Licence Sample and Population 2019

Region*	AFTL Population		AFTL Random Sample	
	Number	%	Number	%
Border, Midland & West	1,780	44%	54	42%
Dublin	358	9%	12	9%
East & South East	775	19%	26	20%
South West	1,123	28%	38	29%
Total	**4,036**	**100%**	**130**	**100%**

Source: Revenue analysis. *Note: Although Revenue realigned in 2018 to move away from geographic region-based districts, the structure is maintained here for comparative purposes to previous sampling programmes.

Revenue enforcement teams tested for the presence of the marker, Accutrace, by taking samples of diesel in the storage tanks of the randomly selected traders. All sampling took place between 24 January 2019 and 19 February 2019.

The purpose of randomly sampling a large number of traders is to ensure representativeness of all national fuel traders in the sample. There are a number of ways to test representativeness, including by comparing distributions of selected characteristics in the sample and the population. For this exercise, geographical location (Figure 1) is used. On the basis of these distributional comparisons and other analysis, the results show a reasonably close match, which provides confidence that the sample is likely to be representative of all AFTL holders in Ireland.

Revenue
Cáin agus Custaim na hÉireann
Irish Tax and Customs

Figure 1: Auto Fuel Trader Licence Sample and Population by Location 2019
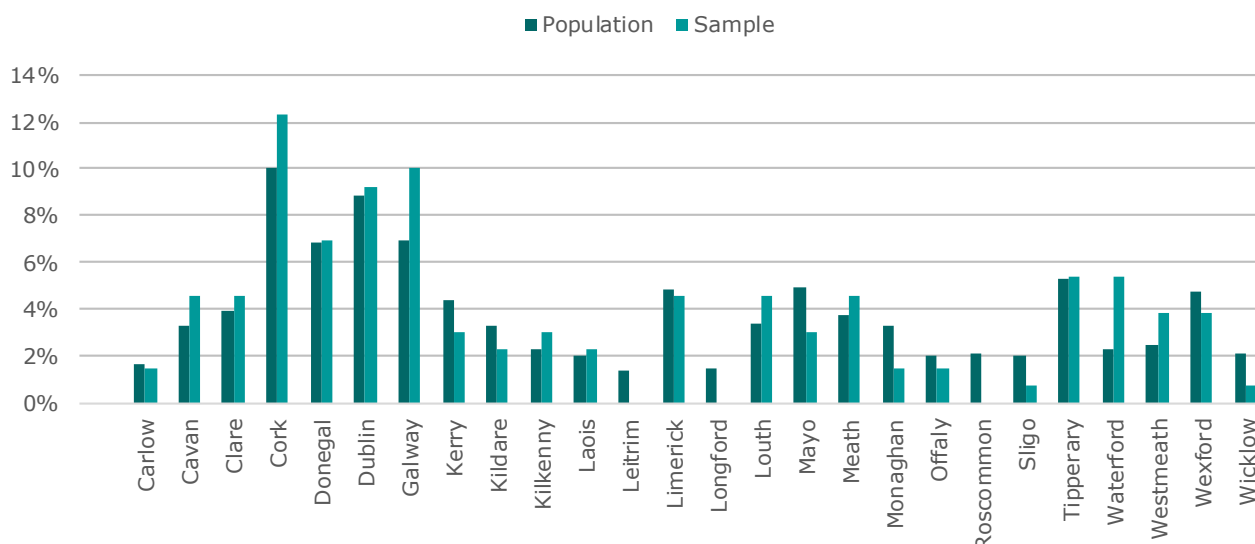
Source: Revenue analysis.

2.2   Transport Sector Traders

Businesses operating in the transport sector are not required to hold a licence for Excise purposes, therefore unlike AFTL holders there is no overall register of cases from which to draw a random sample. Instead, a query is run against Revenue records to identify traders in the transport sector. A number of criteria are used:

- Assigned to one of the following NACE codes: 4931, 4939, 4941 or 4942; or
- Included in their business description the terms: "haulier" or "transport"; or
- Availed of the Diesel Rebate Scheme.

This produced a "population" of 7,443 cases. Of these, a random sample of 127 was selected for sampling (1.7 per cent of the total population). A breakdown of the population and sample by region is shown in Table 2.

Table 2: Transport Sector Traders Sample and Population 2019

Region*	Transport Sector Population		Transport Sector Random Sample	
	Number	%	Number	%
Border, Midland & West	2,459	33	45	35
Dublin	1,624	22	20	16
East & South East	1,580	21	30	24
South West	1,780	24	32	25
Total	**7,443**	**100%**	**127**	**100%**

Source: Revenue analysis. Note: *Although Revenue realigned in 2018 to move away from geographic region-based districts, the structure is maintained here for comparative purposes to previous sampling programmes.

Revenue enforcement teams test for the presence of standard markers. The intent is to sample fuel from the tank of at least one diesel-propelled vehicle owned by each of the randomly selected traders. Along with testing for the presence of Accutrace, the officers test for any identifiable misuse of reduced-rate fuel. To that end the following tests were conducted in all cases sampled:

- A visual check for any dye present;

- A test for the presence of the Euromarker;
- A hydrometer test for the presence of kerosene; and
- A test for the presence of Accutrace.

All sampling took place between 20 May 2019 and 3 July 2019.

Analysis of the sample and population by location (Figure 2) and by other attributes confirms that the sample is likely to be representative of all transport sector traders in Ireland (when the sector is defined as outlined above).

Figure 2: Transport Sector Traders Sample and Population by Location 2019
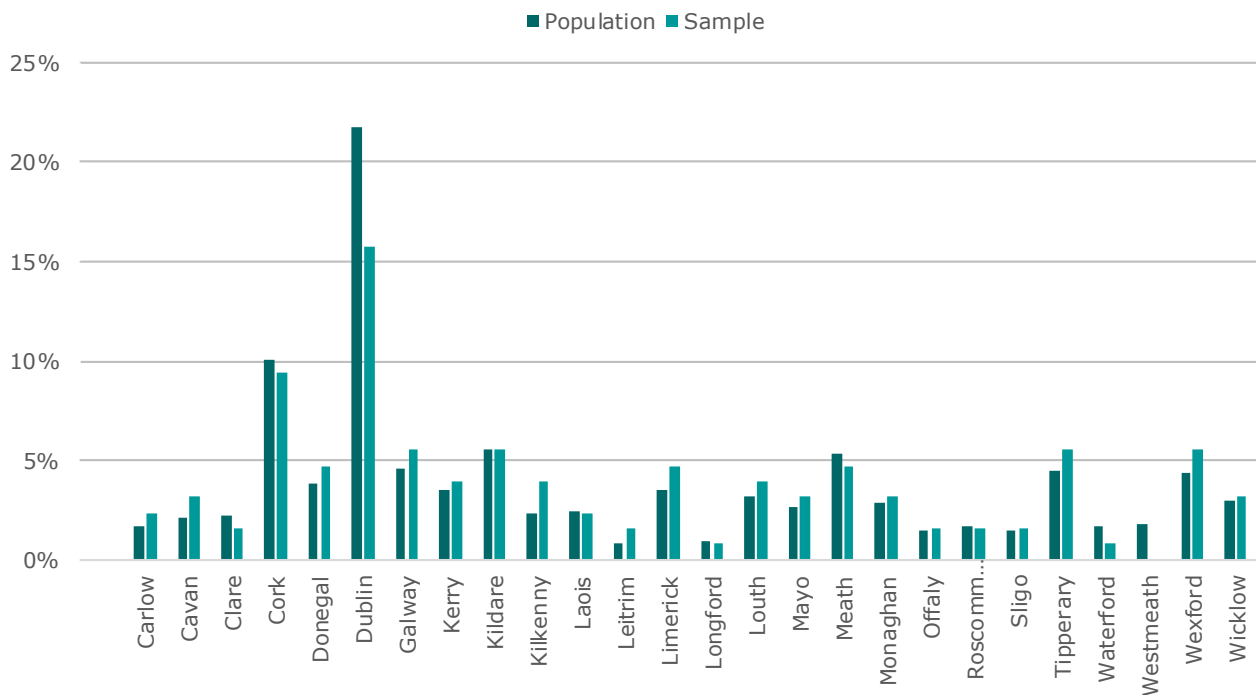
Source: Revenue analysis.

3.1 Licenced Fuel Traders

Of the random sample of 130 licenced fuel traders, 7 cases were unavailable for testing for a number of reasons, including the trader not being involved in selling road diesel or having gone out of business. This results in an effective sample of 123.[4]

Evidence of Accutrace was found in 2 (1.6 per cent) of the 123 licenced fuel traders sampled.

Table 3: Auto Fuel Trader Licence Results 2019

Region	Random Sample	Unavailable for Test	Tested	Evidence of Accutrace
Border, Midland & West	54	4	50	0
Dublin	12	1	11	0
East & South East	26	0	26	2
South West	38	2	36	0
Total	**130**	**7**	**123**	**2**

Source: Revenue analysis.

Transport Sector Traders

Of the random sample of 127 transport sector traders, 18 cases were unavailable for testing for a number of reasons, including the trader having gone out of business or all of the trader's diesel-propelled vehicles being off-site. Officers were requested to re-visit, to a maximum of three visits, those cases where access to a suitable vehicle was not possible on the initial visit. This results in an effective sample of 109.[5]

Evidence of Accutrace or of misuse of reduced-rate fuel was found in 1 (0.92 per cent) of the 109 transport sector traders sampled.

Table 4: Transport Sector Traders Results 2019

Region	Random Sample	Unavailable for Test	Tested	Evidence of Accutrace*
Border, Midland & West	45	4	41	0
Dublin	20	6	14	0
East & South East	30	5	25	1
South West	32	3	29	0
Total	**127**	**18**	**109**	**1**

Source: Revenue analysis. Note: *Includes visual check for any dye present, test for the presence of the Euromarker or hydrometer test for the presence of kerosene.

---

[4] Margin of error on a sample of 123 with 2 findings is in the range 0.4% to 5.7% (at a 95% confidence interval).
[5] Margin of error on a sample of 109 with 1 finding is in the range 0.2% to 5.0% (at a 95% confidence interval).

4   Discussion

This is the fourth year of Revenue's national random sampling programme in fuel. The first two years focused on licenced fuel traders. The programme was extended to include businesses in the transport sector in 2018. This was done to widen the testing to include a group that are important users of diesel and who could stand to benefit significantly in financial terms from the illegal use of reduced-rate fuel.

Evidence of laundered fuel has been found in 2 licenced fuel traders in 2019. In 2019, the second year of sampling transport sector traders, evidence of misuse of reduced-rate fuel was found in 1 trader. Revenue has pursued appropriate follow up action in all cases where necessary.

The results from all four years of the sampling programme are summarised in Table 5.

Table 5: Random Sampling Programmes 2016-2019

Region	2016		2017		2018*		2019*	
	Traders Tested	Evidence of Accutrace	Traders Tested	Evidence of Accutrace	Traders Tested	Evidence of Accutrace**	Traders Tested	Evidence of Accutrace**
Border, Midland & West	75	0	85	0	66	0	91	0
Dublin	17	0	18	0	30	1	25	0
East & South East	58	0	68	0	64	2	51	3
South West	47	0	41	0	38	0	65	0
Total	**197**	**0**	**212**	**0**	**198**	**3**	**232**	**3**

Source: Revenue analysis. Notes: * 2019 and 2018 results include both licence fuel traders and transport sector traders; ** Includes visual check for any dye present, test for the presence of the Euromarker or hydrometer test for the presence of kerosene.

These random sampling exercises, conducted on a national level, provide a powerful and robust measurement of the scale of the selling and use of laundered fuel in the State. The samples, nearly one in twenty fuel selling outlets and around one in fifty users in the transport sector in 2019, are significantly larger than required to provide robust statistical results that can be extrapolated to the full population.

The results represent an authoritative confirmation of the effectiveness of the various measures introduced by Revenue in recent years to enhance compliance in the fuel trade and among users of diesel. The random sampling programme results do not signify the complete elimination of the illicit trade in fuel. However, they do demonstrate that systematic selling of illicit fuel through retail outlets and its use in the transport sector is negligible and close to being fully eliminated.

Revenue
Cáin agus Custaim na hÉireann
Irish Tax and Customs